RAP Executive Summary	ID No.: SWR No. 30516
	Report Date: May 31, 2019

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
Response Action Plan
Cover Page

Regulatory ID number (Solid waste registration number, VCP ID number, etc) **SWR No. 30516**
check one: **X** Initial submittal for this on-site property ___ Subsequent submittal for this on-site property
Report date: **May 31, 2019** TCEQ Region No.: **4**

TCEQ Program (check one)

- [X] Corrective Action (Mail Code 127)
- [ ] Voluntary Cleanup Program (Mail Code 221)
- [ ] RPR Section (Mail Code 137)
- [ ] Superfund PRP Lead (Mail Code 143)
- [ ] Municipal Solid Waste Permits (Mail Code 124)

On-Site Property Information

On-Site Property Name: **Exide Technologies Frisco Recycling Center, Former Operating Plant**
Street no. **7471** Pre dir: ___ Street name **Old Fifth** Street type: **Street** Post dir: ___
City: **Frisco** County: **Collin** County Code: **43** Zip: **75034-5047**
Nearest street intersection or location description: **Intersection of Former Eagan Way/South Fifth Street and Parkwood Boulevard**

Latitude: **Degrees, Minutes, Seconds** OR ~~Decimal Degrees~~ (circle one) North **33^{0}08'30.21''**
Longitude: **Degrees, Minutes, Seconds** OR ~~Decimal Degrees~~ (circle one) West **96^{0}50'04.68''**

Off-Site Affected Property Information

Off-Site Affected Property Name: **Downstream Stewart Creek Property and Parkwood Parcel (see table below)**
Physical Address:
Street no. ___ Pre dir: ___ Street name ___ Street type: ___ Post dir: ___
City: ___ County: ___ County Code: ___ Zip: ___

[ ] Check if no off-site properties affected

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Off-Site Affected Property Information									
Property ID	**Owner Name**	**MAILING ADDRESS**	**CITY**	**STATE**	**ZIP**	**COUNTY**	**COUNTY CODE**	**SITUS**	**LEGAL_DESC (PHYSICAL ADDRESS)**
957548	Burlington Northern Santa Fe RR Co Property Tax Department	PO BOX 961089, PROPERTY TAX DEPARTMENT	FORT WORTH	TX	76161	Collin	43	FRISCO	ABS A0618 L H MCNIEL SURVEY, TRACT 10, 2.284 ACRES
957575	City of Frisco	6101 FRISCO SQUARE BLVD	FRISCO	TX	75034	Collin	43	8234 EAGAN WAY FRISCO TX 75034	ABS A0618 L H MCNIEL SURVEY, TRACT 12, 4.455 ACRES
2737101	City of Frisco	6101 FRISCO SQUARE BLVD	FRISCO	TX	75034	Collin	43	FRONTAGE RD FRISCO TX 75034	STEWART CREEK GENESIS BUSINESS CENTER (CFR), BLK A, LOT 3R; (REPLAT)
2665830	City of Frisco	6101 FRISCO SQUARE BLVD	FRISCO	TX	75034	Collin	43	DALLAS PKWY FRISCO TX 75034	BEAL AEROSPACE ADDITION, BLK 1, LOT 2R; REPLAT
2592405	City of Frisco	6101 FRISCO SQUARE BLVD	FRISCO	TX	75034	Collin	43	FRISCO	ABS A1089 CLAYTON ROGERS SURVEY, TRACT 1 SPLIT BY COUNTY LINE, 17.6782 ACRES
43710	City of Frisco	6101 FRISCO SQUARE BLVD	FRISCO	TX	75034	Denton	61	LEGACY DR TX 75034	A1094A ROGERS, TR 2, 156.3044 ACRES, OLD DCAD TR #2
43703	Frisco Community Development Corp (City of Frisco)	6101 FRISCO SQUARE BLVD	FRISCO	TX	75034	Denton	61	DALLAS PKWY TX 75034	A1094A ROGERS, TR 1, 25.452 ACRES, OLD DCAD TR #1
253754	City of Frisco	6101 FRISCO SQUARE BLVD	FRISCO	TX	75034	Denton	61	LEGACY DR TX 75033	A1094A ROGERS, TR 1A, 49.9692 ACRES

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Property ID	**Owner Name**	**MAILING ADDRESS**	**CITY**	**STATE**	**ZIP**	**COUNTY**	**COUNTY CODE**	**SITUS**	**LEGAL_DESC (PHYSICAL ADDRESS)**
682085	City of Frisco	6101 FRISCO SQUARE BLVD	FRISCO	TX	75034	Denton	61		STONEBROOK AND FIGHTING EAGLES BLK A LOT 1
621602	City of Frisco	6101 FRISCO SQUARE BLVD	FRISCO	TX	75034	Denton	61		LEGACY CHRISTIAN ACADEMY BLK A LOT 1R(NW PT)
647861	City of Frisco	6101 FRISCO SQUARE BLVD	FRISCO	TX	75034	Denton	61		A0980A OGDEN, TR 1A(PT ROW), ACRES 3.983
43646	City of Frisco	6101 FRISCO SQUARE BLVD	FRISCO	TX	75034	Denton	61	STONEBROOK PKWY FRISCO TX 75034	A0980A OGDEN, TR 1, 23.229 ACRES
43650	City of Frisco	6101 FRISCO SQUARE BLVD	FRISCO	TX	75034	Denton	61		A0980A OGDEN, TR 2,3,4, 20.103 ACRES
223507	City of Frisco	6101 FRISCO SQUARE BLVD	FRISCO	TX	75034	Denton	61	5011 LEGACY DR TX 75034	HERITAGE GREEN PH 1 BLK J LOT 20 (PARK)
43657	City of Frisco	6101 FRISCO SQUARE BLVD	FRISCO	TX	75034	Denton	61		A0980A OGDEN, TR 5, 41.338 ACRES
216774	City of Frisco	6101 FRISCO SQUARE BLVD	FRISCO	TX	75034	Denton	61		A0980A OGDEN, TR 6B(PT), 17.1464 ACRES
216773	City of Frisco	6101 FRISCO SQUARE BLVD	FRISCO	TX	75034	Denton	61	FRISCO TX 75034	A0980A OGDEN, TR 6A, 6.74 ACRES
619308	City of Frisco	6101 FRISCO SQUARE BLVD	FRISCO	TX	75034	Denton	61	LEBANON RD FRISCO TX 75034	SOUTHWEST COMMUNITY PARK ADDN BLK A LOT 2(PT)
157208	City of Frisco	6101 FRISCO SQUARE BLVD	FRISCO	TX	75034	Denton	61	5100 4TH ARMY DR TX	A0286A COLLINS, TR 3A(PT), 18.83 ACRES
699524	Oncor Electric Deliver Company	PO BOX 139100	DALLAS	TX	75313	Denton	61		A0980A OGDEN, TR 6B(PT)(1), 4.565 ACRES

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Off-Site Affected Property Information									
Property ID	**Owner Name**	**MAILING ADDRESS**	**CITY**	**STATE**	**ZIP**	**COUNTY**	**COUNTY CODE**	**SITUS**	**LEGAL_DESC (PHYSICAL ADDRESS)**
216775	City of Frisco	6101 FRISCO SQUARE BLVD	FRISCO	TX	75034	Denton	61		A0286A COLLINS, TR 3C(PT), 38.4511 ACRES
660185	City of Frisco	6101 FRISCO SQUARE BLVD	FRISCO	TX	75034	Denton	61		A0286A COLLINS, TR 3C(PT)(ROW2), 0.401 ACRES
660183	City of Frisco	6101 FRISCO SQUARE BLVD	FRISCO	TX	75034	Denton	61		A0286A COLLINS, TR 3A(PT)(ROW), 0.21 ACRES
43705	City of Frisco	6101 FRISCO SQUARE BLVD	FRISCO	TX	75034	Denton	61	TX	A1394A WHITE, TR 4, 5.43 ACRES, OLD DCAD TR #2 & 3
0	USACE, Lewisville/Ray Roberts Lakes	1801 North Mill Street	LEWISVILLE	TX	75057	Denton	61		N/A
611636	GGH Kingswood Lots LLC	15400 Knoll Trail Dr Ste 230	DALLAS	TX	75248	Denton	61	450 ROCK CREEK PKWY TX 75034	THE HILLS OF KINGSWOOD PH 1 BLK A LOT A-4 (COMMON AREA)
655189	Meritage Homes of Texas LLC	8840 Cypress Waters Blvd Ste 100	DALLAS	TX	75019	Denton	61		KINGSWOOD VILLAGE PHASE 2 BLK X LOT 2
676461	Meritage Homes of Texas LLC	8840 Cypress Waters Blvd Ste 100	DALLAS	TX	75019	Denton	61	4477 HARTEBEEST TRL	KINGSWOOD VILLAGE PHASE 3 BLK X LOT 7

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Contact Person Information and Acknowledgement

Person (or company) Name: **Exide Technologies**

Contact Person: **Brad Weaver** Title: **Director, Remediation**

Mailing Address: **P.O. Box 250**

City: **Frisco** State: **TX** Zip: **75034** E-mail address **brad.weaver@exide.com**

Phone: **(927) 335-2121** Fax: **(972) 377-2707**

information to the executive director or to parties who are required to be provided information under this chapter which they know or reasonably should have known to be false or intentionally misleading, or fail to submit available information which is critical to the understanding of the matter at hand or to the basis of critical decisions which reasonably would have been influenced by that information. Violation of this rule may subject a person to the imposition of civil, criminal, or administrative penalties.

Signature of Person Name, print: Brad Weaver Date: 5-31-19

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Use this worksheet to summarize the report. Be sure to complete and submit the Checklist for Report Completeness. **Attach a chronology of activities associated with the affected property (Attached, see page 15).**

Briefly describe the affected property and PCLE zones, the conclusions from the assessment activities, identify any affected or threatened receptors, and describe any other major considerations taken into account when developing this response action plan. If any portion of the response action is necessitated due to an aesthetic or nuisance condition, identify the nature of that condition and identify that portion of the response action proposed to address it. If any media that contains a PCLE zone is not addressed in this RAP, provide justification.

The Exide Technologies (Exide) Former Operating Plant (FOP) is a former oxide manufacturing, battery recycling and secondary lead smelting facility located at 7471 Old 5th Street in Frisco, Collin County, Texas. The FOP together with the surrounding undeveloped buffer property (UBP) formerly owned by Exide were approximately 257 acres and were referred to as the Frisco Recycling Center (FRC). The surrounding buffer property was sold to the City of Frisco Economic Development Corp and City of Frisco Community Development Corp in 2019. The FOP currently encompasses approximately 97 acres. The FOP was developed for industrial purposes in approximately 1964 when Bers Metals constructed the first FOP facility and began operations to produce lead oxide (Lake, 1991). The FOP shut down operations in 2012 and demolished structures on the FOP pursuant to a settlement agreement with the City of Frisco. In 2018, Exide completed field work associated with the remediation of the former UBP under TCEQ's Voluntary Cleanup Program, and submitted the associated Response Action Completion Report (RACR) to TCEQ on July 31, 2018, which is a separate project from what is addressed here. The former UBP RACR was approved by the TCEQ and a certificate of completion was issued on February 27, 2019.

This Response Action Plan (RAP) addresses remediation activities Exide proposes to conduct on the FOP, including the FOP's former operational areas, two closed pre-RCRA landfills (North Disposal Area [NDA] and South Disposal Area [SDA]), one closed Class 2 landfill (the Slag Landfill), one active Corrective Action Management Unit located on the northern portion of the FOP (North CAMU), one proposed CAMU (the Remediation Consolidation Area, or RCA) and other ancillary facilities (Figure 1A-1). This RAP also addresses response action activities for removal of affected media in Stewart Creek at the FOP and downstream of the FOP (Downstream Stewart Creek) and the Parkwood Parcel adjacent to the former UBP and FOP. Stewart Creek is approximately 8 miles long running from east of the FOP to the west of the FOP, ultimately flowing into Lake Lewisville. A portion of Stewart Creek runs through the central portion of the FOP from east to west along the south side of the former production area. The Parkwood Parcel is a parcel of land that has been dedicated to the City of Frisco as public right-of-way. It is connected to the FOP and also located between portions of the former Exide UBP. Parkwood Boulevard runs through the Parkwood Parcel. The FOP, Downstream Stewart Creek and Parkwood Parcel together are considered the "Site" for the purposes of this Response Action Plan.

Land surrounding the properties immediately adjacent to the FOP includes both residential and commercial-industrial properties. Based on discussions with Exide, the current and anticipated future land use of the FOP is commercial-industrial or, with TCEQ's concurrence, potentially recreational. The Parkwood Parcel is used as commercial-industrial (as it is developed with Parkwood Boulevard) and land use is not anticipated to change. Properties immediately surrounding Downstream Stewart Creek between the FOP and Lake Lewisville include residential, undeveloped, agricultural, and commercial-industrial properties. Most of the property along Downstream Stewart Creek between the FOP and the property owned by the United States Army Corps of Engineers (USACE) and by the City of Frisco. Stewart Creek flows through the planned Grand Park area to the west of Dallas North Tollway. Grand Park is a 320-acre property owned by the City of Frisco which is currently unused pasture or wooded floodplain (CJI, 2014). Specific

land use along Stewart Creek is subject to change but is expected to remain a combination of residential, undeveloped, agricultural, recreational, or commercial-industrial properties.

Exide has conducted an extensive evaluation of the conditions on the FOP, the Parkwood Parcel, and in Downstream Stewart Creek, and a summary of those conditions is provided below. Exide's corresponding response actions are designed to protect human health and the environment using proven methods and site-specific design and implementation.

The FOP and Parkwood Parcel will be remediated to commercial/industrial standards, waste will remain consolidated on-site in capped units, and an appropriate restrictive covenant will be recorded to support the long-term protectiveness of the remedy. Downstream Stewart Creek will be remediated to residential standards and no use restrictions, institutional controls (such as restrictive covenants), or physical controls will be required on those properties.

Eight soil affected property areas and one sediment affected property area were identified at the FOP. One soil affected property was identified on the Parkwood Parcel. Each affected property area was delineated using Residential Assessment Level (RALs) or Protective Concentration Limit (PCLs) (for the Parkwood Parcel) established for Site chemicals of concern (COCs). Sample data presented in the Site Investigation Report (SIR), Affected Property Assessment Report (APAR), 2015 APAR Supplement, 2014 Stewart Creek Interim Action Report, 2017 Stewart Creek SLERA, 2018 Deep Groundwater Pre-Design Investigation, and 2018 Parkwood Parcel Investigation Report indicate that soil, groundwater, and sediment are the affected media at the Site as described below.

- **Lead, cadmium, arsenic, antimony, and selenium exceeded critical Protective Concentration Limit (PCLs) in surface and subsurface soil samples from the FOP and Parkwood Parcel (including surface soils located on existing capped areas), therefore, in accordance with Texas Risk Reduction Program (TRRP) requirements, these metals are identified as the primary COCs to be addressed in the soil response action. In most locations, lead exceedances were co-located with exceedances of the other COC metals. The following comprise the affected properties for soil (Affected Properties No. 1 through 7 and No. 9 and No. 10).**

    - **Affected Property No. 1 (North Area) is located north of the North Tributary and south of the North CAMU and includes surface soils containing lead, arsenic, cadmium, selenium and antimony above critical PCLs.**

    - **Affected Property No. 2 (Production Area) encompasses the majority of the former production area, the Slag Landfill, and the NDA. The former UBP is located east of Affected Property No. 2 (PBW, 2014), where the affected property and Protective Concentration Limit Exceedance (PCLE) Zone for the FOP extend to the Site boundary. The former UBP is not part of the Site covered by this RAP. The UBP has been remediated under the TCEQ Voluntary Cleanup Program (VCP) as a separate, stand-alone project from this RAP and has since achieved regulatory closure. Based on their historical use, the entire Slag Landfill and NDA were included within the affected property zone. In addition to the metals detected above critical PCLs in surface and subsurface soil, benzene was detected at 2013-STB-6 (0.0406 mg/kg compared to a RAL of 0.026 mg/kg) in Affected Property No. 2. Benzene did not exceed its RAL in any other samples. Benzene was horizontally delineated in 2015 by 2015-STB-6A, 6B and 6C, but the original location of 2013-STB-6 was inaccessible at the time of the field investigations for additional vertical delineation. No other VOC or SVOC exceedances were detected except for bis(2-chloroethyl) ether detected in the 0-0.5 ft bgs sample at 2014-FFTA-08 and methylene chloride detected in the duplicate sample for 2014-NDA-7 (0-0.5), both are located within Affected Property No. 2. Neither of these compounds were detected in the associated deeper samples.**

- **Affected Property No. 3 (South Area) is located on the south side of the FOP property, south of Stewart Creek (Figure 1B.1). Exceedances of the soil critical PCL for lead were detected in soil samples from the vicinity of the SDA, the wooded area east of the SDA, and the former Shooting Range Berm and South Berm. Arsenic and antimony also exceeded their respective PCLs in several locations. Based on its historical use, the entire SDA was included within this affected property boundary.**

- **Affected Property No. 4 (Crystallizer Way) is a portion of the road (Crystallizer Way) and adjacent ditch containing lead above the critical PCL. Crystallizer Way is a road extending west from Eagan Drive, past the storm water retention pond to the west boundary of the FOP. Affected Property No. 4 includes an approximately 500-foot-long section of the FOP generally to the south of Crystallizer Way, including 2014-CUFT-5B-A at the east end and 2014-CUFT-16 at the west end. On November 30, 2016 Golder collected five surficial soil samples and one duplicate sample in the area of the former Crystallization Unit following its demolition in November 2016. Where concrete was not present, samples were collected from 0-0.5 feet bgs. Where concrete was present, the concrete was cored and samples were collected 0.5-1 feet below ground surface, below the concrete. Samples were analyzed for sulfate, antimony, arsenic, cadmium, lead, and selenium. Analytical results indicated detections did not exceed the RALs. A summary table, analytical results, figure, boring logs and Data Usability Summary (DUS) are presented in Appendix 2.**

- **Affected Property No. 5 (North CAMU Area) is an area to the west of the North CAMU with one small area extending onto the final cap of the North CAMU (near the southwest corner of the unit). Surface soils (including a portion of the unit cap) in this area exceed RALs for lead, antimony, selenium, and/or arsenic.**

- **Affected Property No. 6 (Lake Parcel North) includes one sample location (F-5) in the north part of the Lake Parcel where the lead concentration (367 mg/kg) exceeded the RAL in the 0 to 3-inch bgs depth interval (Figure 4A).**

- **Affected Property No. 7 (North Tributary at Boundary) includes one soil sample location exceeding the lead RAL (2014-NT-3) located between the North Tributary and the M Tract of the former UBP.**

- **Affected Property No. 9 (Entrance driveway to the Crystallization Unit) is located south of Stewart Creek near the entrance driveway to the former Crystallization Unit. Exceedances of the soil RAL for lead were detected in surficial soil.**

- **Affected Property No. 10 (Parkwood Parcel) is located on the Parkwood Parcel to the south of the North Tributary. This affected property was identified based on the presence lead detected above the applicable PCL in samples collected along the boundary of the Parkwood Parcel during UBP remediation and during the Parkwood Parcel investigation (included in Appendix 3).**

- **In addition, an assessment on the Lake Parcel (outside of Affected Property No. 6) on the western portion of the FOP has been performed and lead detected in surface soil between 250 mg/kg and the Residential Assessment Level (RAL) of 274.5 mg/kg was delineated at the request of the City of Frisco. The Frisco Community Development Corporation has a contractual right to acquire this parcel. No response actions under this RAP are included for this area. Voluntary remediation of this area to achieve residential standards or lower, if performed,**

will be done using similar procedures as outlined in this RAP, based on discussions between Exide and the City of Frisco.

- **Sediment samples collected in segments of Stewart Creek on the FOP and Downstream Stewart Creek exceeded the critical PCLs for lead, cadmium and arsenic. In total, Golder has collected 1,402 sediment samples (including 125 duplicates) downstream of the FOP between 2014 and 2017. 144 samples at 143 locations exceeded the arsenic PCL. 102 samples at 98 locations exceeded the cadmium PCL. 120 samples at 114 locations exceeded the lead PCL. In addition, Golder collected 11 samples (including one duplicate) in Stewart Creek upstream of the FOP, ten samples in a tributary to Stewart Creek south of the FOP, and ten samples in the Cottonwood Branch; of those 31 samples, two samples exceeded the arsenic PCL. Many of the PCL exceedances were co-located. These areas on and downstream of the FOP comprise the affected property for sediment (Affected Property No. 8).**
    - **2014 APAR Sampling - 71 sediment samples (including eight duplicates) were collected in off-site Stewart Creek between January and April 2014. 11 samples were collected upstream of the FOP, and 60 samples were collected downstream of the FOP between the railroad immediately to the west of the FOP and Lake Lewisville. One of the 11 upstream samples and nine of the 60 downstream samples exceeded the arsenic PCL of 39.7 ppm. Three downstream samples exceeded the cadmium PCL. No samples exceeded the lead PCL.**
    - **2014 Interim Action Sampling - 815 sediment/soil samples (including 75 duplicates) were collected in Stewart Creek at and downstream of the FOP in May and June 2014. Samples extended as far as Lebanon Road. 78 samples at 77 separate locations exceeded the arsenic PCL of 39.7 ppm. Lead concentrations detected in sediment at 119 sample locations exceeded the lead PCL; concentrations of lead were highest near the FOP and/or in depositional areas downstream of the FOP. 71 samples at 68 sample locations exceeded the cadmium PCL.**
    - **2016 Interim Action Sampling - Golder collected 449 samples (including 41 duplicates) between Stonebrook Parkway and Lake Lewisville. 56 samples at 55 separate locations exceeded the arsenic PCL of 39.7 ppm. One sample exceeded the lead PCL. 28 samples at 27 separate locations exceeded the cadmium PCL.**
    - **2016 SSERA Sampling - 14 sediment samples were collected from Stewart Creek in May 2016 between Dallas North Tollway and Lebanon Road as part of the Site-Specific Ecological Risk Assessment for arsenic. Ten samples each were also collected along a tributary of Stewart Creek to the south of the Site and along the Cottonwood Branch, a separate creek to the northwest of the Site. 50 additional subset samples – 10 samples each at locations 2016-SSERA-SED-07, 2016-SSERA-SED-11, 2016-SSERA-SED-13, 2016-SSERA-SED-15, and 2016-SSERA-SED-17 were also analyzed in August 2016. None of the SSERA samples collected in Stewart Creek exceeded the arsenic, cadmium, or lead PCLs. One sample collected in the Stewart Creek tributary exceeded the arsenic PCL of 39.7 ppm. There were no other exceedances in samples collected in the two reference creeks.**
    - **2017 USACE Sampling - Golder collected 14 sediment samples (including two duplicates) from Stewart Creek on United States Army Corp of Engineers (USACE) property in order to a) further assess metals concentrations in locations which had not previously been sampled and b) to confirm concentrations of arsenic in sediment at locations 2014-SED-051, 2014-SED-053, and 2016-IASED-003, where arsenic had previously been detected above the PCL. The sediment samples were analyzed for arsenic, cadmium, and lead. 2017-SED-009, which was not a**

confirmation sample, exceeded the PCL for arsenic. No other PCL exceedances were detected in either the new locations or the confirmation samples.

- **In addition to the areas described above, two portions of the Former Stewart Creek Wastewater Treatment Plant (FSCWWTP) property are also included in this RAP (The North Area and MW-10 Area). The North Area was investigated and remediated in 2011 and 2012. Battery case fragments were observed on the ground surface in the area of MW-10 at the time of the MW-10 well installation in 2016.**

    - **In June 2011, a TCEQ field inspector discovered suspected battery chips along the northernmost segment of the property (i.e., north of Stewart Creek) during an inspection associated with the Exide FOP. The TCEQ collected samples of the suspected battery chips for evaluation. The source of the chips was attributed to the use of the chips for the surface pavement of an agricultural road that coursed over the property line and encompassed part of the northern property adjacent to the Site, the Museum of the American Railroad Site (MARR). An APAR dated October 25, 2011, addresses the affected property on the MARR site (SWG, 2011). PBW subsequently collected and analyzed additional samples of the chips, surrounding soil and underlying soil during August 2011. The samples did not exceed Texas Risk Reduction Program (TRRP) critical Tier 1 and Tier 2 PCLs for soil, assuming residential land use, Class 3 groundwater and a 0.5 acre or smaller source area. However, the City of Frisco and Exide agreed on a 250 mg/kg cleanup level for lead for the FSCWWTP. Some of the August 2011 samples exceeded the agreed cleanup level, so PBW collected additional surface soil samples during October 2011 to further delineate impacts vertically and horizontally. PBW also installed a series of shallow test pits in the area to confirm that the visual extent of chips did not appear to extend deeper than approximately six inches bgs. The area was remediated in accordance with the FSCWWTP-North Area SIN dated March 26, 2012 (completed under Remedy Standard A). Information related to the investigation and remediation of the FSCWWTP-North Area is included in Appendix 2 and will be included in the Response Action Completion Report for the Site.**

    - **A letter from TCEQ dated December 17, 2013 noted that battery case fragments "remaining in surface soils in the north wooded area north of Stewart Creek, along the north property boundary" should be removed as the fragments could "serve as future sources of COCs into soils, and if transported to Stewart Creek, to sediments and surface water and therefore should be removed." Exide and the City of Frisco agreed that this area of the FSCWWTP would be removed from VCP 2122 (remediated in 2017) and included in this response action for the FOP, which includes Stewart Creek. This area is included as part of the Downstream Stewart Creek Property. A copy of this letter is provided in Appendix 2.**

    - **In March 2016, field personnel observed battery case fragments on the ground surface near MW-10, which was installed to the south of Stewart Creek. There were no battery case fragments observed in subsurface soil. Exide and the City of Frisco agreed that this area would be removed from VCP 2122 (remediated in 2017) and included in this response action for the FOP, which includes Stewart Creek. This area is included as part of the Downstream Stewart Creek Property.**

- **Groundwater beneath soil Affected Property No. 2, including water observed in both shallower and deeper transmissive zones within the upper groundwater bearing unit (UGWBU), is impacted with lead, cadmium, arsenic and/or antimony. Groundwater near the north CAMU is impacted with arsenic and selenium. The PCLE zones for groundwater are described below.**

- **Former Production Area - Historic sampling results for the FOP (from groundwater samples collected in 2014) showed localized impacts to groundwater present beneath the concrete slab of the FOP (at MW-32, MW-33 and MW-34 for lead and/or cadmium) and at MW-46 (screened in the deeper transmissive zone). The shallow impacted water is believed to be storm water that has migrated between cracks and joints of the concrete in the former operations area. Current storm water control features within the former production area include a concrete slab cover located throughout the former production area, the Flood Wall located between the former production area and Stewart Creek (which acts as a flood wall/retaining wall), and a French Drain System (FDS) located on the facility side of the Flood Wall that was constructed as an interim measure to address seepage of perched water in the former operations area through the Flood Wall. In May-June 2018, Exide conducted a Deep Groundwater Pre-Design Investigation (DGW PDI) in order to gather additional hydrogeological information regarding transmissive zones at the Site for the implementation of a groundwater protection element for the RCA and to address the potential for contaminant migration from the RCA to groundwater and the potential for discharge of contaminated groundwater to Stewart Creek. During the DGW PDI, eleven deep and two shallow groundwater monitoring wells were installed at the FOP. The newly installed monitoring wells and select existing monitoring wells were sampled for geochemistry and design parameters (for the implementation of a groundwater remedy) and COC metals (total and dissolved): antimony, arsenic, cadmium, selenium and lead. Results of the DGW PDI indicated exceedances of the critical PCLs for antimony (0.006 mg/L), arsenic (0.01 mg/L), cadmium (0.005 mg/L [total] and 0.0017 mg/L [dissolved]), and lead (0.015 mg/L). A funnel and gate permeable reactive barrier (PRB) wall installed across both shallow and deeper transmissive zones in the UGWBU is proposed to address the potential for groundwater migration to Stewart Creek.**

- **North CAMU Area - LMW-22 was installed as a downgradient well for the North CAMU. Between the time that quarterly monitoring from the well was initiated in June 2014 and the most recent sampling event (May 2018) total and dissolved arsenic have periodically been detected above the PCL of 0.01 mg/L at concentrations ranging from 0.00197 mg/L to 0.0193 total arsenic and 0.00178 mg/L to 0.0203 mg/L dissolved arsenic. In accordance with the Groundwater Monitoring Plan for the North CAMU, an action plan to further assess the arsenic exceedance in the vicinity and downgradient of LMW-22 was implemented. In May 2017, a new groundwater monitoring well (MW-47) between the existing LMW-22 and MW-41 located farther to the southwest was installed and sampled and MW-41 was added to the existing groundwater sampling program for the North CAMU. To date, arsenic was not detected above the PCL in MW-41 or MW-47. Arsenic was last detected above the PCL in LMW-22 in the August 2017 sampling event and confirmed with the resampling event in September 2017. LMW-9 was installed as a crossgradient well for the North CAMU. Between the time that quarterly monitoring was initiated in June 2014 and the last sampling event before the well collapsed, October 2015, total and dissolved selenium were detected above the applicable PCL (0.05 mg/L) at concentrations ranging from 0.486 to 1.07 mg/L for total selenium and 0.481 mg/L to 1.08 mg/L dissolved selenium, when water was present (there were four sampling events where insufficient volume of water was present for sampling). As described in the APAR, the Eagle Ford Shale is known to contain gypsum. Selenium commonly is an impurity in gypsum, where selenium replaces calcium in the crystal matrix, potentially serving as a natural source of selenium. It is likely that the selenium observed in this well was attributed to naturally occurring gypsum present in the subsurface. A replacement well, LMW-9R, was installed in June 2016 and has been sampled on a quarterly basis since that time. There have been no exceedances of the PCL for selenium in the new well. Based on the relatively small extent of the potential arsenic and**

selenium exceedances and the fact that the PCLE zones do not appear to be migrating or expanding, natural attenuation will be used under Remedy Standard B as a physical control remedy. This will be done to ensure that arsenic and selenium concentrations at the downgradient Alternate Points of Exposure (APOEs) at the limits of the Plume Management Zone (PMZ) are contained in accordance with §350.37(l) for Class 2 groundwater. If arsenic or selenium is detected in exceedance of the Site-specific Attenuation Action Levels (AAL) at the Attenuation Monitoring Points (AMPs) or the PCLs in future sampling events, additional evaluation and/or response actions will be proposed and discussed with TCEQ.

- **All areas where slag or battery case fragments were observed outside of the designated on-site disposal areas (i.e., the NDA, SDA, Slag Landfill, and North CAMU), including downstream portions of Stewart Creek, are also included within the PCLE zones. This includes battery case fragments in surface soil identified on the FSCWWTP property (MW-10 Area and the North Area).**

- **Due to the potential for dust generation in connection with soil and sediment remediation and the levels of contamination in soil and sediment, dust suppression will be implemented and lead and cadmium in airborne dust will monitored during the soil and sediment response actions.**

This Response Action Plan is being submitted as an Attachment to the May 2019 supplement to the industrial and hazardous waste permit renewal application for the Site (RCRA Permit Renewal Application). Some required components of this Response Action Plan are included in other attachments to the RCRA Permit Renewal Application (such as the Air Monitoring Plan, Dust Control Plan, and Post-Response Action Care Plans). References to the appropriate sections of the RCRA Permit Renewal Application are included where appropriate.

What is the selected remedy standard for this affected property? **X** A **X** B

Remedy Standard A is selected for Downstream Stewart Creek, portions of the FSCWWTP included in this RAP, and portions of the FOP where soil removal is proposed. Remedy Standard B is selected for the remaining portions FOP and the Parkwood Parcel.

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List all media that contains a PCLE zone and specify the proposed response action for each media. Indicate the type of removal, decontamination, physical control and/or institutional control action that is proposed.

Media	COCs[1]	Removal	Decontamination	Control			
				Physical Control	Modified Groundwater Response Objective[2]		
					PMZ	WCU	TI
Surface Soil (0-15 feet below ground surface) outside of the RCA	**Metals, Methylene Chloride, Bis(2-chloroethyl) ether**	**X**					
Surface Soil (0-5 feet below ground surface) in the area of the RCA, Subsurface Soil (below 5 ft)	**Metals, Benzene**	**X**		**X**			
Surface Soil (0-5 feet below ground surface) on the Parkwood Parcel (south of the North Tributary)	**Lead**	**X**		**X**			
Stewart Creek Sediment	**Metals**	**X**					
North CAMU Groundwater	**Metals**			**X**	**X**		
Affected Property No. 2 Groundwater	**Metals**			**X**	**X**		

Is there a media that contains a PCLE zone that is not addressed in this RAP? ____ yes **X** no

If yes, provide justification for not addressing the PCLE zone in this RAP.

Not Applicable

On-site land use: [ ] Residential [X] Commercial/Industrial

Off-site land use: [X] Residential [X] Commercial/Industrial (check all that apply)

Is this a re-submittal or revision of a previous RAP? **X** Yes ____ No

If yes, explain why the RAP is being revised or resubmitted.

This RAP is being revised and resubmitted to address changes in the proposed response actions based on discussions with the TCEQ and the City of Frisco.

[1] Specify either a specific COC or, if the response action is the same for all COCs in one type, specify the type of COC (for example, VOCs, SVOCs, metals).

[2] If a modified groundwater response objective is proposed, check the type(s) of proposed modifications.

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Were all the appropriate notifications made in accordance with §350.55? **X** Yes ___ No
If no, explain why notifications were not made:

Not Applicable

Checklist For Report Completeness

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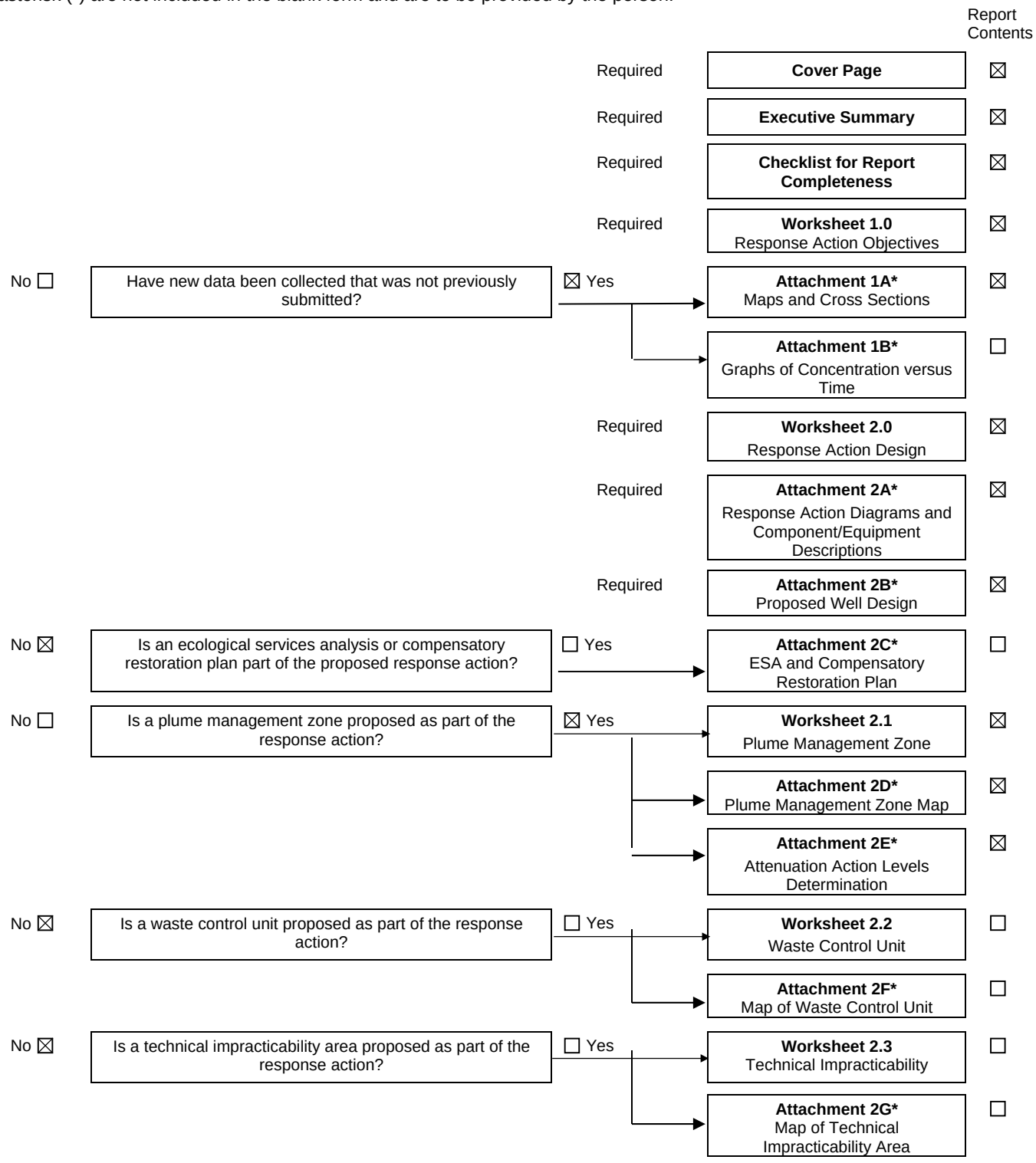
Use this checklist to determine the portions of the form that must be submitted for this report. Answer all questions by checking Yes or No. If the answer is Yes include that portion of the report. If the answer is No, do not complete or submit that portion of the report. All form contents that are marked "Required" must be submitted. Form contents marked with an asterisk (*) are not included in the blank form and are to be provided by the person.



Checklist For Report Completeness	ID No.: SWR No. 30516
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				Report Contents
No ☐	Is the response action a remedy standard B?	☒ Yes →	**Worksheet 2.4** Institutional Controls	☒
		Required	**Worksheet 3.0** Performance Measures and Potential Problems	☒
		Required	**Worksheet 3.1** Monitoring and Sampling	☒
		Required	**Attachment 3A*** Map of Monitoring and Sampling Points	☐
		Required	**Worksheet 3.2** Operation and Maintenance	☒
		Required	**Worksheet 4.0** Confirmation Sampling Plan	☒
		Required	**Attachment 4A*** Map of Confirmation Sampling Points[1]	☐
No ☐	Is the response action a Remedy Standard B?	☒ Yes →	**Worksheet 5.0** Post Response Action Care	☒
		→	**Attachment 5A*** Map of PRAC Monitoring and Sampling Points	☒
		→	**Attachment 5B*** PRAC Costs	☒
No ☒	Does the person, who is a small business, desire to modify the financial assurance requirement?	☐ Yes →	**Attachment 5C*** Small Business Affidavit	☐
		Required	**Worksheet 6.0** Implementation Schedule	☒
		Required	**Appendix 1*** References	☒
No ☐	Was any data collected that was not previously reported?	☒ Yes →	**Appendix 2*** Data Tables and Boring Logs	☒
No ☐	Were any studies or tests conducted?	☒ Yes →	**Appendix 3*** Studies and Tests Documentation	☒
No ☐	Is the response action a Remedy Standard B?	☒ Yes →	**Appendix 4*** Proposed Institutional Controls	☒
No ☐	Are any institutional controls proposed/required on property not owned by the person?	☒ Yes →	**Appendix 5*** Landowner Concurrence	☒
No ☐	Are any of the sample collection or handling procedures different from those reporting in the APAR or other previously submitted report?	☒ Yes →	**Appendix 6*** Sampling Procedures	☒
No ☐	Are statistics or geostatistics proposed to be used as part of the response action?	☒ Yes →	**Appendix 7*** Statistical Methodology	☒
No ☒	Was approval received from the TCEQ regarding the use of different rules to address a media?	☐ Yes →	**Appendix 8*** Split Media Approval	☐

Form contents marked with an asterisk (*) are not included in the blank form.

[1] – Not Applicable for this application

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Date of Report or Event(s)	*Title of Report*/ Assessment Activities	Author/Assessor	Summary of Environmental Assessment and/or Correspondence
May 31, 2019	*Exide Technologies Frisco Recycling Center RCRA Permit Renewal Application*	Golder Associates Inc. (Golder) and Exide Technologies (Exide)	Submittal of updated Resource Conservation and Recovery Act (RCRA) permit for the Exide Frisco Recycling Center (FRC) including a Response Action Plan for the remediation of the FRC.
May 20, 2019	*Notification of Field Sampling Activities - North CAMU Groundwater Sampling and Quarterly French Drain Inspection*	Golder	Email notification from Golder to R. Stuart Goldsmith (TCEQ) regarding upcoming sampling activities of the North CAMU and the quarterly French Drain Inspection.
May 1, 2019	*Quarterly Progress Report No. 31 (February 1, 2019 – April 30, 2019) Exide Technologies, 7471 5th Street, Frisco, Texas, U.S. EPA Docket No.: RCRA 06-2011-0966*	Brad Weaver, Exide	Quarterly progress report for the FRC for activities from February 1, 2019 through April 30, 2019.
April 23, 2019	Collection of on-Site water for Column Studies	Golder	Collection of additional water from DGW-MW-3 and the French Drain System for use in extended column studies for a proposed permeable reactive barrier wall.
April 10-12, 2019	Pumping test of DGW-MW-12	Golder	Pumping test of DGW-MW-12 to gather additional hydrogeologic information for the proposed permeable reactive barrier wall design.
March 20-21, 2019	Collection of on-Site water for Column Studies	Golder	Collection of additional water from DGW-MW-11, DGW-MW-3, and the French Drain System for use in the extended column studies for a proposed permeable reactive barrier wall.
March 8, 2019	Collection of on-Site water for Column Studies	Golder	Collection of additional water from DGW-MW-11 and DGW-MW-3 for use in the extended column studies for a proposed permeable reactive barrier wall.
March 7-8, 2019	First quarter 2019 Class 2 Landfill groundwater sampling event	Golder	First quarter 2019 North CAMU groundwater sampling event.
March 7, 2019	First quarter 2019 French Drain System inspection	Golder	Inspection of the on-Site French Drain System and flood wall.
February 28, 2019	*2018 Fourth Quarter French Drain Operation Report*	Golder	Report on the inspection of the on-Site French Drain System and flood wall.
February 26, 2019	*Notification of Field Sampling Activities – North CAMU Groundwater Sampling*	Golder	Email notification from Golder to R. Stuart Goldsmith (TCEQ) regarding upcoming sampling activities of the North CAMU.

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Date of Report or Event(s)	*Title of Report*/ Assessment Activities	Author/Assessor	Summary of Environmental Assessment and/or Correspondence
February 5, 2019	*Quarterly Progress Report No. 30 (November 1, 2018 – January 31, 2019) Exide Technologies, 7471 5th Street, Frisco, Texas, U.S. EPA Docket No.: RCRA 06-2011-0966*	Brad Weaver, Exide	Quarterly progress report for the FRC for activities from November 1, 2018 through January 31, 2019.
January 21-26, 2019	2019 Response Action Plan Site Investigation	Golder	Investigation to obtain additional data for the installation of a groundwater remedial element at the Site. Field activities included 10 soil borings to bedrock and installation, development, and slug testing of one monitoring well (DGW-MW-12) in the area to the west of the slag landfill. DGW-MW-12 and the remaining boreholes were surveyed and DGW-MW-8 was surveyed (top of casing cut to properly close well).
January 18, 2019	*2018 Second Semiannual Groundwater Monitoring Report, Class 2 Landfill – 3rd and 4th quarter Events, Exide Technologies – Frisco, Texas*	Golder	2018 second semiannual groundwater monitoring report presenting data from the North CAMU 3rd and 4th quarter 2018 sampling events.
January 14, 2019	*RE: Status of CAMU Activities – Annual Report*	Exide Technologies	Annual report to the TCEQ regarding Agreed Docket No. 2013-2207-IHW-E for the North CAMU (Class 2 Landfill).
January 2-3, 2019	Collection of on-Site water for Column Studies	Golder	Collection of additional water from DGW-MW-11 for use in the initial column studies for a proposed permeable reactive barrier wall.
December 28, 2018	*2018 Third Quarter French Drain Operation Report*	Golder	Report on the inspection of the on-Site French Drain System and flood wall.
December 4-5, 2018	Fourth quarter 2018 Class 2 Landfill groundwater sampling event	Golder	Fourth quarter 2018 North CAMU groundwater sampling event.
December 4, 2018	Fourth quarter 2018 French Drain System inspection	Golder	Inspection of the on-Site French Drain System and flood wall.
December 3-7, 2018	Collection of on-Site water for Column Studies	Golder	Collection of on-Site water for use in the initial column studies for a proposed permeable reactive barrier wall.
November 16, 2018	Notification of Field Sampling Activities – North CAMU Groundwater Sampling and Column Studies	Golder	Email notification from Golder to R. Stuart Goldsmith (TCEQ) regarding upcoming sampling activities of the North CAMU and column study water collection.

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Date of Report or Event(s)	*Title of Report*/ Assessment Activities	Author/Assessor	Summary of Environmental Assessment and/or Correspondence
November 11, 2018	*Quarterly Progress Report No. 29 (August 1, 2018 – October 31, 2018) Exide Technologies, 7471 5th Street, Frisco, Texas, U.S. EPA Docket No.: RCRA 06-2011-0966*	Brad Weaver, Exide	Quarterly progress report for the FRC for activities from August 1, 2018 through October 31, 2018.
November 5-8, 2018	Collection of on-Site water for Column Studies	Golder	Collection of on-Site water for use in column studies for a proposed permeable reactive barrier wall.
November 5, 2018	Surveying of former shooting range berm parcel	Brittain & Crawford, Golder	Surveying of former shooting range berm parcel for removal of parcel from the Undeveloped Buffer Property (UBP) at the request of TCEQ. The removal from the UBP was due to the area being included in a TCEQ agreed order and therefore the property could not be included the Voluntary Cleanup Program (VCP).
November 3, 2018	Column Studies Sampling	Golder	Email from Golder to R. Stuart Goldsmith (TCEQ) regarding field schedule for column study water collection.
October 18, 2018	Re: Schedule Update	Golder	Email from Golder to R. Stuart Goldsmith (TCEQ) regarding further delay of column study water collection due to Site conditions limiting accessibility.
October 17, 2018	Schedule Update	Golder	Email notification from Golder to R. Stuart Goldsmith (TCEQ) regarding further delay of column study water collection due to Site conditions limiting accessibility.
October 4, 2018	Re: Notification of Field Sampling Activities – Groundwater Sampling and Column Studies	Golder	Email notification from R. Stuart Goldsmith (TCEQ) regarding delay of column study water collection due to Site conditions limiting accessibility.
September 24-25, 2018	Third quarter 2018 Class 2 Landfill groundwater sampling event	Golder	Third quarter 2018 North CAMU groundwater sampling event.
September 24, 2018	Third quarter 2018 French Drain System inspection	Golder	Inspection of the on-Site French Drain System and flood wall.
September 18, 2018	Notification of Field Sampling Activities – Groundwater Sampling and Column Studies	Golder	Email notification from Golder to Golder to R. Stuart Goldsmith (TCEQ) regarding upcoming sampling activities of the North CAMU and column study water collection.
August 30, 2018	*Exide Technologies Frisco Recycling Center RCRA Permit Renewal Application*	Golder Associates Inc. and Exide	Submittal of updated Resource Conservation and Recovery Act (RCRA) permit for the Exide Frisco Recycling Center (FRC) including a Response Action Plan for the remediation of the FRC.

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Date of Report or Event(s)	*Title of Report*/ Assessment Activities	Author/Assessor	Summary of Environmental Assessment and/or Correspondence
August 29, 2018	Submittal of Conditional Letter of Map Revision (CLOMR) to the City of Frisco	Golder	Submittal of the Conditional Letter of Map Revision (CLOMR) to the City of Frisco for review as required prior to submittal to the Federal Emergency Management Agency (FEMA).
August 17, 2018	Email: RE: Exide FOP WAP	TCEQ	TCEQ comments and recommendations of the submitted DRAFT Waste Analysis Plan (WAP).
August 14, 2018	Email: Exide FOP WAP	Golder	Submittal of work-in-progress draft of the WAP to TCEQ for discussion purposes only.
August 3, 2018	*Quarterly Progress Report No. 28 (May 1, 2018 – July 31, 2018) Exide Technologies, 7471 South 5th Street, Frisco, Texas, U.S. EPA Docket No.: RCRA 06-2011-0966*	Brad Weaver, Exide	Quarterly progress report for the FRC for activities from May 1, 2018 through July 31, 2018.
August 1-2, 2018	Resampling of selected FOP monitoring wells	Golder	Resampling of Deep Groundwater Pre-Design Investigation (PDI) monitoring and select additional FOP monitoring wells.
July 30, 2018 – July 31, 2018	Parkwood Parcel Investigation	Golder	Field investigation for the Parkwood Parcel Investigation for inclusion in the Former Operating Plant Response Action Plan. Activities included drilling, soil sampling, and road restoration.
July 19, 2018	*2018 First Semiannual Groundwater Monitoring Report, Class 2 Landfill – 1st and 2nd Quarter Events, Exide Technologies – Frisco, Texas*	Golder	2018 first semiannual groundwater monitoring report presenting data from the North CAMU 1st and 2nd quarter 2018 sampling events.
July 12-13, 2018	Geotechnical Investigation for modifications and additions to the Flood Wall	Golder	Golder conducted a geotechnical investigation for modifications and additions to the Site Flood Wall. The investigation included the advancement of five borings along the existing/proposed wall location. Split spoon samples, blow counts, Shelby tube samples, and grain size analysis samples were collected from each location.
July 10, 2018	*2018 Second Quarter French Drain Operation Report*	Golder	Report on the inspection of the on-Site French Drain System and flood wall.
July 10, 2018	Online meeting regarding status of the RCRA permit modifications and preliminary results of the DGW-PDI	Golder, TCEQ, Brad Weaver, Exide	Online Skype meeting to present preliminary findings of the DGW-PDI and presentation of remedial options for the groundwater protection element for the Remediation Consolidation Area. Presentation also discussed general current status of Flood Wall and NOD comment responses.

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Date of Report or Event(s)	*Title of Report*/ Assessment Activities	Author/Assessor	Summary of Environmental Assessment and/or Correspondence
July 9, 2018	Email: Parkwood Investigation – UPDATED Schedule July 30-Aug 1	Golder	Email follow-up from Golder Associates to TCEQ notifying rescheduling field activities regarding the Parkwood Boulevard Investigation.
June 22, 2018	Email: Parkwood Investigation July 9-13	Golder	Email from Golder Associates to TCEQ notifying beginning of field activities for the Parkwood Parcel Investigation.
June 26, 2018	*RE: City of Frisco Comment Letters Dated June 1, 2018 and March 19, 2018, RE: Exide Technologies Response Action Plan and Groundwater Preliminary Design Investigation*	Brad Weaver, Exide	Letter from Exide to TCEQ with a memorandum from Golder Associates (dated June 22, 2018) addressing comments from the June 1, 2018 and the March 19, 2018 letters from the City of Frisco regarding the Former Operating Plant Response Action Plan and the Deep Groundwater Preliminary Design Investigation.
June 1, 2018	*Re: Exide Technologies Response Action Plan; Former Operating Plant Response Action Plan*	Russell, Rodriguez, Hyde, Bullock LLP	City of Frisco comments regarding the Former Operating Plant Response Action Plan and the engineering of a groundwater remedy such as a permeable reactive barrier at the Site.
May 30, 2018	Updated Parkwood Boulevard Parcel Investigation Work Plan, Exide Frisco Recycling Facility, 7471 5th Street, Frisco, Texas…	Golder	Updated Work Plan based on comments issued by TCEQ in the April 17, 2018 letter regarding Parkwood Parcel Investigation Work Plan. Additional borings and TCLP analysis were added as a result of comments from TCEQ. The Work Plan was submitted to the City of Frisco for review on May 30, 2018.
May 15, 2018	Re: Re: Response to TCEQ Comment Letter Dated April 9, 2018 RE: Response to Comments on TNOD1 Dated February 19, 2018 and Response to Exide January 18, 2018 Letter, Exide Technologies – Frisco, Collin County…	Golder	Letter from Golder to TCEQ confirming the TCEQ due date of August 31, 2018 for the submittal of the Part B application and RAP.
May 9-10, 2018	Second quarter 2018 Class 2 Landfill groundwater sampling event	Golder	Second quarter 2018 North CAMU groundwater sampling event.
May 9, 2018 – June 12, 2018	DGWPDI Field work	Golder	Field investigation for the Deep Groundwater Pre-Design Investigation. Activities included well installation and development, groundwater elevation survey, slug test analysis, and groundwater sampling.
May 9, 2018	Second quarter 2018 French Drain System inspection	Golder	Inspection of the on-Site French Drain System and flood wall.
May 8, 2018	*2018 First Quarter French Drain Operation Report*	Golder	Report on the inspection of the on-Site French Drain System and flood wall.

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Date of Report or Event(s)	*Title of Report*/ Assessment Activities	Author/Assessor	Summary of Environmental Assessment and/or Correspondence
May 1, 2018	*Quarterly Progress Report No. 27 (February 1, 2018 – April 30, 2018) Exide Technologies, 7471 South 5th Street, Frisco, Texas, U.S. EPA Docket No.: RCRA 06-2011-0966*	Brad Weaver, Exide	Quarterly progress report for the FRC for activities from February 1, 2018 through April 30, 2018.
April 26, 2018	Email: Field Schedule Notification for DGWPDI WP	Golder	Email from Golder Associates to TCEQ notifying beginning of field activities for the Deep Groundwater Pre-Design Investigation, North CAMU groundwater sampling event, and revised boring locations for the DGW PDI.
April 17, 2018	*Comments, Parkwood Boulevard Parcel Investigation Work Plan, Technical Memorandum: Revised Draft RAP Appendix 7 – Statistical Methodology, Stewart Creek Exposure Point Concentration Sampling Work Plan, dated March 29, 2018, Exide Frisco Recycling Center…*	R. Stuart Goldsmith, TCEQ	Letter of comments from TCEQ to Exide regarding the Parkwood Parcel Investigation Work Plan, Technical Memorandum: Revised Draft RAP Appendix 7 – Statistical Methodology, Stewart Creek Exposure Point Concentration Sampling Work Plan, dated March 29, 2018.
April 17, 2018	*Exide Technologies, Request for Threatened and Endangered Species Concurrence, Exide Recycling Facility Project, Collin County, Texas*	Golder	Letter Report from Golder to the U.S. Fish and Wildlife Service (Arlington Ecological Services Field Office) regarding Section 7 consultation for the potential modification of an existing floodwall adjacent to Stewart Creek and consolidation and capping of soil and sediment remediation waste within the footprint of the FOP (on currently paved areas).
April 13, 2018	*Exide Technologies – Hazardous Waste Permit No. 50206, Questions Regarding Waste Characterization, Area of Contamination Concept*	William J. Shafford, P.E.	Letter from TCEQ to Exide as a follow-up to the February 2, 2018 meeting with Baker Botts, LLC regarding waste characterization of an AOC.
April 10, 2018	*Response Deep Groundwater Preliminary Design Investigation (DGWPDI) Work Plan, dated March 1, 2018, Exide Frisco Recycling Facility…*	R. Stuart Goldsmith, TCEQ	Letter from TCEQ to Exide regarding TCEQ review and approval of additional groundwater investigation for the implementation of a groundwater remedy at the Former Operating Plant of the Frisco Recycling Center.
April 9, 2018	*Response to Comments on TNOD2 dated February 19, 2018 and response to Exide January 18, 2018 Letter, Exide Technologies – Frisco…*	Brent Wade, TCEQ	Letter from TCEQ to Exide regarding schedule of the Permit Renewal Application and a due date of August 31, 2018 for an updated Part B application and RAP.

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Date of Report or Event(s)	*Title of Report*/ Assessment Activities	Author/Assessor	Summary of Environmental Assessment and/or Correspondence
March 29, 2018	*Stewart Creek Exposure Point Concentration Sampling Work Plan*	Golder	Work Plan from Golder to TCEQ outlining sampling procedures of areas of Stewart Creek not designated for remediation in the RAP.
March 29, 2018	*Revised Draft RAP Appendix 7 – Statistical Methodology – Stewart Creek Sediment*	Golder	Technical Memorandum from Golder to TCEQ to detail statistical methodology that will be used to calculate and exposure point concentration (EPC) within each exposure area of Stewart Creek.
March 29, 2018	*Parkwood Boulevard Parcel Investigation Work Plan*	Golder	Work Plan from Golder to TCEQ including rationale and methodology to be used while performing an investigation of soils adjacent to and beneath Parkwood Boulevard.
March 19, 2018	*Re: Exide Technologies Response Action Plan; Proposed New Groundwater Investigation*	Russell, Rodriguez, Hyde, Bullock LLP	City of Frisco comments regarding the Former Operating Plant Response Action Plan and the Deep Groundwater Preliminary Design Work Plan submitted to TCEQ on March 1, 2018.
March 1, 2018	*Deep Groundwater Preliminary Design Investigation Work Plan*	Golder	Work Plan from Golder to TCEQ including rationale and methodology to be used while performing investigation activities of deeper groundwater at the Site, and evaluation of remedial measures required by the TCEQ to address the potential migration of Site contaminants of concern to Stewart Creek from the groundwater to surface water discharge pathway.
February 19, 2018	*Response to Texas Commission on Environmental Quality Technical Notice of Deficiency, Exide Technologies – Frisco…*	Golder	Letter Report from Golder and Exide to TCEQ with attachments to address the December 2017 Technical NODs. Included was a table response to comments on how Exide/Golder will proceed in addressing TCEQs NODs in the Permit Renewal Application. Also included was the Draft Memorandum RE: Development of PCLs Protective of Ecological Receptors for Bank Soil prepared by PBW.
February 19, 2018	*2017 Fourth Quarter French Drain Operation Report*	Golder	Report on the inspection of the on-Site French Drain System and flood wall.
February 15, 2018	First quarter 2018 French Drain System inspection	Golder	Inspection of the on-Site French Drain System and flood wall.
February 13-14, 2018	First quarter 2018 Class 2 Landfill groundwater sampling event	Golder	First quarter 2018 North CAMU groundwater sampling event.
February 2, 2018	*Quarterly Progress Report No. 26 (November 1, 2017 – January 31, 2018) Exide Technologies, 7471 South 5th Street, Frisco, Texas, U.S. EPA Docket No.: RCRA 06-2011-0966*	Brad Weaver, Exide	Quarterly progress report for the FRC for activities from November 1, 2017 through January 31, 2018.

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Date of Report or Event(s)	*Title of Report*/ Assessment Activities	Author/Assessor	Summary of Environmental Assessment and/or Correspondence
January 19, 2018	*2017 Second Semiannual Groundwater Monitoring Report, Class 2 Landfill – 3rd and 4th Quarter Events, Exide Technologies – Frisco, Texas*	Golder	2017 second semiannual groundwater monitoring report presenting data from the North CAMU 3rd and 4th quarter 2017 sampling events.
January 18, 2018	*Follow-Up to the January 12, 2018 Meeting Regarding Next Steps for the Permit Renewal Application with a Major Amendment and Compliance Plan, Exide Technologies…*	Golder	Letter to summarize the January 12, 2018 meeting to discuss the response to the TCEQ December 7, 2017 Technical Notice of Deficiency for the RCRA Permit Renewal with a Major Amendment and Compliance Plan Application for the Site. The letter included clarifications desired by TCEQ as well as a proposed schedule of deliverables.
January 12, 2018	Meeting between TCEQ and Exide regarding clarifications on RCRA Permit Renewal	Golder, Exide, TCEQ	Meeting to discuss the response to the TCEQ December 7, 2017 Technical Notice of Deficiency for the RCRA Permit Renewal with a Major Amendment and Compliance Plan Application for the Site.
January 8, 2018	*LMW-22 Evaluation – Class 2 Landfill Groundwater Monitoring; Exide Frisco Recycling Center…*	Golder	Letter report to document results of confirmed arsenic levels present in LMW-22 above the PCL.
December 22, 2017	*Extension for Submittal of Technical Notice of Deficiency (NOD) Response #1, Permit Renewal Application, Exide Technologies…*	Bob Patton, Jr., TCEQ	Response to the December 18, 2017 request for extension to the Technical Notice of Deficiency for the Major Permit Amendment/Permit for the Site. The request was approved for the 45 day extension with a permit due date of February 20, 2018.
December 18, 2017	*Request for Extension to respond to Technical Notice of Deficiency, Exide Technologies – Frisco, Collin County…*	Brad Weaver, Exide	Letter request for a 45 day extension for the response to the Technical Notice of Deficiency for the Major Permit Amendment/Permit for the Site.
December 7, 2017	*Technical Notice of Deficiency, Exide Technologies – Frisco, Collin County…*	Chris Shaw, TCEQ	Letter notice of deficiency for the Site RCRA permit renewal.
November 30, 2017	*2017 Third Quarter French Drain Operation Report*	Golder	Report on the inspection of the on-Site French Drain System and flood wall.
November 28-29, 2017	Fourth quarter 2017 Class 2 Landfill groundwater sampling event	Golder	Fourth quarter 2017 North CAMU groundwater sampling event.
November 27, 2017	Fourth quarter 2017 French Drain System inspection	Golder	Inspection of the on-Site French Drain System and flood wall.

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November 3, 2017	*Quarterly Progress Report No. 25 (August 1, 2017 – October 31, 2017) Exide Technologies, 7471 South 5th Street, Frisco, Texas, U.S. EPA Docket No.: RCRA 06-2011-0966*	Brad Weaver, Exide	Quarterly progress report for the FRC for activities from August 1, 2017 through October 31, 2017.
October 5, 2017	*Confirmation Sampling Event – Class 2 Landfill Groundwater Monitoring, Exide Technologies Frisco Recycling Center – Frisco, TX…*	Golder	Documentation of the September 18, 2017 groundwater monitoring resampling event to confirm existence or non-existence of the applicable PCL exceedance during the Q3 2016 Event.
September 21, 2017	*Exceedance Notification – Class 2 Landfill Groundwater Monitoring, Exide Technologies Frisco Recycling Center…*	Golder	Notification of PCL exceedance of LMW-22 during 3Q 2017 groundwater sampling.
September 18, 2017	Resample of LMW-22 to confirm existence or non-existence of the applicable PCL exceedance during the 3Q 2017 event	Golder	Resample of LMW-22 to confirm existence or non-existence of the applicable PCL exceedance during the 3Q 2017 event.
September 12, 2017	Administrative Notice of Deficiency Letter, Exide Technologies – Frisco Recycling Center…	Golder	Response to the August 22, 2017 TCEQ Administrative Notice of Deficiency regarding the August 1, 2017 RCRA Permit Renewal application for the Site.
August 29, 2017	Third quarter 2017 French Drain System inspection	Golder	Inspection of the on-Site French Drain System and flood wall.
August 28-29, 2017	Third quarter 2017 Class 2 Landfill groundwater sampling event	Golder	Third quarter 2017 North CAMU groundwater sampling event.
August 22, 2017	*Administrative Notice of Deficiency Letter, Exide Technologies – Exide Technologies Frisco Recycling Center…Permit Renewal with a Major Amendment and Compliance Plan*	TCEQ	Administrative Notice of Deficiency regarding the August 1, 2017 RCRA Permit Renewal application for the Site.
August 21, 2017	*2017 Second Quarter French Drain Operation Report*	Golder	Report on the inspection of the on-Site French Drain System and flood wall.

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August 15, 2017	*Quarterly Progress Report No. 24 (May 1, 2017 – July 31, 2017) Exide Technologies, 7471 South 5th Street, Frisco, Texas, U.S. EPA Docket No.: RCRA 06-2011-0966*	Brad Weaver, Exide	Quarterly progress report for the FRC for activities from May 1, 2017 through July 31, 2017.
August 1, 2017	*Exide Technologies Frisco Recycling Center RCRA Permit Renewal Application*	Golder and Exide	Submittal of updated Resource Conservation and Recovery Act (RCRA) permit for the Exide Frisco Recycling Center (FRC) including a Response Action Plan for the remediation of the FRC.
July 20, 2017	*2017 First Semiannual Groundwater Monitoring Report, Class 2 Landfill – 1st and 2nd Quarter Events, Exide Technologies – Frisco, Texas*	Golder	2017 first semiannual groundwater monitoring report presenting data from the North CAMU 1st and 2nd quarter 2016 sampling events.
May 4-5, 2017	Second quarter 2017 Class 2 Landfill groundwater sampling event	Golder	Second quarter 2017 North CAMU groundwater sampling event.
May 4, 2017	Second quarter 2017 French Drain System inspection	Golder	Inspection of the on-Site French Drain System and flood wall
May 2-3, 2017	Installation and development of MW-47 for Class 2 Landfill groundwater monitoring	Golder	Installation and development of MW-43 for North CAMU groundwater monitoring to evaluate periodic arsenic exceedance in LMW-22.
April 28, 2017	2017 First Quarter French Drain Operation Report	Golder	Report on the inspection of the on-Site French Drain System and flood wall.
April 5-6, 2017	Additional Stewart Creek sediment sampling of USACE property	Golder	Collection of 12 sediment samples downstream of the Site and on USACE property.
March 2, 2017	First quarter 2017 French Drain System inspection	Golder	Inspection of the on-Site French Drain System and flood wall
March 1-2, 2017	First quarter 2017 Class 2 Landfill groundwater sampling event	Golder	First quarter 2017 North CAMU groundwater sampling event.

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March 1, 2017	*Acknowledgement of Receipt and Notice to Proceed, LMW-22 Arsenic Exceedance Response, dated February 10, 2017, Class 2 Landfill, Exide Frisco Recycling Center…*	TCEQ	TCEQ approval of installation of new groundwater monitoring well and addition of existing MW-41 to the North CAMU groundwater monitoring to evaluate periodic arsenic exceedance at LMW-22.
February 17, 2017	2016 Fourth Quarter French Drain Operation Report	Golder	Report on the inspection of the on-Site French Drain System and flood wall.
February 3, 2017	*Approval of Affected Property Assessment Report, Screening Level Ecological Rick Assessment (SLERA) Stewart Creek,* dated January 16, 2017	TCEQ, R. Stuart Goldsmith	TCEQ approval and of the Stewart Creek SLERA and final approval of the Site APAR.
January 24, 2017	2016 Third Quarter French Drain Operation Report	Golder	Report on the inspection of the on-Site French Drain System and flood wall.
January 24, 2017	2016 Second Quarter French Drain Operation Report	Golder	Report on the inspection of the on-Site French Drain System and flood wall.
January 24, 2017	2016 First Quarter French Drain Operation Report	Golder	Report on the inspection of the on-Site French Drain System and flood wall.
January 24, 2017	2015 Fourth Quarter French Drain Operation Report	Golder	Report on the inspection of the on-Site French Drain System and flood wall.
December 16, 2016	*Screening Level Ecological Risk Assessment Stewart Creek, Exide Technologies, Frisco, Texas*	Pastor, Behling & Wheeler (PBW)	Report describing the Tier 2 screening-level ecological risk assessment (SLERA) conducted for Stewart Creek. Creation of upper prediction limit (UPL) for arsenic as 39.7 mg/kg.
December 2, 2016	Fourth quarter 2016 French Drain System inspection	Golder	Inspection of the on-Site French Drain System and flood wall
November 30, 2016	Crystallizer Demolition surface soil sampling	Golder	Collection of 5 surficial soil samples in the Crystallization Unit Area following building demolition.

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November 24, 2016	Visual assessment of Stewart Creek	Golder	During the week of November 14, 2016, Golder performed assessment of a limited representation of sidewalls to determine if there were slag or battery case fragments at depth but none were observed at the locations assessed. No confirmation sampling will required other than visual indication of battery case fragments.
September 8, 2016	Third quarter 2016 French Drain System inspection	Golder	Inspection of the on-Site French Drain System and flood wall
July 20, 2016	*2016 First Semiannual Groundwater Monitoring Report, Class 2 Landfill – 1st and 2nd Quarter Events, Exide Technologies – Frisco, Texas*	Golder	2016 first semiannual groundwater monitoring report presenting data from the North CAMU 1st and 2nd quarter 2016 sampling events.
June 1, 2016	Second quarter 2016 French Drain System inspection	Golder	Inspection of the on-Site French Drain System and flood wall
March 1, 2016	Installation of replacement well LMW-9R	Golder	Installation of new North CAMU groundwater monitoring well LMW-9R to replace collapsed LMW-9.
April 13, 2016	2015 Third Quarter French Drain Operation Report	Golder	Inspection of the on-Site French Drain System and flood wall
February 17, 2017	*Confirmation Sampling Event – Class 2 Landfill Groundwater Monitoring, Exide Technologies Frisco Recycling Center – Frisco, TX…*	Golder	Documentation of the February 3, 2016 groundwater monitoring resampling event attempt and notification of the collapse of LMW-9 and replacement plans.
February 11, 2016	*Conditional Approval: Supplement to Affected Property Assessment Report (APAR) for the Former Operating Plant (FOP), dated September 1, 2015*	TCEQ	Conditional approval of the Supplemental APAR submitted on September 1, 2015 with additional groundwater monitoring investigation requirements.
February 9, 2016	Verbal approval from TCEQ to install a replacement for collapsed LMW-9	TCEQ	Verbal approval from TCEQ to install a replacement for collapsed LMW-9

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February 9, 2016	Verbal communication regarding collapsed LMW-9	Golder	Golder notified TCEQ of collapsed LMW-9.
February 3, 2016	First quarter 2016 French Drain System inspection	Golder	Inspection of the on-Site French Drain System and flood wall
February 3, 2016	Class 2 Landfill groundwater resampling event	Golder	Resampling event of all of the North CAMU wells. Monitoring well LMW-9 was identified as being collapsed.
January 20, 2016	*2015 Second Semiannual Groundwater Monitoring Report, Class 2 Landfill – 3rd and 4th Quarter Events, Exide Technologies – Frisco, Texas.*	Golder	2015 second semiannual groundwater monitoring report presenting data from the North CAMU 3rd and 4th quarter 2015 sampling events.
December 17, 2015	Third quarter 2015 French Drain System inspection	Golder	Inspection of the on-Site French Drain System and flood wall
December 14, 2015	Fourth quarter 2015 Class 2 Landfill groundwater sampling event	Golder	Fourth quarter 2015 North CAMU groundwater sampling event.
October 30, 2015	*Conceptual Remedial Action Plan (RAP), Exide Frisco Recycling Facility*	Golder	As requested by TCEQ, this report summarizes general planned remediation plans for the FOP.
September 9, 2015	Third quarter 2015 Class 2 Landfill groundwater sampling event	Golder	Third quarter 2015 North CAMU groundwater sampling event.
September 1, 2015	*Supplement to Affected Property Assessment Report*	Golder	Supplement to Affected Property Assessment Report as requested by TCEQ.
August 24, 2015	*Interim Cover Construction Details and Operation & Maintenance Plan Class 2 Landfill/Corrective Action Management Unit, Exide Frisco Recycling Facility*	W&M Environmental Group, LLC	Plan detailing the construction of the interim cover and post installation operation and maintenance procedures to be implemented.
August 24, 2015	*Class 2 Landfill CAMU Final Closure Plan, Former Exide Frisco Recycling Facility, Frisco, Texas*	Golder	Details surrounding final closure of the North CAMU

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August 8, 2015	Third quarter 2015 French Drain System inspection	Golder	Inspection of the on-Site French Drain System and flood wall
August 3, 2015	2015 Second Quarter French Drain Operation Report	Golder	Inspection of the on-Site French Drain System and flood wall
July 27-29, 2015	Supplement to the APAR surficial soil sampling	Golder	Collection of additional on-site surficial soil samples as requested by TCEQ
July 30, 2015	*Approval, Response to Comments for Affected Property Assessment Report (APAR) for the Former Operating Plant (FOP), dated July 2, 2015*	TCEQ, Gary Beyer	TCEQ approval of the July 2, 2015 response to comments for the FOP APAR. Request for written work plan for Site Specific Ecological Risk Assessment (SSERA) for clarifying the Screening Level Ecological Risk Assessment (SLERA).
July 20, 2015	*2015 First Semiannual Groundwater Monitoring Report, Class 2 Landfill – 1st and 2nd Quarter Events, Exide Technologies – Frisco, Texas*	Golder	2015 first semiannual groundwater monitoring report presenting data from the North CAMU 1st and 2nd quarter 2015 sampling events.
July 2, 2015	5/5/15 TCEQ Comments to the Affected Property Assessment Report for the Former Operating Plant, Exide Frisco Recycling Facility	Exide	Exide's response to TCEQ's 5/5/15 comments on the FOP APAR.
June 23, 2015	Review Request for Exide Technologies Frisco Recycling Center, Collin and Denton Counties.	Texas Parks & Wildlife (TPWD).	Review Request for Exide Technologies Frisco Recycling Center, Collin and Denton Counties.
June 12, 2015	Second quarter 2015 French Drain System inspection	Golder	Inspection of the on-Site French Drain System and flood wall
June 4, 2015	Second quarter 2015 Class 2 Landfill groundwater sampling event	Golder	Second quarter 2015 North CAMU groundwater sampling event.
June 3, 2015	Meeting between TCEQ and Exide regarding requested comments for the FOP APAR	Exide and TCEQ	Meeting between TCEQ and Exide regarding requested comments for the FOP APAR. TCEQ requests a supplement for the APAR to further characterize areas of the FOP for which delineation was not previously completed, specifically including the on-Site Possible Affected Properties.

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May 5, 2015	*Comments to the Affected Property Assessment Report (APAR) for the Former Operating Plant, dated May 22, 2014*, Exide Frisco Recycling Facility…	TCEQ	Comments and request for responses to comments regarding the submitted May 2014 APAR for the FRC FOP. Request for preparation of a Site conceptual Response Action Plan. Requests quarterly inspection report for the on-Site French Drain System.
April 27, 2015	Revised Slag Sampling and Analysis Plan Approval with Conditions, Exide Technologies Frisco Recycling Center, Frisco, Collin County,	TCEQ	Approval of revised Slag Sampling and Analysis Plan Approval with Conditions, Exide Technologies Frisco Recycling Center, Frisco, Collin County with listed conditions.
April 24, 2015	*RE: Exide Technologies, TCEQ Docket No. 2013-2207-IHW-E; Registration No, 30516, Agreed Order Assessing Administrative Penalties and Requiring Certain Action*	TCEQ	TCEQ Docket No. 2013-2207-IHW-E; Registration No, 30516, Agreed Order Assessing Administrative Penalties and Requiring Certain Action and approving designation of Class 2 Landfill as a CAMU
March 2015	Revised Sampling & Analysis Plan Stockpiled Treated Slag Adjacent to Class 2 Non-Hazardous Waste Landfill Exide Technologies, Inc. Frisco, Texas	W&M Environmental	Plan detailing the proposed sampling activities and quality control procedures that will be used to perform additional characterization sampling of treated slag that is stockpiled in the open cell of the Class 2 Landfill.
March 16-17, 2015	First quarter 2015 Class 2 Landfill groundwater sampling event	Golder	First quarter 2015 Class 2 Landfill groundwater sampling event.
March 15, 2015	*Approval of the Exide Class 2 Landfill Risk Evaluation of Alternatives (Risk Evaluation), dated August 2, 2014*	TCEQ	TCEQ approval of the Class 2 Landfill Risk Evaluation to do closure in place rather than removal.
January 20, 2015	*2014 Second Semiannual Groundwater Monitoring Report, Class 2 Landfill – 3rd and 4th Quarter Events, Exide Technologies – Frisco, Texas*	Golder	2014 second semiannual groundwater monitoring report presenting data from the Class 2 Landfill 3rd and 4th quarter 2014 sampling events.
December 16-17, 2014	Fourth quarter 2014 Class 2 Landfill groundwater sampling event	Golder	Fourth quarter 2014 Class 2 Landfill groundwater sampling event.

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September 22-23, 2014	Third quarter 2014 Class 2 Landfill groundwater sampling event	Golder	Third quarter 2014 Class 2 Landfill groundwater sampling event.
August 29, 2014	*City of Frisco Comments; May 22, 2012 Exide Technologies Revised Affected Property Assessment Report, Former Exide Frisco Recycling Center*	Russell & Rodriguez, LLP	City comments to the Revised APAR submitted May 22, 2014 related to engineering controls and wastes within the on-Site Class 2 Landfill.
August 22, 2014	*Interim Action Report, Slag and Battery Case Fragment Removal and Disposal, Exide Frisco Recycling Facility*	Golder	Report detailing the interim actions performed for Stewart Creek.
August 2, 2014	*Exide Class 2 Landfill Risk Evaluation of Remedial Alternatives, Exide Technologies*	Golder	Report detailing the risk evaluation for management of slag in the on-Site Class 2 Landfill. The risk evaluation deemed closure in place with proper containment the preferred method.
July 18, 2014	*City of Frisco Comments; May 22, 2012 Exide Technologies Revised Affected Property Assessment Report, Former Exide Frisco Recycling Center*	Russell & Rodriguez, LLP	City comments on groundwater classification of groundwater within the Revised APAR submitted May 22, 2014 to TCEQ.
July 17, 2014	*Quarterly Groundwater Monitoring Report, Class 2 Landfill – Second Quarter 2014, Exide Technologies – Frisco, Texas*	Golder	Second quarter 2014 Class 2 Landfill groundwater monitoring report.
June 17, 2014	Second quarter Class 2 Landfill groundwater sampling event	Golder	Second quarter Class 2 Landfill groundwater sampling event.
May 22, 2014	*Revised Affected Property Assessment Report and Tier 2 Screening Level Ecological Risk Assessment*	Golder	Revised Affected Property Assessment Report and Tier 2 Screening Level Ecological Risk Assessment as requested by TCEQ.
April 4, 2014	*Approval with Modifications, Class 2 Landfill Groundwater Monitoring Plan, dated July 31, 2013, Exide Frisco Recycling Facility*	TCEQ	Approval of the July 31, 2013 submitted Class 2 Landfill monitoring plan with modifications.

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February 21, 2014	*Request for Assistance with Property Access for Interim Actions, Exide Frisco Recycling Facility…*	Exide	Exide requests TCEQ assistance in gaining access to properties owned by the City of Frisco requiring Interim Actions.
January 10, 2014	*Re: Implementation of Interim Actions, Battery Chip and Slag Removal and Disposal, dated October 14, 2013*	TCEQ	Approval of the October 14, 2013 Interim Action Battery Chip and Slag Removal and Disposal report.
December 17, 2013	*Conditional Approval of IAWP, Slag and Battery Case Fragment Removal and Disposal, dated November 7, 2013*	TCEQ	Conditional approval of IAWP dated November 7, 2013 regarding slag and battery case chip removal from Stewart Creek downstream of the FOP.
December 17, 2013	*Re: Stewart Creek Waste Water Treatment Plant, Eagan Way and Parkwood Boulevard, Frisco, Collin County, TX; Voluntary Cleanup Program (VCP) No. 2122*	TCEQ	Comments regarding the April 1, 2013 Affected Property Assessment Report (APAR), the April 1, 2013 Screening Level Ecological Assessment Report (SLERA), and the April 1, 2013 Response Action Completion Report (RACR) for the Stewart Creek Waste Water Treatment Plant. TCEQ noted additional battery chips remaining in the wooded area north of Stewart Creek to be removed.
November 19, 2013	*Conditional Approval of Response to TCEQ and EPA Comments on APAR and SLERA for the FOP, dated October 29, 2013*	TCEQ	"The [TCEQ] has reviewed the…response to comments dated October 29, 2013, and generally concurs with the response provided. Please see the enclosed comments and ensure you consider these items as you proceed with the additional assessment."
November 7, 2013	*Interim Action Work Plan (IAWP), Slag and Battery Case Fragment Removal and Disposal*	Golder	IAWP addressing slag and battery case chip removal from Stewart Creek downstream of the FOP.
October 29, 2013	*Response to TCEQ and EPA Comments on APAR and SLERA for the FOP*	Exide	Response letter to the TCEQ and EPA proposing additional assessment activities for the FOP and downstream portions of Stewart Creek. The response letter indicated that a revised APAR would be prepared.
October 14, 2013	*Implementation of Interim Actions, Slag and Battery Case Fragment Removal and Disposal, Exide Frisco Recycling Facility, Frisco, Texas*	W&M Environmental	This letter report describes interim measures completed on the Former Operating Plant (FOP) property to remove slag and battery case fragments exposed on the ground surface within the former production area, the designated disposal areas (i.e., the SDA, NDA, and Slag Landfill), areas around the Class 2 Landfill, along the banks of on-site portion of Stewart Creek west of the former production area, in the wooded area east of the SDA, and in the wooded area adjacent to the on-site portion of the North Tributary. The W&M interim action report was approved by the TCEQ in a letter dated January 10, 2014.

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October 8, 2013	*Comments on the APAR and the Tier 2 Screening Level Ecological Risk Assessment (SLERA) for the FOP, dated July 9, 2013, Request for Revised APAR*	TCEQ and EPA	TCEQ and EPA comments on the July 9, 2013 APAR, which required that additional assessments of the FOP and downstream portions of Stewart Creek be conducted. Required that a revised APAR be prepared by Exide.
September 12, 2013	*Comments on Exide Technologies' Affected Property Assessment Report*	United States Environmental Protection Agency, H. Troy Stuckey	EPA comments to the APAR submitted by Exide on July 10, 2013. EPA requests revised APAR to meet the objectives of the AOC.
July 31, 2013	*Revised Class 2 Landfill Groundwater Monitoring Plan, Exide Frisco Recycling Center, Frisco, Texas*	PBW	This plan presents the procedures for the groundwater monitoring program for the operating Class 2 Landfill describing the procedures for monitoring well installation and development, sampling, sample management, analytical methods, Quality Assurance/Quality Control (QA/QC), sample custody and data reduction.
July 10, 2013	*Affected Property Assessment Report (APAR)*	PBW	Pursuant to the Agreed Order effective February 10, 2013, PBW conducted an affected property assessment of potentially affected media at the Site during January - May 2013. Media that were investigated included soil, groundwater, and Stewart Creek and North Tributary surface water and sediments.
July 9, 2013	*FRC Former Shooting Range Berm Removal Action*	PBW	This letter report summarizes interim action measures conducted to remove and dispose of the Former Shooting Range Berm as required by Ordering Provision 3.c.iii of the TCEQ Agreed Order effective February 10, 2013. The letter report also summarizes the removal of bermed material near the south side of the SDA, which was not explicitly required by the Agreed Order.
July 5, 2013	*South Disposal Area Cap Repair Report*	W&M Environmental	This letter report summarizes interim measures conducted to identify and repair discrete areas of the SDA cap.
July 1, 2013	*Approval of Interim Action Work Plan, Battery Chip and Slag Removal and Disposal, dated April 29, 2013*	TCEQ	TCEQ approval of the Interim Action Work Plan for battery chip and slag removal and disposal from Stewart Creek.
May 2013	*Wall Seepage Project; Retaining Wall at Stewart Creek*	W&M Environmental	W&M prepared a report detailing the procedures used to install the French drain along the facility side of the Flood Wall. The French drain was installed as an interim measure to address seepage along the creek side of the Flood Wall.

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April 2013	*Interim Action Work Plan Slag and Battery Case Fragment Removal and Disposal, Exide Frisco Recycling Facility, Frisco, Texas*	W&M Environmental	W&M prepared a report detailing procedures for removal of slag and battery case fragment removal and disposal from Stewart Creek.
March 5, 2013	*Class 2 Non-Hazardous Waste Landfill Investigation and Response Action Work Plan, Exide Technologies, Inc.*	TCEQ	Approval of the March 1 submitted Response Action Work Plan (RAWP).
March 1, 2013	*Final Response Action Work Plan Class 2 Non-Hazardous Waste Landfill Exide Technologies, Inc. North Landfill, Frisco, Texas.*	W&M	This Response Action Work Plan detailing the proposed response action procedures to remove treated slag material within the cells that exceeds the Universal Treatment Standard for lead and/or cadmium.
February 26, 2013	*Exide Technologies Frisco Recycling Center, Frisco, Texas – Dust Control Plan Prepared by Pastor, Behling & Wheeler, LLC and Perimeter Air Monitoring Plan Prepared by Remediation Services, Inc.*	TCEQ	TCEQ letter stating no further comments to the prepared Site Perimeter Air Monitoring and Dust Control Plans.
February 25, 2013	*Exide Technologies, Inc. Frisco Recycling Plant, Notification of Planned Groundwater Monitor Well Installation and Sampling*	Exide	Notification of installation and sampling of two new groundwater wells surrounding the on-Site Class 2 Landfill.
February 20, 2013	*Dust Control Plan,, Facility Demolition for the Exide Technologies Frisco Recycling Center, Frisco, Texas*	PBW and Remediation Services Inc. (RSI)	Revision 3 to the Site Facility Dust Control Plan.
February 20, 2013	*Perimeter Air Monitoring Plan, Facility Demolition for the Exide Technologies Frisco Recycling Center, Frisco, Texas*	PBW and RSI	Revision 3 to the Site Facility Demolition Air Monitoring Plan.

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February 15, 2013	*Exide Technologies, Inc. – Frisco Recycling Center…Facility Decontamination & Demolition Work Plan, Revision 1, dated January 25, 2013 and Associated Plans*	TCEQ	TCEQ request for revisions to the January 25, 2013 submitted plans.
Effective February 10, 2013	*Agreed Order; Docket No. 2011-1712-IHW-E*	TCEQ	The TCEQ Agreed Order was entered effective February 10, 2013, between TCEQ and Exide. The Agreed Order ordered Exide to prevent disposal of waste in the active Class 2 landfill that exceeds LDR Treatment Standards; to submit a groundwater monitoring plan for the active landfill; to submit an APAR to address areas of concern identified in the May 6, 2011 TCEQ inspection; to submit an APAR for the RCRA Facility Investigation units listed in RCRA HW Permit No. 50206, PS IX.C. and any new areas identified by previous EPA and TCEQ investigations; to dispose of the berm material near the west side of the SDA; to prevent release of untreated slag and refractory brick from the Slag Treatment Building; and to ensure integrity of and maintain the cover of the SDA.
February 1, 2013	*Site Safety and Health Plan for Exide Technologies, Inc. Frisco, TX Facility Demolition*	RSI	Site specific health and safety plan for demolition work at the FRC.
January 25, 2013	*Decontamination and Demolition Work Plan for the Exide Technologies Frisco Recycling Center, Frisco, Texas*	PBW and RSI	Work plan developed to address waste removal, decontamination and demolition activities at the FRC.
November 30, 2012	Former Operating Plant ceases operations	Exide	Former Operating Plan ceases operations
November 16, 2012	*Report of: Asbestos Abatement and Project Management, Supervision and Testing Services, Conducted at Exide Technologies Oxide Building #3 / 4 Rooms…*	Industrial Hygiene and Safety Technology, Inc.	Report detailing asbestos abatement activities at the Oxide Building #3 / 4 Rooms at the FOP.

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July 12, 2012	*Site Investigation Report*	PBW	The SIR investigation was performed in accordance with a Sampling and Analysis Work Plan prepared by Conestoga-Rover Associates, submitted November 2011, and approved by the EPA by email on December 2, 2011, and pursuant to Paragraph 33 of the AOC for the Site, dated May 2, 2012. An investigation of soil, groundwater, surface water, and sediment was conducted to evaluate the nature, location, extent, direction, and rate of movement of any hazardous wastes and/or hazardous constituents which are present at or have been released at the facility. Soil samples were collected from the NDA, Slag Landfill, the Raw Material Storage Area, SDA, Boneyard, Bale Stabilization Area, Crystallization Unit Frac Tank area, Stewart Creek Corridor, and the Shooting Range Berm. Sediments were sampled in Stewart Creek and the North Tributary, and surface water was sampled in Stewart Creek. Two surface water gauging stations were installed along Stewart Creek and three monthly gauging events of the surface water and groundwater wells were performed. A groundwater investigation was also conducted during the SIR investigation, which included the installation of two background wells to the east of the Site and sampling of eleven existing wells in order to evaluate groundwater conditions downgradient of WMA 1 (the closed NDA and Slag Landfill), WMA 2 (the closed Battery Storage Area, Raw Material Storage Area, the closed Old Drum Storage Area, the closed Product Waste Pile and the Former Diesel Fuel Tank leak area) and WMA 3 (SDA). The report recommended additional investigation at the Raw Material Storage Area and the Stewart Creek Flood Wall at a creek-side sample location adjacent to the Battery Storage/Receiving Building.
May 2, 2012	*Administrative Order Consent, Docket No. RCRA 06-2011-0966, re-designated by EPA as Docket No. 2011-1712-HW-E*	TCEQ	Administrative order indicating requirements on the completion of the Site Investigation Report.
April 4, 2012	*Report of: Asbestos Abatement and Project Management, Supervision and Testing Services, Conducted at Exide Technologies Two Offices Old Smelter Plant*	Industrial Hygiene and Safety Technology, Inc.	Report detailing asbestos abatement activities of Two Offices Old Smelter Plant at the FOP.

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Date of Report or Event(s)	*Title of Report*/ Assessment Activities	Author/Assessor	Summary of Environmental Assessment and/or Correspondence
March 2012	Texas Commission on Environmental Quality (TCEQ), 2013l. Class 2 Non-Hazardous Waste Landfill Investigation and Response Action Work Plan, Exide Technologies, Inc.	W&M Environmental	W&M summarized the results of the investigation of treated slag material within the Class 2 Non-Hazardous Industrial Waste Landfill.
December 28, 2011	*North and South Disposal Areas Evaluation*	W&M Environmental	W&M conducted a visual inspection of the NDA and the SDA to assess the condition of the soil caps and to inspect for suspected slag on the ground surface within each area. The study identified limited areas of exposed slag and/or battery chips in the SDA as well as isolated occurrences of slag on the ground surface to the north and east of the area. The study also noted cracks in the soil above the SDA, but no slag or battery chips were identified in the areas of cracking. In the NDA, exposed slag was noted within materials storage areas and areas of heavy vehicular traffic in the southern portion of the area. In addition, isolated occurrences of slag were noted along the North Tributary, the railroad spur, and in the north wooded area.
October 7, 2011	*Geotechnical Engineering Report*	Rone Engineering	A geotechnical study was performed in 2011 in the general area of WMA 1 (NDA and Slag Landfill) to support the engineering design for a series of buildings and upgrades to existing facility structures proposed at the time of the report. The lithologic information obtained from the borings drilled for this investigation was used in support of Site hydrogeologic evaluation and for the development of geologic cross-sections in the 2014APAR.
August 1, 2011	*RCRA Section 3013(a) Administrative Order*	EPA	The Administrative Order was issued on August 1, 2011 (Docket No. RCRA 06-2011-0966; re-designated by EPA as Docket No. RCRA 06-2012-0966), following an EPA inspection on December 14-18 2009 and March 29, 2010 and review of historical documents. EPA concluded that there was potential soil, groundwater, sediment and surface water contamination resulting from the activities at the facility and issued the Administrative Order. The Administrative Order ordered Exide to submit to EPA a work plan that proposed sampling and analysis. A sampling and analysis work plan was prepared by Conestoga-Rovers and submitted November 2011. The Site Investigation (PBW, 2012), detailed below, addressed areas noted as potential areas of concern in the Administrative Order. Additional details of the Administrative Order are provided in Table 1C of the 2014 APAR.

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Date of Report or Event(s)	*Title of Report*/ Assessment Activities	Author/Assessor	Summary of Environmental Assessment and/or Correspondence
March 29, 2011	*Suspect Slag Sampling Report; Stewart Creek - West Segment*	W&M Environmental	W&M Environmental conducted a visual survey of the western reach of Stewart Creek from the Battery Receiving/Storage Building to the BNSF railroad. Suspected slag samples collected from the banks of the creek were photographed and evaluated for Pb, Ca, and Fe to develop a visual criteria for identifying suspected slag in the field. Ca and Fe were evaluated to differentiate between Pb slag and limestone fragments. Based on analytical results and the resultant visual criteria, slag occurrences were observed along the majority of the study area on both sides of the creek but were noted to occur more frequently along the central portion and eastern portions of the study area.
2009-2011	*TCEQ and EPA Inspections*	TCEQ and United States Environmental Protection Agency (EPA)	TCEQ and EPA performed multiple inspections of the Site. Key investigations are listed in Table 1C of the 2014 APAR.
August 11, 2008	*Asbestos Survey – Exide Facility, Frisco, Texas*	Environmental Logistics Company	Report detailing asbestos survey results from building located at the FRC.
July 15, 2003	*Leaking Petroleum Storage Tank (LPST) Case Closure of Subsurface Release of Hydrocarbons at G.N.B. Technologies Facility*	Texas Commission on Environmental Quality (TCEQ)	A diesel oil release residue was discovered in April 1988 during the construction of the retaining wall adjacent to Stewart Creek. Details of the discovery and subsequent remedial actions are provided in a letter by Lake Engineering to the Texas Water Commission (Lake, 1988). Following discovery of the residue, a pump and mobile storage tank were immediately installed. Three test holes were advanced to determine the extent of residue; residue was not detected in any of the holes. To enhance collection of residue, an oil recovery sump and intercept trenches were constructed. TCEQ issued a letter dated July 15, 2003, certifying that the former diesel fuel release (LPST ID No. 106075) had met site closure requirements and that no further action was necessary.

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Date of Report or Event(s)	*Title of Report*/ Assessment Activities	Author/Assessor	Summary of Environmental Assessment and/or Correspondence
July 2000	*Stewart Creek Corrective Measures Implementation Report*	JD Consulting, Inc.	As a result of the HHERA described above, an approximate 2,800-foot stretch of the creek sediments was remediated to standards for lead and cadmium approved by the TNRCC (91 milligrams per kilogram [mg/kg] for lead and 4.23 mg/kg for cadmium). The remediation was carried out by first removing visible slag "buttons" from the creek bed and banks, then excavating the soils at an average depth of 1ft. Soils were excavated to deeper depths as needed based on the extent of slag presence in the soil. Excavated soil was screened for recoverable slag fragments, which were recycled in the blast furnace at the facility. Remaining soil was stockpiled and sampled for TCLP analysis for lead and cadmium. Most samples passed the criteria for Class II waste; the samples that did not pass the criteria were treated until they passed. Some stockpiled material was tested for SPLP lead and cadmium for potential re-use as intermediate fill in the active Class 2 landfill at the facility. The TNRCC approved the reuse proposal on November 8, 1999. The material that met the re-use criteria were stored in the Class 2 landfill, while the material that did not meet the re-use criteria but met or was treated to meet the Class 2 waste criteria was disposed of off-site in an appropriate landfill.
January 13, 2000	*Acceptance Closure for Four Solid Waste Management Units*	Texas Natural Resource Conservation Commission	The TNRCC issued a letter dated January 13, 2000, that approved closure for the following SWMUs: the former Battery Storage Area, Old Drum Storage Area, Stewart Creek Dredging Waste Pile and the Product Waste Pile. The letter stated that each SWMU was closed according to the closure plans approved by the TNRCC.
August 1998	*Human Health and Ecological Risk Assessment*	JD Consulting, Inc.	Stewart Creek was addressed as a separate project from the Phase II RFI pursuant to a TNRCC request dated September 6, 1993. The Human Health and Ecological Risk Assessment (HHERA) and Corrective Measures Study for Stewart Creek (JDC, 1998b) were submitted to the TNRCC on August 5, 1998. This study included an evaluation of Stewart Creek sediment and surface water data from several investigations, including the Phase I RFI (Lake, 1991), the Phase II RFI (JDC, 1998a), additional sediment sampling performed by RMT/JN in 1995 and 1996 and the Stewart Creek Final Phase II (RMT/JN, 1996). The study area for the HHERA included portions of Stewart Creek at the facility area and areas downstream of the facility. The study concluded that the levels of cadmium and lead in surface water do not pose a risk to ecological or human receptors. The sediments within the facility boundaries, however, pose a potential risk to human and ecological receptors. In addition, the study noted that cadmium and lead levels at four locations downstream of the facility boundary (6,500 ft, 7,000 ft, 7,200 ft, and 7,600 feet downstream of the former 5th Street) may also pose an ecological risk and warranted further investigation. A Corrective Measures Study was recommended for the on-Site sediments.

Use this worksheet to describe the objectives for the response action in each media.

Response Action Objectives

List the environmental media to which this applies **Surface Soil (0-5 feet below ground surface) outside of the RCA and Existing Caps**

Repeat this section for each medium that has a different response action objective.

State the property-specific response objectives for the PCLE zone in each media in the context of the response objectives set forth in §350.32 or §350.33 as applicable. Explain how the response action is appropriate based on the hydrogeologic characteristics, COC characteristics, and potential unprotective conditions that could continue or result during the remedial period.

Background

Surface soils within PCLE zones at the FOP are primarily impacted with lead, but may also contain elevated levels of antimony, arsenic, cadmium, and/or selenium as well as isolated exceedances of methylene chloride, and bis(2-chloroethyl) ether (collectively, COCs). The primary release mechanism at the affected properties was historic releases from former operations and waste units, including fugitive dust sources and permitted historical air emissions. Based on extensive sampling during SIR and APAR investigations (reports submitted separately), seven surface soil affected property areas (Affected Properties No.1, 3 through 7, and 9) were identified at the Site, each of which has been delineated and includes surficial soil ranging from six inches to four feet. The areas of the Site proposed to be remediated as part of this response action are presented on Figure 1A-2 (PCLE zones). Affected Property No. 2 was identified as a surface soil and subsurface soil affected property.

- **Affected Property No. 2 is divided into two categories for the purposes of this RAP: surface soils outside of the area of the proposed Remediation Consolidation Area [RCA] Corrective Action Management Unit [CAMU], NDA and Slag Landfill and surface and subsurface soils within the area of the RCA, NDA and Slag Landfill (RCA and Existing Caps).**
    - **Groundwater within Affected Property No. 2 is included as a separate worksheet within this Section.**
- **Additionally, Affected Property No. 3 is divided into two categories for the purposes of this RAP: surface soils outside of the area of the SDA and surface soils on top of the cap of the SDA (Existing Cap).**

The PCLE zones were expanded in 2018 to incorporate additional areas based on confirmation sampling data obtained within the FOP boundary during UBP remediation. Based on existing data, it is expected that the majority of these surface soils are non-hazardous and expected to meet the standards for Class 2 waste characterization.

Objective

The response objective for the surface soils outside the RCA containing COCs above the critical PCLs at the Site is to control exposure (direct human contact, ingestion, soil to groundwater transfer, and ecological receptor exposure) by removal in accordance with the Remedy Standard A response objectives outlined in 30 TAC §350.33 and the associated guidance documents Application of Remedy Standards A & B (TCEQ, 2008) and Soil and Groundwater Response

Objectives (TCEQ, 2013). The critical PCL being applied for lead cleanup in soils on the FOP is 274.51 mg/kg, which is below the default residential soil standard of 500 mg/kg and is based on the agreed use of a class 2 groundwater classification.

Response Action Description

Surface soils with COCs above the critical PCLs in Affected Properties No.1 through 7 and 9 (excluding the area of the RCA and Existing Caps) will be removed by excavation and will be consolidated in the RCA, sent off-Site or, if the materials are Class 2 non-hazardous wastes, may be placed the North CAMU (see additional discussion for the RCA in other worksheets).

Exide proposes that a contiguous, discrete area of generally dispersed contamination at the FOP be treated as an Area of Contamination (AOC). Within an AOC, contaminated media/remediation waste can be moved and managed without being considered a waste generation event or triggering land disposal restrictions. The AOC thus provides flexibility to support remediation activities prior to consolidation. Any contaminated media/remediation waste on the FOP within the AOC but outside the RCA will be consolidated into the RCA or will be placed on top of the Slag Landfill or the NDA, subject to meeting CAMU treatment standards, if applicable. The AOC policy will specifically be used to consolidate soil that may be placed in the RCA (a CAMU) or may be consolidated on top of the Slag Landfill or NDA, which will also be capped in the same manner as the RCA. Prior to consolidation, waste would be characterized in accordance with the Waste Analysis Plan included as Attachment Q to the Part B RCRA Permit Renewal Application. The boundaries of the AOC generally include most on-site contaminated media/remediation waste that will be consolidated in the RCA (or placed on top of the Slag Landfill or NDA) and the RCA is located within the boundaries of the AOC. The AOC boundary is shown on Figure 1A-7. Waste materials that may be consolidated in the AOC include Wastes 3 through 6 and 8 (as described in the WAP included as Attachment Q to the Part B Permit Renewal Application). The waste consolidation plan and timeframe are the same that are described in this RAP for the response actions for Surface Soil (0-5 feet below ground surface) outside of the RCA and Existing Caps of the Slag Landfill and NDA.

In addition, the property will be zoned and deed restricted for commercial/industrial use and, with TCEQ concurrence, potentially recreational use, as described in Worksheet 2.4 and Appendix 4.

Rationale

The response action is appropriate for the Site hydrogeology and COCs because COCs are located in shallow soils that can be accessed using traditional construction equipment. The response action will be a permanent remedy for the excavated areas. Potential exposure to COCs in dust generated during excavation activities during the remedial period would be mitigated by the implementation of a dust suppression program and associated air monitoring program. Future use will be limited to commercial/industrial use and/or, subject to TCEQ concurrence, recreational, for which remedial action objectives would be protective.

Explain how the COCs will be handled, treated, disposed, or transferred to another media and document that the response action will not result in any additional potential exposure conditions due to response action activities.

General Response Action Preparation

Prior to implementation of any response actions, a Site-specific health, safety and environment plan (HASEP) will be prepared by each contractor or consultant to address the specific

activities that will be performed as a part of the response action. The HASEP will address potential worker exposure to COCs, safe work practices, appropriate personal protective equipment, emergency procedures, contact information, and other topics as appropriate.

Excavation of Surface Soils

Surface soils will be excavated and transported to the on-Site RCA located on Affected Property No. 2; provided soils meeting the criteria for placement in a non-hazardous Class 2 landfill also may be placed in the North CAMU and provided, for hazardous wastes, applicable CAMU treatment standards must be met. Key components of the removal action relating to the handling, treatment, disposal or transfer of COCs include the following:

- **A remediation contractor will perform removal and management/disposal of affected surface soils from the Site (excluding the area of the RCA and Existing Caps) that were identified as containing levels of COCs at concentrations exceeding the applicable PCLs. Approximately 27,000 cubic yards (in-place) of impacted soil are expected to be removed from Affected Properties and placed in the RCA.**

- **Site workers will utilize appropriate personal protective equipment to mitigate potential exposure to COCs.**

- **Dust control procedures will be implemented during the remediation activities to minimize fugitive dust emissions. Air monitoring will be conducted at the perimeters of the Site during dust-generating activities to determine if concentrations of lead, cadmium and particulate emissions exceed the "Take Action" or "Stop Work" levels established for the response action. These measures have been used and proven effective during the course of the cleanup on the adjacent Undeveloped Buffer Property under the Voluntary Cleanup Program. The FOP/RCA Air Monitoring Plan and Dust Control Plan have been submitted separately as an Appendix to the Closure Plan included in the May 2019 supplement to the RCRA Hazardous Waste Renewal Application for the Site (to which this RAP is an Attachment).**

- **Waste Characterization will be performed as described in the WAP included as Attachment Q to the RCRA Permit Renewal Application. Excavated soils that are non-hazardous when generated and hazardous excavated soils that meet applicable CAMU Treatment Standards (following on-site treatment in less than 90-day accumulation units if necessary) will be placed in the RCA. Any on-site treatment is proposed to consist of permanent stabilization using Enviroblend® CS (or equivalent). Additional solidification can be accomplished by the addition of .1% to 1% by weight of ZapZorb® (or equivalent, per manufacturer's recommendation), a sodium polyacrylate based water absorbing material (if needed due to moisture). The stabilized material will be placed in the RCA following confirmatory analyses (see the WAP included as Attachment Q to the Part B Permit Renewal Application). If stabilization using Enviroblend® CS (or equivalent) is performed, it would be performed in a container within the footprint of the RCA in an area that was lined and bermed to provide secondary containment. Soil piles and containers would be covered when not actively being used.**

- **Excavated soils meeting the criteria for placement in a non-hazardous Class 2 landfill may be transported and managed/disposed of at the North CAMU located on-Site.**

- **Any excavated soils that are not placed in the RCA or the North CAMU will be transported and disposed of in an off-site landfill authorized to receive the soils based on characterization data. See additional discussion in the WAP.**

- **Residual soils in excavated areas will be screened for lead, and may also be screened for cadmium, arsenic, antimony and/or selenium concentrations using an X-ray fluorescence analyzer (XRF). If XRF readings indicate that impacted soils have been removed, confirmation samples will be collected for laboratory analysis to verify that impacted soils have been removed to the response action objectives. If XRF screening indicates that elevated concentrations of lead (or other metals, if screened) are still present, additional excavation will be performed until the screening indicates that impacted soils have been removed, followed by confirmation sampling. During this process, the XRF data will be compared to initial assessment results or confirmation samples to evaluate the accuracy of the XRF and develop a correlation between the screening values and analytical results.**

- **Confirmation samples will be collected for laboratory analysis following excavation of soils to ensure that all affected soils containing COCs at concentrations in excess of the response action objectives have been removed (see Appendix 6).**

- **Upon completion of confirmation sampling, the excavation area will be restored by backfilling and/or grading. Any portion of the existing North CAMU cap that is removed to remove surface soil COCs will be repaired to match existing conditions. The backfill source will be determined at the time of implementation of this RAP and will be sampled prior to use on-Site.**

These procedures for excavation (handling), transport, disposal and confirmation sampling activities have been previously implemented successfully at other sites, including the UBP, and are not expected to result in any additional potential exposure conditions. Based existing data, it is expected that the majority of the impacted media that will be excavated is non-hazardous and likely is within the standards for Class 2 waste characterization.

State the proposed "reasonable time frame" and provide the justification for that time frame in the context of any potential for unprotective exposures to exist or develop, COC characteristics, hydrogeologic and affected property characteristics. If the reasonable time frame is different for the different affected media or for particular tracts of land, be sure to discuss that. Provide how the proposed response action will meet the objectives in a reasonable timeframe.

It is estimated that the removal actions will be implemented as soon as possible following RAP approval and obtaining necessary permits. The response action for surface soil is estimated to require approximately 36 months to complete (including the timeframe required for consolidation and capping in the RCA). Time is not a critical factor in limiting potential exposure because the relevant COCs are considered to be of low mobility, the Site has low permeability soils, no operations are continuing, decontamination and demolition of structures other than the wastewater system are complete, and many of the areas are vegetated, which minimizes the potential for dust.

Soil Response Action Objectives

When using removal and/or decontamination with controls or controls only, demonstrate how that physical control or combination of measures will reliably contain COCs within and/or derived from the surface soil and subsurface soil PCLE zone materials over time.

Not applicable, no physical controls are proposed as a part of the response action for surface soil (0-5 feet below ground surface) outside of the RCA and Existing Caps.

Explain how the removal or decontamination action will reduce the concentration of COCs to the critical surface soil and subsurface soil PCL throughout the soil PCLE zone and prevent COC concentrations above the critical soil PCLs from migrating beyond the existing boundary of the soil PCLE zone.

The removal action will remove material exceeding the PCLs which are as follows: lead = 274.51 mg/kg, cadmium = 30.00 mg/kg, arsenic = 15.90 mg/kg, selenium = 1.60 mg/kg, and antimony = 2.71 mg/kg. Removal will be confirmed through collection of confirmation samples. In the event the confirmation samples indicate COCs with concentrations greater than the PCLs are still present, additional excavation followed by confirmation sampling will be performed to remove the affected soil until confirmation samples indicate the response action objectives have been achieved.

List the environmental media to which this applies **Surface Soil (0-5 feet below ground surface), Subsurface Soil (below 5 ft) in the area of the RCA and Existing Caps**

Repeat this section for each medium that has a different response action objective.

State the property-specific response objectives for the PCLE zone in each media in the context of the response objectives set forth in §350.32 or §350.33 as applicable. Explain how the response action is appropriate based on the hydrogeologic characteristics, COC characteristics, and potential unprotective conditions that could continue or result during the remedial period.

Background

Surface and subsurface soils within the area of the RCA and surface soils located on existing caps are primarily impacted with lead, but may also contain elevated levels of antimony, arsenic, cadmium, and/or selenium as well as isolated exceedances of benzene (COCs). The primary release mechanism at the affected properties was historic releases from former operations and waste units, including fugitive dust sources and permitted historical air emissions. The area of the Site proposed to be remediated as part of this response action are presented on Figure 1A-2 (PCLE zones). Affected groundwater is also present within Affected Property No. 2 and is addressed as its own worksheet within this Section.

Objective

The response objective for the surface soils and subsurface soils in the area of the RCA and Existing Caps containing COCs above the critical PCLs at the Site, is to control exposure (direct human contact, ingestion, soil to groundwater transfer, and ecological receptor exposure) through a combination of removal and physical controls in accordance with the Remedy Standard B response objectives outlined in 30 TAC §350.33 and the associated guidance documents Application of Remedy Standards A & B (TCEQ, 2008) and Soil and Groundwater Response Objectives (TCEQ, 2013). The RCA will allow Exide to consolidate impacted media in an existing impacted area, thus minimizing media disturbance and the footprint of remaining impacted media. The RCA, NDA and Slag Landfill will have a protective multi-layer RCRA cap to prevent migration from the unit and a groundwater monitoring plan to confirm the long term protectiveness of the remedy.

Response Action Description

The response action will include the following major components:

- **Surface soils and sediment generated from other response actions will be consolidated in the area of the RCA. Using the AOC Policy, non-hazardous surface soils may also be placed on top of the Slag Landfill or NDA prior to capping in order to assist with grading for the final cover.**
- **An engineered cap consisting of a geosynthetic clay liner (GCL), geomembrane, geotextile/geocomposite, 30-in clean fill layer, and 6-inch vegetative cover soil layer will be placed over the RCA, Slag Landfill and NDA.**
- **In order to prevent erosion or ponding, the RCA, Slag Landfill and NDA will be graded to support drainage toward Stewart Creek or the North Tributary. The flood wall will be extended based on the results of modeling, if warranted (additional discussion of the flood wall is included in the Engineering Report for the RCA included in the RCRA**

Permit Renewal Application).

- **Existing cap areas of the SDA will receive cap upgrades consisting of a geomembrane, geotextile/geocomposite, 18-in clean fill layer, and 6-inch vegetative cover soil layer. The caps will be graded to support drainage away from the caps.**
- **A groundwater monitoring program will be implemented for the capped areas.**
- **The property will be deed restricted for commercial/industrial and/or, subject to TCEQ concurrence, recreational use only with additional restrictions regarding disturbing capped areas as described in Worksheet 2.4 and Appendix 4.**

Rationale

The multi-layered engineered cap placed over the RCA will control exposure to the surface and subsurface soils in Affected Property No. 2 and will prevent the potential migration of storm water through the existing concrete slab through the shallow subsurface soils toward Stewart Creek. The response action is appropriate because it will significantly reduce potential human or ecological exposure and will prevent soil to groundwater transfer of COCs in the area of the RCA, NDA and Slag Landfill. Further, the RCA is established in an area of existing contamination, avoids disturbance of this impacted media, and is designed to prevent migration of COCs from the unit to satisfy long-term remedial goals. The long-term protection can be ensured through this protective multi-layer cap and continued inspections, monitoring and maintenance. It is implemented using standard construction equipment and labor. The multi-layered engineered cap together with the funnel and gate PRB wall (discussed separately) comprise the design for the RCA that meets the alternate design requirements for a CAMU. The RCA Engineering Report and FOP Closure Plan (Attachments C and F to the Part B RCRA Permit Renewal Application provide additional discussion and rationale for the design.

The groundwater monitoring program that will be implemented for the RCA, NDA, Slag Landfill (Corrective Action Monitoring) and SDA (Detection Monitoring) will ensure that the capped areas are performing as designed and confirm that no unprotective conditions have been generated as a result of the consolidation and capping response actions. See additional discussion regarding groundwater response actions included later in this report.

Potential exposure to COCs in dust generated during waste placement activities during the remedial period will be mitigated by the implementation of a robust dust suppression program and associated air monitoring program.

Future use will be limited to commercial/industrial/potentially recreational use with restrictions on groundwater use and further restrictions on disturbing capped areas to support the protectiveness of the remedial action.

Explain how the COCs will be handled, treated, disposed, or transferred to another media and document that the response action will not result in any additional potential exposure conditions due to response action activities.

General Response Action Preparation

As described above, prior to implementation of any response actions, a Site-specific HASEP will be prepared by each contractor or consultant to address the specific activities that will be performed as a part of the response action. The HASEP will address potential worker exposure to COCs, safe work practices, appropriate personal protective equipment, emergency

procedures, contact information, and other topics as appropriate.

Consolidation and Capping of the RCA

The consolidation and capping of the RCA will include preparation activities, waste placement, and final closure (capping). Key components of this physical control response action relating to the handling, treatment, disposal or transfer of COCs include the following:

Preparation

- **The FDS System will be abandoned and the funnel and gate PRB wall will be installed. Groundwater monitoring to assess funnel and gate performance will be initiated. The groundwater potentiometric surface will be monitored for at least 12 months (and up to 24 months) prior to waste placement in the RCA to allow for the expected change of groundwater flow after placement of the funnel and gate PRB in order to evaluate the change in groundwater conditions over the course of one annual hydrologic cycle with the potential to add a second annual hydrologic cycle based on the first year's conditions.**
- **Monitoring wells within the RCA will be properly abandoned prior to waste placement activities.**
- **Concrete walls and foundations associated with the former facility operation are present within the RCA. To facilitate waste placement, to the extent practical, the walls and above grade foundations will be demolished. The resulting rubble will be spread on the surface of the existing concrete slab.**
- **A number of utilities are present below the concrete slab in the RCA. These utilities consist of pipes, manholes, and sumps for the sanitary sewer, the storm sewer and process drains. To prevent liquid from accumulating in the utilities and to remove the potential for collapse, the pipes, sumps, and manholes will be plugged with flowable fill or other low-permeable material (such as concrete and/or bentonite) prior to final closure of the area.**
- **A vertical extension of the existing flood wall and a new lateral extension of this wall along the eastern boundary of the RCA has been designed to protect the facility from potential 100-year flood waters. The construction of the flood wall extensions will be completed prior to waste placement in the RCA. Additional information for the design of the flood wall is included in the Engineering Report for the RCA, which is included as Attachment F of the May 2019 supplement to the hazardous waste permit renewal application.**

Waste Placement

- **The RCA will be operated in accordance with the RCA O&M Plan that is included as Appendix D to the Final Closure Plan included in the RCRA Permit Renewal Application.**

- **Soil and sediment will be placed on the RCA in approximately one-foot lifts and will be placed in a manner to promote drainage off the RCA. Management of contact water is described in the RCA Operations and Maintenance Plan included as Appendix L to the Closure Plan included in the RCRA Permit Renewal Application.**

Capping

- **The RCA, NDA and Slag Landfill will be capped with a geosynthetic clay liner (GCL), geomembrane, geotextile/geocomposite, 30-in clean fill layer, and 6-inch vegetative cover soil layer.**

- **The RCA, NDA and Slag Landfill will be graded to support drainage away from the cap toward the North Tributary or Stewart Creek.**

Based on existing data, it is expected that the majority of the impacted media that will be added to the RCA are non-hazardous and likely are within the standards for Class 2 waste characterization. The construction of a low permeability cap on the RCA, NDA and Slag Landfill will control the potential transfer of COCs from soil to groundwater. The procedures for preparation, waste placement and capping have been previously implemented at the Site (including placement of Undeveloped Buffer Property Waste at the North CAMU), and are not expected to result in any additional potential exposure conditions.

Upgraded Capping of Existing Capped Waste Areas – South Disposal Area

The existing cap for the SDA will be upgraded. Key components of this physical control response action relating to the handling, treatment, disposal or transfer of COCs include the following:

- **In the areas of existing cap, a cap upgrade including a geomembrane, geotextile/geocomposite, 18-in clean fill layer, and 6-inch vegetative cover soil layer will be placed.**

- **The cap will be graded to support drainage away from the caps.**

The upgrades to the existing cap will be performed using conventional landfill construction equipment and methods. There is no expected handling, treatment, disposal or transfer of COCs to another media and there are no expected additional potential exposure conditions due to response action activities.

State the proposed "reasonable time frame" and provide the justification for that time frame in the context of any potential for unprotective exposures to exist or develop, COC characteristics, hydrogeologic and affected property characteristics. If the reasonable time frame is different for the different affected media or for particular tracts of land, be sure to discuss that. Provide how the proposed response action will meet the objectives in a reasonable timeframe.

It is estimated that the removal actions will be implemented as soon as possible following RAP approval and obtaining necessary permits. The response action for surface soil and subsurface soil in the area of the RCA and Existing Caps is estimated to require approximately 36 months to complete (including the timeframe required for consolidation and capping in the RCA). As discussed above, time is not a critical factor in limiting potential exposure.

Soil Response Action Objectives

When using removal and/or decontamination with controls or controls only, demonstrate how that physical control or combination of measures will reliably contain COCs within and/or derived from the surface soil and subsurface soil PCLE zone materials over time.

Control of COCs in soil and sediment using capping is a presumptive remedy. Because the RCA is requested to be designated by the TCEQ as a CAMU, in the RCRA Permit Renewal Application, Exide has further described in the application materials the manner in which the CAMU will be effective in preventing migration of hazardous constituents from the unit so that long term remedial goals are met by the comprehensive design (see RCA Engineering Report and discussion of PRB for groundwater below). In summary, although the contaminated

material remains onsite, the risk of exposure and potential migration of contaminants is significantly reduced due to the multi-layer RCRA cap combined with the groundwater remedy (discussed below). The long-term protection can be ensured through continued inspections, monitoring and maintenance.

Explain how the removal or decontamination action will reduce the concentration of COCs to the critical surface soil and subsurface soil PCL throughout the soil PCLE zone and prevent COC concentrations above the critical soil PCLs from migrating beyond the existing boundary of the soil PCLE zone.

The multi-layered engineered cap placed over the RCA will control exposure to the surface and subsurface soils in Affected Property No. 2 and will prevent the potential migration of storm water through the existing concrete slab through the shallow subsurface soils toward the flood wall. The design of the cap working in conjunction with the PRB for groundwater prevents migration of COCs from the unit to satisfy long-term remedial goals.

List the environmental media to which this applies **Stewart Creek Sediment and Sidewall Soil**

Repeat this section for each medium that has a different response action objective.

State the property-specific response objectives for the PCLE zone in each media in the context of the response objectives set forth in §350.32 or §350.33 as applicable. Explain how the response action is appropriate based on the hydrogeologic characteristics, COC characteristics, and potential unprotective conditions that could continue or result during the remedial period.

Background

Sediments in previously identified segments of Stewart Creek are impacted with lead, cadmium and/or arsenic. The primary release mechanism at the affected properties was historic releases from former operations and waste units at the former FOP production area(s), use of slag as fill material or bank stabilization on-Site or for road base in off-Site areas, as well as historic releases of contaminants during previous agricultural practices in the watershed. The segments of Stewart Creek with sediment exceeding the critical PCLs are presented on Figure 1A-4. Later sampling results demonstrate the variability of sediment data that is expected in a dynamic creek system. Based on existing data, it is expected that the majority of these sediments and media are non-hazardous and likely are within the standards for Class 2 waste characterization.

Objective

The response objective for the sediment containing COCs above the critical PCLs in Stewart Creek is to control exposure (direct human contact, ingestion, soil to groundwater transfer, and ecological receptor exposure) by removal in accordance with the Remedy Standard A response objectives outlined in 30 TAC §350.32 and the associated guidance documents Application of Remedy Standards A & B (TCEQ, 2008) and Soil and Groundwater Response Objectives (TCEQ, 2013). Because the creek system is dynamic, Exide's objective is to prioritize remediation of predetermined areas that warrant excavation based on existing data and to then evaluate creek conditions to determine the appropriate areas for additional excavation using new data and an approved exposure point concentration methodology (see Appendix 6.2). In this manner, remediation is targeted to effectively addressing the current conditions at the time of remediation while minimizing impacts to the general creek environment.

Response Action Description

The response action for sediment and sidewall soils in Stewart Creek will include the following:

- **Excavation of sediment (including sediment in channel banks) in pre-determined segments of Stewart Creek containing COCs above the applicable PCLs (shown on Figures 2A-10 through 2A-14 and identified by Exide based on where the highest frequency of PCL exceedances and observations of the presence of battery case fragments and slag have been observed in past data).**
- **Performing sampling of sediment in remaining segments of Stewart Creek (where pre-determined excavation is not initially performed) to identify current exposure point concentrations (EPCs) and performing excavation as appropriate (see Appendix 6.2).**
- **Removal of channel sidewall soils containing visible evidence of fill materials containing slag or battery case fragments. Based on visual observations of Stewart Creek by Exide, this is likely limited to areas on the FOP or immediately downstream (upstream from Dallas North Tollway).**

- **Inspection of the area surrounding MW-10 and the North Area on the FSCWWTP for any visible battery case fragments or slag will be conducted during adjacent Stewart Creek response actions. Should battery case fragments or slag be identified, the material will be removed to a depth of six inches followed by confirmation sampling. If additional battery case fragments or slag are observed or confirmation sampling indicates that soil results are above the applicable soil PCLs, additional excavation will be performed.**

- **Based on field conditions and data to be collected as part of the RAP implementation, Exide may propose to use the AOC policy for one or more contiguous portions of Stewart Creek to facilitate management of impacted media to advance the remediation project as appropriate and through coordination with TCEQ.**

- **Implementation of an ongoing periodic visual assessment and removal of any slag or battery case fragments following the completion of excavation activities.**

Rationale

The response action is appropriate for sediment in Stewart Creek because it will remove COCs above applicable PCLs, as well as slag and battery case fragments encountered within the areas where sediment concentrations exceed applicable PCLs. The combination of pre-determined excavation in selected segments with a resampling program for other segments (see Appendix 6.2) will provide a method to remove sediment exceeding applicable PCLs based on data current to the time of the excavation.

The critical PCLs developed for Stewart Creek sediment are 81.9 mg/kg for lead, 2.985 mg/kg for cadmium, and 39.7 mg/kg for arsenic. The extent of the current PCLE zones are presented in Figures 1A-4 through 1A-7. The PCLE zones are currently defined by data collected between 2014 and 2017.

As a part of the Site-Specific Ecological Risk Assessment Work Plan for Arsenic in Sediment in Stewart Creek, sediment sample locations were chosen based on existing data to obtain samples with arsenic concentrations ranging from low to high (from less than 21.4 mg/kg to 100 mg/kg). However, during implementation of the work plan, analytical results from the selected locations did not demonstrate concentrations consistent with previous samples across the range of previously sampled concentrations. Specifically, of the 14 samples taken from Stewart Creek only two samples exceeded the default PCL of 21.4 mg/kg (26.4 mg/kg and 32.2 mg/kg) and no samples contained arsenic at levels for the high concentration range category. These results demonstrate the variability of sediment data that is expected in a dynamic creek system. Based on determinations outlined by PBW in the December 16, 2016 *Screening Level Ecological Risk Assessment Stewart Creek, Exide Technologies, Frisco, Texas,* the UPL for arsenic was determined to be 39.7 mg/kg and is referenced throughout this RAP as the critical PCL.

In order to address concerns regarding the timing of response action implementation and the dynamic environment of Stewart Creek, a combination of pre-determined excavation and resampling is proposed (see Appendix 6.2). Pre-determined areas of excavation are shown on Figures 2A-10 through 2A-4. This combination of approaches will conservatively address segments of Stewart Creek where the highest frequency of PCL exceedances and observations of the presence of battery case fragments and slag have been observed (based on 1,402 sediment samples, including 125 duplicates, downstream of the FOP between 2014 and 2017) and will also provide for the determination of additional areas of excavation based on then current data for the remaining areas of Stewart Creek with a current and representative exposure point concentration that will allow response actions to be targeted to those areas where current exposure point concentrations exceed the critical PCL.

Slag and battery case fragments outside of these areas, if present, will be addressed by ongoing inspection and removal (semiannually for five years (the five year period will start after the completion of all closure activities) with an evaluation of additional inspection and removal to be performed at the end of five years, if needed). No sediment/soil sampling is proposed for this ongoing inspection and removal because the presence of battery case fragments or slag in Stewart Creek does not generally correlate with PCL exceedances in sediment and the PCL exceedances in sediment are thus not related to the observed material. As noted in the executive summary, a significant number of sediment and soil samples have been collected in Stewart Creek in the locations where battery case fragments or slag have been observed (results repeated below):

- **2014 Interim Action Sampling - 815 sediment/soil samples (including 75 duplicates) were collected at and downstream of the FOP in May and June 2014. Samples extended as far as Lebanon Road. 78 samples at 77 separate locations exceeded the arsenic PCL of 39.7 ppm. Lead concentrations detected in sediment at 119 sample locations exceeded the lead PCL; concentrations of lead were highest near the FOP and/or in depositional areas downstream of the FOP. 71 samples exceeded the cadmium PCL. Review of this extensive sampling indicates only an approximately 9-15% coincident presence of battery case fragments or slag to adjacent soil concentration greater than PCL.**

- **2016 Interim Action Sampling - Golder collected 449 samples (including 41 duplicates) between Stonebrook Parkway and Lake Lewisville. 56 samples at 55 separate locations exceeded the arsenic PCL of 39.7 ppm. One sample exceeded the lead PCL. 28 samples at 27 separate locations exceeded the cadmium PCL. . Review of this extensive sampling indicates only approximately 6-12% coincident presence of battery case fragments or slag to adjacent soil concentration greater than the applicable PCL.**

This data demonstrated that the presence of battery case fragments or slag in Stewart Creek does not generally correlate with PCL exceedances in sediment and the PCL exceedances in adjacent sediment are not likely related to the observed material. More specific evaluation indicates that the overall range of instances where the presence of battery case fragments or slag material corresponded to an exceedance of the applicable PCL ranged from less than 1% of the instances to approximately 15% of the instances. In 2016, where interim action sampling was performed primarily downstream of Stonebrook Parkway, lead exceedances were identified in less than 1% of the samples collected based on the presence of battery case fragments or slag and cadmium exceedances were identified in less than 7%. The frequency of arsenic PCL exceedances in the presence of battery case fragments or slag was slightly higher, but the presence of arsenic in Stewart Creek is also partially attributable to other anthropogenic sources (cotton farming). It is noted that arsenic in exceedance of the PCL was also observed upstream from the FOP on Stewart Creek and in a tributary to Stewart Creek not downstream from the FOP.

Based on the review of this extensive set of data, in segments that are not excavated based on PCL exceedances, visual observation and removal is the appropriate response action and soil/sediment sampling at a locations due to the observation of battery case fragments and slag that will be removed is not warranted.

Fill material containing battery case fragments or slag have been identified in areas between the FOP and the Dallas North Tollway Bridge. In the areas where this material is observed, the material will be removed to a depth of six inches followed by confirmation sampling. If additional battery case fragments or slag are observed or confirmation sampling indicates that

soil results are above the applicable PCLs, additional excavation will be performed. In areas where soil sidewalls containing fill with battery case fragments or slag will be removed, TCEQ's Wildlife PCL Database was used to determine PCLs for the soil in the side banks. This is a unique type of exposure (e.g., side banks) and the most appropriate species and exposure models were developed and documented in determining the PCLs. The inputs and assumptions were provided to TCEQ in a Technical Memorandum dated January 8, 2018 which is included in Appendix 3.

In summary, the combination of these removal actions combined with additional investigation (and removal as appropriate) will significantly reduce potential exposure to human or ecological receptors and prevent further migration of COCs in Stewart Creek. Excavation methods are well-established and can be performed using conventional construction equipment. The inspection and removal activities have been performed in the past and can be performed efficiently to address any potential residual contamination of slag or battery case fragments that are not removed during the initial response actions.

A suitable disposal facility (the RCA) is available and close to Stewart Creek and there are also suitable areas for equipment staging and handling adjacent to Stewart Creek. Based on the observed flow in Stewart Creek, water diversion is practical so that dry excavation methods can be used. The depth of sediment excavation is generally bounded by the presence of bedrock. Backfill of sediment of similar size and composition will help to facilitate restoration of aquatic habitat. Compared to other potential sediment response actions (such as in-situ capping or monitored natural recovery), excavation presents the timeliest option and would not result in use limitations after completion (other than as required for restoration purposes in accordance with a USACE approved restoration plan).

Explain how the COCs will be handled, treated, disposed, or transferred to another media and document that the response action will not result in any additional potential exposure conditions due to response action activities.

As described above, prior to implementation of any response actions, a Site-specific HASEP will be prepared by each contractor or consultant to address the specific activities that will be performed as a part of the response action. The HASEP will address potential worker exposure to COCs, safe work practices, appropriate personal protective equipment, emergency procedures, contact information, and other topics as appropriate.

Key components of this removal response action relating to the handling, treatment, disposal or transfer of COCs include the following:

- **Starting at the up-stream end of the total creek excavation program, a short length of stream, approximately 500 to 1,000 feet in length, will be sectioned off for remediation activities. Each sub-section of stream will be remediated using "dry-excavation" methodology. Dry-excavation will include using inflatable coffer dams placed at the up-stream and down-stream ends of the sub-section where excavation will occur. A by-pass pumping system of adequate capacity will capture the flow of the natural stream, re-route it through piping, and return that flow to the natural stream course just down-stream of the lower coffer dam.**

- **Following placement and activation of the coffer dam/by-pass pumping system, the sediments will be allowed to dry in-place and if necessary, in-situ stabilization of high residual water content sediments will be performed using an approved drying agent. (If necessary, dewatering or stabilization could occur on adjacent banks for non-hazardous sediments.) Chemically drying soils is accomplished by applying, for example,**

quicklime to wet soils to reduce the free (non-chemically bonded) water in the soil to achieve the optimal moisture content as determined by the soil's moisture-density relationship. 3% (or greater) of granular quicklime by dry weight of soil is normally applied to achieve chemical modification or stabilization. The application dosage is determined in-situ by the drying characteristics of the treated sediments. Mixing of the drying agent and sediments/soils will be performed using an excavator's toothed bucket. Proper incorporation of the lime into the soil is necessary. It requires thorough mixing, and adequate time (approximately 24 to 48 hours) for the lime mixture to mellow (react with the soils).

- **Materials that will be excavated will be characterized in-situ to determine whether the material will be hazardous waste upon generation (i.e., once excavated) prior to stabilization, as described in the WAP. It is assumed that most wastes will be non-hazardous and that stabilization will consist of mixing the stabilization agent with the sediment in a temporary stockpile area with the excavator bucket. If it is determined that material from downstream Stewart Creek will be hazardous waste upon generation, the mixing will be done in-situ prior to removing the sediment.**

- **Excavation of sediments within a coffer dammed sub-section of stream will be from surface to top of bedrock or the top of natural soil. Battery chips and slag identified in the affected property assessment, and encountered during the response action, will also be removed. For this application, natural or native soils are defined as competent, undisturbed deposits that clearly show no indication of secondary re-working or the presence of foreign objects such as battery chips or other anthropogenic material. The presence of natural soil will be determined based on visual inspection by Exide's consultant during excavation activities.**

- **Excavation of sidewall soils within a coffer dammed sub-section will be to a depth of 6 inches, but only on sidewalls of low angle relief or where there is visible indications of fill material containing slag or battery case fragments. Other vertical or near-vertical sidewalls with existing vegetation that are non-depositional in nature and provide channel stability will not be excavated or sampled.**

- **Excavated sediments or soils that are not placed in the RCA will be transported and disposed of in an off-Site landfill authorized to receive the sediments or soils.**

- **For on-Site sediment, in-Place Waste Characterization will be performed as described in the WAP included as Attachment Q to the RCRA Permit Renewal Application. If in-place waste characterization cannot be performed, samples will be collected from stockpiles or roll-offs. Excavated soils that are non-hazardous when generated and hazardous excavated soils that meet applicable CAMU Treatment Standards (following on-site treatment in less than 90-day accumulation units if necessary) will be placed in the RCA. Any on-site treatment is proposed to consist of permanent stabilization using Enviroblend® CS (or equivalent). Additional solidification can be accomplished by the addition of .1% to 1% by weight of ZapZorb® (or equivalent, per manufacturer's recommendation), a sodium polyacrylate based water absorbing material (if needed due to moisture). The stabilized material will be placed in the RCA following confirmatory analyses (see the WAP included as Attachment Q to the Part B Permit Renewal Application). If stabilization using Enviroblend® CS (or equivalent) is performed, it would be performed in a container within the footprint of the RCA in an area that was lined and bermed to provide secondary containment. Soil piles and containers would be covered when not actively being used.**

None of the proposed response action activities are expected to result in any additional exposure conditions. Work will be conducted starting on the FOP and working downstream. To minimize turbidity/siltation downstream of the sub-section, sediment barriers shall be maintained in good operating condition throughout the construction period and throughout the rainy season. This project will be conducted with an awareness of predicted storms and likely increases in stream flow. Silt fencing, straw wattles, sandbag check dams, aqua barrier bags, and Geotube® filtering may be utilized to prevent siltation downstream. Following completion of the total stream remediation, a re-vegetation program will be performed in areas where stream banks or over-bank vegetation has been removed.

State the proposed "reasonable time frame" and provide the justification for that time frame in the context of any potential for unprotective exposures to exist or develop, COC characteristics, hydrogeologic and affected property characteristics. If the reasonable time frame is different for the different affected media or for particular tracts of land, be sure to discuss that. Provide how the proposed response action will meet the objectives in a reasonable timeframe.

It is estimated that the removal actions will be implemented as soon as possible following RAP approval. Given the dynamic nature of stream flow in the creek, removal actions will follow a seasonal pattern such that creek excavation occurs during periods of low rainfall. This will result in a multiple mobilizations as all the anticipated excavations are not expected to be able to be performed in a single season. The response action is estimated to require approximately 36 months to complete (including the timeframe required for consolidation and capping in the RCA). Time is not a critical factor in limiting potential exposure because the response action includes a combination of pre-determined excavation and additional sampling to establish current conditions when the excavation activity is taking place.

Soil Response Action Objectives

When using removal and/or decontamination with controls or controls only, demonstrate how that physical control or combination of measures will reliably contain COCs within and/or derived from the surface soil and subsurface soil PCLE zone materials over time.

Not applicable. Impacted media is being removed from Stewart Creek to meet Remedy Standard A and will be consolidated in the RCA, the North CAMU or sent off-site for disposal, as discussed above.

Explain how the removal or decontamination action will reduce the concentration of COCs to the critical surface soil and subsurface soil PCL throughout the soil PCLE zone and prevent COC concentrations above the critical soil PCLs from migrating beyond the existing boundary of the soil PCLE zone.

The response action will remove sediment exceeding the applicable PCLs (81.9 mg/kg for lead, 2.985 mg/kg for cadmium, and 39.7 mg/kg for arsenic) as well as visible slag and battery case fragments. In areas where soil sidewalls containing fill with battery case fragments or slag will be removed, TCEQ's Wildlife PCL Database was used to determine PCLs for the soil in the side banks. This is a unique type of exposure (e.g., side banks) and the most appropriate species and exposure models were developed and documented in determining the PCLs. The inputs and assumptions were provided to TCEQ in a Technical Memorandum dated January 8, 2018 which is included in Appendix 3.

List the environmental media to which this applies **Surface Soil (0-5 feet below ground surface) on the Parkwood Parcel**

Repeat this section for each medium that has a different response action objective.

State the property-specific response objectives for the PCLE zone in each media in the context of the response objectives set forth in §350.32 or §350.33 as applicable. Explain how the response action is appropriate based on the hydrogeologic characteristics, COC characteristics, and potential unprotective conditions that could continue or result during the remedial period.

Background

The Parkwood Parcel is a parcel of land that has been dedicated to the City of Frisco as public right-of-way. It is connected to the FOP and also located between portions of the former UBP. Parkwood Boulevard runs through the Parkwood Parcel. A response action was performed by Exide on the former UBP under the TCEQ's Voluntary Cleanup Program (VCP). During the former UBP response action activities, portions of the Parkwood Parcel adjacent to the former UBP were excavated and backfilled with clean fill material, consistent with the former UBP Response Action Plan (UBP RAP). Due to safety and structural considerations, materials adjacent to Parkwood Boulevard extending to depths greater than two feet below ground surface and material present beneath Parkwood Boulevard were left in-place. The VCP Co-Applicants and the TCEQ agreed that affected material located adjacent to and outside of the UBP and within the Parkwood Parcel would be addressed within the FOP RAP.

While some samples were collected within the Parkwood Parcel along its boundary with the UBP during remediation of the UBP in 2017 and 2018, an investigation of and additional data collection from the Parkwood Parcel was performed to determine the presence and concentrations of lead and cadmium in the material beneath and adjacent to Parkwood Boulevard (i.e. beneath and adjacent to road base).

An investigation of the Parkwood Parcel was performed in July 2018 as described in Appendix 3.3. Three samples collected as part of the Parkwood Boulevard Parcel Investigation contained lead above the critical PCL (274.5 mg/kg): 2018-PB-11 (0-1) (498 mg/kg), 2018-PB-19 (6-7) (533 mg/kg) and 2018-PB-19 (7-8) (454 mg/kg). In addition, lead was detected in one location along the edge of and within the boundary of the Parkwood Parcel above the critical PCL during UBP remediation confirmation sampling (TP-9 CS-12 [lead detected at 5,520 mg/kg, the critical PCL is 958 mg/kg]). Detailed sampling information and results for the former UBP remediation, including sampling within the Parkwood Parcel boundary, was submitted under separate cover to the TCEQ on July 31, 2018 in the UBP Response Action Completion Report (included as Attachment U to the Part B RCRA Permit Renewal Application). The source of the lead detected in the Parkwood Parcel is believed to be fill material that was placed on the Parkwood Parcel prior to construction of Parkwood Boulevard.

Objective

The response objective for the surface soils on the Parkwood Parcel containing lead above the critical PCL, is to control exposure (direct human contact, ingestion, soil to groundwater transfer, and ecological receptor exposure) using physical controls in accordance with the Remedy Standard B response objectives outlined in 30 TAC §350.33 and the associated guidance documents Application of Remedy Standards A & B (TCEQ, 2008) and Soil and Groundwater Response Objectives (TCEQ, 2013).

Response Action Description

The response action will include the following major components:

- **The area of the Parkwood Parcel with lead impacts above the critical PCL will receive a cap consisting of a geomembrane, geotextile/geocomposite, 18-in clean fill layer, and 6-inch vegetative cover soil layer.**
- **A soil management plan will be proposed and implemented for the Parkwood Parcel such that any work performed within the Parkwood Parcel capped areas would be subject to specific requirements that will be attached to a Right-of-Way permit issued by the City of Frisco.**
- **The property will be deed restricted for commercial/industrial use only with additional restrictions regarding disturbing capped areas as described in Worksheet 2.4 and Appendix 4.**
- **Additional sampling will be performed in the area to the west of the Parkwood Parcel (former UBP) to delineate exceedances detected in 2018-PB-19. Additional response actions will be proposed, if needed based on the results of the additional sampling work.**

Rationale

The cap placed over the area of the Parkwood Parcel with lead impacts above the critical PCL will control exposure to the surface soils in Affected Property No. 10 and will prevent infiltration. The response action is appropriate because it will significantly reduce potential human or ecological exposure and will prevent soil to groundwater transfer of COCs in the area of the lead exceedance. The long-term protection can be ensured through continued implementation of the soil management plan and maintenance of the cap. It is implemented using standard construction equipment and labor.

Future use will be limited to commercial/industrial use with restrictions on groundwater use and further restrictions/requirements on disturbing the capped area to support the protectiveness of the remedial action.

Explain how the COCs will be handled, treated, disposed, or transferred to another media and document that the response action will not result in any additional potential exposure conditions due to response action activities.

General Response Action Preparation

Prior to implementation of any response actions, a Site-specific health, safety and environment plan (HASEP) will be prepared by each contractor or consultant to address the specific activities that will be performed as a part of the response action. The HASEP will address potential worker exposure to COCs, safe work practices, appropriate personal protective equipment, emergency procedures, contact information, and other topics as appropriate.

Capping

The area of the lead PCL exceedance will be capped. Key components of this physical control response action relating to the handling, treatment, disposal or transfer of COCs include the

following:

- **Surface soil (consisting of clean backfill placed during UBP response actions) will be removed to a depth of two feet and stockpiled on plastic adjacent to the excavation. This clean soil will be taken to the FOP for disposal in the RCA.**

- **A cap consisting of a geomembrane, geotextile/geocomposite, 18-in clean fill layer (soil that was stockpiled adjacent to the excavation), and 6-inch vegetative cover soil layer will be installed. The cap will be attached using batten strips to the Parkwood Boulevard infrastructure. Guard rails would be replaced as appropriate.**

The capping activities will be performed using conventional landfill construction equipment and methods. There is no expected handling, treatment, disposal or transfer of COCs to another media and there are no expected additional potential exposure conditions due to response action activities.

Implementation of Soil Management Plan

A soil management plan will be proposed and implemented for all portions of the Parkwood Parcel. The soil management plan will outline required PPE, soil waste handling procedures, and instructions regarding repair of the geomembrane, if work on the Parkwood Parcel requires disturbance of the cap. Exide will work with the City of Frisco to provide for the implementation of the requirements of the soil management plan through the Right-of-Way Permit Program that is currently in place if possible.

Sampling

The sampling to the west of 2018-PB-19 will be performed using the same procedures outline for the Parkwood Parcel in Appendix 3.3. A work plan for this sampling will be submitted to TCEQ under separate cover.

State the proposed "reasonable time frame" and provide the justification for that time frame in the context of any potential for unprotective exposures to exist or develop, COC characteristics, hydrogeologic and affected property characteristics. If the reasonable time frame is different for the different affected media or for particular tracts of land, be sure to discuss that. Provide how the proposed response action will meet the objectives in a reasonable timeframe.

It is estimated that the removal actions will be implemented as soon as possible following RAP approval and obtaining necessary permits. The response action for surface soil is estimated to require approximately 2 months to complete. As discussed above, time is not a critical factor in limiting potential exposure.

Soil Response Action Objectives

When using removal and/or decontamination with controls or controls only, demonstrate how that physical control or combination of measures will reliably contain COCs within and/or derived from the surface soil and subsurface soil PCLE zone materials over time.

Control of COCs in soil using capping is a presumptive remedy. The implementation of a soil management plan will ensure that the cap is maintained in good condition. Although the contaminated material remains on-site, the risk of exposure and potential migration of contaminants is significantly reduced due to the cap. The long-term protection can be ensured

through continued inspections and maintenance.

Explain how the removal or decontamination action will reduce the concentration of COCs to the critical surface soil and subsurface soil PCL throughout the soil PCLE zone and prevent COC concentrations above the critical soil PCLs from migrating beyond the existing boundary of the soil PCLE zone.

The cap placed over the lead-impacted area of the Parkwood Parcel will control exposure to the surface soils in Affected Property No. 10 and will prevent the potential migration of surface water through the impacted surface soils.

Groundwater Response Action Objectives

Name of groundwater-bearing unit to which this information applies **Upper GWBU – North CAMU**

Repeat this section for each groundwater-bearing unit for which a different response action is proposed.

Groundwater classification ____ 1 **X** 2 ___ 3

Is a modified groundwater response action being proposed for any part of the groundwater PCLE zone (§350.33(f)(2), (3), or (4))? **X** Yes ___ No

If yes, does the affected property meet the qualifying criteria for a modified groundwater response action using a waste control unit, plume management zone, or technical impracticability? **X** Yes ___ No

If yes, complete the appropriate portions of this report.

If no to either question, complete the following:

Explain how the removal or decontamination action will reduce the concentration of COCs to the critical groundwater PCL throughout the groundwater PCLE zone and prevent COC concentrations above the critical groundwater PCL from migrating beyond the existing boundary of the groundwater PCLE zone.

Background

LMW-22 was installed as a downgradient monitoring well for the North CAMU. Between the time that quarterly monitoring was initiated in June 2014 and the most recent sampling event (May 2018) total and dissolved arsenic have periodically been detected above the PCL of 0.01 mg/L at concentrations ranging from 0.0105 mg/L to 0.0203 total arsenic. In accordance with the Groundwater Monitoring Plan for the North CAMU, an action plan to further assess the intermittent arsenic exceedance in the vicinity and downgradient of LMW-22 was implemented. In May 2017, a new groundwater monitoring well (MW-47) was installed between the existing LMW-22 and MW-41, located farther to the southwest, was installed. MW-41 was added to the existing groundwater sampling program for the North CAMU. To date, arsenic has not been detected above the PCL in MW-41 or MW-47. Arsenic was last detected above the PCL in LMW-22 in the August 2017 sampling event and confirmed with a resampling event in September 2017.

LMW-9 was installed as a cross gradient monitoring well for the North CAMU. Between the time that quarterly monitoring was initiated in June 2014 and October 2015, when the last sampling event before the well collapsed occurred, total and dissolved selenium were detected above the applicable PCL (0.05 mg/L) at concentrations ranging from 0.481 to 1.08 mg/L for total selenium, when water was present (there were four sampling events where an insufficient volume of water was present for sampling). As described in the APAR, the Eagle Ford Shale is known to contain gypsum. Selenium commonly is an impurity in gypsum, where selenium replaces calcium in the crystal matrix, potentially serving as a natural source of selenium. It is likely that the selenium observed in this well was attributed to naturally occurring gypsum present in the subsurface.

At the time of the first quarterly 2016 sampling event, the well was observed to be collapsed and a sample could not be collected. A replacement well, LMW-9R, was installed in June 2016 and has been sampled on a quarterly basis since that time. There have been no exceedances of the PCL for selenium in the replacement well.

Objective

The response objective for the Upper GWBU around the North CAMU containing COCs above the critical PCLs at the Site, is to control exposure (direct human contact, ingestion, and ecological receptor exposure) through physical and institutional controls in accordance with the Remedy Standard B response objectives outlined in 30 TAC §350.33 and the associated guidance documents Application of Remedy Standards A & B (TCEQ, 2008) and Soil and Groundwater Response Objectives (TCEQ, 2013).

Response Action Description

A Plume Management Zone (PMZ) will be established around the PCLE zones south and east of the North CAMU. Monitored Natural Attenuation will be the physical control response action. The PMZ and groundwater monitoring program will allow Exide to monitor the effectiveness of the physical control and confirm the long term protectiveness of the remedy.

An institutional control in the form of a restrictive covenant is anticipated to document the location of the PMZ, describe the monitoring required until TCEQ approves modification, state the reason the PMZ was established, and provide information regarding COCs within the PMZ, in accordance with §350.111(b)(3) and §350.33(f)(4)(C)(i)).

Maintenance and monitoring requirements will be included in the institutional control document.

Rationale

Based on the relatively small extent of the potential arsenic and selenium exceedances and the fact that the PCLE zones do not appear to be migrating or expanding, natural attenuation will be used under Remedy Standard B as a physical control remedy. This will be done to ensure that arsenic and selenium concentrations at the downgradient Alternate Points of Exposure (APOEs) at the limits of the PMZ are contained in accordance with §350.37(l) for Class 2 groundwater. If arsenic or selenium is detected in exceedance of the site specific Attenuation Action Level (AAL) or PCL in future sampling events, additional evaluation and/or response actions will be proposed and discussed with TCEQ.

General Response Action Preparation

As described above, prior to implementation of any response actions, a Site-specific HASEP will be prepared by each contractor or consultant to address the specific activities that will be performed as a part of the response action. The HASEP will address potential worker exposure to COCs, safe work practices, appropriate personal protective equipment, emergency procedures, contact information, and other topics as appropriate.

Performance Monitoring

Groundwater monitoring will be continued to be conducted quarterly for two years and will then switch to semi-annual monitoring to verify natural attenuation mechanisms are occurring and to evaluate stability of the PCLE zone. The implementation of the PMZ will be consistent with the corrective actions described in the RCRA Permit Renewal Application. North CAMU Semiannual Groundwater Monitoring Reports will continue to be submitted to TCEQ before January 20 and July 20 of each calendar year.

Explain how the response action will prevent COCs from migrating to air at concentrations above the PCLs for air if the groundwater-to-air PCLs ($^{Air}GW_{Inh\text{-}V}$) is exceeded.

The $^{Air}GW_{Inh\text{-}V}$ exposure pathway PCLs were not exceeded and this is not anticipated to become a pathway in the future due to the nature of the COCs present in the groundwater.

Explain how the response action will prevent COCs from migrating to surface water at concentrations above the PCLs for groundwater discharges to surface water if surface water is a factor.

Based on the current PCLE zones and the nature of the COCs, migration of COCs to surface water at concentrations above the PCLs is not expected. There are two monitoring wells upgradient of the nearest surface water body (North Tributary) that will be designated as APOEs and the PMZ monitoring program is designed so that if the concentration of the COCs is above the PCLs at either of the APOEs, then additional evaluation and/or response actions will be proposed and discussed with TCEQ.

Explain how the response action will prevent human and ecological receptor exposure to the groundwater PCLE zone.

The restrictive covenant will prohibit groundwater use within the PMZ. Ecological receptor exposure to the groundwater PCLE zone is not expected.

Groundwater Response Action Objectives

Name of groundwater-bearing unit to which this information applies **Upper GWBU (Affected Property No. 2)**

Repeat this section for each groundwater-bearing unit for which a different response action is proposed.

Groundwater classification ____ 1 **X** 2 ____ 3

Is a modified groundwater response action being proposed for any part of the groundwater PCLE zone (§350.33(f)(2), (3), or (4))? **X** Yes ____ No

If yes, does the affected property meet the qualifying criteria for a modified groundwater response action using a waste control unit, plume management zone, or technical impracticability? **X** Yes ___ No

If yes, complete the appropriate portions of this report.

If no to either question, complete the following:

Explain how the removal or decontamination action will reduce the concentration of COCs to the critical groundwater PCL throughout the groundwater PCLE zone and prevent COC concentrations above the critical groundwater PCL from migrating beyond the existing boundary of the groundwater PCLE zone.

Background

Historic sampling results for the FOP (from groundwater samples collected in 2014) show localized impacts to groundwater present beneath the concrete slab of the FOP (at MW-32, MW-33 and MW-34 for lead and/or cadmium) and at MW-46 (screened in the deeper transmissive zone). The shallow impacted water is believed to be storm water that has migrated between cracks and joints of the concrete in the former production area. Current storm water control features within the former production area include a concrete slab cover located throughout the former production area, the Flood Wall located between the former production area and Stewart Creek (which acts as a flood wall/retaining wall), and a FDS located on the facility side of the Flood Wall that was constructed as an interim measure to address seepage of perched water in the former production area through the Flood Wall.

In May-June 2018, Exide conducted a Deep Groundwater Pre-Design Investigation (DGW PDI) in order to gather additional hydrogeological information regarding transmissive zones at the Site for the implementation of a groundwater protection element for the RCA and to address the potential for contaminant migration from the RCA to groundwater and the potential for discharge of contaminated groundwater to Stewart Creek. During the DGW PDI, eleven deep and two shallow groundwater monitoring wells were installed at the Site. The newly installed monitoring wells and select existing monitoring wells were sampled for geochemistry and design parameters (for the implementation of a groundwater remedy) and COC metals (total and dissolved): antimony, arsenic, cadmium, selenium and lead. Results of the DGW PDI indicated exceedances of the critical PCLs for antimony (0.006 mg/L), arsenic (0.01 mg/L), cadmium (0.005 mg/L [total] and 0.0017 mg/L [dissolved]), and lead (0.015 mg/L). The DGW PDI Report, including a detailed discussion of shallow and deeper transmissive zones within the UGWBU, is included in Appendix 3.1. In August 2018, monitoring wells that were installed in 2018 were resampled along with older wells with concentrations of metals detected in 2018 above applicable PCLs. The results from the resampling effort are included in Appendix 3.6 and were similar or indicated that previous exceedances were not confirmed. Because detections are not consistent over time, the

groundwater PCLE zones were determined by including all wells that exhibited a PCLE exceedance for the COC metals from 2014-2018. See Figure 1A-8.

In addition to addressing the groundwater PCLE zones, a groundwater protection element is proposed as a component of the RCA design as a CAMU, which further supports satisfaction of Alternate Design Requirements. The groundwater protection element also covers the NDA and Slag Landfill based on discussions with the City of Frisco and the TCEQ.

Objective

The response objective for shallow and deep groundwater within the UGWBU around the FOP containing COCs above the critical PCLs at the Site, is to control exposure (direct human contact, ingestion, and ecological receptor exposure) through physical and institutional controls in accordance with the Remedy Standard B response objectives outlined in 30 TAC §350.33 and the associated guidance documents Application of Remedy Standards A & B (TCEQ, 2008) and Soil and Groundwater Response Objectives (TCEQ, 2013). As previously described, a response action for groundwater is also a component of the alternate CAMU design. It will be used as a component of the closure design for the CAMU and also addresses the Slag Landfill and NDA.

Rationale

As described in the Part B RCRA Permit Renewal Application, the facility must be closed "in a manner that minimizes need for further maintenance and controls, or eliminates, to the extent necessary to protect human health and the environment, the post-closure release of hazardous waste, hazardous constituents, leachate, contaminated rainfall, or waste decomposition products to the groundwater, surface waters, or to the atmosphere."

A groundwater remedial evaluation (GRE) was conducted using similar criteria to address the potential for migration of Site chemicals of concern (COCs) to Stewart Creek from the groundwater to surface water discharge pathway and has been prepared to supplement the information included in this worksheet. The GRE is included as Appendix 3.2.

Based on the detailed evaluation in this GRE and column studies performed to evaluate In-Situ Chemical Reduction (ISCR) using Zero-Valent Iron (ZVI) for treating Site groundwater (see Appendix 3.6), a funnel and gate PRB (using ISCR) is recommended for the groundwater protection element at the FOP as both a component of the Corrective Action Program at the Site and a component of the RCA CAMU design.

ISCR using ZVI is a proven technology for removing arsenic, antimony, cadmium, lead and selenium, the relevant COCs, from groundwater at the Site. The application of ISCR using a PRB is a proven and accepted remedy. To the extent it is may be viewed as a somewhat newer technology (compared to a slurry wall and pump and treat system), the CAMU criteria specifically encourage the incorporation of innovative technologies into the CAMU design. 40CFR 264.552(c)(6). The PRB offers a proven protection element without the adverse residuals of filter cakes, sludge, or removal of treated condensed leachate. When ZVI is co-applied with low-permeability slurry-wall sections ('funnels'), groundwater is directed towards permeable reactive barrier segments ('gates') where treatment is monitored and maintained. The funnel and gate is the most sustainable, low-energy remedy, and it avoids unnecessary waste generation and management. In addition, it maximizes future use of the surface site by avoiding the need for long-term above ground wastewater treatment facilities.

Response Action Design and Construction Overview

The detailed design for the funnel and gate is described in detail in Appendix 3.7, the Groundwater Remedy Design Report (GRDR). The GRDR provides the background and details for the design, operation, maintenance and monitoring of the proposed funnel and gate system. The proposed location of the gate section of the funnel and gate has been placed to the west of the Slag Landfill to provide an area where groundwater downgradient from the gate can be monitored prior to discharging to Stewart Creek (the area west of the Slag Landfill). The funnels (slurry wall portions of the funnel and gate system) have been placed along Stewart Creek generally to the south of the RCA and Slag Landfill and to the north of the NDA and Slag Landfill to direct groundwater from the FOP toward the gate. The configuration and design parameters for the funnel and gate were determined through groundwater modeling (also discussed in Appendix 3.7) and column studies (discussed in Appendix 3.6).

Prior to implementation of any response actions, a Site-specific HASEP will be prepared by each contractor or consultant to address the specific activities that will be performed as a part of the response action. The HASEP will address potential worker exposure to COCs, safe work practices, appropriate personal protective equipment, emergency procedures, contact information, and other topics as appropriate.

Key components of this response action relating to the handling, treatment, disposal or transfer of COCs include the following:

- **Two "reactors" are designed for the funnel and gate groundwater protection system.**
  - **One reactor will be a traditional style of permeable reaction barrier (PRB, basically a trench backfilled with reactive media) located to the west of the Slag Landfill. The PRB is approximately 100 ft in length x 3 ft in width. The height of the PRB is from bedrock (at approximately 615 ft msl) to ground surface (at approximately 637 ft msl). The PRB will be keyed into competent bedrock. The reactive media is a ZVI/sand mix for treatment of Site COCs.**
  - **One reactor will be an approximate 15,000-gallon steel tank, perforated to act as a groundwater collection sump and backfilled with reactive media containing a ZVI/sand mix for the treatment of Site COCs. The sump reactor will be located within the funnel (within the slurry wall) near the northwest corner of the FOP. The sump reactor is 13 ft in diameter x 14 ft in height with an approximate volume of 15,000 gallons.**
  - **A transfer Pipe will connect the Sump Reactor to the PRB via a primary and a back-up pipe.**
  - **Both "reactors" will be constructed with 40% by weight zero-valent iron and sand mix. Metals passing through the reactors will be treated through ISCR.**
- **The funnel portions of the funnel and gate will consist of slurry walls to the north and south of the RCA, NDA and Slag Landfill with short sections of sheet pile in areas where slurry wall construction is not feasible.**
- **Excavated soil from the funnel and gate construction (approximately 7,000 cubic yards of soil) will be stockpiled within the footprint of the RCA and sampled and handled in accordance with the WAP included as Attachment Q to the RCRA Permit Renewal Application.**
- **Air Monitoring and Dust Control will be performed during funnel and gate construction.**
- **Groundwater monitoring will be performed following construction of the funnel and gate prior to waste placement in order to evaluate changes in hydrogeological conditions following funnel and gate construction.**

Following implementation, the funnel and gate would require performance monitoring. The PRB reactive material (i.e. zero-valent iron) for the reactor gates will be regenerated using an acid-wash process. If during the operation of the PRB or the Sump Reactor breakthrough of metals concentrations in exceedance of 75%+ of the applicable PCLs at any downgradient monitoring well is detected and confirmed (with 4 monthly sampling events), a rejuvenation event will be performed (also described in Appendix 3.7).

Explain how the response action will prevent COCs from migrating to air at concentrations above the PCLs for air if the groundwater-to-air PCLs ($^{Air}GW_{Inh-V}$) is exceeded.

The $^{Air}GW_{Inh-V}$ exposure pathway PCLs were not exceeded and this is not anticipated to become a pathway in the future due to the nature of the COCs present in the groundwater.

Explain how the response action will prevent COCs from migrating to surface water at concentrations above the PCLs for groundwater discharges to surface water if surface water is a factor.

The funnel and gate PRB would be constructed along the downgradient side of the RCA, Slag Landfill and NDA. Water flowing through the PRB would be treated in-situ prior to discharge to Stewart Creek. See Appendix 3.2 for a detailed discussion of ISCR treatment technologies applied within a PRB to treat COCs in groundwater and Appendix 3.6 for the results of column studies showing the treatment of Site groundwater with the proposed media.

Explain how the response action will prevent human and ecological receptor exposure to the groundwater PCLE zone.

The restrictive covenant will prohibit groundwater use within the FOP area and require compliance with the monitoring and maintenance program that is established. The PRB treats water in-situ, preventing human and ecological exposure in downgradient areas. See Appendix 3.2 for a detailed discussion of overall protection of human health and the environment, short-term effectiveness, and long-term effectiveness.

Response Action Design

Use this worksheet to provide detailed descriptions of the response action. Attach design and layout drawings and equipment specifications in Attachment 2A.

Media: **Surface Soil (0-5 feet below ground surface) outside of the RCA and Existing Caps**

List all media to which this information applies. If the response action is different for another media, complete a separate worksheet.

Provide a detailed description of the response action. Describe the removal action, decontamination, treatment system(s), and/or physical or institutional control actions that are proposed for each media and discuss the reasons for choosing the response action(s). Identify and describe any ecological services analysis and compensatory restoration plan that will be utilized (if so, include the complete ESA and compensatory restoration plan in Attachment 2C).

The removal action for surface soils at the FOP will be conducted under Remedy Standard A. The removal action has been designed to remove surface soils containing COCs at concentrations exceeding the PCLs. The proposed excavation soils will be excavated to the vertical extent of the PCLE zones, which are presented in Figures 2A-1 through Figure 2A-9.

The critical PCLs developed for surface soils are 274.51 mg/kg for lead, 30.00 mg/kg for cadmium, 15.90 mg/kg for arsenic, 1.60 mg/kg for selenium, and 2.71 mg/kg antimony. It is estimated that approximately 25,600 cubic yards (in-place) of impacted surface soils will be excavated.

Preparation

As described in Worksheet 1.0, prior to implementation of any response actions, a Site-specific health, safety and environment plan (HASEP) will be prepared by each contractor or consultant to address the specific activities that will be performed as a part of the response action. The HASEP will address potential worker exposure to COCs, safe work practices, appropriate personal protective equipment, emergency procedures, contact information, and other topics as appropriate. The HASEP will also include considerations for best practices provided by TPWD to minimize disturbance to state fish and wildlife resources and protected species (TPWD, 2015).

Prior to implementation of the response action, the boundaries of the affected areas will be marked with stakes and/or flagging to serve as excavation control points using a differential Global Positioning System (GPS) handheld receiver. Prior to beginning land-clearing activities, a Tree Permit for removal of trees during the response action will be obtained from the City of Frisco. In impacted areas containing trees, an arborist will be consulted to ensure compliance with the City of Frisco Tree Preservation Requirements. Prior to excavation, trees and bushes that require removal in impacted areas will be removed by cutting close to ground level. Removed trees will be disposed at an off-site facility authorized to accept the material, or will be ground or chipped as mulch left in place at the FOP. Any remaining root structures will be removed during the excavation activities. Root structures will be disposed of with the soil from the area where they were removed.

Excavation Procedures

Affected Property No. 1 (North Area): **Response actions for this affected property will include excavation of soils to depths of 0.5 and 2 feet below ground surface (ft bgs) based on previous analytical testing and consolidation of the soils on Affected Property No. 2 (RCA). Excavation**

boundaries are shown on Figure 2A-2. The estimated volume of material to be removed from this area is 4,300 cubic yards.

Affected Property No. 2 (Production Area): **Surface soil excavation response actions for this affected property includes excavation of surface soils at depths of 0.5, 1, and 2 ft bgs around the perimeter and eastern portion of the Affected Property, based on previous analytical testing, with excavated soils consolidated on Affected Property No. 2 (RCA). This will include a small portion of the NDA that is proposed for removal instead of capping. Excavation boundaries are shown on Figure 2A-3. The estimated volume of material to be removed from this area is 11,900 cubic yards.**

Affected Property No. 3 (South Area): **A Surface soil excavation response actions for this affected property includes excavation of soils to depths of 0.5, 2, and 4 ft bgs based on previous analytical testing and consolidation of the soils on Affected Property No. 2 (RCA). Excavation boundaries are shown on Figure 2A-4. The estimated volume of material to be removed from this area is 8,300 cubic yards.**

Affected Property No. 4 (Crystallizer Way): **Response actions for this affected property will include excavation of soils to depths of 0.5 and 2 ft bgs based on previous analytical testing and consolidation of the soils on Affected Property No. 2 (RCA). Excavation boundaries are shown on Figure 2A-5. The estimated volume of material to be removed from this area is 1,000 cubic yards.**

Affected Property No. 5 (North CAMU Area): **Response actions for this affected property will include excavation of soils to depths of 0.5 and 1 foot below ground surface, based on previous analytical testing with excavated soils consolidated on Affected Property No. 2 (RCA). This will include a portion of the North CAMU cap, which will be removed and replaced to match existing conditions (described in the Closure Plan for the North CAMU included in the RCRA Permit Renewal Application). Excavation boundaries are shown on Figure 2A-6. The estimated volume of material to be removed from this area is 1,200 cubic yards.**

Affected Property No. 6 (Lake Parcel North): **Response actions for this affected property will include excavation of soils up to six inches below ground surface, based on previous analytical testing, with excavated soils consolidated on Affected Property No. 2 (RCA). Excavation boundaries are shown on Figure 2A-7. The estimated volume of material to be removed from this area is less than 20 cubic yards.**

Affected Property No. 7 (North Tributary at Boundary): **Response actions for this affected property will include excavation of soils up to six inches below ground surface, based on previous analytical testing, with excavated soils consolidated on Affected Property No. 2 (RCA). This area was extended based on confirmation sampling results during the UBP Response Actions in early 2017. Excavation boundaries are shown on Figure 2A-8. The estimated volume of material to be removed from this area is 200 cubic yards.**

Affected Property No. 9 (Entrance Driveway to Crystallization Unit): **Response actions for this affected property will include excavation of soils up to six inches below ground surface, based on previous analytical testing, with excavated soils consolidated on Affected Property No. 2 (RCA). Excavation boundaries are shown on Figure 2A-9. The estimated volume of material to be removed from this area is 121 cubic yards.**

Excavation Along Roads

For small access roads on-Site, if an excavation encroaches on an existing road and the sidewall of the excavation indicates that fill material containing process waste, slag, or battery chips are

present, the material under the road will be sampled and the road will be addressed either pursuant to Remedy Standard B or removed and, as needed, replaced as a part of the response action. If an excavation encroaches on the FOP property boundary, and also against an existing road (which may be applicable on the east side of the FOP), and the sidewall of the excavation indicates that fill material containing process waste, slag, or battery chips are present, an evaluation of the current use of the property will be performed in accordance with TRRP procedures. On the southern portion of the FOP, the adjacent property is the former Exide UBP. It is anticipated that if the excavation encroaches on an existing road (former 5th Street) in this area and the sidewall of the excavation indicates that fill material containing process waste, slag, or battery chips are present, the material under the road will be sampled and the road will be addressed either pursuant to Remedy Standard B or removed and, as needed.

Dust Suppression and Air Monitoring

Dust suppression measures will be implemented during soil excavation activities. Air quality will be monitored during the excavation activities as described in the FOP/RCA Air Monitoring Plan. The FOP/RCA Air Monitoring and Dust Plans have been submitted separately as Appendices to the Closure Plan included in the Part B RCRA Permit Renewal Application for the Site (to which this RAP is an Attachment). Air monitoring includes real-time measurements of wind speed, wind direction and particulate matter at the perimeters of the Site. Take action and stop work criteria have been established to ensure dust generating activities do not present an undue risk to off-site receptors. Site monitoring data and quality assurance data generated during the response action will continue to be provided to the public and TCEQ in a summary report that will be posted on the Exide Frisco closure website (www.exidefriscoclosure.com).

Soil Handling Procedures:

Soil will be excavated and stockpiled or may also be placed in roll-offs, if needed. Samples will be collected from stockpiles or roll-offs for waste characterization in accordance with the WAP. Excavated soils that are non-hazardous when generated and hazardous excavated soils that meet applicable CAMU Treatment Standards (following on-site treatment in less than 90 day accumulation units if necessary) will be placed in the RCA. Any on-site treatment is proposed to consist of permanent stabilization using Enviroblend® CS (or equivalent). Additional solidification can be accomplished by the addition of .1% to 1% by weight of ZapZorb® (or equivalent, per manufacturer's recommendation), a sodium polyacrylate based water absorbing material (if needed due to moisture). The stabilized material will be placed in the RCA following confirmatory analyses (see the WAP included as Attachment Q to the Part B Permit Renewal Application). If stabilization using Enviroblend® CS (or equivalent) is performed, it would be performed within the footprint of the RCA in an area that was lined and bermed or would be performed within a container with secondary containment. Soil piles and containers would be covered when not actively being used.

Confirmation Sampling Procedures:

Upon completion of the excavation activities in a particular impacted area, a handheld X-ray fluorescence (XRF) meter will be used to screen the base and sidewalls of the excavated area for the presence of lead concentrations exceeding the RAL. Screening for additional metals may also be performed. If the XRF screening indicates concentrations of lead greater than 274.51 mg/kg are present (or the PCL for other metals), additional excavation will be conducted in those areas and the area screened again following excavation or confirmation testing will be conducted. During the response action, XRF data will be compared to project data to correlate the accuracy of the XRF. Once excavation has been completed, i.e., all soil exceeding 274.51 mg/kg lead appears to be removed based on XRF screening (or the PCL for other metals as appropriate), confirmation samples will be collected from the excavation area. Confirmation

samples will be collected from the base of the excavation at a frequency of one sample for each 50-foot by 50-foot or 2,500 square foot area and the locations recorded using a differential GPS. Confirmation samples will be collected from the ground surface (0 to 3 inches) along the perimeter of the excavation area (sidewall or wall samples) at a frequency of one sample per 100 linear feet of perimeter, or one on each side of the excavation if smaller than 100 x 100 ft. Wall confirmation samples will not be collected along the former UBP boundary in locations where previous response actions have been addressed as this has been completed and documented in the former UBP's Response Action Completion Report (submitted in July 2018 and since approved by the TCEQ). Confirmation samples from impacted areas will be analyzed by EPA method 6010B/6020A for total antimony, arsenic, cadmium, lead, and selenium to ensure that all soils with COC concentrations greater than the PCLs have been removed. The results of the confirmation sampling activities will be summarized in a Response Action Completion Report (RACR) prepared and submitted to TCEQ for review and approval upon completion of the response action.

Restoration Procedures:

Areas of the Site where the excavation depths did not exceed one foot will be re-graded to avoid ponding and promote adequate drainage. In areas where the excavation depths exceed one foot below surrounding ground surface, the excavation will be backfilled with clean soil that is able to support vegetative growth. Areas along the former South 5th Street and Crystallizer Way will be restored in a manner to minimize the potential for erosion along the roadway. Restored areas will be re-seeded in accordance with a Storm Water Pollution Prevention Plan (SWPPP) prepared for the Site. Mitigation requirements for trees removed during the response action will be performed in accordance with the requirements of City of Frisco ordinances. The backfill source will be determined at the time of implementation of this RAP and will be sampled prior to use on-Site.

Institutional Controls:

Institutional controls are required for this response action, and all areas of the FOP will be subject to institutional controls consisting of deed recordations and/or restrictive covenants placed on the property that limit future land use to commercial and/or industrial activities (and/or with TCEQ concurrence, potentially recreational use) and restricting the use of groundwater. Maintenance and monitoring requirements will be included in the institutional control documents.

Describe all major treatment system components and equipment of the response action. Illustrate the response action design and provide equipment specifications in Attachment 2A.

No treatment systems will be used as a part of the response action. Excavation will be completed using traditional excavation equipment, primarily bull dozers and excavators. Figures showing the impacted soils to be addressed as part of the response action are provided in Attachment 2A. See additional discussion for consolidation and capping.

List permits or registrations needed to construct or implement the response action, including permits or registrations needed to conduct studies or tests. For VCP sites, list the permits that would be required if the site was not in the VCP (required by the VCP).

Permitting/Registration Authority	Type of permit/registration	Permit or registration number if already issued	Anticipated application date
City of Frisco	**Tree Permit**		**Within 90 days of RAP approval**
TCEQ	**Construction SWPPP**		**Within 90 days of RAP approval**

Identify and discuss the results of any studies or tests, such as pilot studies, feasibility studies, technical impracticability studies, treatability studies, and/or toxicity studies conducted or proposed to be conducted at the affected property. Discuss the reason for the study or test and how it verifies the effectiveness and appropriateness of the chosen response action or documents that a particular response action is not appropriate for the affected property. Describe how the results of completed studies or tests determined the design or choice of response action. Attach any separate reports and supporting documentation in Appendix 3.

None.

Media: **Surface Soil (0-5 feet below ground surface), Subsurface Soil (below 5 ft) in the area of the RCA and Existing Caps**

List all media to which this information applies. If the response action is different for another media, complete a separate worksheet.

Provide a detailed description of the response action. Describe the removal action, decontamination, treatment system(s), and/or physical or institutional control actions that are proposed for each media and discuss the reasons for choosing the response action(s). Identify and describe any ecological services analysis and compensatory restoration plan that will be utilized (if so, include the complete ESA and compensatory restoration plan in Attachment 2C).

The control action for surface soil (0-5 feet below ground surface), subsurface soil (below 5 ft) in the area of the RCA and Existing Caps will be conducted under Remedy Standard B. The control action has been designed to control exposure to soils containing COCs at concentrations exceeding the PCLs. The proposed cap areas are depicted on Figure 2A-1 and shown in detail in the Closure Plan included in the Part B RCRA Permit Renewal Application for the Site (to which this RAP is an Attachment).

Preparation

As described in Worksheet 1.0, prior to implementation of any response actions, a Site-specific health, safety and environment plan (HASEP) will be prepared by each contractor or consultant to address the specific activities that will be performed as a part of the response action. The HASEP will address potential worker exposure to COCs, safe work practices, appropriate personal protective equipment, emergency procedures, contact information, and other topics as appropriate. The HASEP will also include considerations for best practices provided by TPWD to minimize disturbance to state fish and wildlife resources and protected species (TPWD, 2015).

Consolidation and Installation of RCA Cap

Preparation for Consolidation and Capping

- **The FDS System will be abandoned and the funnel and gate PRB wall will be installed. Groundwater monitoring to assess funnel and gate performance will be initiated. The groundwater potentiometric surface will be monitored for at least 12 months (and up to 24 months) prior to waste placement in the RCA to allow for the expected change of groundwater flow after placement of the funnel and gate PRB. 12 months and up to 24 months are proposed in order to evaluate the change in groundwater conditions over the course of one annual hydrologic cycle with the potential to add a second annual hydrologic cycle based on the first year's conditions. Monitoring wells within the RCA will be properly abandoned prior to waste placement activities. Concrete walls and foundations associated with the Facility operation are present within the RCA. To facilitate waste placement, to the extent practical, the walls and above grade foundations will be demolished. The resulting rubble will be spread on the surface of the existing concrete slab.**
- **Utility infrastructure that served the former production area are present below the concrete slab in the RCA. This consists of pipes, manholes, and sumps for the sanitary sewer, the storm sewer and process drains. To prevent liquid from accumulating in the utility features and to remove the potential for collapse, the pipes, sumps, and manholes will be plugged with flowable fill or other low-permeable material (such as concrete and/or bentonite) of the area.**
- **A vertical extension of the existing flood wall and a new lateral extension of this wall**

along the eastern boundary of the RCA has been designed to protect the facility from potential 100-year flood waters. The construction of the flood wall extensions will be completed prior to waste placement in the RCA. Additional information for the design of the flood wall is included in the Engineering Report for the RCA which is included as Attachment F of the Part B RCRA Permit Renewal Application.

Waste Placement

- **The RCA will be operated in accordance with the RCA O&M Plan that is included as Appendix D to the Final Closure Plan included in the RCRA Permit Renewal Application.**
- **Soil and sediment will be placed on the RCA in approximately one foot lifts and will be placed in a manner to promote drainage off of the RCA cap.**
- **Using the AOC Policy, non-hazardous surface soils may also be placed on top of the Slag Landfill or NDA prior to capping in order to assist with grading for the final cover.**

Capping

- **The RCA, NDA and Slag Landfill will be capped with a geosynthetic clay liner (GCL), geomembrane, geotextile/geocomposite, 30-in clean fill layer, and 6-inch vegetative cover soil layer. This cap meets RCRA standards and employs well understood and proven materials and construction procedures.**
- **The RCA's cap will be graded to support drainage away from the cap toward the northern portion of the RCA cover where it will be directed to Stewart Creek.**

Additional detailed design information and specifications for the RCA are included in the Closure Plan included in the Part B RCRA Permit Renewal Application.

Installation of North CAMU Cap

Waste Placement

- **The North CAMU will be operated in accordance with the North CAMU O&M Plan that is included in the Final Closure Plan included in the Part B RCRA Permit Renewal Application.**

- **Soil that meets Class 2 waste characterization criteria may be placed in the North CAMU in approximately one-foot lifts and will be placed in a manner to promote drainage off of the North CAMU cap.**

Capping

- **The North CAMU will be capped with a geosynthetic clay liner (GCL) geomembrane, geotextile/geocomposite, 18-in clean fill layer, and 18-inch vegetative cover soil layer.**

- **The North CAMU cap will be graded to support drainage away from the cap toward the northern portion of the RCA cover where it will be directed to Stewart Creek.**

Additional detailed design information and specifications for the North CAMU are included in the Closure Plan included in the Part B RCRA Permit Renewal Application for the FOP (to which this RAP is an Attachment).

Upgrade of Existing SDA Cap

- **In the areas of existing cap, the cap will be upgraded with a geomembrane, geotextile/geocomposite, 18-in clean fill layer, and 6-inch vegetative cover soil layer.**

- **The cap will be graded to support drainage away from the cap.**

Specifications and procedures used for the installation of the geomembrane, geotextile/geocomposite, 18-in clean fill layer, and 6-inch vegetative cover soil layer will be the same as those outlined for the RCA. Decontamination will also be performed in accordance with the procedures outlined for the RCA. Additional detailed design information and specifications for the RCA are included in the Closure Plan included in the Part B RCRA Permit Renewal Application.

Institutional Controls:

Institutional controls are required for this response action and all areas of the FOP will be subject to institutional controls consisting of deed recordations and/or restrictive covenants placed on the property that limit future land use to commercial and/or industrial activities and/or, subject to TCEQ concurrence, recreational use, and restricting the use of groundwater. Maintenance and monitoring requirements will be included in the institutional control documents.

Describe all major treatment system components and equipment of the response action. Illustrate the response action design and provide equipment specifications in Attachment 2A.

Excavation will be completed using traditional excavation equipment, primarily bull dozers and excavators. Figures showing the impacted soils to be addressed as part of the response action are provided in Attachment 2A.

List permits or registrations needed to construct or implement the response action, including permits or registrations needed to conduct studies or tests. For VCP sites, list the permits that would be required if the site was not in the VCP (required by the VCP).

Permitting/Registration Authority	Type of permit/registration	Permit or registration number if already issued	Anticipated application date
City of Frisco	**Tree Permit**		**Within 90 days of RAP approval**
TCEQ	**Construction SWPPP**		**Within 90 days of RAP approval**

Identify and discuss the results of any studies or tests, such as pilot studies, feasibility studies, technical impracticability studies, treatability studies, and/or toxicity studies conducted or proposed to be conducted at the affected property. Discuss the reason for the study or test and how it verifies the effectiveness and appropriateness of the chosen response action or documents that a particular response action is not appropriate for the affected property. Describe how the results of completed studies or tests determined the design or choice of response action. Attach any separate reports and supporting documentation in Appendix 3.

None.

Media: **Stewart Creek Sediment and Sidewall Soil**

List all media to which this information applies. If the response action is different for another media, complete a separate worksheet.

Provide a detailed description of the response action. Describe the removal action, decontamination, treatment system(s), and/or physical or institutional control actions that are proposed for each media and discuss the reasons for choosing the response action(s). Identify and describe any ecological services analysis and compensatory restoration plan that will be utilized (if so, include the complete ESA and compensatory restoration plan in Attachment 2C).

The removal action for sediment (including sediment in channel banks) and sidewall soil in Stewart Creek will be conducted under Remedy Standard A. The Stewart Creek response action has been designed to remove sediments containing COCs at concentrations exceeding the applicable PCLs and remove channel sidewall soils containing visible evidence of fill material containing slag or battery case fragments. Battery case fragments and slag identified in the affected property assessment, and encountered during the response action, will also be removed along with battery case fragments observed on the FSCWWTP Property (MW-10 Area and North Area). In addition, following the completion of excavation activities, an ongoing periodic visual assessment and removal of any observed slag or battery case fragments will be performed.

Following the removal of the sediment in Stewart Creek from segments that are pre-determined for excavation, the creek will be inspected to determine the current physical characteristics. Exide may elect to conservatively remove sediment in additional segments based on visual observations, if warranted and approved by the USACE.

For areas where pre-determined or other sediment removal is not performed as part of initial response action activity for Stewart Creek, the creek was be divided into exposure areas based on the physical characteristics of the creek (i.e. stream flow rate, location of tributary intersections, slopes and width of shallow sediment, etc.) and other considerations (such as the locations of discharges from point and non-point sources and infrastructure crossings) as outlined in the Stewart Creek EPC Sampling Work Plan included as Appendix 6.2 . Exide will perform additional sampling and areas with results exceeding the applicable PCLs will be excavated in accordance with the procedures outlined in this RAP and in the Stewart Creek EPC Sampling Work Plan.

For planning purposes, it is estimated that approximately 17,500 cubic yards (in-place) of impacted sediment will be removed from areas of Stewart Creek that are pre-determined for excavation. An additional volume of sediment and channel sidewall soils will be removed from Stewart Creek based on the results of visual inspections and future sampling events as described above.

The critical PCLs developed for Stewart Creek sediment are 81.9 mg/kg for lead, 2.985 mg/kg for cadmium, and 39.7 mg/kg for arsenic. In areas where soil sidewalls containing fill with battery case fragments or slag will be removed, TCEQ's Wildlife PCL Database was used to determine PCLs for the soil in the side banks. This is a unique type of exposure (e.g., side banks) and the most appropriate species and exposure models were developed and documented in determining the PCLs. The inputs and assumptions were provided to TCEQ in a Technical Memorandum dated January 8, 2018 which is included in Appendix 3.

Inspection of the area surrounding MW-10 and the North Area on the FSCWWTP for any visible battery case fragments or slag will be conducted during adjacent Stewart Creek response actions. Should battery case fragments or slag be identified, the material and surrounding soil will be removed to a depth of six inches followed by confirmation sampling. If additional battery case fragments or slag are observed or confirmation sampling indicates that soil results are above the applicable soil PCLs, additional excavation will be performed.

Remediation Segments

The PCLE Zone within Stewart Creek has been divided into 5 segments of similar character. An overview of Stewart Creek is presented in Figure 2A-10 and these segments are presented in greater detail in Figures 2A-11 through 2A-15. The data and assumptions used for planning and volume estimation purposes are listed below:

- **Exide-Owned Property**
    - **The average width of Stewart Creek within at the FOP is estimated to be approximately 34 feet. The average sediment depth is assumed to be 1.75 feet. The length of the predetermined excavation segment that will be excavated is approximately 1,230 feet.**
    - **All sediments within this segment will be mechanically excavated to top of bedrock (approximately 2,700 (in-place) cubic yards.**
    - **Sidewall soils will be removed where battery case fragments and slag are observed or there are low-lying soils adjacent to the stream.**
- **Downstream Segment 1 (roughly from the BNSF Railroad Bridge to North Dallas Tollway Bridges).**
    - **The average width of Stewart Creek in this segment is estimated to be approximately 31 feet. The average sediment depth is assumed to be 1.75 feet. The length of this predetermined excavation segment is approximately 2,300 feet.**
    - **All sediments within this excavation segment will be mechanically excavated to top of bedrock or natural soils (approximately 4,700 cubic yards). For this application, natural or native soils are defined as competent, undisturbed deposits that clearly show no indication of secondary re-working or the presence of foreign objects such as battery chips or other anthropogenic material. It is noted that samples were not collected in this segment during the 2016 interim actions as this area was pre-designated for response actions. Therefore, this entire segment is included in the PCLE zone. If the excavation terminates in natural soils, a confirmation sample will be collected. The presence of natural soil will be determined based on visual inspection during excavation activities.**
    - **Sidewall soils will be removed where battery case fragments and slag are observed or there are low-lying soils adjacent to the stream.**
    - **Based on visual observations of battery chips on the FSCWWTP made by Golder and City of Frisco representatives and correspondence from TCEQ, an inspection of the area surrounding MW-10 and the North Area on the FSCWWTP will be performed and any visible battery case fragments or slag will be removed.**

- **The BNSF Railroad property and North Dallas Tollway Bridges are not included in the area that is predetermined for excavation and will be sampled following upstream excavation activities as described in the SAP in Appendix 6.**

- **Downstream Segment 2 (roughly from the North Dallas Tollway Bridges to Stonebrook Parkway)**

  - **The average width of Stewart Creek in this segment is estimated to be approximately 26 feet. The average sediment depth is assumed to be 1.75 feet. The length of the predetermined excavation area in this segment is approximately 4,200 feet.**

  - **All sediments within the predetermined excavation area in this segment will be mechanically excavated to top of bedrock or natural soils (approximately 7,000 cubic yards). If the excavation terminates in natural soils, a confirmation sample will be collected. For this application, natural or native soils are defined as competent, undisturbed deposits that clearly show no indication of secondary re-working or the presence of foreign objects such as battery chips or other anthropogenic material. The presence of natural soil will be determined based on visual inspection by Exide's consultant during excavation activities.**

  - **In this segment, there were no observed fill materials in channel sidewalls containing slag or battery case fragments and none are expected. There were some low-lying areas adjacent to sediment remediation areas observed during Golder's inspection of the creek and assessment of likely depositional areas. As a conservative measure, six inches of soil will be removed from these low-lying areas adjacent to sediment remediation areas where battery case fragments are observed. If additional battery case fragments are observed, an additional six inches of sediment will be removed.**

  - **Following the completion of excavation activities in Stewart Creek on the FOP and in Downstream Segments 1 and 2, areas outside the planned excavation area will be resampled to determine a current exposure point concentration and any additional segments to be excavated as described in Appendix 6 and Appendix 7.**

- **Downstream Segment 3 (from Stonebrook Parkway to the U.S. Army Corp of Engineers Property)**

  - **The average width of Stewart Creek in this segment is estimated to be approximately 20 feet. The average sediment depth is assumed to be 1.75 feet.**

  - **Following the completion of excavation activities on the FOP and in Downstream Segments 1 and 2, this segment will be resampled to determine a current exposure point concentration and any additional segments to be excavated as described in Appendix 6 and Appendix 7.**

  - **In this segment, there were no observed fill materials in channel sidewalls containing slag or battery case fragments and none are expected.**

- **Downstream Segment 4 (the U.S. Army Corp of Engineers Property).**

  - **In this segment, there were no observed lead or cadmium PCL exceedances. As described in the Executive Summary, Golder collected 14 sediment samples (including two duplicates) on USACE property in order to a) further assess metals**

concentrations in locations which had not previously been sampled and b) to confirm concentrations of arsenic in sediment at locations 2014-SED-051, 2014-SED-053, and 2016-IASED-003, where arsenic had previously been detected above the applicable PCL. The sediment samples were analyzed for arsenic, cadmium, and lead. 2017-SED-009, which was not a confirmation sample, exceeded the PCL for arsenic. No other PCL exceedances were detected in either the new locations or the confirmation samples.

- **Following the completion of excavation activities in Stewart Creek on the FOP and in Downstream Segments 1 and 2, this segment will be resampled to determine a current exposure point concentration as described in Appendix 6 and Appendix 7.**

- **Response actions in this segment will be determined based on the results of additional sampling and may include excavation or another alternative that will be determined based on ongoing discussions with TCEQ and USACE.**

Preparation

Exide will secure a Clean Water Act authorization from the USACE prior to excavation in areas under USACE jurisdiction. Exide will also coordinate access agreements with the current landowners and public entities is needed for access and coordination of implementation near existing structures.

Prior to implementation of the response action, the boundaries of the affected segments will be marked with stakes and/or flagging to serve as excavation control points using a differential GPS. Prior to beginning land-clearing activities, a Tree Permit for removal of trees during the response action will be obtained from the City of Frisco. In impacted areas containing trees, an arborist will be consulted to ensure compliance with the City of Frisco Tree Preservation Requirements. Prior to excavation, trees and bushes that require removal in impacted areas will be removed by cutting close to ground level. Removed trees will be disposed at an off-Site facility authorized to accept the material, or will be ground or chipped with the mulch to be left in place at the FOP. Any remaining root structures will be removed during the excavation activities. Root structures will be disposed of with the soil from the area where they were removed.

Upon approval of this RAP, Golder will work with Texas Parks and Wildlife Department to develop an Aquatic Resource Relocation Plan (ARRP) if needed, and when possible, Exide will minimize disturbance to the area surrounding the PCLE excavation areas as suggested by the TPWD. Exide will also coordinate permitting and restoration with the applicable landowners (City of Frisco and other current landowners) prior to the implementation of the response action.

Golder will also coordinate specific excavation procedures and work practices surrounding bridges with the City of Frisco and North Texas Tollway Authority. If any modifications to the response action plan are required which would require affected sediments to remain in place, Golder will communicate those requested changes to and secure approval from TCEQ prior to implementing response actions in that segment.

Once additional data has been collected as part of the implementation of the RAP, use of the AOC policy may be proposed and coordinated with TCEQ as appropriate to facilitate appropriate management of impacted media for the remediation project.

Dust Suppression and Air Monitoring

Air monitoring and dust suppression measures will be implemented during sediment excavation activities. Air quality will be monitored during the excavation activities as described in the FOP/RCA Air Monitoring Plan. The FOP/RCA Air Monitoring and Dust Plans have been submitted separately as Appendices to the Closure Plan included in the Part B RCRA Permit Renewal Application for the Site (to which this RAP is an Attachment). Air monitoring includes real-time measurements of wind speed, wind direction and particulate matter at the perimeters of the Site. Take action and stop work criteria have been established to ensure dust generating activities do not present an undue risk to off-site receptors. Site monitoring data and quality assurance data generated during the response action will continue to be provided to the public and TCEQ in a summary report that will be posted on the Exide Frisco closure website (www.exidefriscoclosure.com).

Excavation Procedures (Pre-Determined Excavation Areas)

Each excavation area will be broken into sub-sections, each approximately 500 to 1,000 feet in length.

- **Depending on the segment length, each segment will have one to two staging areas on the upland soils adjacent to the creek. The staging area will be surrounded by erosion controls. The staging area will serve as an equipment and materials storage area and project administration area for all activities in the segment.**

- **A temporary access and haul road will be constructed to each staging area. Haul roads will be planned to minimize the traffic on existing City/County/State roads, but some traffic on existing roads leading to/from the RCA is likely.**

- **A coffer dam/by-pass pumping system will be placed. The coffer dams are heavy rubber bladders that are filled with water and conform to the streambed geometry. Behind the upstream bladder, a pumping station will be set-up to capture the creek and by-pass the flow around the coffer dammed work area within fixed and/or flexible piping. The captured flow will be returned to the creek immediately downstream of the lower bladder. A sediment curtain will be installed immediately downstream of the discharge point to reduce turbidity within the creek. Sediment will be placed in stockpiles or a roll-off and sampled in accordance with the WAP. Non-hazardous sediment captured by the sediment curtain will be removed and placed with other waste to be placed in the RCA. Any hazardous sediment captured by the sediment curtain in downstream segments will be sent to an authorized off-Site facility for treatment, as needed, and disposal.**

- **One ingress/egress ramp will be built (per sub-section) out of earthen materials to allow movement of equipment, materials and excavated sediments.**

- **Large debris, such as fallen trees or rip-rap, will be removed prior to sediment excavation. Excavation areas within the stream bed will be cleared of trees and brush prior to excavation beginning. Root/subsurface obstructions will be removed during excavation activities as needed. Removed trees will be disposed at an off-Site facility authorized to accept the material or the FOP, or will be ground or chipped with the mulch left in place at the FOP.**

- **Following placement and activation of the coffer dam/by-pass pumping system, the sediments will be allowed to dry in-place and if necessary, in-situ stabilization of high residual water content sediments will be performed using an approved drying agent to meet the Paint Filter Test criteria, and allow for transportation of sediments to the RCA or off-Site disposal facility, as applicable. To ensure materials are being adequately dried or**

stabilized, samples will be collected to determine the presence of free liquids. A detailed description of waste characterization procedures is provided in the Waste Analysis Plan provided as Attachment Q to the Part B RCRA Permit Renewal Application.

- **If sediments are determined to be non-hazardous, stabilization for residual water content may be performed adjacent to the Creek.**

- **All sediments within the ordinary high water mark (OHWM) will be mechanically excavated to top of bedrock or the top of natural soil. The OHWM will be determined using field indicators by a professional experienced in determining the OHWM. Excavation of sediments within a coffer dammed sub-section of stream will generally be from surface to bedrock or to natural soils, which ranges in depth from approximately 0 feet (i.e. exposed bedrock) to 3-4 feet in some depositional areas. If the excavation terminates in natural soils, a confirmation sample will be collected. For this application, natural or native soils are defined as competent, undisturbed deposits that clearly show no indication of secondary re-working or the presence of foreign objects such as battery chips or other anthropogenic material. The presence of natural soil will be determined based on visual inspection during excavation activities.**

- **Battery case fragments and slag identified in the affected property assessment, and encountered during the response action, will also be removed.**

- **Sidewall soils in areas that are of low angle relief where battery case fragments or slag are observed within a coffer dammed sub-section will be excavated to a depth of 6 inches.**

- **Vertical or near-vertical sidewalls with existing vegetation that are non-depositional in nature and provide channel stability will not be excavated or sampled.**

- **Where fill material containing slag or battery case fragments is observed in the channel sidewalls, the depth of removal into the sidewall soil will be limited based on visual observation of battery case fragments and slag. Confirmation samples will be collected as described in Appendix 6.**

Erosion Controls and Surface Water Protection

- **To minimize turbidity/siltation downstream of the sub-section, sediment barriers shall be maintained in good operating condition throughout the construction period and throughout the rainy season. This project will be conducted with an awareness of predicted storms and likely increases in stream flow. Silt fencing, straw wattles, sandbag check dams, aqua barrier bags, and Geotube® filtering may be utilized to prevent siltation downstream.**

- **Erosion control measures will be implemented inside and outside of the stream zone prior to precipitation events to minimize siltation downstream. These sediment control measures were implemented during cutback of vegetation.**

- **Best Management Practices will be utilized to prevent spills or leaks into water bodies. Equipment will not be refueled or maintained near the channel drainage, spill kits will be located on site, and products that could be hazardous to aquatic life will be subject to spill prevention measures to avoid potential impacts to the creek.**

- **As required by USACE Permits, surface water sampling for turbidity and settleable material will be conducted during in-stream work.**

Sediment Handling Procedures

Sediment and soil that will be disposed of in the RCA will be excavated, loaded, and transported to and placed in the RCA.

A detailed description of waste characterization procedures is provided in the Waste Analysis Plan provided as Attachment Q to the Part B RCRA Permit Renewal Application. As necessary, excavated material that will not be directly placed into the RCA will be stockpiled on plastic sheeting or in less than 90 day accumulation units. Stockpiled sediments will be covered to minimize exposure pending characterization and disposal.

For on-Site sediment, in-Place Waste Characterization will be performed as described in the WAP included as Attachment Q to the RCRA Permit Renewal Application. If in-place waste characterization cannot be performed, samples will be collected from stockpiles or roll-offs. Excavated soils that are non-hazardous when generated and hazardous excavated soils that meet applicable CAMU Treatment Standards (following on-site treatment in less than 90 day accumulation units if necessary) will be placed in the RCA. Any on-site treatment is proposed to consist of permanent stabilization using Enviroblend® CS (or equivalent). Additional solidification can be accomplished by the addition of .1% to 1% by weight of ZapZorb® (or equivalent, per manufacturer's recommendation), a sodium polyacrylate based water absorbing material (if needed due to moisture). The stabilized material will be placed in the RCA following confirmatory analyses (see the WAP included as Attachment Q to the Part B Permit Renewal Application). If stabilization using Enviroblend® CS (or equivalent) is performed, it would be performed in a container within the footprint of the RCA in an area that was lined and bermed to provide secondary containment. Soil piles and containers would be covered when not actively being used.

Restoration

- **Following completion of the remediation in all designated segments of Stewart Creek, a sediment replacement and re-vegetation program will be performed in areas where stream banks or over-bank vegetation has been removed. Bank stabilization will also be performed as required.**
- **Restoration of disturbed sediments, sidewall soils, vegetation, staging areas, temporary haul roads, etc. will be performed to meet the requirements of the USACE permit(s).**
- **Exide understands that although details have not yet been provided regarding the future development of the Grand Park area, including the segment of Stewart Creek running through Grand Park, restoration of Stewart Creek in this area may include considerations relating to development plans.**

Describe all major treatment system components and equipment of the response action. Illustrate the response action design and provide equipment specifications in Attachment 2A.

No treatment systems will be used as a part of the response action other than stabilization regarding free liquids or treatment of waste that does not meet the CAMU treatment standards as described above. Excavation will be completed using traditional, but small-sized excavation equipment, primarily mini-excavators and haulers. Figures showing the impacted sediment to be addressed as part of the response action are included as Figures 2A-10 through 2A-15.

List permits or registrations needed to construct or implement the response action, including permits or registrations needed to conduct studies or tests. For VCP sites, list the permits that would be required if the site was not in the VCP (required by the VCP).

Permitting/Registration Authority	Type of permit/registration	Permit or registration number if already issued	Anticipated application date
City of Frisco	**Tree Permit**		**Within 90 days of RAP approval**
TCEQ	**Construction Storm water General Permit**		**Within 90 days of RAP approval**
U.S. Army Corps of Engineers	**TBD - Nationwide Permit(s)**		**Within 90 days of RAP approval**
U.S. Army Corps of Engineers	**Conditional Letter of Map Revision**		**Submitted to the City of Frisco for submittal to the USACE on August 29, 2018**
Texas Parks and Wildlife Department	**TBD - An Aquatic Resource Relocation Plan (ARRP) will be developed and approved by the department 30 days prior to the dewatering and/or resource relocation, if needed.**		**Within 90 days of obtaining USACE approval.**
Texas Parks and Wildlife Department	**TBD - If state-navigable streambeds are to be disturbed during RAP activities, TPWD will be contacted to determine permitting applicability and relevant application forms.**		**Within 90 days of obtaining USACE approval.**

Identify and discuss the results of any studies or tests, such as pilot studies, feasibility studies, technical impracticability studies, treatability studies, and/or toxicity studies conducted or proposed to be conducted at the affected property. Discuss the reason for the study or test and how it verifies the effectiveness and appropriateness of the chosen response action or documents that a particular response action is not appropriate for the affected property. Describe how the results of completed studies or tests determined the design or choice of response action. Attach any separate reports and supporting documentation in Appendix 3.

None

Media: **Surface Soil (0-5 feet below ground surface) on the Parkwood Parcel**

List all media to which this information applies. If the response action is different for another media, complete a separate worksheet.

Provide a detailed description of the response action. Describe the removal action, decontamination, treatment system(s), and/or physical or institutional control actions that are proposed for each media and discuss the reasons for choosing the response action(s). Identify and describe any ecological services analysis and compensatory restoration plan that will be utilized (if so, include the complete ESA and compensatory restoration plan in Attachment 2C).

The control action for surface soil (0-5 feet below ground surface) on the Parkwood Parcel will be conducted under Remedy Standard B. The control action has been designed to control exposure to soils containing COCs at concentrations exceeding the PCLs. The proposed cap area extends from the edge of Parkwood Boulevard (west boundary of the cap area) to the edge of the Property Boundary with the former UBP (east boundary of the cap area) in the areas where soil was detected in exceedance of the PCL (see Figure 2A-17). Additional sampling will be performed in the area to the west of the Parkwood Parcel (former UBP) to delineate exceedances detected in 2018-PB-19. Additional response actions will be proposed, if needed based on the results of the additional sampling work.

Preparation

As described in Worksheet 1.0, prior to implementation of any response actions, a Site-specific health, safety and environment plan (HASEP) will be prepared by each contractor or consultant to address the specific activities that will be performed as a part of the response action. The HASEP will address potential worker exposure to COCs, safe work practices, appropriate personal protective equipment, emergency procedures, contact information, and other topics as appropriate. The HASEP will also include considerations for best practices provided by TPWD to minimize disturbance to state fish and wildlife resources and protected species (TPWD, 2015).

Installation of Cap

- **Surface soil (consisting of clean backfill placed during former UBP response actions) will be removed to a depth of approximately two feet and stockpiled on plastic adjacent to the excavation. This clean soil will be taken to the FOP for disposal in the RCA.**
- **A cap consisting of a geomembrane, geotextile/geocomposite, 18-in clean fill layer (soil that was stockpiled adjacent to the excavation), and 6-inch vegetative cover soil layer will be installed. The cap will be attached using batten strips to the Parkwood Boulevard infrastructure. Guard rails would be replaced as appropriate.**

Specifications and procedures used for the installation of the geomembrane, geotextile/geocomposite, 18-in clean fill layer, and 6-inch vegetative cover soil layer will be the same as those outlined for the RCA, as applicable. Decontamination will also be performed in accordance with the procedures outlined for the RCA. Additional detailed design information and specifications for the RCA are included in the Closure Plan included in the Part B RCRA Permit Renewal Application.

Implementation of Soil Management Plan

A soil management plan will be proposed and implemented for all portions of the Parkwood

Parcel. The soil management plan will outline required PPE, soil waste handling procedures, and instructions regarding repair of the geomembrane, if work on the Parkwood Parcel requires disturbance of the cap. Exide will work with the City of Frisco to provide for the implementation of the requirements of the soil management plan through the Right-of-Way Permit Program that is currently in place if possible.

Institutional Controls

Institutional controls are required for this response action and all areas of the Parkwood Parcel will be subject to institutional controls consisting of deed recordations and/or restrictive covenants placed on the property that limit future land use to commercial and/or industrial activities, and restricting the use of groundwater. Maintenance and monitoring requirements will be included in the institutional control documents.

Sampling

The sampling to the west of 2018-PB-19 will be performed using the same procedures outline for the Parkwood Parcel in Appendix 3.3. A work plan for this sampling will be submitted to TCEQ under separate cover.

Describe all major treatment system components and equipment of the response action. Illustrate the response action design and provide equipment specifications in Attachment 2A.

Excavation will be completed using traditional excavation equipment, primarily bull dozers and excavators. A design detail for the cap is included in Attachment 2A.

List permits or registrations needed to construct or implement the response action, including permits or registrations needed to conduct studies or tests. For VCP sites, list the permits that would be required if the site was not in the VCP (required by the VCP).

Permitting/Registration Authority	Type of permit/registration	Permit or registration number if already issued	Anticipated application date
TCEQ	**Construction SWPPP**		**Within 90 days of RAP approval**
City of Frisco	**Right-of-Way Permit**		**Within 90 days of RAP approval**

Identify and discuss the results of any studies or tests, such as pilot studies, feasibility studies, technical impracticability studies, treatability studies, and/or toxicity studies conducted or proposed to be conducted at the affected property. Discuss the reason for the study or test and how it verifies the effectiveness and appropriateness of the chosen response action or documents that a particular response action is not appropriate for the affected property. Describe how the results of completed studies or tests determined the design or choice of response action. Attach any separate reports and supporting documentation in Appendix 3.

None.

Response Action Design

Use this worksheet to provide detailed descriptions of the response action. Attach design and layout drawings and equipment specifications in Attachment 2A.

Media: **Groundwater – North CAMU**

List all media to which this information applies. If the response action is different for another media, complete a separate worksheet.

Provide a detailed description of the response action. Describe the removal action, decontamination, treatment system(s), and/or physical or institutional control actions that are proposed for each media and discuss the reasons for choosing the response action(s). Identify and describe any ecological services analysis and compensatory restoration plan that will be utilized (if so, include the complete ESA and compensatory restoration plan in Attachment 2C).

A Plume Management Zone (PMZ) will be established around the PCLE zones south and east of the North CAMU. Monitored Natural Attenuation will be the physical control response action. The PMZ and groundwater monitoring program will allow Exide to monitor the effectiveness of the physical control and confirm the long term protectiveness of the remedy.

An institutional control in the form of a restrictive covenant is anticipated to document the location of the PMZ; describe the monitoring required until TCEQ approves modification; state the reason the PMZ was established; and provide information regarding COCs in the groundwater PMZ, in accordance with §350.111(b)(3) and §350.33(f)(4)(C)(i)).

Maintenance and monitoring requirements will be included in the institutional control document.

Describe all major treatment system components and equipment of the response action. Illustrate the response action design and provide equipment specifications in Attachment 2A.

No treatment system is anticipated to be installed; therefore, no components or equipment will be a part of the response action plan.

List permits or registrations needed to construct or implement the response action, including permits or registrations needed to conduct studies or tests. For VCP sites, list the permits that would be required if the site was not in the VCP (required by the VCP).

Permitting/Registration Authority	Type of permit/registration	Permit or registration number if already issued	Anticipated application date
No permits required			

Identify and discuss the results of any studies or tests, such as pilot studies, feasibility studies, technical impracticability studies, treatability studies, and/or toxicity studies conducted or proposed to be conducted at the affected property. Discuss the reason for the study or test and how it verifies the effectiveness and appropriateness of the chosen response action or documents that a particular response action is not appropriate for the affected property. Describe how the results of completed studies or tests determined the design or choice of response action. Attach any separate reports and supporting documentation in Appendix 3.

Not applicable.

Response Action Design

Use this worksheet to provide detailed descriptions of the response action. Attach design and layout drawings and equipment specifications in Attachment 2A.

Media: **Upper GWBU (Affected Property No. 2)**

List all media to which this information applies. If the response action is different for another media, complete a separate worksheet.

Provide a detailed description of the response action. Describe the removal action, decontamination, treatment system(s), and/or physical or institutional control actions that are proposed for each media and discuss the reasons for choosing the response action(s). Identify and describe any ecological services analysis and compensatory restoration plan that will be utilized (if so, include the complete ESA and compensatory restoration plan in Attachment 2C).

To treat residual COC metals in groundwater and minimize the potential for COC metals to migrate to Stewart Creek, Exide proposes to install a funnel and gate PRB, composed of a ZVI PRB (a mixture of sand and ZVI) with slurry wall and sheet pile funnels. The gate is located to the west of the Slag Landfill and the funnels are located along Stewart Creek and the North Tributary to the south of the Slag Landfill and RCA and to the north of the Slag Landfill and the NDA. The design of the funnel and gate ZVI PRB is based on FOP geology, COC concentrations, and groundwater remediation objectives. A detailed description of the design and rationale for choosing the response action is included in Worksheet 1.0 and Appendix 3.7. This worksheet describes an overview of response action implementation.

A PMZ will also be established around the PCLE zones at the FOP. ISCR using ZVI will be the physical control response action. The PMZ and groundwater monitoring program will allow Exide to monitor the effectiveness of the physical control and confirm the long term protectiveness of the remedy.

The steps planned for the excavation and PRB installation generally include the following:

Preparation

As described in Worksheet 1.0, prior to implementation of any response actions, a Site-specific health, safety and environment plan (HASEP) will be prepared by each contractor or consultant to address the specific activities that will be performed as a part of the response action. The HASEP will address potential worker exposure to COCs, safe work practices, appropriate personal protective equipment, emergency procedures, contact information, and other topics as appropriate. The HASEP will also include considerations for best practices provided by TPWD to minimize disturbance to state fish and wildlife resources and protected species (TPWD, 2015).

Prior to the start of construction activities, the trench area will be cleared and grubbed and pavement will be removed where necessary. The wastewater treatment plant on the FOP will be demolished.

All equipment used for trench excavation will be decontaminated prior to use and prior to demobilization from the Site. Excavation and construction of the PRB will be coordinated with other on-Site remedial activities in order to reduce the need for decontamination during trenching. In addition, construction planning and work staging will be conducted to reduce the area of

disturbance as a best management practice for limiting storm water erosion of disturbed areas. Erosion control measures will be employed to protect disturbed areas as soon as possible in staged work areas.

Construction Methods

The ZVI reactive section (the gate of the funnel and gate system) will be constructed using a "trench shoring excavation system" or a "slip rail shoring system". The trench will be excavated by first removing approximately five feet of soil to lower the working elevation of the excavation and then excavating down to bedrock. A dry trench will be maintained, using dewatering if needed. Any water removed from the excavation would be containerized and sampled in accordance with the WAP. The PRB would be keyed into competent bedrock and sealed if needed. Bedding sand and distribution pipe would be placed to connect piping that will be coming from the sump reactor and access wells would be pre-installed (to allow rejuvenation later if needed). The trench would then be backfilled with the ZVI/sand mix. A permeable membrane would be installed on top of the sand/iron as well as a geotextile. Clay would then be installed in the upper portion of the PRB. Following construction of the PRB, the discharge secant walls would be installed downgradient of the PRB and the area would be restored and reseeded.

The sump reactor would be constructed by excavating approximately 15 feet of soil (down to bedrock) in the area to the north of the Battery Storage Building (see figure 2A-19). The sump reactor would sit on top of bedrock and would consist of an approximate 15,000-gallon steel tank which has been perforated to allow water to flow into the tank. Extraction wells to transfer water to the PRB would be installed and pre-plumbed along with access wells in order to allow rejuvenation later if needed. The sump would be backfilled with the ZVI/sand mix and then capped. Following installation of the sheet pile that will be placed downgradient of the sump reactor, the area will be backfilled with the stockpiled excavated soils to the target elevation and graded.

The slurry wall sections (the funnels of the funnel and gate system) will be constructed using traditional excavator trenching, a process of digging a trench while simultaneously filling the trench with slurry (usually a mixture of bentonite and water) to form a wall. The dense but liquid slurry prevents the trench from collapsing by providing outward pressure, which balances the inward hydraulic forces and also retards water flow into the trench. The bentonite/cement slowly cures the slurry into a solid composite wall. Subsurface conditions will be evaluated during construction of the slurry wall to ensure the slurry wall to the south of the RCA is extended past the former stream channels on the eastern side of the RCA.

The transfer pipe from the Sump Reactor will be installed using excavator trenching. The transfer pipe from the manhole to the PRB will be installed using horizontal drilling technology.

Installation of the sheet pile barrier will be completed using standard sheet pile installation techniques with the exception of applying a sealant to the joints.

Detailed construction methods are included in Appendix 3.7.

Storm Water, Groundwater, and Waste Management

Unsaturated soils removed from the excavation will be stockpiled on the FOP. The soils will be characterized in accordance with the Waste Analysis Plan provided as Attachment Q to the Part B RCRA Permit Renewal Application. Soil stockpiles will be covered with plastic whenever they are not actively being used and at the end of each day to reduce contact with storm water.

Saturated soils will be containerized and will be sampled to determine appropriate disposal methods. Containerized soil will be covered whenever the containers are not actively in use and at the end of each day to reduce contact with storm water.

Groundwater or storm water may be removed/pumped from the excavation to facilitate soil removal activities. Any groundwater or storm water removed from the excavation will be containerized. The water will be characterized in accordance with the Waste Analysis Plan provided as Attachment Q to the Part B RCRA Permit Renewal Application.

Other storm water best management practices may include good housekeeping and temporary berms, soil stabilization, and silt fences. Inspections will also be implemented as required in the storm water permit and as specified in the construction SWPPP.

Quality Assurance and Quality Control

Construction quality assurance and quality control measures are important to the construction of the ZVI PRB and must be followed so that the design criteria for the reactive media are achieved. Golder personnel will oversee all construction activities and perform the construction quality assurance monitoring and required testing. A QA/QC plan for the PRB installation will be submitted for TCEQ review and approval following approval of this RAP and prior to commencing construction activities.

Describe all major treatment system components and equipment of the response action. Illustrate the response action design and provide equipment specifications in Attachment 2A.

Excavation and funnel and gate PRB installation will be completed using traditional excavation equipment, excavators and dump trucks, as well as concrete mixing trucks. Figures showing the layout of the PRB are provided in Attachment 2A.

List permits or registrations needed to construct or implement the response action, including permits or registrations needed to conduct studies or tests. For VCP sites, list the permits that would be required if the site was not in the VCP (required by the VCP).

Permitting/Registration Authority	Type of permit/registration	Permit or registration number if already issued	Anticipated application date
TCEQ	**Construction SWPPP**		**Within 90 days of RAP approval**

Identify and discuss the results of any studies or tests, such as pilot studies, feasibility studies, technical impracticability studies, treatability studies, and/or toxicity studies conducted or proposed to be conducted at the affected property. Discuss the reason for the study or test and how it verifies the effectiveness and appropriateness of the chosen response action or documents that a particular response action is not appropriate for the affected property. Describe how the results of completed studies or tests determined the design or choice of response action. Attach any separate reports and supporting documentation in Appendix 3.

Flow-through column tests using potential treatment mixtures of zero-valent iron and sand and using Site groundwater were performed to provide an evaluation of PRB treatment design parameters and assess performance under simulated groundwater flow conditions. The field sampling methodology, groundwater analytical data, laboratory procedures, and column study results are described in detail in Appendix 3.6 and a brief overview of the tests is provided below.

The field program for collecting water for the column studies included collection of pre-study analytical samples to confirm concentrations of COCs were present at the desired range for the

column studies. Based on these groundwater sampling results DGW-MW-3, DGW-MW-11, and the FDS were chosen for use in the columns studies. These locations were chosen in consideration of concentrations exceeding critical PCLs for Site COCs, location relative to the proposed RCA and FOP and groundwater yield.

For each of the three water sources (DGW-MW-3, DGW-MW-11, and the FDS), three micron-scale zero valent iron (ZVI) mixtures (30%, 35% and 40% ZVI by weight with Ottawa sand) were evaluated in three separate columns to determine the design media for the funnel and gate treatment system. The column study objective was to evaluate ZVI:sand ratios resulting in the appropriate mix of material for the funnel and gate system. A fourth column with 100% sand served as a control in the study to assess removal of the COCs through mechanisms not related to ZVI. The column testing was performed in 5 cm diameter, 50 cm long clear polyvinyl chloride (PVC) pipes, each filled with 30%, 35% and 40% ratios of ZVI and sand by weight.

The original column study program was performed for a total of 40 pore volumes for each source water with a flow rate of approximately 0.1 L/min. At the start of the test and every 5 pore volumes thereafter (one pore volume being equal to the liquid filled porosity of the ZVI-sand media), samples were collected at the inlet, outlet, and mid-point sampling ports along the length of the column. Samples were collected into laboratory supplied containers at the same flow rate as the column feed rate. The samples were analyzed for the following parameters: Site COC metals (Sb, As, Cd, Pb, and Se) and iron using EPA Method SW-846 6020; Major cations (Na+, K+, Mg2+, and Ca2+) using EPA Method SW-846 6020; and Major anions (Cl-, SO42-, NO3-, HCO3-, CO32-) using EPA Method SW-846 6020. Samples were also analyzed for additional geochemical parameters (total dissolved solids using EPA Method SM 2540C; Total hardness using SM 2340B; and Alkalinity SM 2320B) at the start of the test (at the inlet port) and at 5, 20, and 40 pore volumes (at the outlet port).

Results from the original column study showed reduction of Site COCs in all three ZVI mixtures below critical PCLs, where they were present.

In order to better investigate the longevity of the PRB, an extended column study including a mixed groundwater source and spiked COC concentrations (to approximately twice the maximum COC concentration detected at the Site) was performed. For the extended study, the three 30% ZVI columns (the 30% ZVI column from each original source) and the control column from the French Drain were used. The flow rate was increased to approximately 4-5 times the original flow rate. At the start of the extended study and every 10 pore volumes thereafter (one pore volume being equal to the total volume of liquid within the column), samples were collected at the inlet, outlet, and mid-point sampling ports along the length of the column. The samples were analyzed for the Site COC metals (Sb, As, Cd, Pb, and Se) and iron using EPA Method SW-846 6020.

Results from the extended column study showed reduction of Site COCs in all three 30% (by weight) ZVI-sand mixtures below critical PCLs, excepting selenium. All three 30% ZVI-sand columns (DGW-MW-11, DGW-MW-3 and the French Drain) removed the spiked antimony, arsenic, chromium and lead and to below PCLs with no breakthrough observed at the 50 cm sampling port during the original study over 40 pore volumes. Selenium (total and dissolved) did breakthrough at the 50 cm sampling port in the 30% ZVI-sand columns at concentrations exceeding the PCL after 33 pore volumes of the extended study but it is noted that selenium has not been detected above the PCL in the area of the RCA, NDA or Slag Landfill and was included for completeness as it is a COC for the Site.

Plume Management Zone	RAP Worksheet 2.1	Page 1 of 5
Associated Information: Attachments 2D, 2E	ID No.: SWR No. 30516	Report Date: May 31, 2019

Complete this worksheet when a PMZ is proposed as part of the response action. Include in Attachment 2D a map of the proposed PMZ with alternate POE(s) and attenuation monitoring points identified and the current groundwater PCLE zone. If a PMZ is not proposed, do not submit this worksheet.

Groundwater-bearing unit **Upper GWBU (North CAMU)**

Repeat this worksheet for each groundwater-bearing unit for which a PMZ is proposed.

Groundwater classification **X** 2 ____ 3

Provide justification as to why the PMZ is appropriate in accordance with §350.33(f)(4)(A). Include supporting documentation in Attachment 2E.

The PMZ is a protective remedy because, based on the hydrogeologic conditions of the shallow aquifer and the available data, it is likely that the calculated Attenuation Action Levels (AALs) will not be exceeded at their respective Attenuation Monitoring Points. The extent of affected groundwater is limited to a very small area and based on recent detected concentrations below PCLs may not in fact exceed applicable standards at this point.

No users of the shallow groundwater unit have been identified within the PMZ and any future use of shallow groundwater in the area is not anticipated and will be prohibited on the FOP through a restrictive covenant. Potential adverse effects on groundwater quality are minimal.

If further monitoring indicates plume expansion at concentrations above the calculated AALs shown in Attachment 2E, then additional assessment (such as the number and locations of additional AMPs) and/or response actions may be warranted.

Is the alternate POE proposed to be beyond the current limits of the PCLE zone? ____ Yes **X** No

If yes, how far? _____ (§350.37(l) or (m) as applicable)

Is it to be off-site? ____ Yes ____ No

On an off-site property that currently does not contain a residential-based groundwater PCLE zone?

____ Yes ____ No

If yes and this is a Class 2 groundwater, provide the basis for concluding that this groundwater does not have a reasonably anticipated future beneficial use (§350.37(l)(3)).

Not applicable.

Is NAPL present? ____ Yes X No

If so, describe how the response action will achieve the performance criteria in §350.33(f)(4)(E).

Not applicable.

If this is a Class 2 groundwater, explain how the response action will ensure that leachate from the surface soil and subsurface soil PCLE zones will not increase concentration of COCs greater than the current measured concentrations (at time of RAP submittal). (§350.33(a)(2))

There are no surface soil or subsurface soil exceedances in the vicinity of LMW-9/LMW-9R. Surficial soil exceedances in the vicinity of LMW-22 have been delineated and are included in the soil response action for Affected Property No.1. There are no subsurface exceedances in this area.

Provide the basis that the COCs will not migrate beyond the downgradient boundary of the PMZ at concentrations above the critical PCL. Include supporting documentation in Attachment 2E.

Horizontal groundwater flow is low, which indicates limited potential for contaminant movement. A review of the geochemical and field purging data collected to date support indications that the groundwater bearing unit is limited in potential yield and flow rate. These conditions will inhibit the migration of COCs. Also, based on recent sampling data and historic data evaluation of the wells in the monitoring network, neither COC covered by the PMZ appears to have any PCL exceedances on a consistent basis, which indicates that there is no ongoing problem.

Describe the methods used to determine that there are no artificial penetrations which can allow COCs to migrate from the groundwater PCLE zone to currently unaffected groundwater-bearing units. Include supporting documentation in Attachment 2E.

Based on the available investigation information for the FOP and interviews with long-time Exide employees, there are no water supply wells or penetrations (other than monitoring wells used for site assessment) located within the PCLE zone or within the proposed boundary of the PMZ.

List the attenuation action level determined for each attenuation monitoring point. Illustrate the proposed attenuation monitoring points and the groundwater PCLE zone on the map in Attachment 2D. Include all calculations and other methods of determining the attenuation action levels in Attachment 2E.

COC	Attenuation Monitoring Point (well number)	Attenuation Action Level (mg/L)	Attenuation Action Level limited by $^{Air}GW_{Inh\text{-}V}$ or existing COC concentration? Y/N
Area 1 PCLE Zone			
To be determined based on one year of quarterly monitoring data from proposed AMPs			
LMW-22 Arsenic Plume	**LMW-22**	**0.092**	**N**
	MW-47	**0.043**	**N**
Area 2 PCLE Zone			
To be determined based on one year of quarterly monitoring data from proposed AMPs			
LMW-9 Selenium Plume	**LMW-17**	**14.40**	**N**
	LMW-22	**2.22**	**N**
	MW-47	**0.653**	**N**

Complete this worksheet when a PMZ is proposed as part of the response action. Include in Attachment 2D a map of the proposed PMZ with alternate POE(s) and attenuation monitoring points identified and the current groundwater PCLE zone. If a PMZ is not proposed, do not submit this worksheet.

Groundwater-bearing unit **Upper GWBU - FOP**

Repeat this worksheet for each groundwater-bearing unit for which a PMZ is proposed.
Groundwater classification **X** 2 ____ 3

Provide justification as to why the PMZ is appropriate in accordance with §350.33(f)(4)(A). Include supporting documentation in Attachment 2E.

The PMZ is a protective remedy because the hydrogeologic conditions of the GWBU at the FOP and the available data presented in Appendix 3.2 and 3.6 regarding the proposed installation of the funnel and gate PRB, indicates that the Critical PCLs will not be exceeded downgradient of the funnel and gate PRB. The lower of the Groundwater to Surface (^{SW}GW) PCLs and the Class 2 Groundwater Ingestion $^{GW}GW_{Ing}$ PCLs are considered as the AALs.

No users of the shallow groundwater unit have been identified within the PMZ and any future use of shallow groundwater in the area is not anticipated and will be prohibited on the FOP through a restrictive covenant. Potential adverse effects on groundwater quality are minimal.

Is the alternate POE proposed to be beyond the current limits of the PCLE zone? ____ Yes **X** No
If yes, how far? _____ (§350.37(l) or (m) as applicable)
Is it to be off-site? ____ Yes ____ No

On an off-site property that currently does not contain a residential-based groundwater PCLE zone?
____ Yes ____ No

If yes and this is a Class 2 groundwater, provide the basis for concluding that this groundwater does not have a reasonably anticipated future beneficial use (§350.37(l)(3)).

Not applicable.

Is NAPL present? ____ Yes **X** No
If so, describe how the response action will achieve the performance criteria in §350.33(f)(4)(E).

Not applicable.

If this is a Class 2 groundwater, explain how the response action will ensure that leachate from the surface soil and subsurface soil PCLE zones will not increase concentration of COCs greater than the current measured concentrations (at time of RAP submittal). (§350.33(a)(2))

As part of overall Site remedial activities, a Corrective Action Management Unit (CAMU) referred to as the Remediation Consolidation Area (RCA), will be designed, engineered, constructed, and operated within the Former Operating Plant (FOP) area of the former Frisco Recycling Center (FRC). The proposed RCA is in an area of existing soil and groundwater contamination and will be used as a consolidation area for soil and sediment excavated from other areas of the FOP and Stewart Creek. An engineered cap will be placed over the RCA, Slag Landfill and NDA to prevent infiltration to consolidated waste, surface soil and subsurface soil to minimize the potential generation of leachate through the area.

Provide the basis that the COCs will not migrate beyond the downgradient boundary of the PMZ at concentrations above the critical PCL. Include supporting documentation in Attachment 2E.

Installation of the funnels of the funnel and gate PRB system will comprise slurry wall segments composed of a low-permeable material such as bentonite having a hydraulic conductivity no greater than $1x10^{-07}$ cm/sec and will encompass the west, south, and north perimeter of the RCA. This geometry will ensure that COCs in groundwater will be directed to the gate portion of the PRB system. As demonstrated by groundwater modeling studies, the "open" east, non-COC impacted upgradient groundwater will provide the necessary hydraulic gradient to direct groundwater to the PRB gate.

Key operating parameters for the funnel and gate PRB are groundwater monitoring data. COC concentrations and water level elevations will be monitored both upgradient and downgradient of each section of the funnel and gate PRB. The funnel and gate PRB will be determined to be functioning properly as long as COC concentrations downgradient of the funnel and gate PRB are below the applicable PCLs. Increased water levels along the slurry wall portions of the funnel and gate PRB or increased COC concentrations (above applicable PCLs) downgradient of the PRB will indicate additional evaluation or actions are required. If downgradient COC concentrations are detected above applicable PCLs and confirmed through resampling (as indicated in the FOP groundwater monitoring plan), additional groundwater monitoring may be conducted or additional response actions may be evaluated, proposed, or implemented, if conditions warrant.

Describe the methods used to determine that there are no artificial penetrations which can allow COCs to migrate from the groundwater PCLE zone to currently unaffected groundwater-bearing units. Include supporting documentation in Attachment 2E.

Based on the available investigation information for the FOP and interviews with long-time Exide employees, there are no water supply wells or penetrations (other than monitoring wells used for site assessment) located within the PCLE zone or within the proposed boundary of the PMZ. All of the current monitoring wells "inside" the PRB system will be decommissioned during the installation of the engineered cover.

List the attenuation action level determined for each attenuation monitoring point. Illustrate the proposed attenuation monitoring points and the groundwater PCLE zone on the map in Attachment 2D. Include all calculations and other methods of determining the attenuation action levels in Attachment 2E.

COC	Attenuation Monitoring Point (well number)	Applicable PCLs (mg/L)	Attenuation Action Level limited by $^{Air}GW_{Inh\text{-}V}$ or existing COC concentration? Y/N
Lead	PRB-MW-3, PRB-MW-4, PRB-MW-5, PRB-MW-6, and PRB-MW-7	0.015 (Total and Dissolved)	**N**
Cadmium	PRB-MW-3, PRB-MW-4, PRB-MW-5, PRB-MW-6, and PRB-MW-7	0.004 (Total) 0.0017 (Dissolved)	**N**
Arsenic	PRB-MW-3, PRB-MW-4, PRB-MW-5, PRB-MW-6, and PRB-MW-7	0.01 (Total and Dissolved)	**N**
Antimony	PRB-MW-3, PRB-MW-4, PRB-MW-5, PRB-MW-6, and PRB-MW-7	0.006 (Total and Dissolved)	**N**
Selenium	PRB-MW-3, PRB-MW-4, PRB-MW-5, PRB-MW-6, and PRB-MW-7	0.0333 (Total and Dissolved)	**N**

*Attenuation Action Levels other than the applicable PCLs were not determined as there are no proposed monitoring wells within the PRB gate. The lower of the Groundwater to Surface Water (^{SW}GW) PCLs or the Class 2 Groundwater Ingestion $^{GW}GW_{Ing}$ PCLs are considered as the AALs. The wells downgradient from the Funnel and Gate PRB are included as Alternate Point of Exposure Wells and Point of Compliance Wells. Additional corrective action groundwater monitoring will also be performed as discussed in Attachment L to the Part B RCRA Permit Renewal Application (FOP Groundwater Monitoring Plan) and in other portions of this RAP.

Institutional Control	RAP Worksheet 2.4 Page 1 of 1	
Associated Information: Appendices 4, 5	ID No.: SWR No. 30516	Report Date: May 31, 2019

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **Exide Technologies Frisco Recycling Center, Former Operating Plant and Parkwood Parcel**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[1]				Property Ownership		Anticipated Filing Date[2]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))		**X**			**X**		**Within 90 days after RACR Approval**
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**			**X**		**Within 90 days after RACR Approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2)) – adapted for CAMU (RCA)		**X**			**X**		**Within 90 days after RACR Approval**
Document establishing a PMZ (§350.33(f)(4)(C)(I))		**X**			**X**		**Within 90 days after RACR Approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))							

[1] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[2] Specify date or amount of time after RAP approval.

Performance Measures

List and describe the performance measures for each environmental medium containing a PCLE zone that will be used to determine if reasonable progress is being made by the response action in a timely manner. Use these measures to document effectiveness of the response action in the RAER.

Surface Soil (0-5 feet below ground surface) outside of the RCA and Existing Caps

- **The effectiveness of the response action for affected surface soils in this area will be demonstrated by confirmation sampling that indicates COC concentrations in remaining soils are below the response action objectives (274.51 mg/kg for lead, 30.00 mg/kg for cadmium, 15.90 mg/kg for arsenic, 1.6 mg/kg for selenium, and 2.71 mg/kg antimony).**

Surface Soil (0-5 feet below ground surface), Subsurface Soil (below 5 ft) in the area of the RCA and Existing Caps and the Parkwood Parcel

- **The effectiveness of the response action for soils beneath the RCA and for existing caps will be demonstrated by the results of long-term inspections and groundwater monitoring that will be completed as described in RAP Worksheet 5.0.**

Stewart Creek Sediment

- **The effectiveness of the response action for affected sediments will be demonstrated by the complete removal of sediment in creek segments containing COC concentrations greater than the response action objectives (81.9 mg/kg for lead, 2.985 mg/kg for cadmium, and 39.7 mg/kg for arsenic) in pre-determined areas and areas identified through sampling conducted close in time to the removal activity and the visible indication that battery case fragments and slag are no longer present following the periodic inspection and removal activities as described in RAP Worksheet 5.0.**

Stewart Creek Sidewall Soil where Fill Material Containing Battery Case Fragments or Slag is Observed

- **The effectiveness of the response action for sidewall soil where fill material containing battery case fragments or slag is observed will be demonstrated by confirmation sampling that indicates COC concentrations in remaining soils (excavation walls and floors) adjacent to the area where fill and sidewall soils have been removed are below the response action objectives. In areas where soil sidewalls containing fill with battery case fragments or slag will be removed, TCEQ's Wildlife PCL Database was used to determine PCLs for the soil in the side banks. This is a unique type of exposure (e.g., side banks) and the most appropriate species and exposure models were developed and documented in determining the PCLs. The inputs and assumptions were provided to TCEQ in a Technical Memorandum dated January 8, 2018 which is included in Appendix 3.**

Groundwater at LMW-22 and LMW-9/LMW-9R (North CAMU)

- **The effectiveness of the proposed response action for groundwater at LMW-22 and LMW-9/LMW-9R will be monitored through laboratory analysis and through the collection of field parameter measurements in groundwater from the monitoring wells. Analysis will include at a minimum: total arsenic and total selenium. Monitoring data collected over time will be evaluated to:**
  - **Monitor the PCLE zone for steady state conditions;**
  - **Verify that COC concentrations within the PCLE zone are not increasing and the plume is not expanding;**
  - **Demonstrate that the COC concentrations within the plume are reduced to critical PCLs through natural attenuation, and**
  - **Maintain the PCLE zone within the PMZ.**

- **In addition, an institutional control in the form of a restrictive covenant will be established to document the PMZ and information regarding COCs in groundwater at the site and to restrict the use of groundwater and set forth monitoring requirements.**

Groundwater at Affected Property No. 2

- **The effectiveness of the proposed funnel and gate PRB response action will be monitored through laboratory analysis and through the collection of field parameter measurements in groundwater from the monitoring wells. Analysis will include at a minimum: lead, cadmium, arsenic, antimony and selenium as well as water levels. Monitoring data collected over time will be evaluated to:**
  - **Verify that COC concentrations within the PCLE zone are not increasing and the plume is not expanding; and**
  - **Demonstrate that the COC concentrations within the plume are reduced to below critical PCLs within the treatment zone.**
- **In addition, an institutional control in the form of a restrictive covenant will be established to restrict FOP use to commercial-industrial use only and restrict the use of groundwater and set forth monitoring and maintenance requirements.**

No RAER reports will be required since the results of the performance measures described above will be reported in Post-Response Action Care Reports (PRACR) as described in RAP Worksheets 5.0 and 6.0.

Potential Problems

Complete the table for the response action. When the response action consists of several components or multiple actions, complete one table for each major component or action.

Response Action Name/Designation: **Surface soil excavation, disposal, regrading/backfilling**

List the potential problems that might be reasonably anticipated for the response action, describe the impact of each problem, and the response to the problem.

Description of the Potential Problem	Impact	Will this cause a response action failure?		Corrective Response
		Yes	No	
COC concentration exceeds response action objective post-excavation	**Potential exposure condition**	**X**		**Continue excavation until COC concentrations in remaining soil are below the response action objectives.**
Dust generation during excavation activities	**Potential exposure condition**		**X**	**Implement additional dust suppression measures, stop work if necessary.**
Exceedance of air monitoring criteria during remediation activities	**Potential exposure condition**		**X**	**Implement additional dust suppression measures, stop work if necessary.**

Response Action Name/Designation: **Creek sediment excavation, disposal, and restoration**

List the potential problems that might be reasonably anticipated for the response action, describe the impact of each problem, and the response to the problem.

Description of the Potential Problem	Impact	Will this cause a response action failure?		Corrective Response
		Yes	No	
Landowner denial of access to conduct work	**Response actions in Stewart Creek cannot be implemented without landowner concurrence**		**X**	**Work with landowners and TCEQ to obtain access**
Lack of agreement on proposed approach with USACE leading to inability to secure needed permit	**Response actions in Stewart Creek cannot be implemented without USACE permit**		**X**	**Work with TCEQ and USACE to resolve and to obtain permit**
Sediment does not pass paint filter test	**Sediment that is otherwise CAMU-eligible waste cannot be placed in RCA or North CAMU**		**X**	**Stabilize sediment with approved drying agent/absorbent until criteria are met.**
Flooding conditions are encountered for extended periods in Stewart Creek	**Creek is inaccessible for remediation for an extended period**		**X**	**Work will be scheduled in smaller available segments and postponed until Stewart Creek can be safely accessed**
Restoration activities are not effective (revegetation or other erosion control does not take hold)	**Potential erosion into Stewart Creek**		**X**	**Work will be scheduled in smaller available segments and postponed until Stewart Creek can be safely accessed**

Response Action Name/Designation: **Consolidation and Installation of RCA, Slag Landfill and NDA Cap**

List the potential problems that might be reasonably anticipated for the response action, describe the impact of each problem, and the response to the problem.

Description of the Potential Problem	Impact	Will this cause a response action failure?		Corrective Response
		Yes	No	
Dust generation during waste placement activities	**Potential exposure condition**		**X**	**Implement additional dust suppression measures, stop work if necessary.**
Exceedance of air monitoring criteria dust generating activities	**Potential exposure condition**		**X**	**Implement additional dust suppression measures, stop work if necessary.**
Groundwater exceedances are detected during post-closure monitoring	**Potential exposure condition**	**X**		**An evaluation of the exceedances will be performed and a supplemental response action will be proposed to address the soil to groundwater pathway. The potential supplemental response actions are described in Appendix 3.**
Generation of hazardous waste that is 10x UTS or greater requiring treatment to meet CAMU treatment standards	**Requires treatment**		**X**	**On-site treatment may be applied or alternate treatment standard may be requested under applicable CAMU regulations, or off-Site disposal will be required**

Response Action Name/Designation: **Installation of North CAMU Cap and Removal/Repair of Portion of Existing Cap**

List the potential problems that might be reasonably anticipated for the response action, describe the impact of each problem, and the response to the problem.

Description of the Potential Problem	Impact	Will this cause a response action failure?		Corrective Response
		Yes	No	
COC concentration in areas of cap to be removed exceeds response action objective post-excavation	**Potential exposure condition**	**X**		**Continue excavation until COC concentrations in remaining soil are below the response action objectives.**
Dust generation during waste placement activities	**Potential exposure condition**		**X**	**Implement additional dust suppression measures, stop work if necessary.**
Exceedance of air monitoring criteria dust generating activities	**Potential exposure condition**		**X**	**Implement additional dust suppression measures, stop work if necessary.**

Response Action Name/Designation: **Upgrade of the Existing Cap at SDA**

List the potential problems that might be reasonably anticipated for the response action, describe the impact of each problem, and the response to the problem.

Description of the Potential Problem	Impact	Will this cause a response action failure?		Corrective Response
		Yes	No	
Dust generation during upgrade activities (until existing cap is covered with the geomembrane)	**Potential exposure condition**		**X**	**Implement additional dust suppression measures, stop work if necessary.**
Exceedance of air monitoring criteria during dust generating activities (until existing cap is covered with the geomembrane)	**Potential exposure condition**		**X**	**Implement additional dust suppression measures, stop work if necessary.**

Response Action Name/Designation: **Parkwood Parcel Capping and Soil Management Plan**

List the potential problems that might be reasonably anticipated for the response action, describe the impact of each problem, and the response to the problem.

Description of the Potential Problem	Impact	Will this cause a response action failure?		Corrective Response
		Yes	No	
Utilities are Present within the areas proposed for the cap	**Delay in field implementation**		**X**	**Coordinate with the City of Frisco and utility companies to work safely around utilities**

Response Action Name/Designation: **Groundwater Response Actions at LMW-22 and LMW-9/LMW-9R**

List the potential problems that might be reasonably anticipated for the response action, describe the impact of each problem, and the response to the problem.

Description of the Potential Problem	Impact	Will this cause a response action failure?		Corrective Response
		Yes	No	
Groundwater sampling indicates increasing concentration trends or plume instability.	**Potential expansion of PCLE zone beyond current PMZ boundary.**	**X**		**Initially evaluate increases to determine potential cause and if PCLE zone is expanding or if COC concentrations are fluctuating due to short term hydrogeologic effects. Additional groundwater monitoring may be conducted or additional response actions may be evaluated, proposed, or implemented, if conditions warrant.**

Response Action Name/Designation: **Groundwater Response Actions at Affected Property No. 2**

List the potential problems that might be reasonably anticipated for the response action, describe the impact of each problem, and the response to the problem.

Description of the Potential Problem	Impact	Will this cause a response action failure?		Corrective Response
		Yes	No	
Potential for increased contaminant loading to PRB	**COC concentrations are not reduced to below applicable PCLs on the downgradient side of the PRB.**	**X**		**Should breakthrough occur, the PRB gate will be rejuvenated using an acid wash procedure.**
Potential for fouling of PRB.	**COC concentrations are not reduced to below applicable PCLs on the downgradient side of the PRB.**	**X**		**If evidence of significant fouling is observed and breakthrough of COCs is indicated, the PRB gate will be rejuvenated using an acid wash procedure.**
Potential for mounding of groundwater on upgradient side of the PRB or slurry wall/sheet pile portions of the funnel and gate.	**Increased pressure on "funnel" sections of the PRB or flooding.**		**X**	**If evidence of mounding is observed, water levels will be monitored more closely and additional actions, potentially including the installation of additional transfer piping or sumps may be considered. In the area of the sump, changes to the planned flow from the sump to the PRB may also be considered.**

Monitoring and Sampling Associated Information: Attachment 3A	RAP Worksheet 3.1 Page 1 of 4	
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List the monitoring and sampling of COC concentrations or other parameters that will be conducted during the response action. Illustrate the monitoring or sampling locations in Attachment 3A. If statistics or geostatistics will be used, provide details in Appendix 7. If monitoring or observation wells will be constructed for the response action, provide well construction details in Attachment 2B if not previously provided.

Monitored Media	COC[1]	Other parameter (specify)	Sampling Method[2]	Sampling points or locations[3]	Depth/Height[4] (ft.)	Analytical or Field Screening Method	Sampling or Monitoring Frequency[5]
Surface Soil (including sidewall soil from Stewart Creek)	**Lead (and potentially other COC metals)**	**None**	**Hand-held XRF analyzer**	**Throughout excavation area**	**Soil surface at base of excavation**	**XRF screening**	**After initial excavation**
	Post excavation confirmation sampling described in RAP Worksheet 4.0 and in Appendix 6. Waste characterization is described in the WAP included as Attachment Q to the Part B RCRA Permit Renewal Application.						
Subsurface Soil	**None**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
Groundwater	**Arsenic Selenium**	**Field parameters including DO, pH, Specific conductivity, and ORP**	**Low-flow purging and sampling methodologies**	**North CAMU Locations: LMW-8, LMW-9R, LMW-17, LMW-22, MW-41, MW-42, MW-47**	**Depth of groundwater and screened intervals vary. The Upper GWBU is encountered at depths ranging between 17 to 32 feet bgs.**	**Metals – EPA Method 6020A**	**Sampling will be quarterly for two years and then semi-annually thereafter for a total of 30 years.**

[1] Specify the COCs to be monitored in this media. List either type of COC (such as VOCs, metals) if all the COCs of that type will be monitored the same way.
[2] Describe the sampling or monitoring methods and QC procedures in Appendix 1 unless the proposed sampling or monitoring procedure is the same as the sampling or monitoring procedure described in the APAR.
[3] Specify the sampling or monitoring point, such as the specific monitor well or general sampling or monitoring location.
[4] Specify the depth or height of the sampling or monitoring points.
[5] Specify the frequency at which this monitoring or sampling will occur.

Monitored Media	COC[1]	Other parameter (specify)	Sampling Method[2]	Sampling points or locations[3]	Depth/Height[4] (ft.)	Analytical or Field Screening Method	Sampling or Monitoring Frequency[5]
	Lead Cadmium Arsenic Antimony Selenium			**FOP Locations: Existing monitoring wells B7N, B9N, DGW-MW-9, MW-10, MW-17, MW-18, MW-21, MW-22, MW-23, MW-26, MW-27, MW-29, MW-44, and proposed monitoring wells SR-MW-1, PRB-MW-1, PRB-MW-2, PRB-MW-3, PRB-MW-4, PRB-MW-5, PRB-MW-6, PRB-MW-6, MW-16SR, MW-48, and MW-49**	**Depth of groundwater and screened intervals vary. The shallow transmissive unit is inconsistently present but is encountered between 0 and 7.5 feet below ground surface. The deeper transmissive unit varies in depth and thickness but is present as high as 4 feet below ground surface and extends up to 19.5 feet below ground surface. The depth to bedrock in the vicinity of the RCA varies between 12 and 30 feet below ground surface.**	**Metals – EPA Method 6020A**	**Sampling will be quarterly for two years and then semi-annually thereafter for a total of 30 years.**
	The detection monitoring plan for the North CAMU is included with the Part B RCRA Permit Renewal Application as Attachment J. The groundwater monitoring plan for the rest of the FOP, including the RCA, is included as Attachment K. Groundwater sampling procedures will be the same as those described in these two attachments. Wells sampled as a part of corrective action will be sampled at the same time as wells sampled for detection monitoring.						
Surface water	**None**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**

Monitoring and Sampling	RAP Worksheet 3.1 Page 3 of 4	
Associated Information: Attachment 3A	ID No.: SWR No. 30516	Report Date: May 31, 2019

Monitored Media	COC[1]	Other parameter (specify)	Sampling Method[2]	Sampling points or locations[3]	Depth/Height[4] (ft.)	Analytical or Field Screening Method	Sampling or Monitoring Frequency[5]
Sediment	**Lead, Cadmium and Arsenic to determine EPC**	**None**	**Grab Sample**	**Exposure areas to be determined based on physical characteristics of the creek as further described in Appendix 6.**	**4 inches**	**EPA Method 6020A for metals.**	**At least 20 samples per exposure area**
	Post excavation confirmation sampling described in RAP Worksheet 4.0 and in Appendix 6. Waste characterization is described in the WAP included as Attachment Q to the Part B RCRA Permit Renewal Application.						
Air	**Lead, Cadmium**	**None**	**Lo-vol cartridge filter samplers**	**At or near Property perimeter**	**NA**	**NIOSH 7300**	**lead and cadmium 3 x per week during work**
	Particulates (PM10)	**wind direction, wind speed**	**E-bam particulate monitors, Site weather station**	**At or near Property perimeter**	**NA**		**Dust/PM10/ wind – continuous monitoring, reported in 30-minute and 60-minute block averages, daily summary report**

Monitoring and Sampling Associated Information: Attachment 3A	RAP Worksheet 3.1 Page 4 of 4	
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Explain the reasons for the above-listed monitoring and sampling plan.

During the response action activities, air monitoring will be performed to determine if concentrations of lead, cadmium and particulate emissions are in excess of the "Take Action" or "Stop Work" levels established for the response action (see Appendix 6). A detailed description of the air monitoring program and related dust control program are provided in the FOP/RCA Air Monitoring Plan and Dust Control Plan. The FOP/RCA Air Monitoring Plan and Dust Control Plan have been submitted separately as Appendices to the Closure Plan included in the Part B RCRA Permit Renewal Application. Sample locations will be variable depending on wind direction, no Attachment 3A is included.

Groundwater monitoring will be conducted to verify natural attenuation mechanisms and ISCR mechanisms are occurring and to evaluate stability of the PCLE zones. The implementation of the PMZs will be consistent with the corrective actions described in the Part B RCRA Permit Renewal Application.

Groundwater monitoring will also be conducted to verify the performance of the funnel and gate PRB at the RCA/Slag Landfill/NDA. The proposed groundwater monitoring network includes wells on the upgradient and downgradient sides of each section of the PRB (including both "funnel" and "gate" sections). Water levels collected during groundwater monitoring will also be evaluated to assess PRB performance.

Operation and Maintenance	RAP Worksheet 3.2 Page 1 of 10	
	ID No.: SWR No. 30516	Report Date: May 31, 2019

Use this worksheet to describe the operation and maintenance (O&M) activities for each response action. In situations where the response action consists of more than one major component, for clarity one worksheet can be completed for each major component.

Response Action Name/Designation: **Surface soil excavation, disposal, regrading/backfilling**
List all portions of the response action to which this information applies.

Describe the O&M and inspection activities that will be required to operate and maintain response action components.

There are no operations and maintenance that will be required during the surface soil excavation, disposal, regrading/backfilling other than routine operations and maintenance of contractor equipment and inspections performed in accordance with the SWPPP and HASEP that will be developed for the planned activities.

List and discuss the key operating parameters for a properly functioning response action. Address how changes in these parameters will result in operating changes, providing sufficient detail to explain how the operator will know the component is functioning properly.

Not Applicable.

List the routine tasks required to operate the response action.

Not Applicable.

List the routine tasks required to maintain the response action, including scheduled inspections, maintenance, and component replacement.

Not Applicable.

Response Action Name/Designation: **Creek sediment excavation, disposal, and restoration**

List all portions of the response action to which this information applies.

Describe the O&M and inspection activities that will be required to operate and maintain response action components.

There are no operations and maintenance that will be required during the creek sediment excavation, disposal, and restoration other than routine operations and maintenance of contractor equipment and inspections performed in accordance with the SWPPP and HASEP that will be developed for the planned activities.

List and discuss the key operating parameters for a properly functioning response action. Address how changes in these parameters will result in operating changes, providing sufficient detail to explain how the operator will know the component is functioning properly.

Not Applicable.

List the routine tasks required to operate the response action.

Not Applicable.

List the routine tasks required to maintain the response action, including scheduled inspections, maintenance, and component replacement.

Not Applicable.

Response Action Name/Designation: **Consolidation and Installation of RCA/Slag Landfill/NDA Cap**

List all portions of the response action to which this information applies.

Describe the O&M and inspection activities that will be required to operate and maintain response action components.

The proposed operations and maintenance (O&M) activities that will be conducted during the implementation of the response action include inspections and maintenance during waste placement and final closure of the RCA. These activities are briefly summarized below and described in detail in the Closure Plan and its appendices, which are included as Attachment C to the Part B RCRA Permit Renewal Application.

O&M during RCA construction and filling includes: preparing the RCA for waste placement; waste placement, including compacting the waste lifts and grading the waste to create positive surface water drainage channels; contact water management; and equipment decontamination. The RCA O&M Plan describes these activities in greater detail (Appendix L to Attachment C of the Part B RCRA Permit Renewal Application).

The RCA will be inspected regularly, as described below. If an inspection reveals that the RCA cap, operating equipment, the flood wall, or other key features of the remedy have deteriorated, maintenance will be performed as described in the Closure Plan and the attached RCA O&M Plan.

List and discuss the key operating parameters for a properly functioning response action. Address how changes in these parameters will result in operating changes, providing sufficient detail to explain how the operator will know the component is functioning properly.

Not Applicable.

List the routine tasks required to operate the response action.

Not Applicable.

List the routine tasks required to maintain the response action, including scheduled inspections, maintenance, and component replacement.

Inspections and monitoring protocols for the RCA are described in the Closure Plan referenced above and in Section 6.0 of the RCA O&M Plan, which is included as Attachment L to the Closure Plan. Inspections and maintenance actions are summarized below.

During active operations, the RCA will be inspected a minimum of weekly and after each significant storm event to look for the following:

- **Deterioration, malfunction, or improper operation of surface water control features;**
- **Erosion of RCA cap or berms;**
- **Confirm that procedures are being followed by operations and maintenance staff; and**
- **Confirm the condition of the operating equipment, including earth moving equipment, alarms, and pumps.**

In addition, inspections of the security system (existing fences, gates, locks, etc.), emergency equipment, and communications equipment will be conducted weekly during active operations. If, during a periodic inspection, damage, deterioration, or malfunction of any of the systems, components, or facilities is observed, steps shall be initiated to rectify the situation. Site personnel, or their designated contractor, will perform minor maintenance activities as described in the RCA O&M Plan.

Response Action Name/Designation: **Installation of North CAMU Cap and Removal/Repair of Portion of Existing Cap**

List all portions of the response action to which this information applies.

Describe the O&M and inspection activities that will be required to operate and maintain response action components.

The proposed operations and maintenance activities that will be conducted during the implementation of the response action include inspections and maintenance during waste placement and final closure of the North CAMU. These activities are briefly summarized below and described in detail in the Closure Plan and its appendices, which are included as Attachment C to the Part B RCRA Permit Renewal Application.

O&M during North CAMU operation and filling includes waste characterization; preparing the North CAMU for waste placement; waste placement, including compacting the waste lifts and grading the waste to create positive surface water drainage channels; leachate and contact water management; and equipment decontamination.

The North CAMU will be inspected regularly, as described below. If an inspection reveals that the North CAMU cap, operating equipment, leachate collection system, or other key features of the remedy have deteriorated, maintenance will be performed as described in the Closure Plan and the attached North CAMU O&M Plan.

List and discuss the key operating parameters for a properly functioning response action. Address how changes in these parameters will result in operating changes, providing sufficient detail to explain how the operator will know the component is functioning properly.

Not Applicable.

List the routine tasks required to operate the response action.

Not Applicable.

List the routine tasks required to maintain the response action, including scheduled inspections, maintenance, and component replacement.

Inspections and monitoring protocols for the North CAMU are described in the Closure Plan referenced above and in Section 6.0 of the North CAMU O&M Plan, which is included as Appendix D to the Closure Plan. Inspections and maintenance actions are summarized below.

During active operations, the North CAMU will be inspected a minimum of weekly and after each significant storm event to look for the following:

- **Deterioration, malfunction, or improper operation of surface water control features;**
- **Erosion of RCA cap or berms;**
- **Confirm that procedures are being followed by operations and maintenance staff; and**
- **Confirm the condition of the operating equipment, including earth moving equipment, alarms, and pumps.**

In addition, inspections of the security system (existing fences, gates, locks, etc.), emergency equipment, and communications equipment will be conducted weekly during active operations. If, during a periodic inspection, damage, deterioration, or malfunction of any of the systems, components, or facilities is observed, steps shall be initiated to rectify the situation. Site personnel, or their designated contractor, will perform minor maintenance activities as described in the North CAMU O&M Plan.

Response Action Name/Designation: Upgrade of the Existing SDA Cap

List all portions of the response action to which this information applies.

Describe the O&M and inspection activities that will be required to operate and maintain response action components.

There are no operations and maintenance that will be required during the upgrade of the existing SDA cap other than routine operations and maintenance of contractor equipment and inspections performed in accordance with the SWPPP and HASEP that will be developed for the planned activities.

Following the completion of cap upgrades, the existing cap will be inspected regularly, as described below. If an inspection reveals that the cap has deteriorated, maintenance will be performed as described in the Closure Plan and the attached RCA O&M Plan.

List and discuss the key operating parameters for a properly functioning response action. Address how changes in these parameters will result in operating changes, providing sufficient detail to explain how the operator will know the component is functioning properly.

Not Applicable.

List the routine tasks required to operate the response action.

Not Applicable.

List the routine tasks required to maintain the response action, including scheduled inspections, maintenance, and component replacement.

Not Applicable.

Response Action Name/Designation: **Parkwood Parcel Capping and Soil Management Plan**

List all portions of the response action to which this information applies.

Describe the O&M and inspection activities that will be required to operate and maintain response action components.

There are no operations and maintenance that will be required during the placement of the cap other than routine operations and maintenance of contractor equipment and inspections performed in accordance with the SWPPP and HASEP that will be developed for the planned activities.

Following the completion of cap upgrades and implementation of the soil management plan, the area will be inspected regularly. If an inspection reveals that there is a possible penetration of the geomembrane, repairs will be performed as needed.

List and discuss the key operating parameters for a properly functioning response action. Address how changes in these parameters will result in operating changes, providing sufficient detail to explain how the operator will know the component is functioning properly.

Not Applicable.

List the routine tasks required to operate the response action.

Not Applicable.

List the routine tasks required to maintain the response action, including scheduled inspections, maintenance, and component replacement.

The cap area will be inspected semi-annually concurrently with the performance of groundwater monitoring activities for the FOP.

Response Action Name/Designation: Groundwater Response Actions (Groundwater Sampling)

List all portions of the response action to which this information applies.

Describe the O&M and inspection activities that will be required to operate and maintain response action components.

A visual inspection of the groundwater monitoring wells will be performed during each routine groundwater sampling event as described in the North CAMU Detection Monitoring Plan and the FOP Groundwater Monitoring Plan. Any wells identified as needing replacement, repair or maintenance will be noted on field sampling forms, and repairs will be implemented.

List and discuss the key operating parameters for a properly functioning response action. Address how changes in these parameters will result in operating changes, providing sufficient detail to explain how the operator will know the component is functioning properly.

Key operating parameters include ensuring that the monitoring wells are properly maintained so that no potential contamination can be introduced from the surface. Routine groundwater monitoring will be conducted.

List the routine tasks required to operate the response action.

A visual inspection of the groundwater monitoring wells will be performed during each routine groundwater sampling event. Monitoring wells will be gauged with a decontamination water level meter. Low-flow purging and sampling methodologies will be used to collect groundwater samples from monitoring wells. Groundwater samples will be containerized and delivered under standard Chain-of-Custody protocols to an approved laboratory. Quality assurance/quality control samples include one duplicate sample per sampling event (such that the duplicate samples collected as a part of the North CAMU Detection Monitoring Plan will be sufficient to meet the QA/QC requirements for the sampling performed as a part of the groundwater response actions). Any wells identified as needing replacement, repair or maintenance will be noted on field sampling forms, and repairs will be implemented. Groundwater will be evaluated and data validation will be completed upon receipt of laboratory data, and groundwater potentiometric surface maps will be created to be used in site evaluation. Laboratory analytical data will be requested to meet TRRP requirements (RG-366/TRRP-13). Procedures are described in greater detail in the detection monitoring plan for the North CAMU (included with the Part B RCRA Permit Renewal Application as Attachment K) and the detection monitoring plan for the rest of the FOP, including the RCA, (included with the Part B RCRA Permit Renewal Application as Attachment L).

List the routine tasks required to maintain the response action, including scheduled inspections, maintenance, and component replacement.

A visual inspection of the groundwater monitoring wells will be performed during each routine groundwater sampling event. Any wells identified as needing repair or maintenance will be noted on field sampling forms, and repairs will be implemented. Bolts, gaskets, well caps, and manway covers will be replaced as needed.

Response Action Name/Designation: **Groundwater Response Actions (PRB Funnel and Gate)**

List all portions of the response action to which this information applies.

Describe the O&M and inspection activities that will be required to operate and maintain response action components.

O&M and activities associated with the funnel and gate PRB (other than for monitoring wells discussed above) would include rejuvenation of the PRB reactive gate or repair/replacement of slurry wall or sheet pile segments if breakthrough is indicated. No other O&M is required outside of groundwater monitoring. Rejuvenation of the PRB is described in detail in Appendix 3.7. If a pump is required to assist with the transfer of water from the sump reactor to the PRB, minor pump maintenance may also be required.

List and discuss the key operating parameters for a properly functioning response action. Address how changes in these parameters will result in operating changes, providing sufficient detail to explain how the operator will know the component is functioning properly.

Key operating parameters for the funnel and gate PRB are groundwater monitoring data. COC concentrations and water level elevations will be monitored both upgradient and downgradient of each section of the funnel and gate PRB. The funnel and gate PRB will be determined to be functioning properly as long as COC concentrations downgradient of the RCA/NDA/Slag Landfill are below the applicable PCLs. Increased water levels upgradient from the PRB or increased COC concentrations (above applicable PCLs) downgradient of the PRB will indicate additional evaluation or actions are required. If downgradient COC concentrations are detected above applicable PCLs, and confirmed through resampling (as indicated in the FOP groundwater monitoring plan)., additional groundwater monitoring may be conducted or additional response actions may be evaluated, proposed, or implemented, if conditions warrant.

List the routine tasks required to operate the response action.

Not Applicable.

List the routine tasks required to maintain the response action, including scheduled inspections, maintenance, and component replacement.

Not Applicable.

Confirmation Sampling Plan	RAP Worksheet 4.0 Page 1 of 4	
Associated Information: Attachment 4A	ID No.:	Report Date: May 31, 2019

List the COCs and other parameters that will be sampled to confirm completion of the response action. Illustrate the monitoring or sampling locations in Attachment 4A. If monitoring or observation wells will be constructed for the response action, provide well construction details in Attachment 2B if not previously provided. If needed, describe the sample collection and handling methods, if not previously provided, in Appendix 6.

Media	COC[1]	Other parameter (specify)	Sampling Method	Sampling points[2]	Depth/height (ft.)	Analytical Method	Sampling Frequency
Surface Soil (including soil in sidewalls of Stewart Creek where fill containing slag or battery case fragments is observed).	**Antimony, Arsenic, Cadmium, Lead, and Selenium**		**Hand auger or stainless steel trowel**	**Excavation areas of the FOP**	**Base of excavation**	**US EPA method 6010B/6020A**	**One sample per 50' x 50' area of excavation (or approximate 2,500 square foot area)**
	Antimony, Arsenic, Cadmium, Lead, and Selenium		**Hand auger or stainless steel trowel**	**Excavation areas of the FOP**	**Along perimeter of excavation/ sidewall**	**US EPA method 6010B/6020A**	**One sample per 100 linear feet of perimeter length, except along previously remediated areas along the former UBP Boundary**
	Lead, Cadmium, Arsenic		**Hand auger or stainless steel trowel or scoop or disposable plastic sampling cup**	**Excavation areas where fill with battery case fragments or slag is removed along Stewart Creek**	**Base of excavation**	**US EPA method 6010B/6020A**	**One sample per 50' x 50' area of excavation (or approximate 2,500 square foot area)**

[1] Specify either a specific COC or type of COC (such as VOCs, metals).
[2] Specify the sampling point to the degree it is known, (for example, MW-1, or near former boring #2).

Media	COC[1]	Other parameter (specify)	Sampling Method	Sampling points[2]	Depth/height (ft.)	Analytical Method	Sampling Frequency
	Lead, Cadmium, Arsenic		**Hand auger or stainless steel trowel or scoop or disposable plastic sampling cup**	**Excavation areas where fill with battery case fragments or slag is removed along Stewart Creek**	**Along perimeter of excavation/ sidewall**	**US EPA method 6010B/6020A**	**One sample per 100 linear feet of perimeter length**
	Lead		**XRF Screening**	**Perimeter and base of excavation areas**	**Excavation surface**	**NA**	**Determined by excavation progress and data obtained**
Subsurface Soil	**None**						
Groundwater (as a part of PMZ)	**Arsenic**	**Field parameters including DO, pH, Specific conductivity, and ORP**	**Low-flow purging and sampling methodologies**	**LMW-22, MW-41, MW-47**	**Depth of groundwater and screened intervals vary. The Upper GWBU is encountered at depths ranging between 17 to 32 feet bgs.**	**Total and Dissolved Metals – EPA Method 6020A**	**Sampling will be quarterly for two years and then semi-annually thereafter for a total of 30 years.**

Confirmation Sampling Plan Associated Information: Attachment 4A	RAP Worksheet 4.0 Page 3 of 4 ID No.: Report Date: May 31, 2019

Media	COC[1]	Other parameter (specify)	Sampling Method	Sampling points[2]	Depth/height (ft.)	Analytical Method	Sampling Frequency
Groundwater (as a part of PMZ)	**Selenium**	**Field parameters including DO, pH, Specific conductivity, and ORP**	**Low-flow purging and sampling methodologies**	**LMW-8, LMW-9R, LMW-17**	**Depth of groundwater and screened intervals vary. The Upper GWBU is encountered at depths ranging between 17 to 32 feet bgs.**	**Total and Dissolved Metals – EPA Method 6020A**	**Sampling will be quarterly for two years and then semi-annually thereafter for a total of 30 years.**
Groundwater (as a part of PMZ)	**Lead, cadmium, arsenic, antimony, and selenium**	**Field parameters including DO, pH, Specific conductivity, and ORP**	**Low-flow purging and sampling methodologies**	**PRB-MW-3, PRB-MW-4, PRB-MW-5, PRB-MW-6, and PRB-MW-7**	**Depth of groundwater and screened intervals vary. The Upper GWBU is encountered at depths ranging between 17 to 32 feet bgs.**	**Total and Dissolved Metals – EPA Method 6020A**	**Sampling will be quarterly for two years and then semi-annually thereafter for a total of 30 years.**
Surface water	**None**						
Air	**None**						
Other media	**None**						

Confirmation Sampling Plan	RAP Worksheet 4.0 Page 4 of 4	
Associated Information: Attachment 4A	ID No.:	Report Date: May 31, 2019

Explain the reasons for the above-listed sampling plan. Discuss statistical or geostatistical methodology(ies) which will be applied, if any, in the data collection process. Discuss any assumptions made in the statistical/geostatistical assessment, and how they will be met.

Excavated soil areas at the FOP will initially be screened using a portable XRF meter to identify areas potentially requiring additional excavation. Following excavation, confirmation samples will be collected and analyzed for antimony, arsenic, cadmium, lead, and selenium in each PCLE zone at the FOP, to ensure the response action objectives or RALs have been met. Confirmation samples will be collected within each 2,500 square foot area from the base of each excavation and every 100 feet along the perimeter/sidewall of each excavation except along previously remediated areas along the former UBP Boundary.

Excavated soil areas containing fill containing battery case fragments or slag along Stewart Creek will initially be screened using a portable XRF meter to identify areas potentially requiring additional excavation. Following excavation, confirmation samples will be collected and analyzed for arsenic, cadmium and lead to ensure the response action objectives or RALs have been met. Confirmation samples will be collected within each 2,500 square foot area from the base of each excavation and every 100 feet along the perimeter/sidewall of each excavation.

Groundwater monitoring will be conducted to verify natural attenuation mechanisms are occurring and to evaluate stability of the PMZ.

Post-Response Action Care	RAP Worksheet 5.0 Page 1 of 5	
Associated Information: Attachments 5A-5C	ID No.: SWR No. 30516	Report date: May 31, 2019

Complete this worksheet only if Remedy Standard B will be used.

What is the proposed initial post-response action care period? (default 30 yr.) **30** years

If the proposed initial post-response action care period is less than 30 years, provide a technical justification in accordance with §350.33(h).

Not applicable, the post-response action care period is 30 years.

What is the foreseeable land use during the post-response action care period?	**Future land use will likely be commercial/industrial and/or, subject to TCEQ concurrence, recreational.**

Describe how the future use of the property will not compromise the integrity of the physical controls, will not interfere with the function of the monitoring systems, will not pose a threat to human health or the environment, and will be in accordance with any institutional controls.

Future land use will likely be commercial/industrial and/or, subject to TCEQ concurrence, recreational. Future use of the property will be restricted to maintain the integrity of the capped areas, to restrict the use of groundwater and ensure to that the closure requirements outlined in the Closure Plan for the FOP are maintained.

Briefly describe the proposed post-response action care activities. Describe the type of monitoring and/or inspections to be performed. Discuss the rationale for not including COC(s) analyzed during the response action, monitoring or sampling point location, frequency of monitoring and/or inspections, and the duration of the monitoring program.

The proposed post-response action care activities include inspections, maintenance and monitoring for the North CAMU, RCA, NDA, SDA, and Slag Landfill and the cap to be added to a portion of the Parkwood Parcel. These activities are briefly summarized below and described in detail in the Closure Plan that is included as Attachment C to the Part B RCRA Permit Renewal Application. The detection monitoring plan for the North CAMU is included with the Part B RCRA Permit Renewal Application as Attachment K. The detection monitoring plan for the rest of the FOP, including the RCA, is included as Attachment L.

- **Groundwater monitoring will be performed quarterly for two years following closure and then semiannually thereafter.**
- **Inspections of the final cover of capped areas will be performed to look for evidence of erosion, subsidence, ponded water, animal burrows, cracks along the cover, and loss of soil.**
- **The vegetative surface will be mowed after initial establishment of the planted species on the final covers. Mowing is assumed to occur twice a year.**
- **Any areas with rills and gullies greater than 6 inches in depth will be filled with soil and the vegetation re-established. Settlement, subsidence, or displacement will be corrected. Temporary erosion and sediment control measures will be employed on steep slopes to enhance restoration of the restored surfaces.**

- **Security devices, including chain-link fencing, gates, locks, and signs, will be maintained around the perimeter of the FOP or around the capped areas throughout the post closure care period, unless otherwise approved by TCEQ.**

- **Surveyed benchmarks will receive maintenance if damage or signs of movement are noted.**

- **The on-site access road will be inspected semiannually and maintained so that routine inspections can be performed. Any potholes or washouts of the road will be repaired and the road will be graded, as needed.**

- **The North CAMU leachate collection and conveyance system will be inspected regularly. The pumps will be removed and cleaned annually and will be replaced as needed during the post-closure care period. Sediment will be cleaned from the collection pipes and the enclosed sump by a high pressure jet cleaning contractor as needed.**

- **Inspections of each well in the groundwater monitoring network will be performed at least semiannually during sampling activities and will include checks of the protective casing, padlock, and concrete pad. Groundwater monitoring well maintenance activities include keeping the locks in operating condition or replacing them; maintaining the structural integrity of the concrete bollards that protect the wells; replacing the surface components of the wells that become compromised, such as the ground surface seal and protective casing; and redeveloping the well to maintain the full monitoring depth.**

- **Surface water management features at the FOP will receive maintenance in accordance with the proposed inspection schedule. Typical activities that will occur include repair of drainage ditches that have experienced erosion by re-grading the surface and restoring channel linings, repair of erosion and sediment control devices to their original condition, and removal of obstructions found in culverts and drainage conveyance pipes.**

- **The flood wall will be inspected regularly. The condition of waterstops and joint filters will be assessed to ensure they are in good condition, and the flood wall will be inspected for signs of seepage through the wall, cracks, and other signs of damage. Inspections will also look for trash or debris, erosion, and high vegetation along the flood wall. Repairs to the flood wall will be completed as needed.**

In addition to the inspections and maintenance described above associated with the FOP, following the completion of excavation and restoration activities on Stewart Creek, Exide will implement an inspection and removal program to remove any battery case fragments or slag that may appear in Stewart Creek. The inspection and removal program will be performed approximately twice per year for five years. The need to perform additional inspection and removal events will be determined following the completion of the initial five-year monitoring period through discussion with TCEQ. The procedures for the inspection and removal activities generally consist of the following:

- **The first step will be to obtain access to the inspection area (shown on Figure 5A-2). If no response is received, or access is denied, Exide will request assistance from TCEQ as needed.**

- **Once access is obtained, methods for identifying slag developed by W&M (W&M, 2013) will be implemented. These methods will involve observing visual and physical characteristics and collecting/removing suspect materials. A number of materials were previously identified and sampled along Stewart Creek to develop a protocol to distinguish slag materials from native rock or stone fragments. Sampling results**

indicated that probable slag is generally denser and has darker colors along with reddish hues whereas natural materials suspect of being slag tended to be lighter colored and more readily identifiable as limestone fragments and/or asphalt material.

- **The field team will locate and identify slag and battery case fragments by traversing the creek bed and associated immediate bank areas. The identification process will consist of visual, on the ground observations only and will not include physical digging or intrusive investigations. Locations where slag and/or battery case fragments are observed or the corners of larger areas where multiple battery case fragments or slag are observed will be measured using a differential GPS handheld receiver. For each identified feature, the geographic coordinates as well as visual observations at each location will be recorded, including, for larger areas identified by their corners, the approximate number of battery case fragments or slag. Identified slag or battery case fragments will be removed wherever observed. The removal method has been designed to minimize the generation of dust. Removal of slag and battery case fragments will be completed with hand tools such as shovels and trowels. The hand tool blades will consist of stainless steel or other inert material. All tools used in removal efforts will be decontaminated between each removal event. The sediment or soil in direct contact and immediately surrounding the slag or battery casing fragments will also be removed.**

- **Only areas where slag and/or battery case fragments can be removed by use of hand tools will be completed as part of this periodic inspection and removal event. Although it is unexpected after the completion of the response action implementation, if areas of slag or battery case fragments are sufficiently large to require the use of mechanical excavation equipment, they will be identified in the field and removed in a separate mobilization with appropriate equipment. Should slag or battery case fragments at any location extend to depth beyond six inches below grade, removal of this material will cease and they will be removed at a later date with appropriate equipment. Reasonable attempts will be made with hand tools available to determine the apparent boundaries of such areas. The results of such attempts will be recorded.**

- **The slag and battery case fragments and soil/sediment in direct contact and immediately surrounding, will be loaded into 5 gallon buckets. Each bucket will be closed when material is not being actively added and will be labeled to identify its contents (i.e., slag/battery case fragments). Buckets will be taken to the FOP at the end of each day and placed in a secure location.**

- **If removed materials are not placed in the RCA, they will be transferred into 55-gallon drums (buckets will be emptied into drums) and stored in a secure location. Drums will be sealed at the end of each day and when they have reached their capacity. Once a drum has been filled, it will be transferred to a storage location on a paved area at the FOP. The drum label will identify the drum as "Currently Being Analyzed" and the date of accumulation. A composite sample will be collected from the drums and analyzed for TCLP lead and cadmium using EPA Method SW1311/6020. Additional analysis will be performed as required by the anticipated disposal facility. Based upon the results of the waste characterization analysis, each 55-gallon drum will be labeled and transported to an appropriate off-site disposal facility within 90 days of removal.**

- **No sampling activities (other than waste characterization) are proposed as a part of the on-going inspection and removal activities.**

Will PRAC sampling procedures be the same as those as previously documented for monitoring and/ or confirmation sampling? ____ Yes **X** ____ No

If no, provide in Appendix 6 a description of the monitoring or sampling collection procedures to be conducted during the post-response action care period.

The detection monitoring plan for the North CAMU is included with the Part B RCRA Permit Renewal Application as Attachment K. Based on the results of ongoing monitoring at the North CAMU, a new well was installed and an existing well was added to the detection monitoring network.

The detection monitoring plan for the rest of the FOP, including the RCA, the Existing Cap Areas (NDA, Slag Landfill and SDA), is included as Attachment L.

Cost Estimate

Complete this portion of the form only if a physical control is proposed (installed hydraulic control system, slurry wall, cap, etc.). Provide in Attachment 5B a detailed cost estimate for a third party to operate and maintain the physical control during the PRAC period, based on current dollar amount.

Specify the physical control to which this information applies	**RCA, NDA, Slag Landfill, SDA, Parkwood Parcel and Stewart Creek inspections, maintenance and monitoring.**

Complete this worksheet for each physical control that will be used as part of the response action.

What is the total estimated annual cost of O&M for the PRAC period?	$ **139,000 (including 10% contingency required by RCRA Permit Renewal Application)**
What is the total estimated cost for a third party to perform PRAC activities?	$ **4,184,000 (including 10% contingency required by RCRA Permit Renewal Application, 2019 Costs)**

Identify the type of financial assurance mechanism to be used, and the contact person managing fiduciary responsibility, if known.

Surety Bond

Does the person meet the criteria and definition of a small business? (see §350.33(n)) ___ Yes **X** No
If yes and the person desires to pursue the reduced amount of financial assurance, provide a legally binding affidavit as Attachment 5C. Include in the affidavit the information requested in 30 TAC §350.33(l), (m), and (n). An example affidavit is attached in the instructions.

Specify the physical control to which this information applies	**North CAMU inspections, maintenance and monitoring.**

Complete this worksheet for each physical control that will be used as part of the response action.

What is the total estimated annual cost of O&M for the PRAC period?	**$68,000**
What is the total estimated cost for a third party to perform PRAC activities?	**$2,055,000 (including 10% contingency required by RCRA Permit Renewal Application, 2019 Costs)**

Identify the type of financial assurance mechanism to be used, and the contact person managing fiduciary responsibility, if known.

Surety Bond

Does the person meet the criteria and definition of a small business? (see §350.33(n)) ___ Yes **X** No
If yes and the person desires to pursue the reduced amount of financial assurance, provide a legally binding affidavit as Attachment 5C. Include in the affidavit the information requested in 30 TAC §350.33(l), (m), and (n). An example affidavit is attached in the instructions.

Implementation Schedule	RAP Worksheet 6.0 Page 1 of 2	
	ID No.: SWR No. 30516	Report Date: May 31, 2019

Document the proposed schedule for implementing the response action. Include all major response action activities through the life of the project, including all removal, decontamination, and control actions, component installations, O&M, monitoring, and post-response action care activities.

Implementation of Response Action (specify component or action)	Start	Finish	Duration
Construction of Funnel and Gate PRB	**Within six months of RAP Approval**	**Approximately six months after initiating response action**	**Approximately six months**
USACE Permitting Process	**Within six months of RAP Approval**	**Approximately one year after initiating USACE Permitting Process**	**Approximately one year**
Funnel and Gate Construction Performance Groundwater Monitoring	**Within 30 days of completion of Funnel and Gate Construction**	**Approximately two years after initiating Funnel and Gate Construction Performance Groundwater Monitoring**	**Approximately 2 years**
Surface soil excavation, consolidation, regrading/backfilling	**Within 90 days of completion of Funnel and Gate Construction Performance Groundwater Monitoring (it is noted that the flood wall construction activities must also be completed prior to surface soil excavation and consolidation)**	**Approximately two years after initiating response action**	**Approximately 2 years**
Creek sediment excavation, disposal, and restoration	**Within 90 days of RAP approval and obtaining USACE permit (it is noted that the Funnel and Gate Construction Performance Groundwater Monitoring must also be completed prior to creek sediment excavation and disposal)**	**Approximately 2 years after initiating response action and obtaining USACE permit**	**Approximately 2 years**
Installation of RCA/NDA/Slag Landfill Cap	**Following completion of surface soil and sediment response actions**	**Approximately 4 months following the completion of surface soil and sediment response actions**	**Approximately 4 months**
Installation of Parkwood Parcel Cap and Implementation of Soil Management Plan	**Following completion of surface soil and sediment response actions**	**Approximately three months after initiating response action**	**Approximately 3 months**

Continued Groundwater Monitoring	**A schedule will be determined within 30 days of RAP approval**	**A schedule will be determined within 30 days of RAP approval, 30 years**	**A schedule will be determined within 30 days of RAP approval Proposed as quarterly for two years, then semi-annually for a total of 30 years**
Installation of North CAMU Cap and Removal/Repair of Portion of Existing Cap	**Following completion of surface soil and sediment response actions, or when the North CAMU reaches the design capacity, whichever is first**	**Approximately 4 months following the completion of surface soil and sediment response actions or when the North CAMU reaches the design capacity, whichever is first**	**Approximately 4 months**
Upgrade of the Existing SDA Cap	**Following completion of surface soil and sediment response actions**	**Approximately 4 months following the completion of surface soil and sediment response actions**	**Approximately 4 months**
Post-Response Action Care - Stewart Creek Inspection and Removal Program	**Within 6 months of the completion of final closure activities at the FOP**	**Approximately 5 years following the completion of sediment response action activities**	**5 years**
Post-Response Action Care - RCA Inspections, Monitoring and Maintenance	**Within 30 days of completion of final closure of the RCA**	**Approximately 30 years following the final closure of the RCA**	**30 years**
Post-Response Action Care - North CAMU Inspections, Monitoring and Maintenance	**Within 30 days of completion of final closure of the North CAMU**	**Approximately 30 years following the final closure of the North CAMU**	**30 years**

List the proposed schedule for report submittals. Add additional lines if more reports than listed will be needed to complete the response action.

Reports	Submittal date
Response Action Effectiveness Report (RAER)	
Not Applicable	**Not Applicable**
Response Action Completion Report (RACR)	**Within 90 days of completion of the response action**
Post-Response Action Care Report (PRACR)	
Annual PRACR (including the results of inspections, maintenance, and monitoring for Stewart Creek, the RCA, North CAMU, and other capped areas).	**Within 180 days of completion of the response action and then annually thereafter.**
Revised Annual PRACR	**If warranted, within 30 days of comments from TCEQ**

ATTACHMENT 1A

Maps and Cross Sections

ATTACHMENT 2A

Response Action Diagrams and Component/Equipment Descriptions

ATTACHMENT 2D

Plume Management Zone Map

ATTACHMENT 2E

Attenuation Action Levels Determination

Attachment 5A

Map of PRAC Monitoring and Sampling Points

Attachment 5B

PRAC Costs

APPENDIX 1

REFERENCES

APPENDIX 1
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APPENDIX 2

DATA TABLES, FIGURES AND LAB DATA

APPENDIX 3

STUDIES AND TESTS DOCUMENTATION

APPENDIX 4

PROPOSED INSTITUTIONAL CONTROLS

APPENDIX 6

SAMPLING PROCEDURES

APPENDIX 7

STATISTICAL METHODOLOGY

LEGEND

- Former Operating Plant Property Boundary
- Flood Wall Location

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Anne Faeth-Boyd 5-20-19

NOTE(S)

1. Original figure prepared by PBW as part of the APAR dated July 9, 2013.

REFERENCE(S)

1. Source of Photo: Imagery from NCTCOG, 2009 photography.
2. Aerial Image: Dallas Aerial Survey, April 2017.

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CONSULTANT
GOLDER

YYYY-MM-DD	MAY 2019
DESIGNED	JWT
PREPARED	BCL
REVIEWED	AMF
APPROVED	AMF

PROJECT
EXIDE TECHNOLOGIES FORMER OPERATING PLANT
RESPONSE ACTION PLAN

TITLE
ON-SITE PROPERTY MAP

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STATE OF TEXAS
ANNE M FAETH-BOYD
GEOLOGY
12300
LICENSED
PROFESSIONAL GEOSCIENTIST

LEGEND

- FOP Property Boundary
- Former Path of North Tributary (1951 Aerial Photo)
- Former Path of North Tributary (1972 Aerial Photo)
- Former Path of Stewart Creek (1951 Aerial Photo)
- Stewart Creek (Approximate Creek Centerline)
- North Tributary (Approximate Creek Centerline)
- Monitoring Well Location
- Soil Boring Location (2012 - 2019)
- Soil Sample Location (2012 - 2014)
- Phase II RFI Soil Sample Location (1998)
- Phase I RFI Soil Sample Location (1991)
- Disposal Area Delineation Boring Location (1993)
- Dredged Sediment Stockpile Sample Location (1986)
- Dredged Sediment Stockpile Sample Location (1987)
- Old Drum Storage Area Sample Location (1987)
- Geotech Boring Location (2011-2018)
- Class 2 Landfill Notification Boring (1995)
- UBP Soil Sample Location (2017-2018)
- Soil Critical PCL Exceedance Zone (PCLE Zone)
- Undeveloped Buffer Property Excavation
- Surface Drainage Direction
- Water Line
- Fire Hydrant
- Sanitary Sewer Line
- Sanitary Sewer Manhole
- Stormwater Line
- Stormwater Manhole
- Stormwater Inlet/Basin
- Gas Line
- Fiber Optic Line
- Flood Wall Location
- Former Undeveloped Buffer Property (UBP)

NOTE(S)

1. Locations of utilities shown are approximate. Additional underground utilities are present throughout the former production area, commonly within concrete trenches.
2. Original figure prepared by PBW as part of the APAR dated July 9, 2013.
3. Monitoring wells LMW-9, MW-19, MW-28, VCP-MW-12, and VCP-MW-13 are abandoned.
4. Data presented for Undeveloped Buffer Property soil samples included as Attachment U to the Part B RCRA Permit Renewal Application.
5. Data for Off-Site Parkwood Boulevard boring locations presented in Appendix 3.3 of this Response Action Plan.

REFERENCE(S)

1. Source of Photo: Imagery from NCTCOG, 2009 photography.
2. Source of Utilities: City of Frisco, GIS Department.
3. Aerial Image, Dallas Aerial Survey, April 2017.

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CONSULTANT
GOLDER

YYYY-MM-DD	MAY 2019
DESIGNED	JWT
PREPARED	BCL
REVIEWED	EPW
APPROVED	AMF

PROJECT
EXIDE TECHNOLOGIES FORMER OPERATING PLANT
RESPONSE ACTION PLAN

TITLE
AFFECTED PROPERTY MAP - SOIL

PROJECT NO.	Control No.	REV.	Figure
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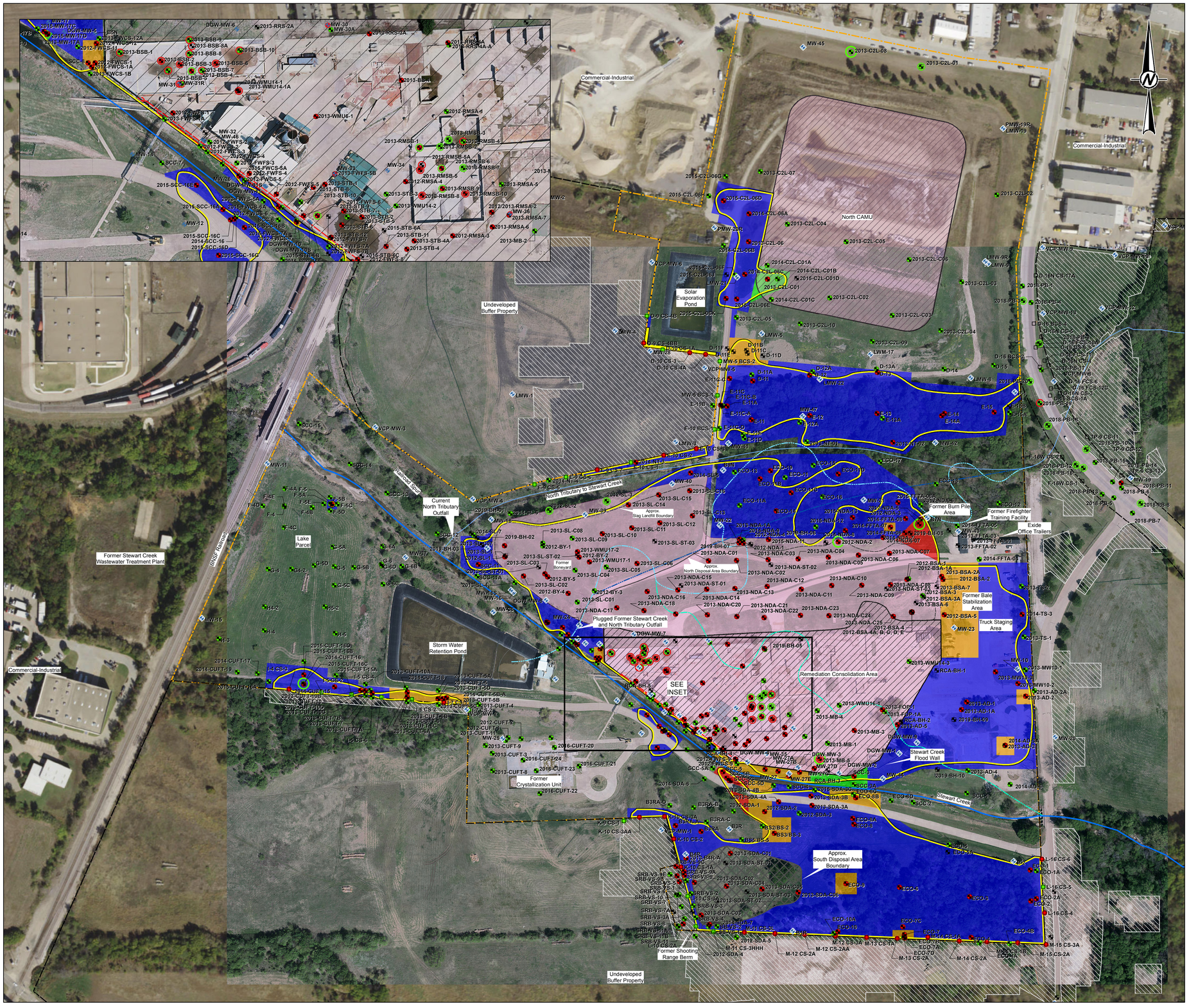

LEGEND

- Monitoring Well Location
- Soil Boring / Soil Sample Location (2012 - 2019)
- Undeveloped Buffer Property Soil Sample (2017-2018)

FOP Action Level (0 - 5 feet bgs)

- Exceedance of Lead RAL/Critical PCL for Soil
- No Exceedance of Lead RAL/Critical PCL for Soil

FOP Action Level (5 - 15 feet bgs)

- Exceedance of Lead RAL/Critical PCL for Soil
- No Exceedance of Lead RAL/Critical PCL for Soil

FOP Action Level (>15 feet bgs)

- Exceedance of Lead RAL/Critical PCL for Soil
- No Exceedance of Lead RAL/Critical PCL for Soil
- French Drain
- Stewart Creek (Appoximate Creek Centerline)
- North Tributary (Appoximate Creek Centerline)
- Former Path of North Tributary (1951 Aerial Photo)
- Former Path of North Tributary (1972 Aerial Photo)
- Former Path of Stewart Creek (1951 Aerial Photo)
- Critical PCL Exceedence
- Approximate Extent of Disposal Area
- Former Operating Plant Property Boundary
- Former Undeveloped Buffer Property
- Corrective Action Management Unit
- Cap Supplement
- Undeveloped Buffer Property Excavation
- Engineered Cap

FOP PCLE Zone Proposed Excavation Area

- 0.5 ft
- 1 ft
- 2 ft
- 4 ft

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5-30-19

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Feet

NOTE(S)

NOTES:
1. A LOCATION WITH NO ACTION LEVEL SYMBOL MEANS THE LOCATION WAS NOT SAMPLED FOR THE DISPLAYED CONSTITUENT OR WAS NOT SAMPLED AS A PART OF THE SIR OR APAR INVESTIGATIONS.
2. SOIL SAMPLES ANALYZED FOR THE SIR AND APAR INVESTIGATIONS (2012-2015) WERE USED TO DELINEATE AFFECTED PROPERTY BOUNDARIES. THEREFORE, ONLY SIR AND APAR SOIL SAMPLE RESULTS ARE PRESENTED.
3. MONITORING WELLS LMW-9, MW-19, MW-28, VCP-MW-12 AND VCP-MW-13 ARE ABANDONED.
4. DATA PRESENTED FOR UNDEVELOPED BUFFER PROPERTY SOIL SAMPLES INCLUDED AS ATTACHMENT U TO THE PART B RCRA PERMIT RENEWAL APPLICATION.
5. DATA FOR OFF-SITE PARKWOOD BOULEVARD BORING LOCATIONS PRESENTED IN APPENDIX 3.3 OF THIS RESPONSE ACTION PLAN.

REFERENCE(S)

1. BASEMAP BY PBW AS PART OF THE APAR DATED JULY 9, 2013. MODIFIED BY GOLDER MAY 2014 - APRIL 2019
2. LOCATIONS - PBW AND GOLDER, 2012 - 2019
3. AERIAL IMAGERY: PLANT SITE, APRIL 2017; BACKGROUND IMAGERY: SOURCE: ESRI, DIGITALGLOBE, GEOEYE, I-CUBED, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEX, GETMAPPING, AEROGRID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY,

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PROJECT
EXIDE TECHNOLOGIES FORMER OPERATING PLANT RESPONSE ACTION PLAN

TITLE
FOP AFFECTED PROPERTY AND PCLE ZONE MAP - SOIL COCS

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-28
DESIGNED	JWT
PREPARED	JWT
REVIEWED	EPW
APPROVED	AMF

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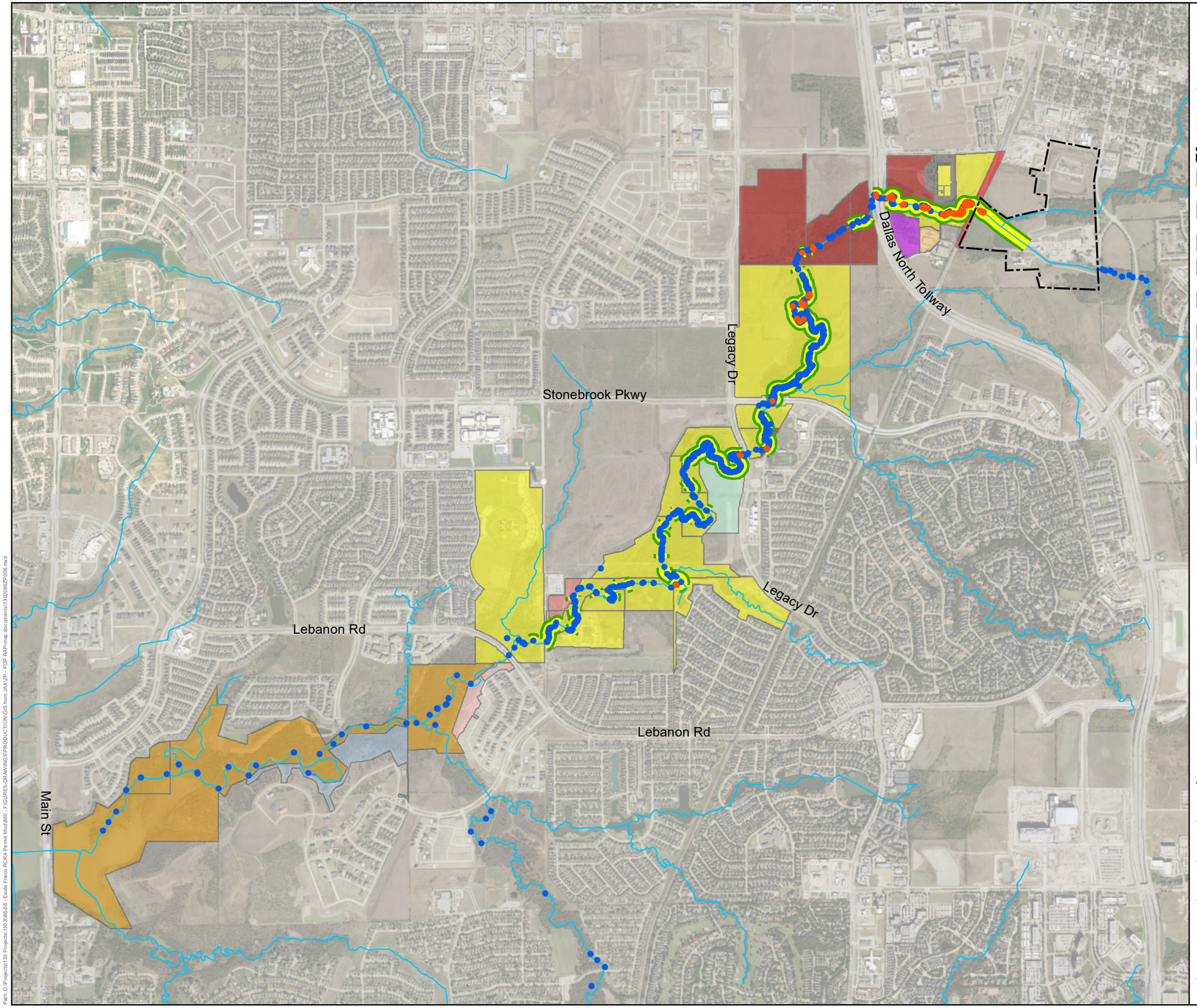

LEGEND

- Sediment Sample (No Exceedance)
- Sediment Sample (Exceedance)
- Creek Centerline
- Affected Property No.8 - Stewart Creek Sediments
- Former Operating Plant Property Boundary
- Artistry Senior Residences at Edgestone
- Bellevue Partners Ltd & Stewart Creek International Investors LP
- Burlington Northern Santa Fe RR Co
- City of Frisco
- Frisco Community Development Corp (City of Frisco)
- GGH Kingswood Lots LLC
- Meritage Homes of Texas
- Oncor Electric Delivery Company
- Owner Unknown
- Pirwig Properties LLC
- USACE

STATE OF TEXAS
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12300
LICENSED
PROFESSIONAL GEOSCIENTIST

NOTES

1. SEDIMENT SAMPLE LOCATIONS INCLUDE THOSE COLLECTED BY GOLDER (2014 THROUGH 2017).
2. PROPERTY INFORMATION UPDATED FROM COLLIN AND DENTON COUNTY APPRAISAL DISTRICT WEBSITES, MAY 2019.

REFERENCE

1. SITE FEATURES - GOLDER, 2014 AND 2016
2. AERIAL IMAGERY - SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

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PROJECT
EXIDE TECHNOLOGIES FORMER OPERATING PLANT RESPONSE ACTION PLAN

TITLE
AFFECTED PROPERTY AND PCLE ZONE MAP - LEAD EXCEEDANCES IN SEDIMENT

CONSULTANT
GOLDER

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APPROVED	AMF

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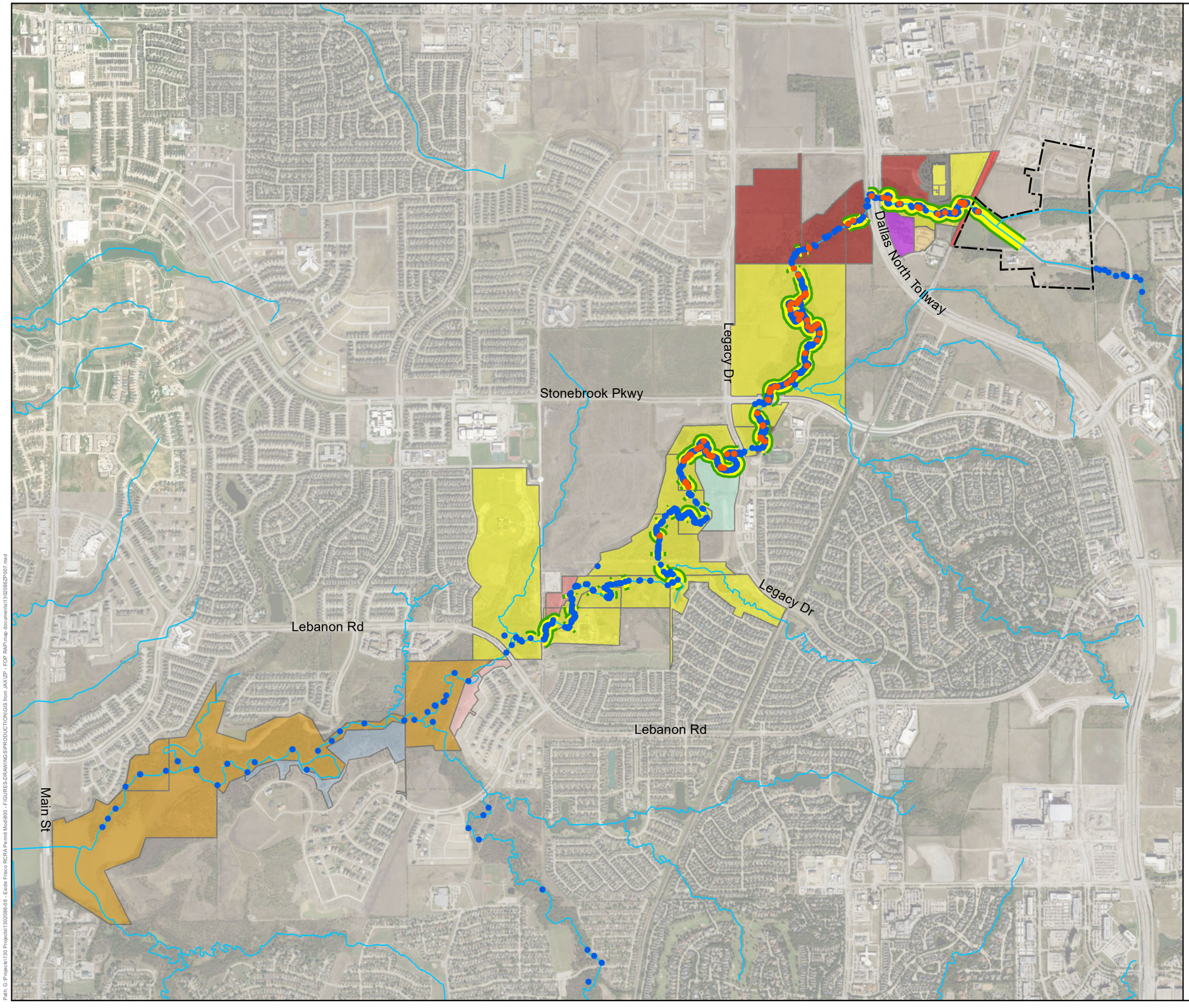

LEGEND

- Sediment Sample (No Exceedance)
- Sediment Sample (Exceedance)
- Creek Centerline
- Affected Property No.8 - Stewart Creek Sediments
- Former Operating Plant Property Boundary
- Artistry Senior Residences at Edgestone LLC
- Bellevue Partners Ltd & Stewart Creek International Investors LP
- Burlington Northern Santa Fe RR Co Property Tax Department
- City of Frisco
- Frisco Community Development Corp (City of Frisco)
- GGH Kingswood Lots LLC
- Meritage Homes of Texas LLC
- Oncor Electric Delivery Company
- Owner Unknown
- Pirwig Properties LLC
- USACE

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NOTES

1. SEDIMENT SAMPLE LOCATIONS INCLUDE THOSE COLLECTED BY GOLDER (2014 THROUGH 2017).
2. PROPERTY INFORMATION UPDATED FROM COLLIN AND DENTON COUNTY APPRAISAL DISTRICT WEBSITES, MAY 2019.

REFERENCE

1. SITE FEATURES - GOLDER, 2014 AND 2016
2. AERIAL IMAGERY - SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

0.35 0.175 0 0.35 Miles

CLIENT
EXIDE TECHNOLOGIES

PROJECT
EXIDE TECHNOLOGIES FORMER OPERATING PLANT RESPONSE ACTION PLAN

TITLE
AFFECTED PROPERTY AND PCLE ZONE MAP - CADMIUM EXCEEDANCES IN SEDIMENT

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-08
PREPARED	EFT
DESIGN	AM
REVIEW	EPW
APPROVED	AMF

PROJECT No.	CONTROL	Rev.	FIGURE
13-0208606	1302086ZP007.mxd	0	**1A-5**

Path: G:\Projects\1302086-06 - Exide Frisco RCRA Permit Mod\800 - FIGURES-DRAWINGS\PRODUCTION\GIS from JAX\ZP - FOP RAP\mxd documents\1302086ZP007.mxd

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI B
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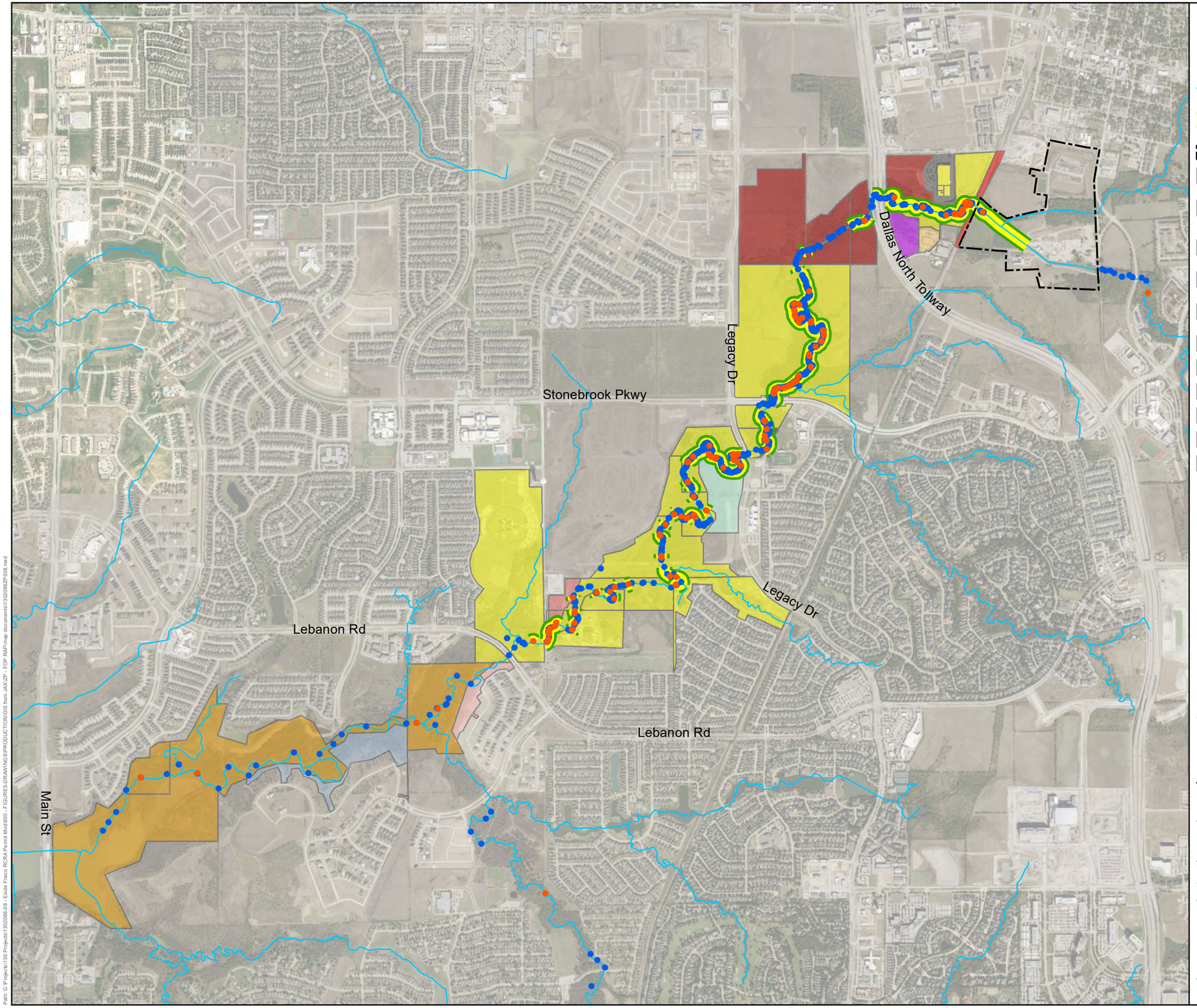

LEGEND

- Sediment Sample (No Exceedance)
- Sediment Sample (Exceedance)
- Creek Centerline
- Affected Property No.8 - Stewart Creek Sediments
- Former Operating Plant Property Boundary
- Artistry Senior Residences at Edgestone LLC
- Bellevue Partners Ltd & Stewart Creek International Investors LP
- Burlington Northern Santa Fe RR Co Property Tax Department
- City of Frisco
- Frisco Community Development Corp (City of Frisco)
- GGH Kingswood Lots LLC
- Meritage Homes of Texas LLC
- Oncor Electric Delivery Company
- Owner Unknown
- Pirwig Properties LLC
- USACE

STATE OF TEXAS
ANNE M FAETH-BOYD
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12300
LICENSED
PROFESSIONAL GEOSCIENTIST
5-20-19

NOTES

1. SEDIMENT SAMPLE LOCATIONS INCLUDE THOSE COLLECTED BY GOLDER (2014 THROUGH 2017).
2. PROPERTY INFORMATION UPDATED FROM COLLIN AND DENTON COUNTY APPRAISAL DISTRICT WEBSITES, MAY 2019.

REFERENCE

1. SITE FEATURES - GOLDER, 2014 AND 2016
2. AERIAL IMAGERY - SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

0.35 0.175 0 0.35
Miles

CLIENT
EXIDE TECHNOLOGIES

PROJECT
EXIDE TECHNOLOGIES FORMER OPERATING PLANT RESPONSE ACTION PLAN

TITLE
AFFECTED PROPERTY AND PCLE ZONE MAP - ARSENIC EXCEEDANCES IN SEDIMENT

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-08
PREPARED	EFT
DESIGN	AM
REVIEW	EPW
APPROVED	AMF

PROJECT No.	CONTROL	Rev.	FIGURE
13-0208606	1302086ZP008.mxd	0	**1A-6**

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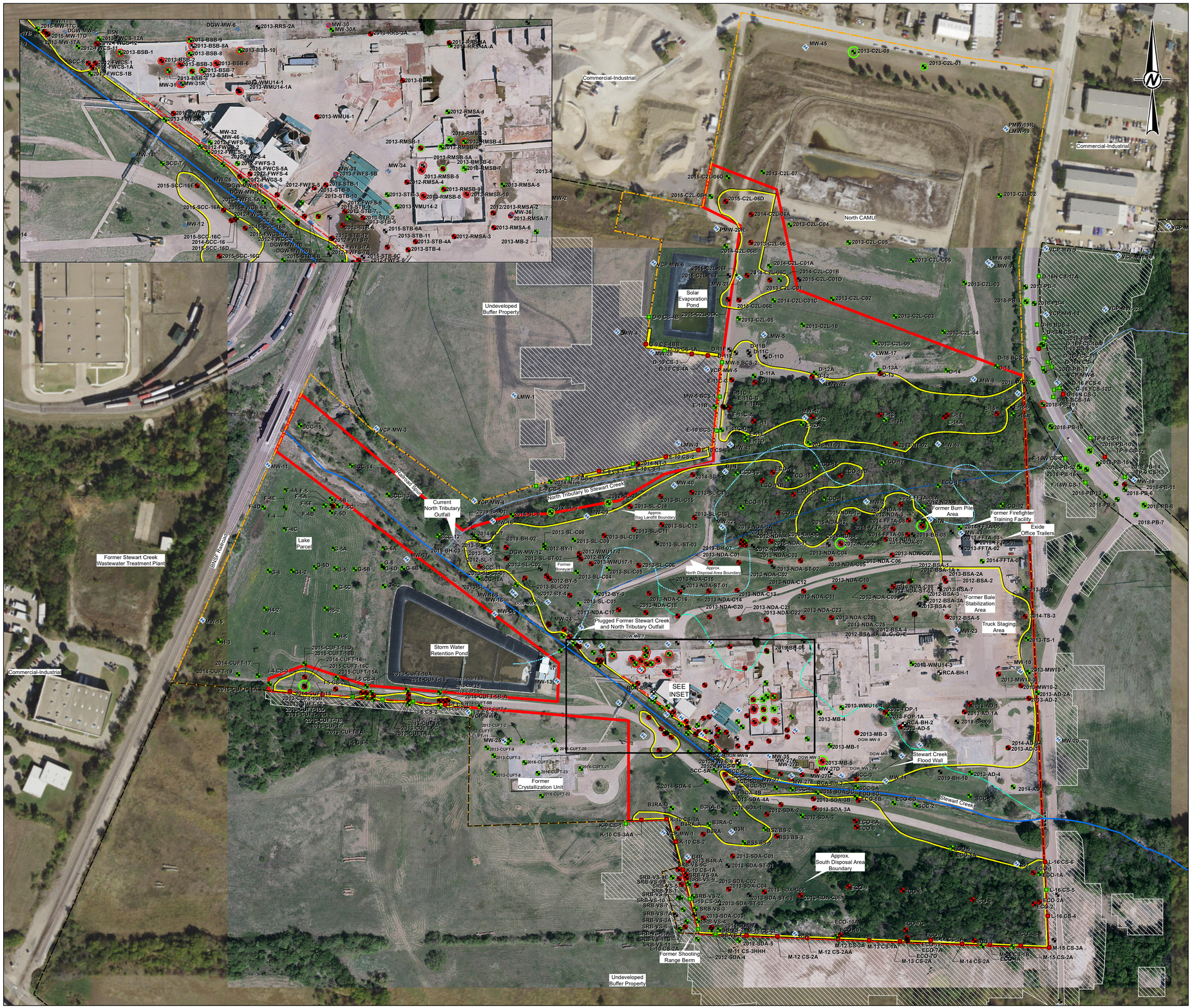

LEGEND

- Monitoring Well Location
- Soil Boring / Soil Sample Location (2012 - 2018)
- Undeveloped Buffer Property Soil Sample (2017-2018)

FOP Action Level (0 - 5 feet bgs)

- Exceedance of Lead RAL/Critical PCL for Soil
- No Exceedance of Lead RAL/Critical PCL for Soil

FOP Action Level (5 - 15 feet bgs)

- Exceedance of Lead RAL/Critical PCL for Soil
- No Exceedance of Lead RAL/Critical PCL for Soil

FOP Action Level (>15 feet bgs)

- Exceedance of Lead RAL/Critical PCL for Soil
- No Exceedance of Lead RAL/Critical PCL for Soil
- French Drain
- Stewart Creek (Approximate Creek Centerline)
- North Tributary (Approximate Creek Centerline)
- Former Path of North Tributary (1951 Aerial Photo)
- Former Path of North Tributary (1972 Aerial Photo)
- Former Path of Stewart Creek (1951 Aerial Photo)
- Critical PCL Exceedence
- Approximate Extent of Disposal Area
- Former Operating Plant Property Boundary
- Former Undeveloped Buffer Property
- Undeveloped Buffer Property Excavation
- Area of Contamination

0 150 300
Feet

NOTE(S)

NOTES:
1. A LOCATION WITH NO ACTION LEVEL SYMBOL MEANS THE LOCATION WAS NOT SAMPLED FOR THE DISPLAYED CONSTITUENT OR WAS NOT SAMPLED AS A PART OF THE SIR OR APAR INVESTIGATIONS.
2. SOIL SAMPLES ANALYZED FOR THE SIR AND APAR INVESTIGATIONS (2012-2015) WERE USED TO DELINEATE AFFECTED PROPERTY BOUNDARIES. THEREFORE, ONLY SIR AND APAR SOIL SAMPLE RESULTS ARE PRESENTED.
3. MONITORING WELLS LMW-9, MW-19, MW-28, VCP-MW-12 AND VCP-MW-13 ARE ABANDONED.
4. DATA PRESENTED FOR UNDEVELOPED BUFFER PROPERTY SOIL SAMPLES INCLUDED AS ATTACHMENT U TO THE PART B RCRA PERMIT RENEWAL APPLICATION.
5. DATA FOR OFF-SITE PARKWOOD BOULEVARD BORING LOCATIONS PRESENTED IN APPENDIX 3.3 OF THIS RESPONSE ACTION PLAN.

REFERENCE(S)

1. BASEMAP BY PBW AS PART OF THE APAR DATED JULY 9, 2013. MODIFIED BY GOLDER MAY 2014.
2. LOCATIONS - PBW AND GOLDER, 2012 - 2018
3. AERIAL IMAGERY: PLANT SITE, APRIL 2017; BACKGROUND IMAGERY: SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY, IMAGERY ACQUISITION DATE UNKNOWN.

STATE OF TEXAS
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PROFESSIONAL GEOSCIENTIST
5-23-19

CLIENT
EXIDE TECHNOLOGIES

PROJECT
EXIDE TECHNOLOGIES FORMER OPERATING PLANT RESPONSE ACTION PLAN

TITLE
AREA OF CONTAMINATION (AOC)

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-23
DESIGNED	JWT
PREPARED	JWT
REVIEWED	EPW
APPROVED	AMF

PROJECT NO.	CONTROL	REV.	FIGURE
13-0208606	1302086ZP034	0	1A-7

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI D

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LEGEND

- Monitoring Well Location
- Surface Water Centerline
- Groundwater Protective Concentration Level Exceedance (PCLE) Zone (Metals)
- Disposal Area
- Remediation Consolidation Area
- Approximate North CAMU Extent
- Former Operating Plant Property Boundary

STATE OF TEXAS
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12300
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PROFESSIONAL GEOSCIENTIST

300 150 0 300
Feet

REFERENCE

1. SITE FEATURES - GOLDER, 2014
2. AERIAL IMAGERY - SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY AND AERIAL IMAGERY PROVIDED BY DALLAS AERIAL SURVEY DATED APRIL, 2017

CLIENT
EXIDE TECHNOLOGIES

PROJECT
RESPONSE ACTION PLAN

TITLE
FOP GROUNDWATER PCLE ZONE MAP (GROUNDWATER PLUME MAP)

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-21
PREPARED	EFT
DESIGN	BEF
REVIEW	EPW
APPROVED	AMF

PROJECT No.	CONTROL	Rev.	FIGURE
13-0208606	1302086ZP038.mxd	0	1A-8

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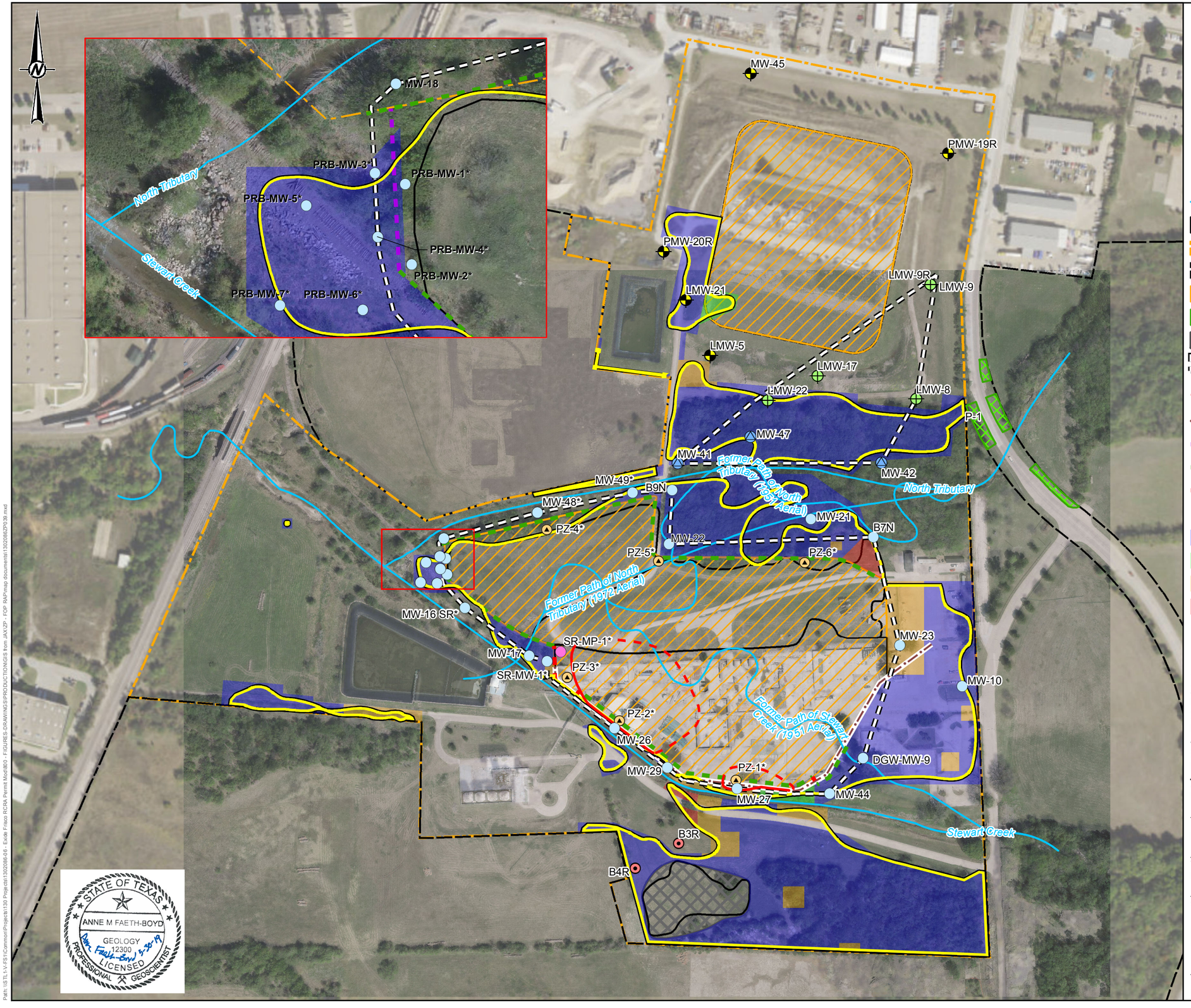

LEGEND

- North CAMU Detection Monitoring Well
- North CAMU Detection/Corrective Action Monitoring Well
- North CAMU Corrective Action Monitoring Well
- SDA Detection Monitoring Well
- FOP Corrective Action Monitoring Well
- Piezometer Location
- Sump Reactor Monitoring Point
- Surface Water Centerline
- Disposal Area
- Former Operating Plant Property Boundary
- Former Undeveloped Buffer Property
- Engineered Cap
- Parkwood Cap
- Cap Supplement
- Plume Management Zone
- Protective Concentration Level Exceedance (PCLE) Zone
- Proposed Flood Wall
- Proposed PRB (Gate) Location
- Proposed Slurry Wall Locations
- Proposed Sheet Pile (Funnel) Location

FOP PCLE Zone Proposed Excavation Area

- 0.5 ft
- 1 ft
- 2 ft
- 4 ft

300 150 0 300 Feet

REFERENCE

1. SITE FEATURES - GOLDER, 2014
2. DGW-PDI MONITORING WELL LOCATIONS & CREEK ELEVATIONS - BRITTAIN & CRAWFORD, 05/22/2018
3. AERIAL IMAGERY - PROVIDED BY DALLAS AERIAL SURVEY, DATED APRIL, 2017.
4. RAP - RESPONSE ACTION PLAN.
5. * - PROPOSED MONITORING WELL/PIEZOMETER LOCATION, NOT YET INSTALLED.

CLIENT
EXIDE TECHNOLOGIES

PROJECT
RESPONSE ACTION PLAN

TITLE
RESPONSE ACTION OVERVIEW MAP

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-28
PREPARED	EFT
DESIGN	EPW
REVIEW	EPW
APPROVED	AMF/THR

PROJECT No. 13-02086-06 | CONTROL 1302086ZP039 | Rev. 0 | FIGURE **2A-1A**

STATE OF TEXAS
ANNE M FAETH-BOYD
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12300
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PROFESSIONAL GEOSCIENTIST
5-30-19

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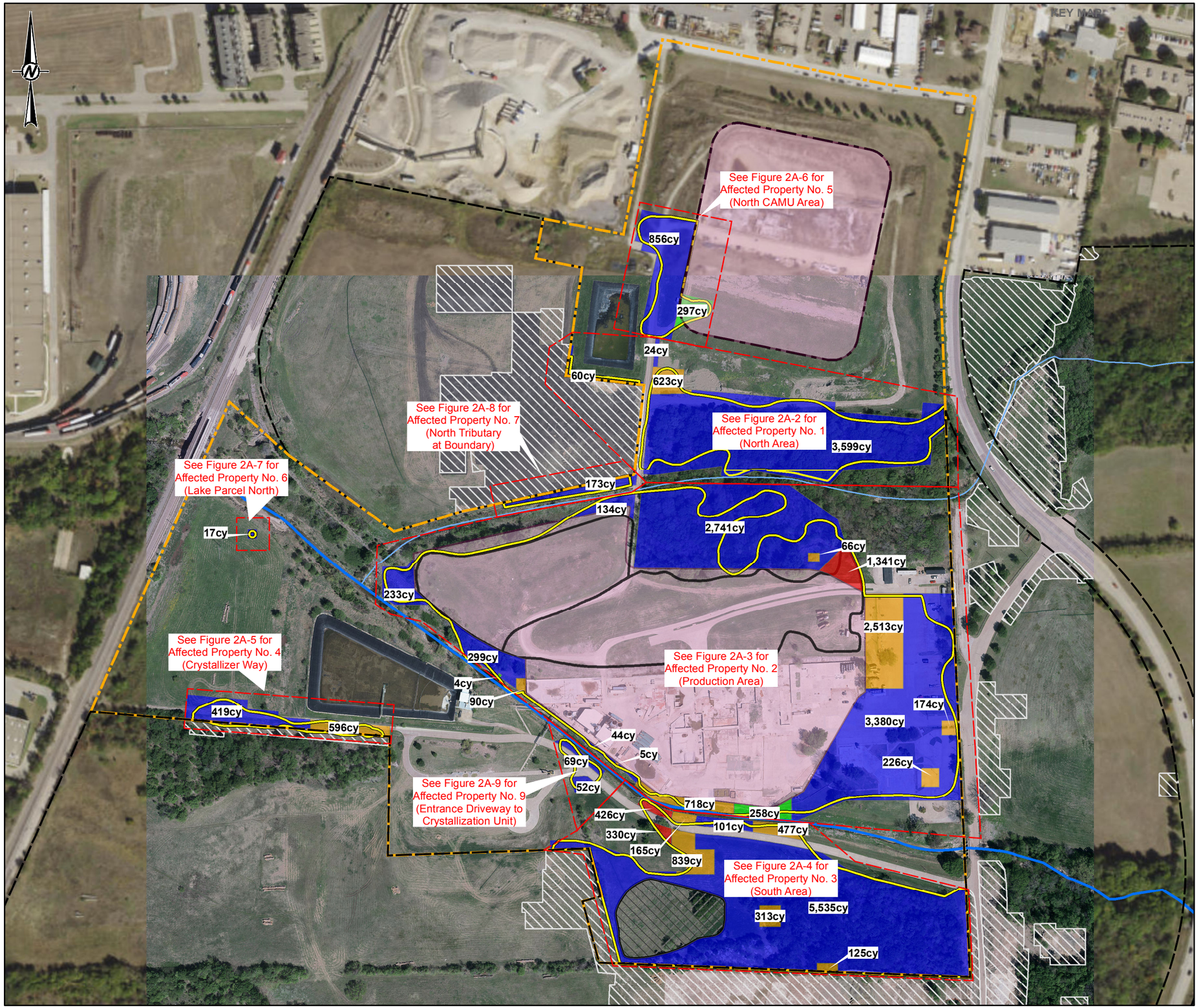

LEGEND

- North CAMU
- Stewart Creek (Appoximate Creek Centerline)
- North Tributary (Appoximate Creek Centerline)
- Critical PCL Exceedance Zone (PCLE Zone)
- Engineered Cap
- Cap Supplement
- Former Operating Plant Property Boundary
- Former Undeveloped Buffer Property
- General Outline of Affected Property Area
- Undeveloped Buffer Property Excavation Areas

PCLE Zone Proposed Excavation Area

- 0.5 ft
- 1 ft
- 2 ft
- 4 ft

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5-29-19

0 150 300 600
Feet

NOTE(S)

1. CY - CUBIC YARD
2. FOP - FORMER OPERATING PLANT
3. NDA - NORTH DISPOSAL AREA
4. SDA - SOUTH DISPOSAL AREA
5. PCL - PROTECTIVE CONCENTRATION LEVEL
6. SDA TO RECEIVE CAP SUPPLEMENT. NDA AND SLAG LANDFILL TO BE CAPPED WITH AN ENGINEERED CAP DURING CAPPING OF THE REMEDIATION CONSOLIDATION AREA.
7. PAVED ROADS LOCATED WITHIN OR ADJACENT TO AFFECTED PROPERTIES WILL REMAIN IN PLACE. GRAVEL ROADS LOCATED IN AFFECTED PROPERTIES WILL BE REMOVED. PAVED ROADS IN POOR CONDITION ADJACENT TO OR WITHIN AFFECTED PROPERTIES WILL BE EVALUATED AND MAY BE REMOVED WITH SURROUNDING SOIL IN ACCORDANCE WITH THE RESPONSE ACTION PLAN.

REFERENCE(S)

1. PROPOSED EXCAVATION AREAS: GOLDER, 2019
2. AERIAL IMAGERY: SOURCE: ESRI, DIGITALGLOBE, GEOEYE, I-CUBED, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEX, GETMAPPING, AEROGRID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY, IMAGERY ACQUISITION DATE UNKNOWN; DALLAS AERIAL SURVEY, DATED APRIL 2017.

CLIENT
EXIDE TECHNOLOGIES

PROJECT
EXIDE TECHNOLOGIES FORMER OPERATING PLANT RESPONSE ACTION PLAN

TITLE
SOIL EXCAVATION AND CAP AREA - OVERVIEW

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-28
DESIGNED	JWT
PREPARED	JWT
REVIEWED	EPW
APPROVED	AMF

PROJECT NO.	CONTROL	REV.	FIGURE
13-02086-06	1302086ZP001	0	**2A-1B**

PATH: \\STL-1-V-FS1\Common\Projects\1302 Projects\13020086-06 - Exide Frisco RCRA Permit Mod\800 - FIGURES-DR AWINGS\PRODUCTION GIS from JAX\ZP - FOP RAP\mxd documents\13020862P001.mxd

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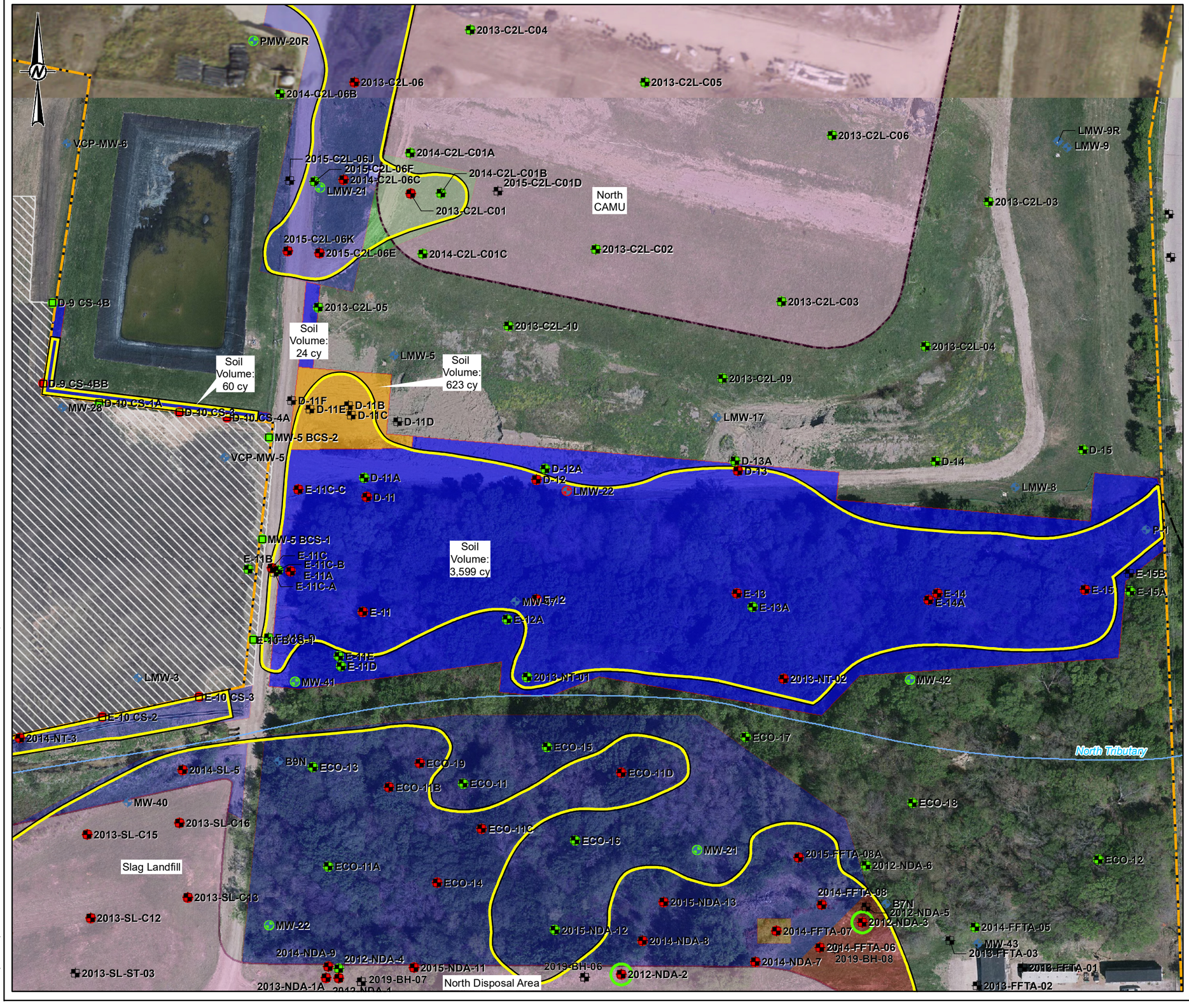

LEGEND

- North CAMU
- Monitoring Well Location
- Soil Boring / Soil Sample Location
- Undeveloped Buffer Property Soil Sample

Action Level (0 - 5 feet bgs)

- Exceedance of Lead RAL/Critical PCL for Soil
- No Exceedance of Lead RAL/Critical PCL for Soil

Action Level (>15 feet bgs)

- No Exceedance of Lead RAL/Critical PCL for Soil
- North Tributary (Appoximate Creek Centerline)
- Critical PCL Exceedance Zone (PCLE Zone)
- Engineered Cap
- Former Operating Plant Property Boundary
- Former Undeveloped Buffer Property
- Undeveloped Buffer Property Excavation

PCLE Zone Proposed Excavation Area

- 0.5 ft
- 1 ft
- 2 ft
- 4 ft

0 50 100 200 Feet

STATE OF TEXAS — ANNE M FAETH-BOYD — GEOLOGY — 12300 — LICENSED PROFESSIONAL GEOSCIENTIST

NOTE(S)

1. CY - CUBIC YARDS
2. FOP - FORMER OPERATING PLANT
3. NDA - NORTH DISPOSAL AREA
4. SDA - SOUTH DISPOSAL AREA
5. PCL - PROTECTIVE CONCENTRATION LEVEL
6. SDA TO RECEIVE CAP SUPPLEMENT. NDA AND SLAG LANDFILL TO BE CAPPED WITH AN ENGINEERED CAP DURING CAPPING OF THE REMEDIATION CONSOLIDATION AREA.
7. PAVED ROADS LOCATED WITHIN OR ADJACENT TO AFFECTED PROPERTIES WILL REMAIN IN PLACE. GRAVEL ROADS LOCATED IN AFFECTED PROPERTIES WILL BE REMOVED. PAVED ROADS IN POOR CONDITION ADJACENT TO OR WITHIN AFFECTED PROPERTIES WILL BE EVALUATED AND MAY BE REMOVED WITH SURROUNDING SOIL IN ACCORDANCE WITH THE RESPONSE ACTION PLAN.
8. A LOCATION WITH NO ACTION LEVEL SYMBOL MEANS THE LOCATION WAS NOT SAMPLED FOR THE DISPLAYED CONSTITUENT OR WAS NOT SAMPLED AS A PART OF THE SIR OR APAR INVESTIGATIONS.

REFERENCE(S)

1. PROPOSED EXCAVATION AREAS: GOLDER, 2019
2. AERIAL IMAGERY: SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY, IMAGERY ACQUISITION DATE UNKNOWN.
3. AERIAL IMAGERY, DALLAS AERIAL SURVEY, APRIL 2017.

CLIENT
EXIDE TECHNOLOGIES

PROJECT
EXIDE TECHNOLOGIES FORMER OPERATING PLANT
RESPONSE ACTION PLAN

TITLE
SOIL EXCAVATION MAP - AFFECTED PROPERTY NO. 1 (NORTH AREA)

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-29
DESIGNED	JWT
PREPARED	EFT
REVIEWED	EPW
APPROVED	AMF

PROJECT NO.	CONTROL	REV.	FIGURE
13-0208606	1302086ZP019	0	**2A-2**

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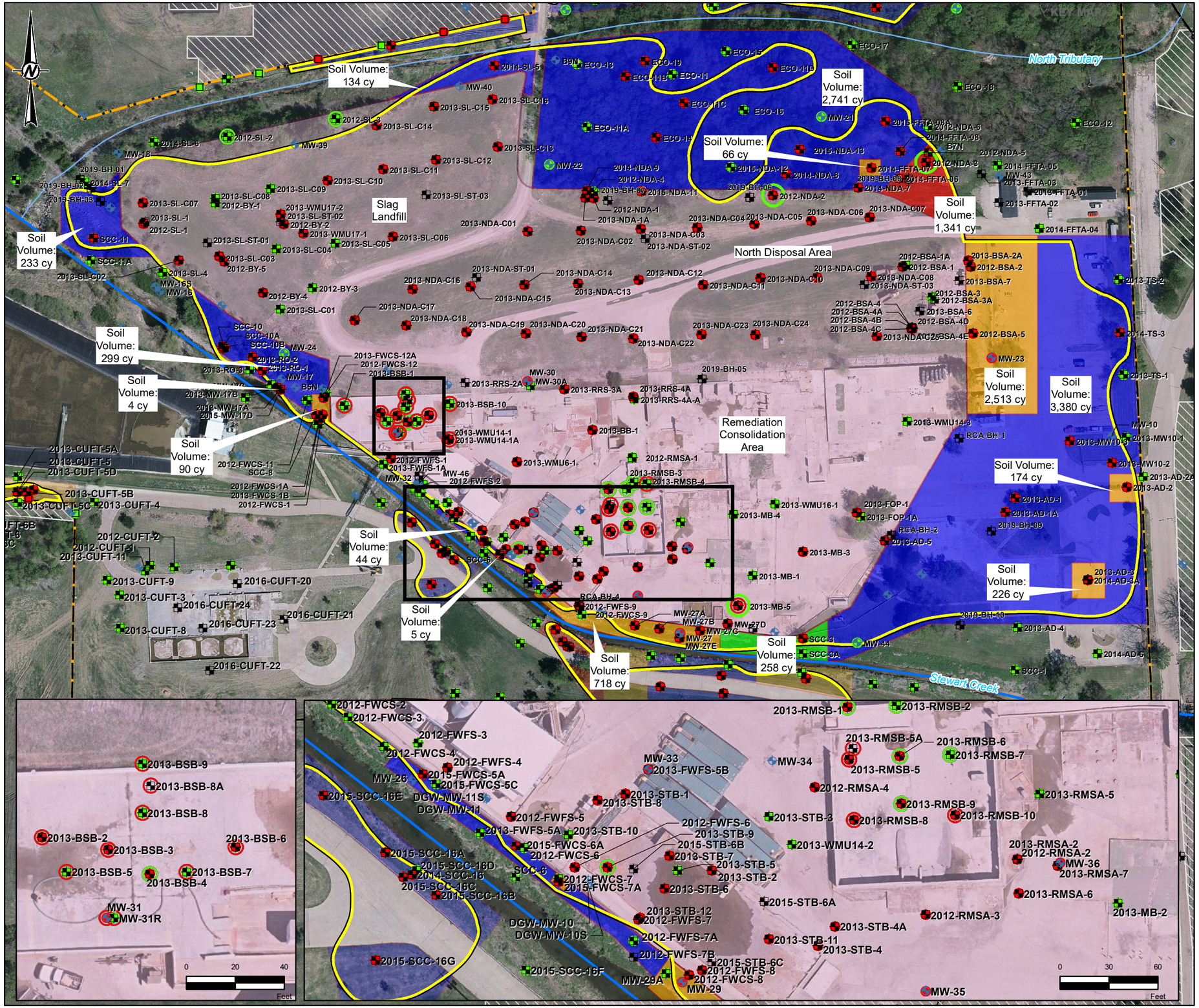

LEGEND

- Monitoring Well Location
- Soil Boring / Soil Sample Location
- Undeveloped Buffer Property Soil Sample

Action Level (0 - 5 feet bgs)

- Exceedance of Lead RAL/Critical PCL for Soil
- No Exceedance of Lead RAL/Critical PCL for Soil

Action Level (5 - 15 feet bgs)

- Exceedance of Lead RAL/Critical PCL for Soil
- No Exceedance of Lead RAL/Critical PCL for Soil

Action Level (>15 feet bgs)

- No Exceedance of Lead RAL/Critical PCL for Soil

- Stewart Creek (Appoximate Creek Centerline)
- North Tributary (Appoximate Creek Centerline)
- Critical PCL Exceedance Zone (PCLE Zone)
- Engineered Cap
- Former Operating Plant Property Boundary
- Former Undeveloped Buffer Property
- Undeveloped Buffer Property Excavation

PCLE Zone Proposed Excavation

- 0.5 ft
- 1 ft
- 2 ft
- 4 ft

NOTE(S)

1. CY - CUBIC YARDS
2. FOP - FORMER OPERATING PLANT
3. NDA - NORTH DISPOSAL AREA
4. SDA - SOUTH DISPOSAL AREA
5. PCL - PROTECTIVE CONCENTRATION LAYER
6. SDA TO RECEIVE CAP SUPPLEMENT. NDA AND SLAG LANDFILL TO BE CAPPED WITH AN ENGINEERED CAP DURING CAPPING OF THE REMEDIATION CONSOLIDATION AREA.
7. PAVED ROADS LOCATED WITHIN OR ADJACENT TO AFFECTED PROPERTIES WILL REMAIN IN PLACE. GRAVEL ROADS LOCATED IN AFFECTED PROPERTIES WILL BE REMOVED. PAVED ROADS IN POOR CONDITION ADJACENT TO OR WITHIN AFFECTED PROPERTIES WILL BE EVALUATED AND MAY BE REMOVED WITH SURROUNDING SOIL IN ACCORDANCE WITH THE RESPONSE ACTION PLAN.
8. A LOCATION WITH NO ACTION LEVEL SYMBOL MEANS THE LOCATION WAS NOT SAMPLED FOR THE DISPLAYED CONSTITUENT OR WAS NOT SAMPLED AS A PART OF THE SIR OR APAR INVESTIGATIONS.

REFERENCE(S)

1. PROPOSED EXCAVATION AREAS: GOLDER, 2019
2. AERIAL IMAGERY: DALLAS AERIAL SURVEY, APRIL 2017.

STATE OF TEXAS — ANNE M FAETH-BOYD — GEOLOGY — 12300 — LICENSED PROFESSIONAL GEOSCIENTIST

CLIENT
EXIDE TECHNOLOGIES

PROJECT
EXIDE TECHNOLOGIES FORMER OPERATING PLANT
RESPONSE ACTION PLAN

TITLE
SOIL EXCAVATION MAP - AFFECTED PROPERTY NO. 2 (PRODUCTION AREA)

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-28
DESIGNED	JWT
PREPARED	EFT
REVIEWED	EPW
APPROVED	AMF

PROJECT NO.	CONTROL	REV.	FIGURE
13-02086-06	1302086ZP020	0	**2A-3**

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Remediation Consolidation Area

South Disposal Area

Soil Volume: 426 cy

Soil Volume: 165 cy

Soil Volume: 101 cy

Soil Volume: 330 cy

Soil Volume: 477 cy

Soil Volume: 839 cy

Soil Volume: 5,535 cy

Soil Volume: 313 cy

Soil Volume: 125 cy

Stewart Creek

SCC-5A
SCC-5
SCC-5B
SCC-5C
SCC-5D
SCC-4
SCC-2
2014-SDA-6
2013-SDA-4B
2015-SDA-3C
2013-SDA-3B
2013-SDA-4A
2013-SDA-3A
2012-SDA-1
2012-SDA-2
2012-SDA-3
2014-SDA-7
2012-SDA-4
2012-SDA-5
B3RA-D
B3RA-B
B3RA-C
B3RA-A
B3RA
B3R
K-9 CS-4
K-10 CS-3A
K-10 CS-3AA
K-10 CS-2
VGP-MW-1
BS2/BS-2
BS3/BS-3
BS5/BS-5
ECO-8C
ECO-8B
ECO-8D
ECO-8A
ECO-8
ECO-5
ECO-5A
ECO-6
ECO-3
ECO-1
ECO-1A
ECO-2A
ECO-2
ECO-4
ECO-4A
ECO-4B
ECO-10
ECO-10A
ECO-7C
ECO-7
ECO-7A
ECO-7B
ECO-7D
B4R
2013-B4R-A
2013-SDA-C01
2013-SDA-ST-01
SRB-VS-9E
SRB-VS-9B
SRB-VS-9A
SRB-VS-9
SRB-VS-1
SRB-VS-5
SRB-VS-6
SRB-VS-10
SRB-VS-2
L-10 CS-3A
SRB-VS-7
SRB-VS-7A
SRB-VS-3
SRB-VS-3A
SRB-VS-4
SRB-VS-8
SRB-VS-11
SRB-VS-11A
SRB-VS-11B
SB-VS-2
SB-VS-1
L-10 CS-2A
2013-SDA-C02
2013-SDA-C04
2013-SDA-C05
2013-SDA-ST-03
2013-SDA-C06
2013-SDA-ST-02
2013-SDA-C03
M-11 CS-3L
M-11 CS-3HHH
M-12 CS-2A
M-12 CS-2AA
M-12 CS-3A
M-13 CS-1A
M-13 CS-2A
M-14 CS-1A
M-14 CS-2A
M-15 CS-2A
M-15 CS-1B
M-15 CS-
L-16 CS-6
L-16 CS-5
L-16 CS-4
P-2

LEGEND

- Monitoring Well Location
- Soil Boring / Soil Sample Location
- Undeveloped Buffer Property Soil Sample

Action Level (0 - 5 feet bgs)
- Exceedance of Lead RAL/Critical PCL for Soil
- No Exceedance of Lead RAL/Critical PCL for Soil

Action Level (5 - 15 feet bgs)
- Exceedance of Lead RAL/Critical PCL for Soil
- No Exceedance of Lead RAL/Critical PCL for Soil

Action Level (>15 feet bgs)
- No Exceedance of Lead RAL/Critical PCL for Soil

- Stewart Creek (Appoximate Creek Centerline)
- Critical PCL Exceedance Zone (PCLE Zone)
- Engineered Cap
- Cap Supplement
- Former Operating Plant Property Boundary
- Former Undeveloped Buffer Property

PCLE Zone Proposed Excavation
- 0.5 ft
- 1 ft
- 2 ft
- 4 ft

0 57.5 115 230
Feet

STATE OF TEXAS
ANNE M FAETH-BOYD
GEOLOGY
12300
LICENSED
PROFESSIONAL GEOSCIENTIST

NOTE(S)
1. CY - CUBIC YARDS
2. FOP - FORMER OPERATING PLANT
3. NDA - NORTH DISPOSAL AREA
4. SDA - SOUTH DISPOSAL AREA
5. PCL - PROTECTIVE CONCENTRATION LEVEL
6. SDA TO RECEIVE CAP SUPPLEMENT. NDA AND SLAG LANDFILL TO BE CAPPED WITH AN ENGINEERED CAP DURING CAPPING OF THE REMEDIATION CONSOLIDATION AREA.
7. PAVED ROADS LOCATED WITHIN OR ADJACENT TO AFFECTED PROPERTIES WILL REMAIN IN PLACE. GRAVEL ROADS LOCATED IN AFFECTED PROPERTIES WILL BE REMOVED. PAVED ROADS IN POOR CONDITION ADJACENT TO OR WITHIN AFFECTED PROPERTIES WILL BE EVALUATED AND MAY BE REMOVED WITH SURROUNDING SOIL IN ACCORDANCE WITH THE RESPONSE ACTION PLAN.
8. A LOCATION WITH NO ACTION LEVEL SYMBOL MEANS THE LOCATION WAS NOT SAMPLED FOR THE DISPLAYED CONSTITUENT OR WAS NOT SAMPLED AS A PART OF THE SIR OR APAR INVESTIGATIONS.

REFERENCE(S)
1. PROPOSED EXCAVATION AREAS: GOLDER, 2019
2. AERIAL IMAGERY: SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY, IMAGERY ACQUISITION DATE UNKNOWN.
3. AERIAL IMAGERY, DALLAS AERIAL SURVEY, APRIL 2017.

CLIENT
EXIDE TECHNOLOGIES

PROJECT
EXIDE TECHNOLOGIES FORMER OPERATING PLANT
RESPONSE ACTION PLAN

TITLE
SOIL EXCAVATION MAP - AFFECTED PROPERTY NO. 3 (SOUTH AREA)

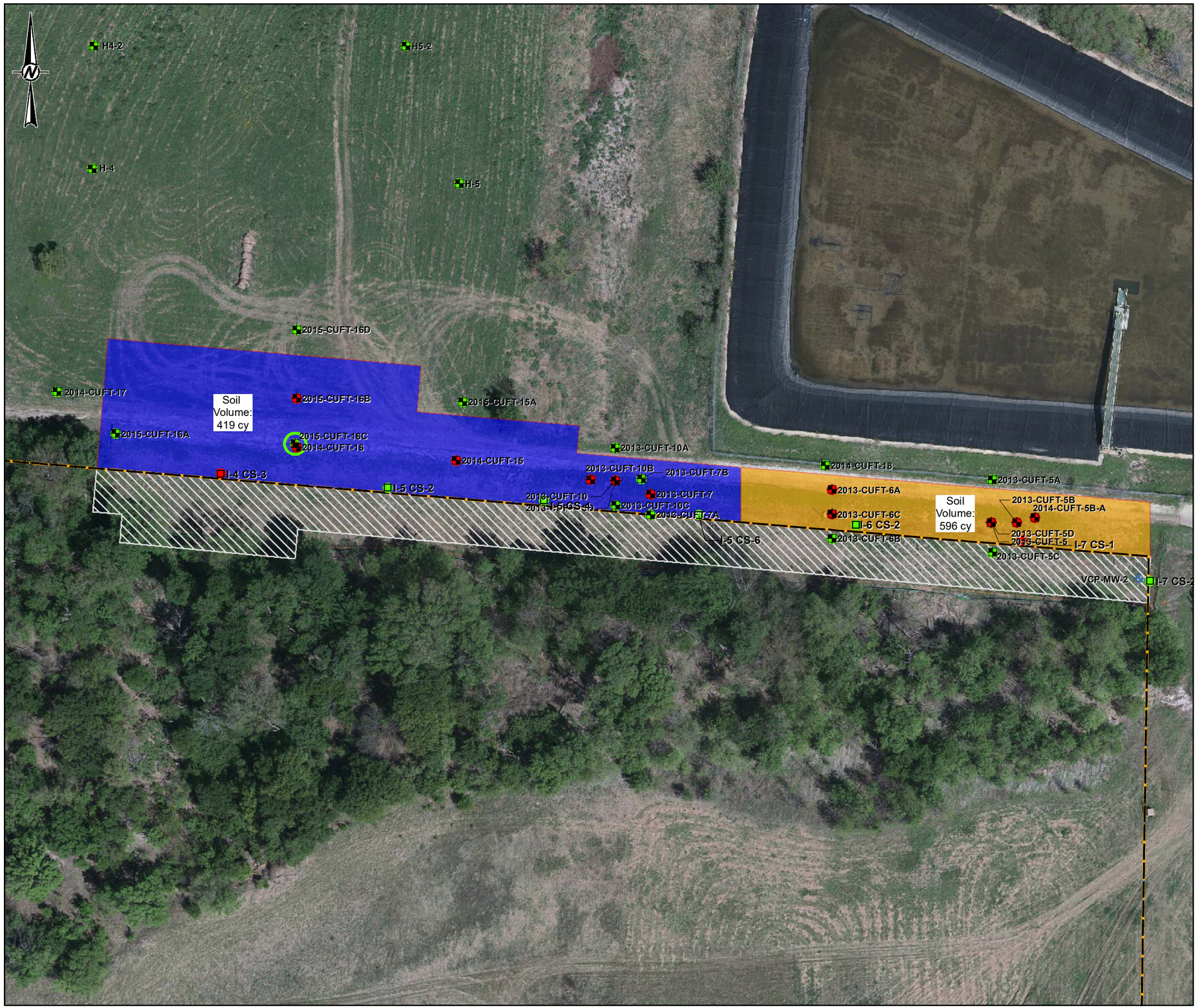
CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-29
DESIGNED	JWT
PREPARED	EFT
REVIEWED	EPW
APPROVED	AMF

PROJECT NO.	CONTROL	REV.	FIGURE
13-02086-06	1302086ZP021	0	2A-4

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

PATH: G:\Projects\130 Projects\1302086-08 - Exide Frisco RCRA Permit\Mxd\800 - FIGURES-DRAWINGS\PRODUCTION\GIS from JAX\2P - FOP RAP\mxd documents\1302086ZP021.mxd



LEGEND

- Monitoring Well Location
- Soil Boring / Soil Sample Location
- Undeveloped Buffer Property Soil Sample

Action Level (0 - 5 feet bgs)

- Exceedance of Lead RAL/Critical PCL for Soil
- No Exceedance of Lead RAL/Critical PCL for Soil

Action Level (>15 feet bgs)

- No Exceedance of Lead RAL/Critical PCL for Soil

- Former Operating Plant Property Boundary
- Former Undeveloped Buffer Property
- Undeveloped Buffer Property Excavation Areas

PCLE Zone Proposed Excavation

- 0.5 ft
- 2 ft

STATE OF TEXAS
ANNE M FAETH-BOYD
GEOLOGY
12300
LICENSED
PROFESSIONAL GEOSCIENTIST

0 25 50 100
Feet

NOTE(S)

1. CY - CUBIC YARDS
2. FOP - FORMER OPERATING PLANT
3. NDA - NORTH DISPOSAL AREA
4. SDA - SOUTH DISPOSAL AREA
5. PCL - PROTECTIVE CONCENTRATION LEVEL
6. SDA TO RECEIVE CAP SUPPLEMENT. NDA AND SLAG LANDFILL TO BE CAPPED WITH AN ENGINEERED CAP DURING CAPPING OF THE REMEDIATION CONSOLIDATION AREA.
7. PAVED ROADS LOCATED WITHIN OR ADJACENT TO AFFECTED PROPERTIES WILL REMAIN IN PLACE. GRAVEL ROADS LOCATED IN AFFECTED PROPERTIES WILL BE REMOVED. PAVED ROADS IN POOR CONDITION ADJACENT TO OR WITHIN AFFECTED PROPERTIES WILL BE EVALUATED AND MAY BE REMOVED WITH SURROUNDING SOIL IN ACCORDANCE WITH THE RESPONSE ACTION PLAN.

REFERENCE(S)

1. PROPOSED EXCAVATION AREAS: GOLDER, 2019
2. AERIAL IMAGERY: DALLAS AERIAL SURVEY, APRIL 2017.

CLIENT
EXIDE TECHNOLOGIES

PROJECT
EXIDE TECHNOLOGIES FORMER OPERATING PLANT
RESPONSE ACTION PLAN

TITLE
SOIL EXCAVATION MAP - AFFECTED PROPERTY NO. 4 (CRYSTALLIZER WAY)

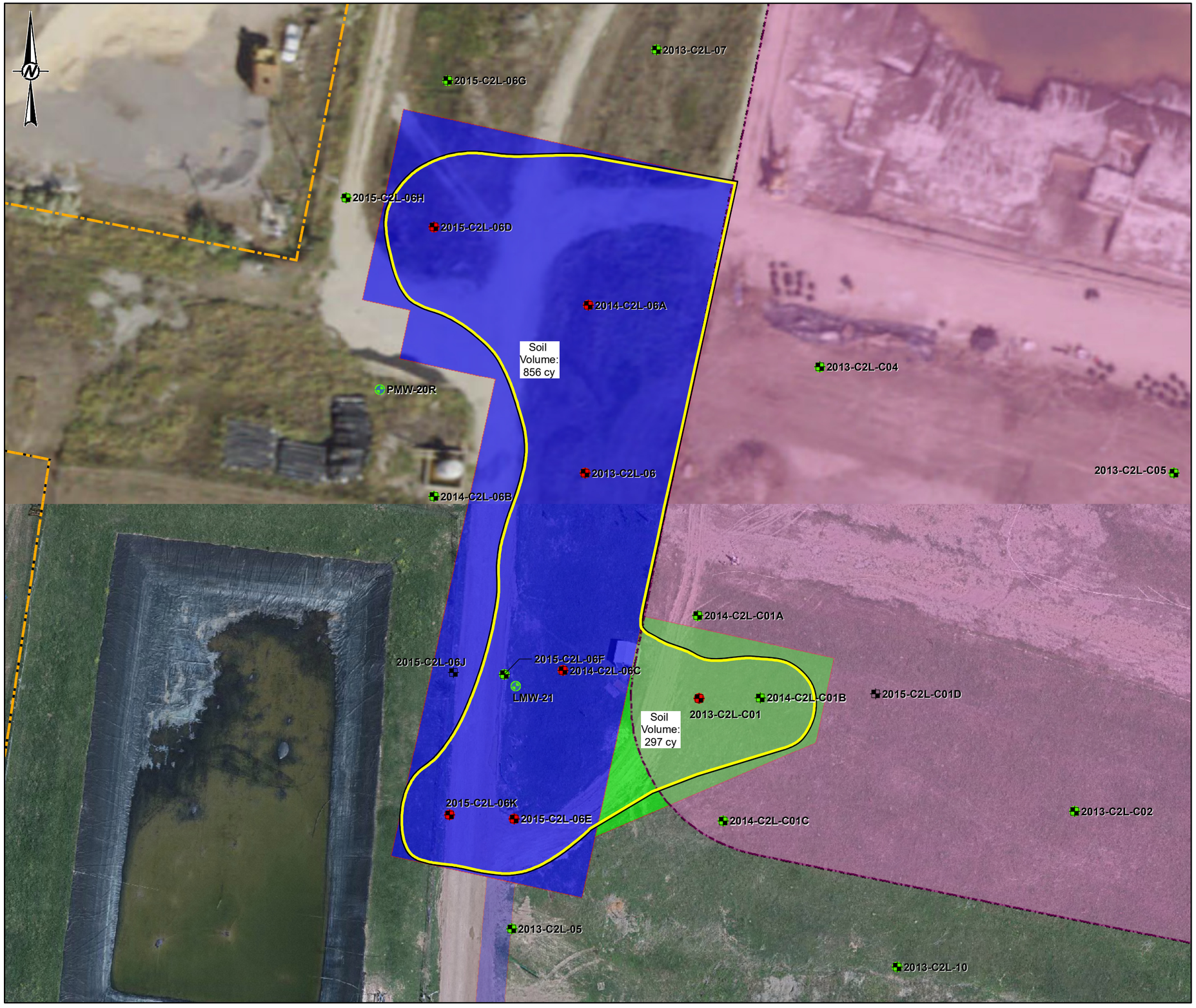
CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-29
DESIGNED	JWT
PREPARED	EFT
REVIEWED	EPW
APPROVED	AMF

PROJECT NO.	CONTROL	REV.	FIGURE
13-02086-06	1302086ZP022	0	**2A-5**

PATH: G:\Projects\1302086-06 - Exide Frisco RCRA Permit Mod\800 - FIGURES-DRAWINGS\PRODUCTION\GIS from JAX\ZP - FOP RAPmxap documents\1302086ZP022.mxd

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



LEGEND

- North CAMU
- Monitoring Well Location
- Soil Boring / Soil Sample Location

Action Level (0 - 5 feet bgs)

- Exceedance of Lead RAL/Critical PCL for Soil
- No Exceedance of Lead RAL/Critical PCL for Soil
- Critical PCL Exceedance Zone (PCLE Zone)
- Engineered Cap
- Former Operating Plant Property Boundary
- Former Undeveloped Buffer Property

PCLE Zone Proposed Excavation Area

- 0.5 ft
- 1 ft

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0 25 50 100 Feet

NOTE(S)

1. CY - CUBIC YARDS
2. FOP - FORMER OPERATING PLANT
3. NDA - NORTH DISPOSAL AREA
4. SDA - SOUTH DISPOSAL AREA
5. PCL - PROTECTIVE CONCENTRATION LEVEL
6. SDA TO RECEIVE CAP SUPPLEMENT. NDA AND SLAG LANDFILL TO BE CAPPED WITH AN ENGINEERED CAP DURING CAPPING OF THE REMEDIATION CONSOLIDATION AREA.
7. PAVED ROADS LOCATED WITHIN OR ADJACENT TO AFFECTED PROPERTIES WILL REMAIN IN PLACE. GRAVEL ROADS LOCATED IN AFFECTED PROPERTIES WILL BE REMOVED. PAVED ROADS IN POOR CONDITION ADJACENT TO OR WITHIN AFFECTED PROPERTIES WILL BE EVALUATED AND MAY BE REMOVED WITH SURROUNDING SOIL IN ACCORDANCE WITH THE RESPONSE ACTION PLAN.
8. A LOCATION WITH NO ACTION LEVEL SYMBOL MEANS THE LOCATION WAS NOT SAMPLED FOR THE DISPLAYED CONSTITUENT OR WAS NOT SAMPLED AS A PART OF THE SIR OR APAR INVESTIGATIONS.

REFERENCE(S)

1. PROPOSED EXCAVATION AREAS: GOLDER, 2019
2. AERIAL IMAGERY: SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY, IMAGERY ACQUISITION DATE UNKNOWN.
3. AERIAL IMAGERY: DALLAS AERIAL SURVEY, APRIL 2017.

CLIENT
EXIDE TECHNOLOGIES

PROJECT
EXIDE TECHNOLOGIES FORMER OPERATING PLANT RESPONSE ACTION PLAN

TITLE
SOIL EXCAVATION MAP - AFFECTED PROPERTY NO. 5 (NORTH CAMU AREA)

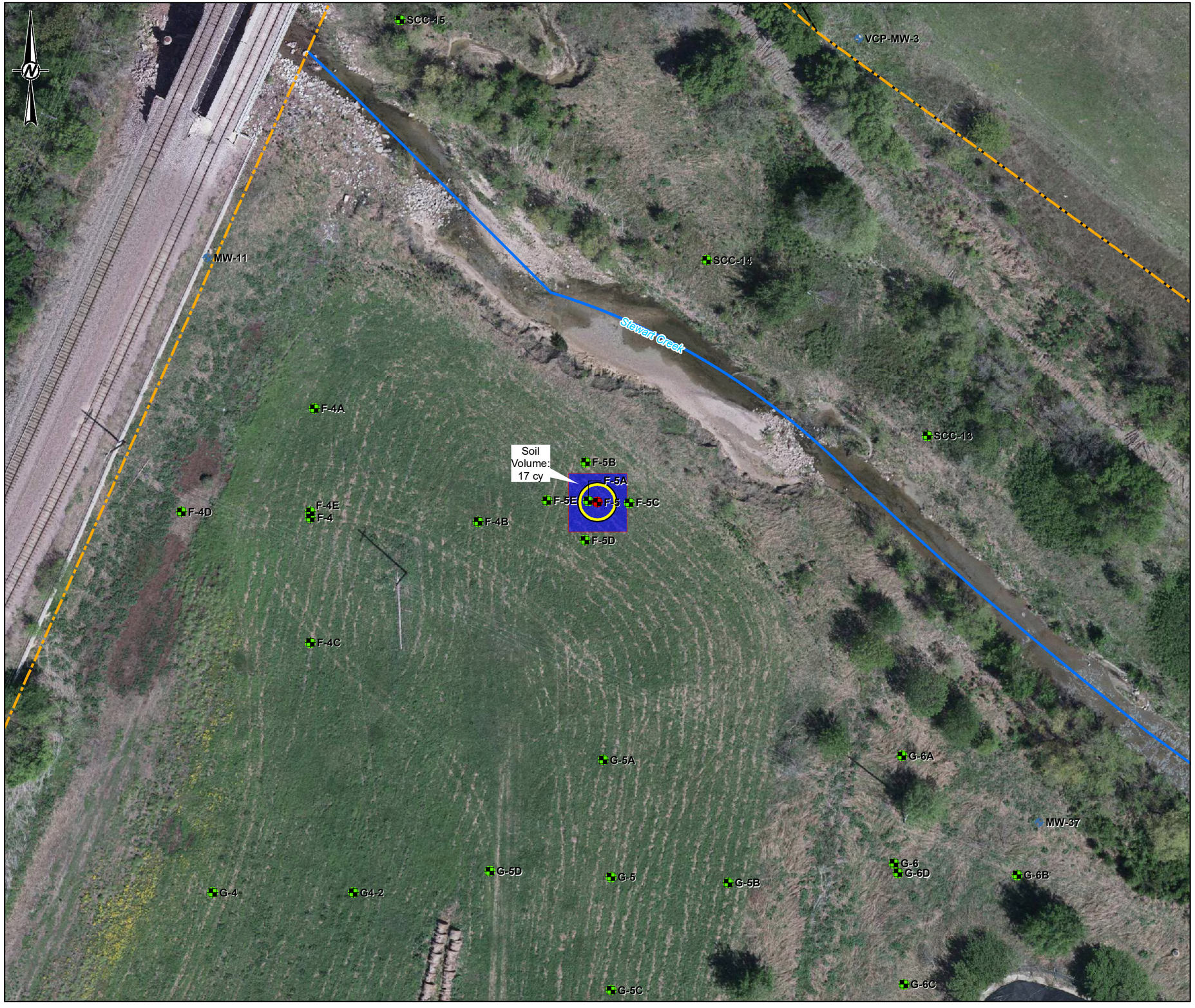
CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-29
DESIGNED	JWT
PREPARED	EFT
REVIEWED	EPW
APPROVED	AMF

PROJECT NO.	CONTROL	REV.	FIGURE
13-02086-06	1302086ZP023	0	**2A-6**

PATH: G:\Projects\130 Projects\13020086-06 - Exide Frisco RCRA Permit Mod\800 - FIGURES-DRAWINGS\PRODUCTION\GIS from JAX\ZP - FOP RAP\map documents\1302086ZP023.mxd

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



LEGEND

- Monitoring Well Location
- Soil Boring / Soil Sample Location

Action Level (0 - 5 feet bgs)

- Exceedance of Lead RAL/Critical PCL for Soil
- No Exceedance of Lead RAL/Critical PCL for Soil
- Stewart Creek (Approximate Creek Centerline)
- Critical PCL Exceedance Zone (PCLE Zone)
- Former Operating Plant Property Boundary
- Former Undeveloped Buffer Property

PCLE Zone Proposed Excavation

- 0.5 ft

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ANNE M FAETH-BOYD
GEOLOGY
12300
LICENSED
PROFESSIONAL GEOSCIENTIST

0 25 50 100
Feet

NOTE(S)

1. CY - CUBIC YARDS
2. FOP - FORMER OPERATING PLANT
3. NDA - NORTH DISPOSAL AREA
4. SDA - SOUTH DISPOSAL AREA
5. PCL - PROTECTIVE CONCENTRATION LEVEL
6. SDA TO RECEIVE CAP SUPPLEMENT. NDA AND SLAG LANDFILL TO BE CAPPED WITH AN ENGINEERED CAP DURING CAPPING OF THE REMEDIATION CONSOLIDATION AREA.
7. PAVED ROADS LOCATED WITHIN OR ADJACENT TO AFFECTED PROPERTIES WILL REMAIN IN PLACE. GRAVEL ROADS LOCATED IN AFFECTED PROPERTIES WILL BE REMOVED. PAVED ROADS IN POOR CONDITION ADJACENT TO OR WITHIN AFFECTED PROPERTIES WILL BE EVALUATED AND MAY BE REMOVED WITH SURROUNDING SOIL IN ACCORDANCE WITH THE RESPONSE ACTION PLAN.

REFERENCE(S)

1. PROPOSED EXCAVATION AREAS: GOLDER, 2019
2. AERIAL IMAGERY: DALLAS AERIAL SURVEY, APRIL 2017.

CLIENT
EXIDE TECHNOLOGIES

PROJECT
EXIDE TECHNOLOGIES FORMER OPERATING PLANT
RESPONSE ACTION PLAN

TITLE
SOIL EXCAVATION MAP - AFFECTED PROPERTY NO. 6 (LAKE PARCEL NORTH)

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-28
DESIGNED	JWT
PREPARED	EFT
REVIEWED	EPW
APPROVED	AMF

PROJECT NO.	CONTROL	REV.	FIGURE
13-02086-06	1302086ZP024	0	**2A-7**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

PATH: G:\Projects\130 Projects\13020086-06 - Exide Frisco RCRA Permit\Mod9800 - FIGURES-DRAWINGS\PRODUCTION\GIS from JAX\2P - FOP RAP\map documents\1302086ZP024.mxd

LEGEND

- Monitoring Well Location
- Soil Boring / Soil Sample Location
- Undeveloped Buffer Property Soil Sample

Action Level (0 - 5 feet bgs)

- Exceedance of Lead RAL/Critical PCL for Soil
- No Exceedance of Lead RAL/Critical PCL for Soil

Action Level (5 - 15 feet bgs)

- No Exceedance of Lead RAL/Critical PCL for Soil
- North Tributary (Approximate Creek Centerline)
- Critical PCL Exceedance Zone (PCLE Zone)
- Engineered Cap
- Former Operating Plant Property Boundary
- Former Undeveloped Buffer Property
- Undeveloped Buffer Property Excavation Areas

PCLE Zone Proposed Excavation Area

- 0.5 ft

0 25 50 100
Feet

NOTE(S)

1. CY - CUBIC YARDS
2. FOP - FORMER OPERATING PLANT
3. NDA - NORTH DISPOSAL AREA
4. SDA - SOUTH DISPOSAL AREA
5. PCL - PROTECTIVE CONCENTRATION LEVEL
6. SDA TO RECEIVE CAP SUPPLEMENT. NDA AND SLAG LANDFILL TO BE CAPPED WITH AN ENGINEERED CAP DURING CAPPING OF THE REMEDIATION CONSOLIDATION AREA.
7. PAVED ROADS LOCATED WITHIN OR ADJACENT TO AFFECTED PROPERTIES WILL REMAIN IN PLACE. GRAVEL ROADS LOCATED IN AFFECTED PROPERTIES WILL BE REMOVED. PAVED ROADS IN POOR CONDITION ADJACENT TO OR WITHIN AFFECTED PROPERTIES WILL BE EVALUATED AND MAY BE REMOVED WITH SURROUNDING SOIL IN ACCORDANCE WITH THE RESPONSE ACTION PLAN.
8. A LOCATION WITH NO ACTION LEVEL SYMBOL MEANS THE LOCATION WAS NOT SAMPLED FOR THE DISPLAYED CONSTITUENT OR WAS NOT SAMPLED AS A PART OF THE SIR OR APAR INVESTIGATIONS.

REFERENCE(S)

1. PROPOSED EXCAVATION AREAS: GOLDER, 2019
2. AERIAL IMAGERY: DALLAS AERIAL SURVEY, APRIL 2017.

STATE OF TEXAS
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GEOLOGY
12300
LICENSED
PROFESSIONAL GEOSCIENTIST

CLIENT
EXIDE TECHNOLOGIES

PROJECT
EXIDE TECHNOLOGIES FORMER OPERATING PLANT
RESPONSE ACTION PLAN

TITLE
SOIL EXCAVATION MAP - AFFECTED PROPERTY NO. 7 (NORTH TRIBUTARY AT BOUNDARY)

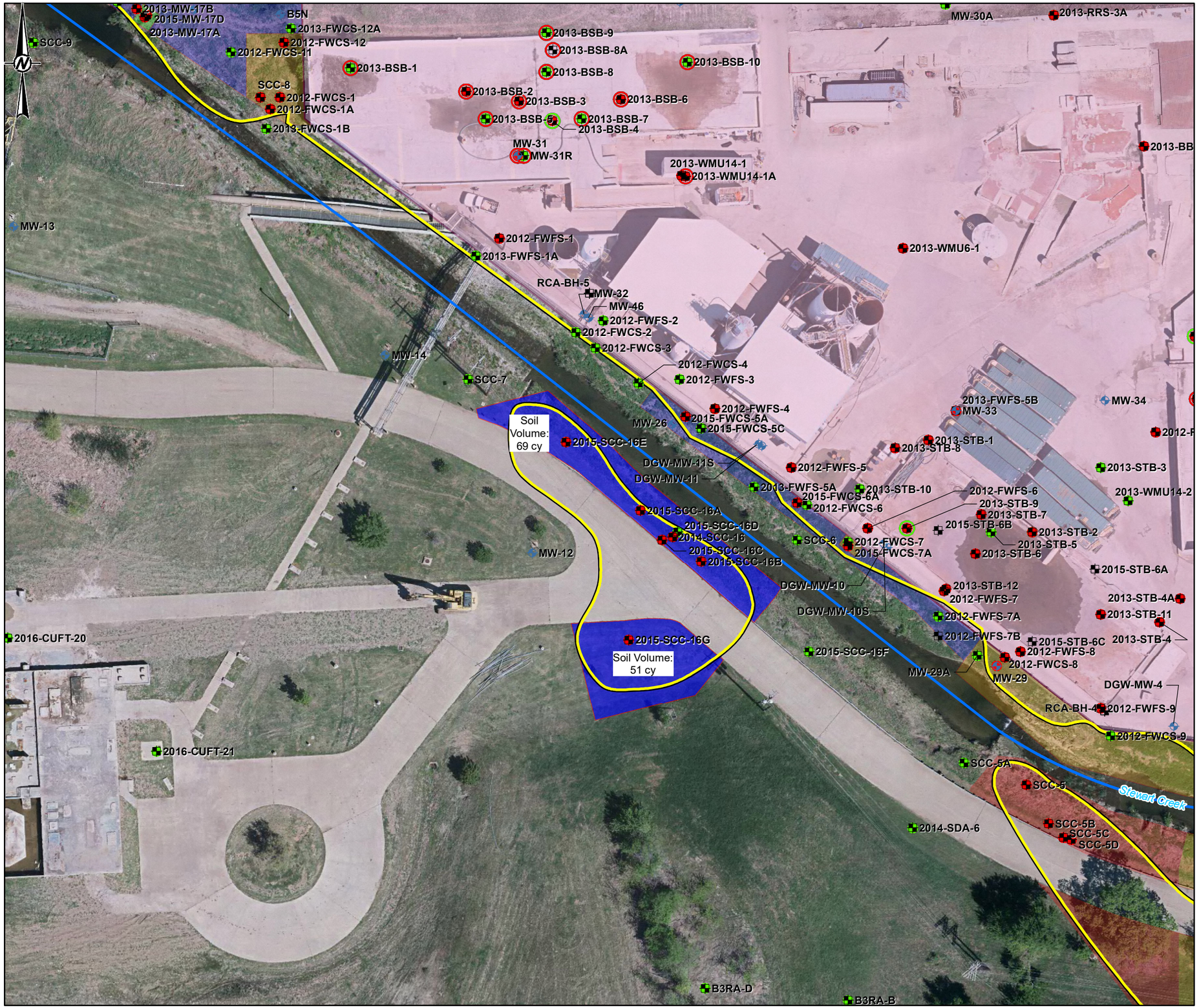
CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-28
DESIGNED	JWT
PREPARED	EFT
REVIEWED	EPW
APPROVED	AMF

PROJECT NO.	CONTROL	REV.	FIGURE
13-02086-06	1302086ZP025	0	**2A-8**

PATH: \\STL-1VF81\Common\Projects\1302086-06 - Exide Frisco RCRA Permit Mod\800 - FIGURES-DRAWINGS\PRODUCTION\GIS from JAX\ZP - FOP RAP\map documents\1302086ZP025.mxd

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



LEGEND

- Monitoring Well Location
- Soil Boring / Soil Sample Location

Action Level (0 - 5 feet bgs)

- Exceedance of Lead RAL/Critical PCL for Soil
- No Exceedance of Lead RAL/Critical PCL for Soil

Action Level (5 - 15 feet bgs)

- Exceedance of Lead RAL/Critical PCL for Soil
- No Exceedance of Lead RAL/Critical PCL for Soil
- Stewart Creek (Appoximate Creek Centerline)
- Critical PCL Exceedance Zone (PCLE Zone)
- Engineered Cap
- Former Operating Plant Property Boundary

PCLE Zone Proposed Excavation Area

- 0.5 ft
- 1 ft
- 2 ft
- 4 ft

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0 25 50 100 Feet

NOTE(S)

1. CY - CUBIC YARDS
2. FOP - FORMER OPERATING PLANT
3. NDA - NORTH DISPOSAL AREA
4. SDA - SOUTH DISPOSAL AREA
5. PCL - PROTECTIVE CONCENTRATION LEVEL
6. SDA TO RECEIVE CAP SUPPLEMENT. NDA AND SLAG LANDFILL TO BE CAPPED WITH AN ENGINEERED CAP DURING CAPPING OF THE REMEDIATION CONSOLIDATION AREA.
7. PAVED ROADS LOCATED WITHIN OR ADJACENT TO AFFECTED PROPERTIES WILL REMAIN IN PLACE. GRAVEL ROADS LOCATED IN AFFECTED PROPERTIES WILL BE REMOVED. PAVED ROADS IN POOR CONDITION ADJACENT TO OR WITHIN AFFECTED PROPERTIES WILL BE EVALUATED AND MAY BE REMOVED WITH SURROUNDING SOIL IN ACCORDANCE WITH THE RESPONSE ACTION PLAN.
8. A LOCATION WITH NO ACTION LEVEL SYMBOL MEANS THE LOCATION WAS NOT SAMPLED FOR THE DISPLAYED CONSTITUENT OR WAS NOT SAMPLED AS A PART OF THE SIR OR APAR INVESTIGATIONS.

REFERENCE(S)

1. PROPOSED EXCAVATION AREAS: GOLDER, 2019
2. AERIAL IMAGERY: DALLAS AERIAL SURVEY, APRIL 2017.

CLIENT
EXIDE TECHNOLOGIES

PROJECT
EXIDE TECHNOLOGIES FORMER OPERATING PLANT
RESPONSE ACTION PLAN

TITLE
SOIL EXCAVATION MAP - AFFECTED PROPERTY NO. 9 (ENTRANCE DRIVEWAY TO CRYSTALLIZATION UNIT)

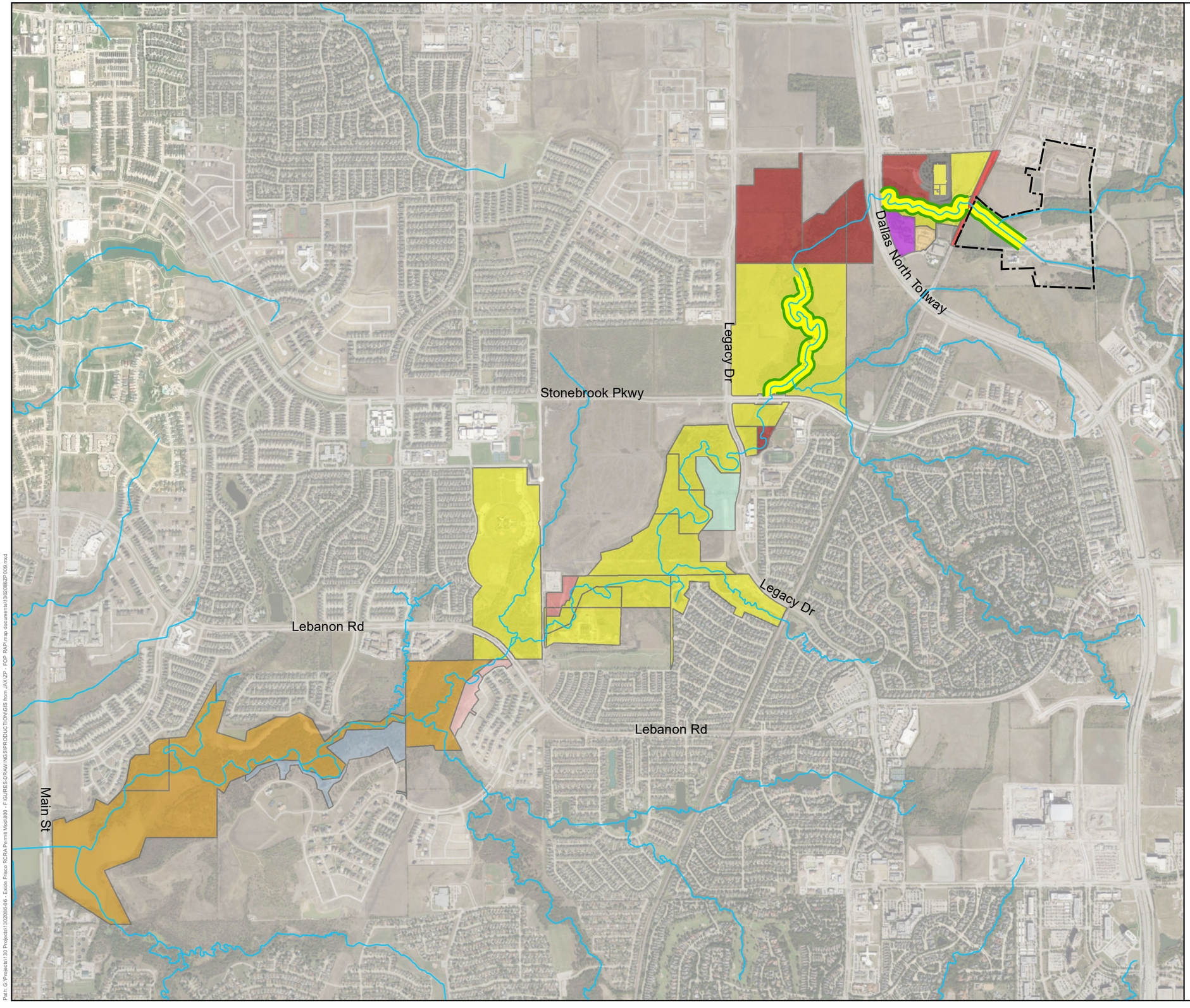
CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-28
DESIGNED	JWT
PREPARED	EFT
REVIEWED	EPW
APPROVED	AMF

PROJECT NO.	CONTROL	REV.	FIGURE
13-02086-06	1302086ZP026	0	**2A-9**

PATH: \\STL-1VF51\Common\Projects\1302086-06 - Exide Frisco RCRA Permit Mod\800 - FIGURES-DRAWINGS\PRODUCTION\GIS from JAX\ZP - FOP RAP\map documents\1302086ZP026.mxd

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



LEGEND

- Creek Centerline
- Predetermined Excavation
- Former Operating Plant Property Boundary
- Artistry Senior Residences at Edgestone LLC
- Bellevue Partners Ltd & Stewart Creek International Investors LP
- Burlington Northern Santa Fe RR Co Property Tax Department
- City of Frisco
- Frisco Community Development Corp (City of Frisco)
- GGH Kingswood Lots LLC
- Meritage Homes of Texas LLC
- Oncor Electric Delivery Company
- Owner Unknown
- Pirwig Properties LLC
- USACE

STATE OF TEXAS
ANNE M FAETH-BOYD
GEOLOGY
12300
LICENSED
PROFESSIONAL GEOSCIENTIST

NOTES

1. AREAS NOT DESIGNATED FOR EXCAVATION WILL BE INSPECTED AND RESAMPLED IN ACCORDANCE WITH THE RESPONSE ACTION PLAN.
2. PROPERTY INFORMATION UPDATED FROM COLLIN AND DENTON COUNTY APPRAISAL DISTRICT WEBSITES, MAY 2019.

REFERENCE

1. SITE FEATURES - GOLDER, 2014 AND 2016
2. AERIAL IMAGERY - SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

0.35 0.175 0 0.35 Miles

CLIENT
EXIDE TECHNOLOGIES

PROJECT
EXIDE TECHNOLOGIES FORMER OPERATING PLANT RESPONSE ACTION PLAN

TITLE
SEDIMENT EXCAVATION MAP - AFFECTED PROPERTY NO. 8 (STEWART CREEK) OVERVIEW MAP

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-08
PREPARED	EFT
DESIGN	EPW
REVIEW	EPW
APPROVED	AMF

PROJECT No.	CONTROL	Rev.	FIGURE
13-02086-06	1302086ZP009.mxd	0	**2A-10**

Path: G:\Projects\1130 Project\1302086-06 - Exide Frisco RCRA Permit Mod\800 - FIGURES-DRAWINGS\PRODUCTION\GIS from JAX\2P - FOP RAP\map documents\1302086ZP009.mxd

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI B
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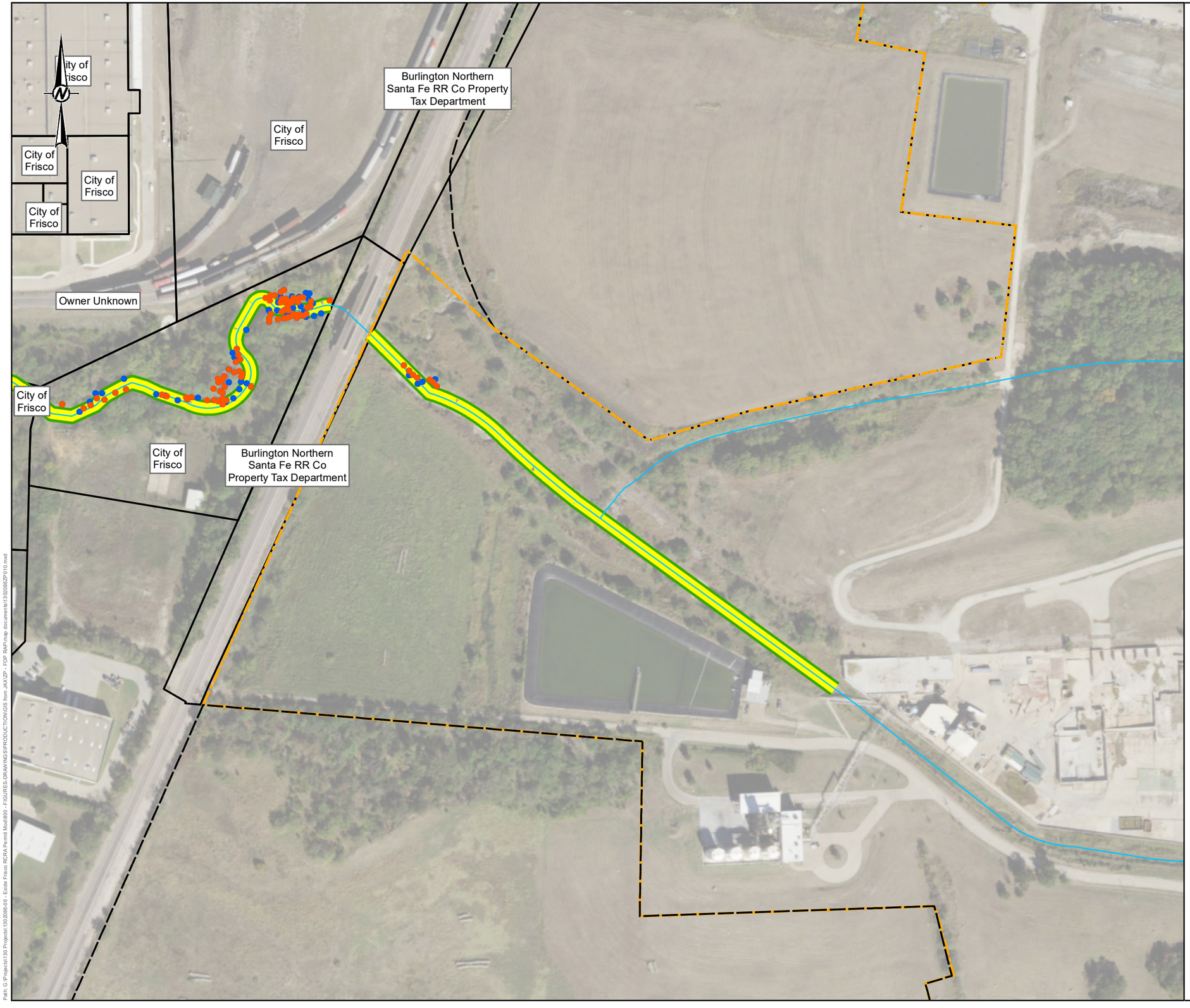

LEGEND

- No Exceedance
- Exceedance of PCL for Lead, Cadmium or Arsenic
- Creek Centerline
- Predetermined Excavation Area
- Former Operating Plant Property Boundary
- Former Undeveloped Buffer Property
- Property Boundary

STATE OF TEXAS
ANNE M FAETH-BOYD
GEOLOGY
12300
LICENSED
PROFESSIONAL GEOSCIENTIST

NOTES

1. CREEK WIDTH FOR PURPOSES OF PLANNING SEDIMENT EXCAVATION IS ASSUMED TO BE 34 FEET IN THIS SEGMENT BASED ON OBSERVATIONS MADE BY GOLDER AND THE CITY OF FRISCO.
2. AREAS NOT DESIGNATED FOR EXCAVATION WILL BE INSPECTED AND RESAMPLED IN ACCORDANCE WITH THE RESPONSE ACTION PLAN.
3. PROPERTY INFORMATION UPDATED FROM COLLIN AND DENTON COUNTY APPRAISAL DISTRICT WEBSITES, MAY 2019.

REFERENCE

1. SITE FEATURES - GOLDER, 2014
2. AERIAL IMAGERY - SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

200 100 0 200
Feet

CLIENT
EXIDE TECHNOLOGIES

PROJECT
EXIDE TECHNOLOGIES FORMER OPERATING PLANT
RESPONSE ACTION PLAN

TITLE
SEDIMENT EXCAVATION MAP - ON-SITE

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-29
PREPARED	JWT
DESIGN	JWT
REVIEW	AMF
APPROVED	AMF

PROJECT No.	CONTROL	Rev.	FIGURE
13-02086-06	1302086ZP010.mxd	0	**2A-11**

Path: G:\Projects\130 Projects\13\2086-06 - Exide Frisco RCRA Permit Mod\800 - FIGURES-DRAWINGS\PRODUCTION\GIS from JAX\ZP - FOP RAP\map documents\1302086ZP010.mxd

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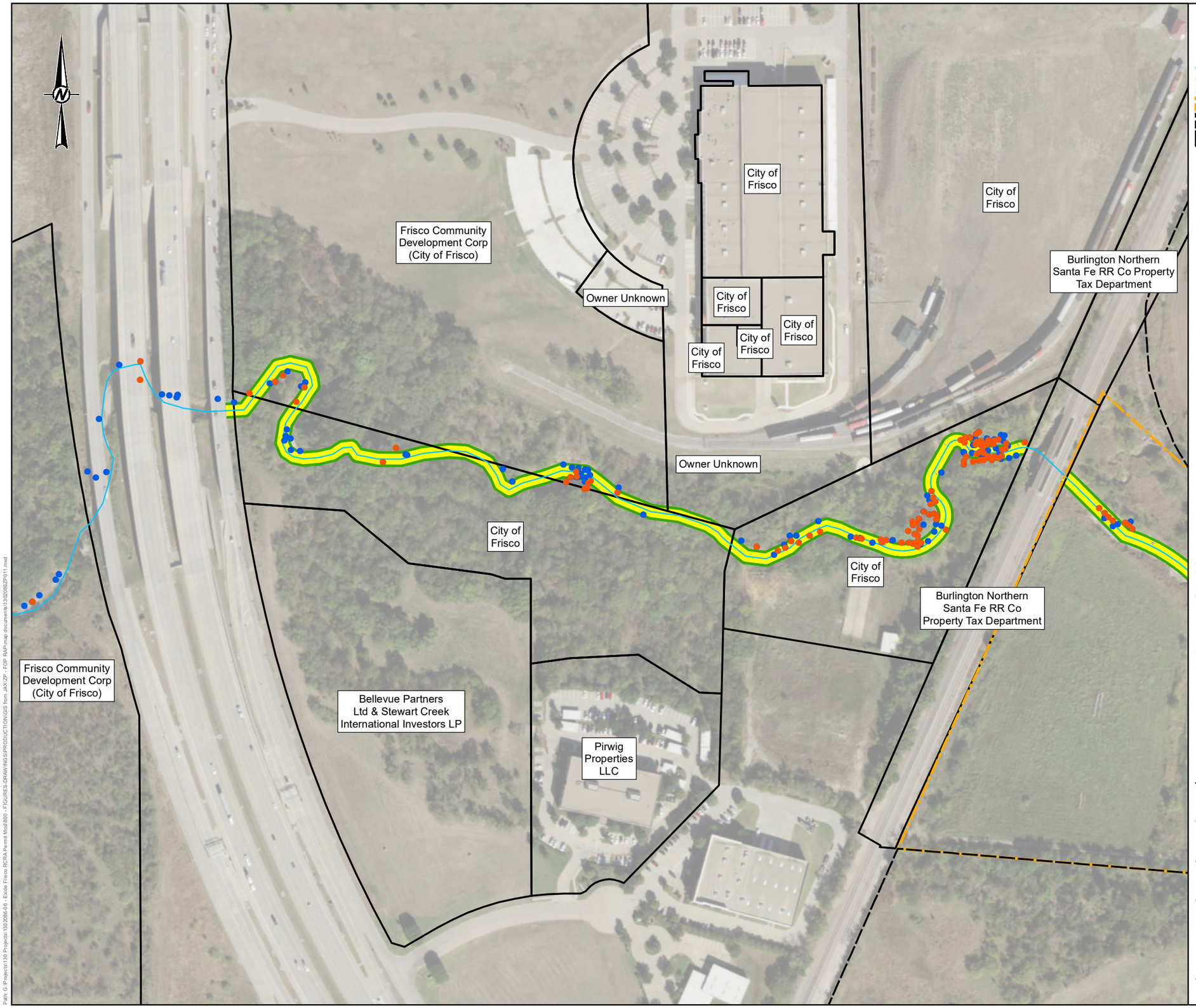

LEGEND

- No Exceedance
- Exceedance of PCL for Lead, Cadmium or Arsenic
- Creek Centerline
- Predetermined Excavation Area
- Former Operating Plant Property Boundary
- Former Undeveloped Buffer Property
- Property Boundary

STATE OF TEXAS
ANNE M. FAETH-BOYD
GEOLOGY
12300
LICENSED
PROFESSIONAL GEOSCIENTIST

NOTES

1. CREEK WIDTH FOR PURPOSES OF PLANNING SEDIMENT EXCAVATION IS ASSUMED TO BE 31 FEET IN THIS SEGMENT BASED ON OBSERVATIONS MADE BY GOLDER AND THE CITY OF FRISCO.
2. AREAS NOT DESIGNATED FOR EXCAVATION WILL BE INSPECTED AND RESAMPLED IN ACCORDANCE WITH THE RESPONSE ACTION PLAN.
3. PROPERTY INFORMATION UPDATED FROM COLLIN AND DENTON COUNTY APPRAISAL DISTRICT WEBSITES, MAY 2019.

REFERENCE

1. SITE FEATURES - GOLDER, 2014
2. AERIAL IMAGERY - SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

200 100 0 200
Feet

CLIENT
EXIDE TECHNOLOGIES

PROJECT
EXIDE TECHNOLOGIES FORMER OPERATING PLANT
RESPONSE ACTION PLAN

TITLE
SEDIMENT EXCAVATION MAP - SEGMENT 1 (SITE TO TOLLWAY)

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-29
PREPARED	JWT
DESIGN	JWT
REVIEW	AMF
APPROVED	AMF

PROJECT No.	CONTROL	Rev.	FIGURE
13-02086-06	1302086ZP011.mxd	0	**2A-12**

Path: G:\Projects\130 Projects\13-02086-06 - Exide Frisco RCRA Permit Mod\800 - FIGURES-DRAWINGS\PRODUCTION\GIS from JAX\ZP - FOP RAP\map documents\1302086ZP011.mxd

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI B
1 in
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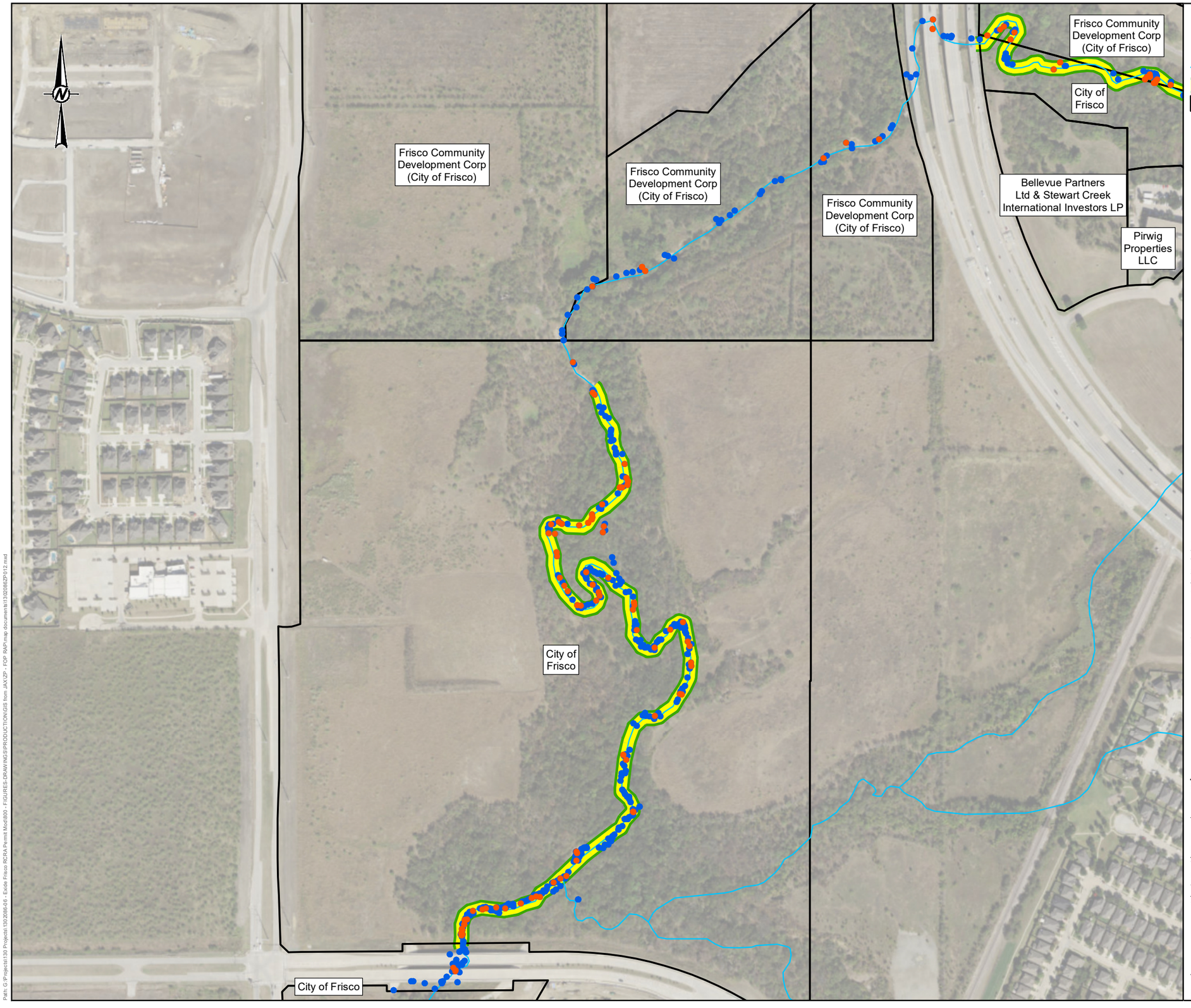

LEGEND

- No Exceedance
- Exceedance of PCL for Lead, Cadmium or Arsenic
- Creek Centerline
- Predetermined Excavation Area
- Property Boundary

STATE OF TEXAS
ANNE M FAETH-BOYD
GEOLOGY
12300
LICENSED
PROFESSIONAL GEOSCIENTIST

NOTES

1. CREEK WIDTH FOR PURPOSES OF PLANNING SEDIMENT EXCAVATION IS ASSUMED TO BE 26 FEET IN THIS SEGMENT BASED ON OBSERVATIONS MADE BY GOLDER AND THE CITY OF FRISCO.
2. AREAS NOT DESIGNATED FOR EXCAVATION WILL BE INSPECTED AND RESAMPLED IN ACCORDANCE WITH THE RESPONSE ACTION PLAN.
3. PROPERTY INFORMATION UPDATED FROM COLLIN AND DENTON COUNTY APPRAISAL DISTRICT WEBSITES, MAY 2019.

REFERENCE

1. SITE FEATURES - GOLDER, 2014
2. AERIAL IMAGERY - SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

400 200 0 400
Feet

CLIENT
EXIDE TECHNOLOGIES

PROJECT
EXIDE TECHNOLOGIES FORMER OPERATING PLANT
RESPONSE ACTION PLAN

TITLE
SEDIMENT EXCAVATION MAP - SEGMENT 2 (DALLAS NORTH TOLLWAY BRIDGES TO STONEBROOK PKWY)

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-29
PREPARED	JWT
DESIGN	JWT
REVIEW	AMF
APPROVED	AMF

PROJECT No.	CONTROL	Rev.	FIGURE
13-02086-06	1302086ZP012.mxd	0	**2A-13**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI B

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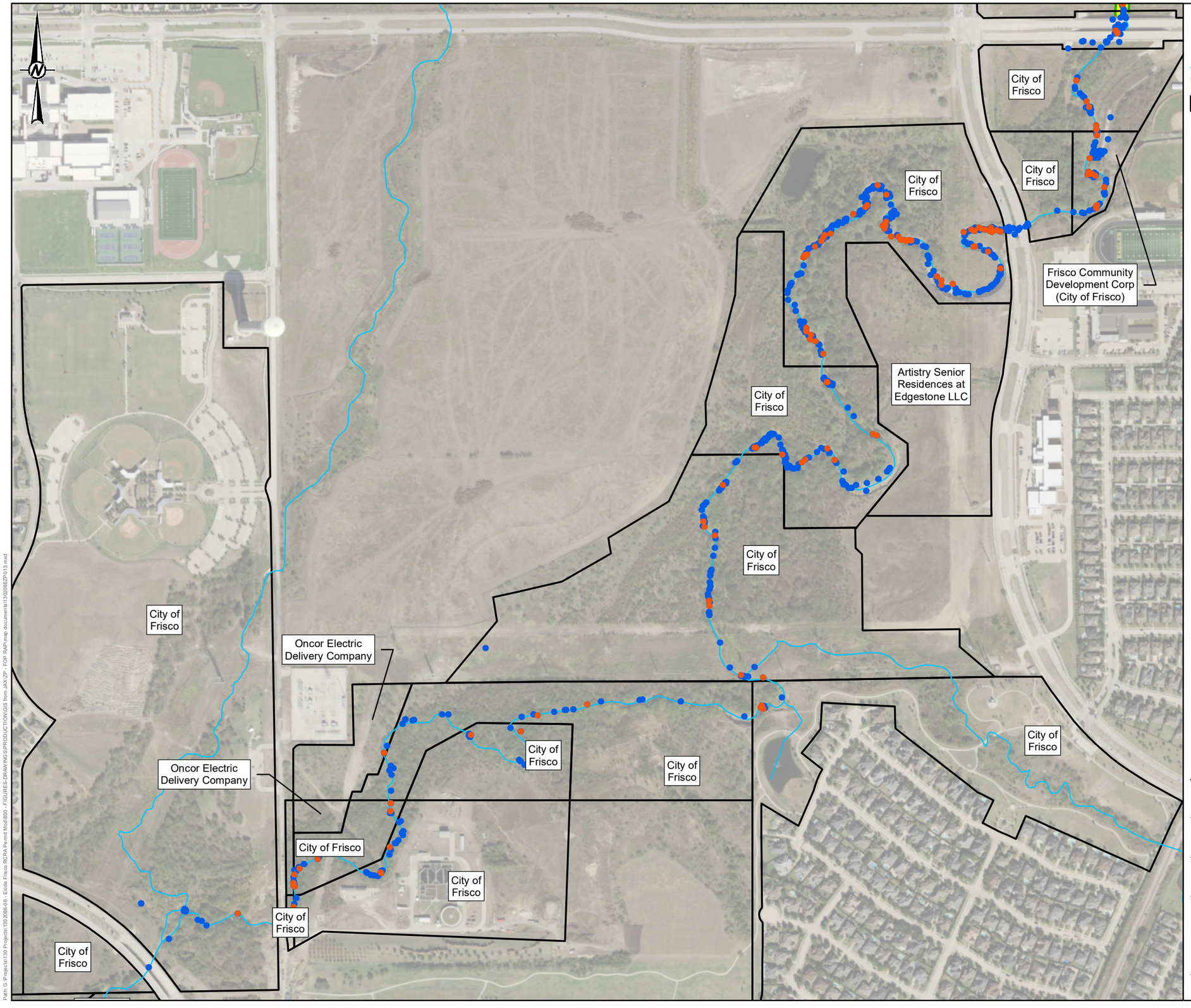

LEGEND

- No Exceedance
- Exceedance of PCL for Lead, Cadmium or Arsenic
- Creek Centerline
- Predetermined Excavation Area
- Property Boundary

STATE OF TEXAS
ANNE M FAETH-BOYD
GEOLOGY
12300
LICENSED
PROFESSIONAL GEOSCIENTIST

NOTES

1. CREEK WIDTH FOR PURPOSES OF PLANNING SEDIMENT EXCAVATION IS ASSUMED TO BE 20 FEET IN THIS SEGMENT BASED ON OBSERVATIONS MADE BY GOLDER AND THE CITY OF FRISCO.
2. AREAS NOT DESIGNATED FOR EXCAVATION WILL BE INSPECTED AND RESAMPLED IN ACCORDANCE WITH THE RESPONSE ACTION PLAN.
3. PROPERTY INFORMATION UPDATED FROM COLLIN AND DENTON COUNTY APPRAISAL DISTRICT WEBSITES, MAY 2019.

REFERENCE

1. SITE FEATURES - GOLDER, 2014
2. AERIAL IMAGERY - SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

500 250 0 500
Feet

CLIENT
EXIDE TECHNOLOGIES

PROJECT
EXIDE TECHNOLOGIES FORMER OPERATING PLANT
RESPONSE ACTION PLAN

TITLE
SEDIMENT EXCAVATION MAP - SEGMENT 3 (STONEBROOK TO LEBANON/USACE PROPERTY)

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-29
PREPARED	JWT
DESIGN	JWT
REVIEW	AMF
APPROVED	AMF

PROJECT No.	CONTROL	Rev.	FIGURE
13-02086-06	1302086ZP013.mxd	0	2A-14

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI B

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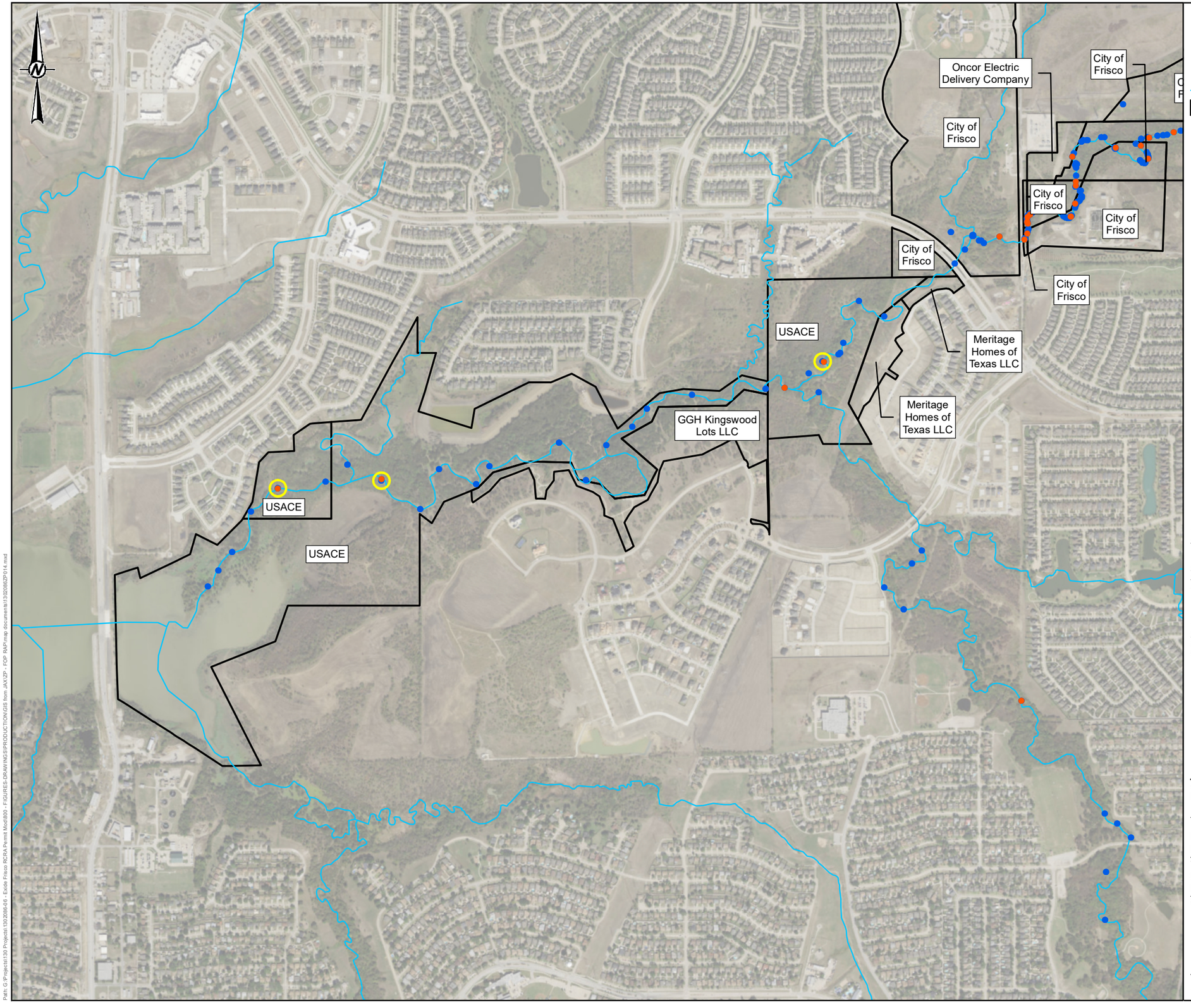

LEGEND

- Resampled Location (See Note 1)
- No Exceedance
- Exceedance of PCL for Lead, Cadmium or Arsenic
- Creek Centerline
- Property Boundary

STATE OF TEXAS
ANNE M FAETH-BOYD
GEOLOGY
12300
LICENSED
PROFESSIONAL GEOSCIENTIST
5-31-19

NOTES

1. 2014 SAMPLES 2014-SED-051, 2014-SED-053, AND 2016-IASED-003 WERE RESAMPLED AS 2017-SED-010, 2017-SED-011, AND 2017-SED-012, RESPECTIVELY. THE 2014 RESULTS EXCEEDED THE PCL. THE 2017 CONFIRMATION SAMPLES RESULTS WERE BELOW THE PCL.
2. AREAS NOT DESIGNATED FOR EXCAVATION WILL BE INSPECTED AND RESAMPLED IN ACCORDANCE WITH THE RESPONSE ACTION PLAN.
3. PROPERTY INFORMATION UPDATED FROM COLLIN AND DENTON COUNTY APPRAISAL DISTRICT WEBSITES, MAY 2019.

REFERENCE

1. SITE FEATURES - GOLDER, 2014
2. AERIAL IMAGERY - SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

1,000 500 0 1,000
Feet

CLIENT
EXIDE TECHNOLOGIES

PROJECT
EXIDE TECHNOLOGIES FORMER OPERATING PLANT
RESPONSE ACTION PLAN

TITLE
SEDIMENT EXCAVATION MAP - SEGMENT 4 (USACE PROPERTY)

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-29
PREPARED	JWT
DESIGN	JWT
REVIEW	AMF
APPROVED	AMF

PROJECT No.	CONTROL	Rev.	FIGURE
13-02086-06	1302086ZP014.mxd	0	**2A-15**

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI B
1 in
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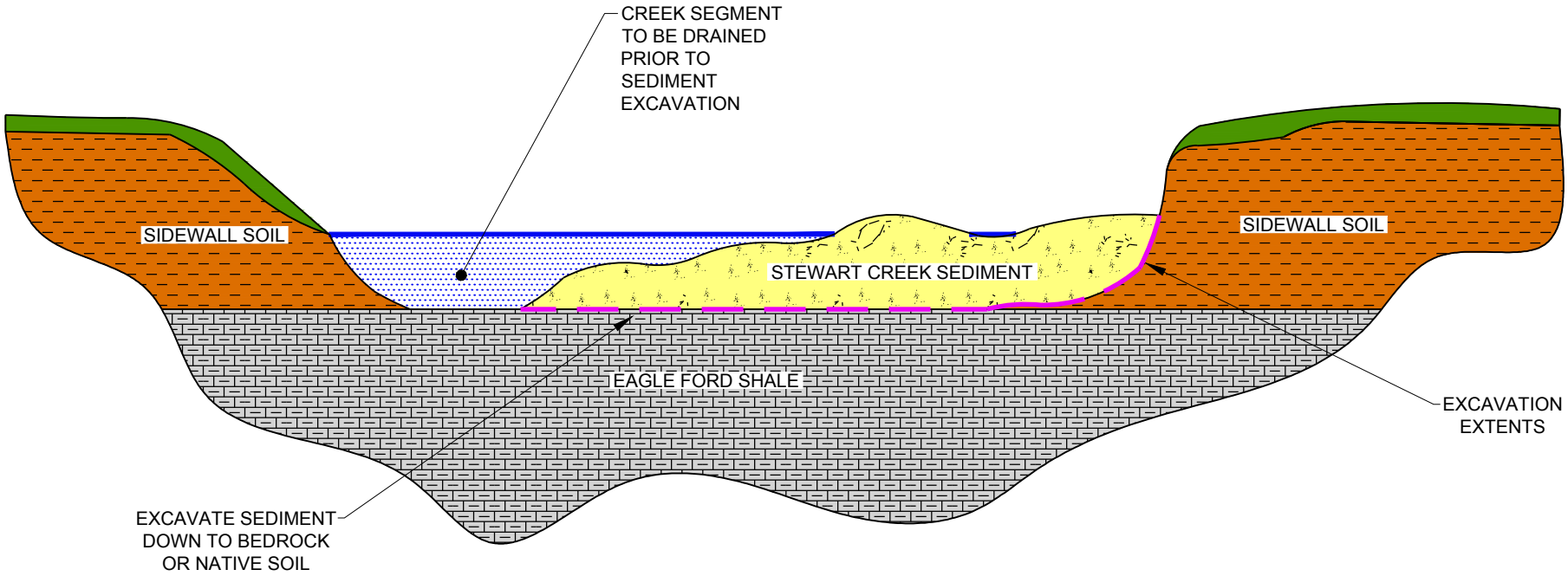


STATE OF TEXAS
ANNE M FAETH-BOYD
GEOLOGY
12300
LICENSED
PROFESSIONAL GEOSCIENTIST

CLIENT
EXIDE TECHNOLOGIES

CONSULTANT
GOLDER

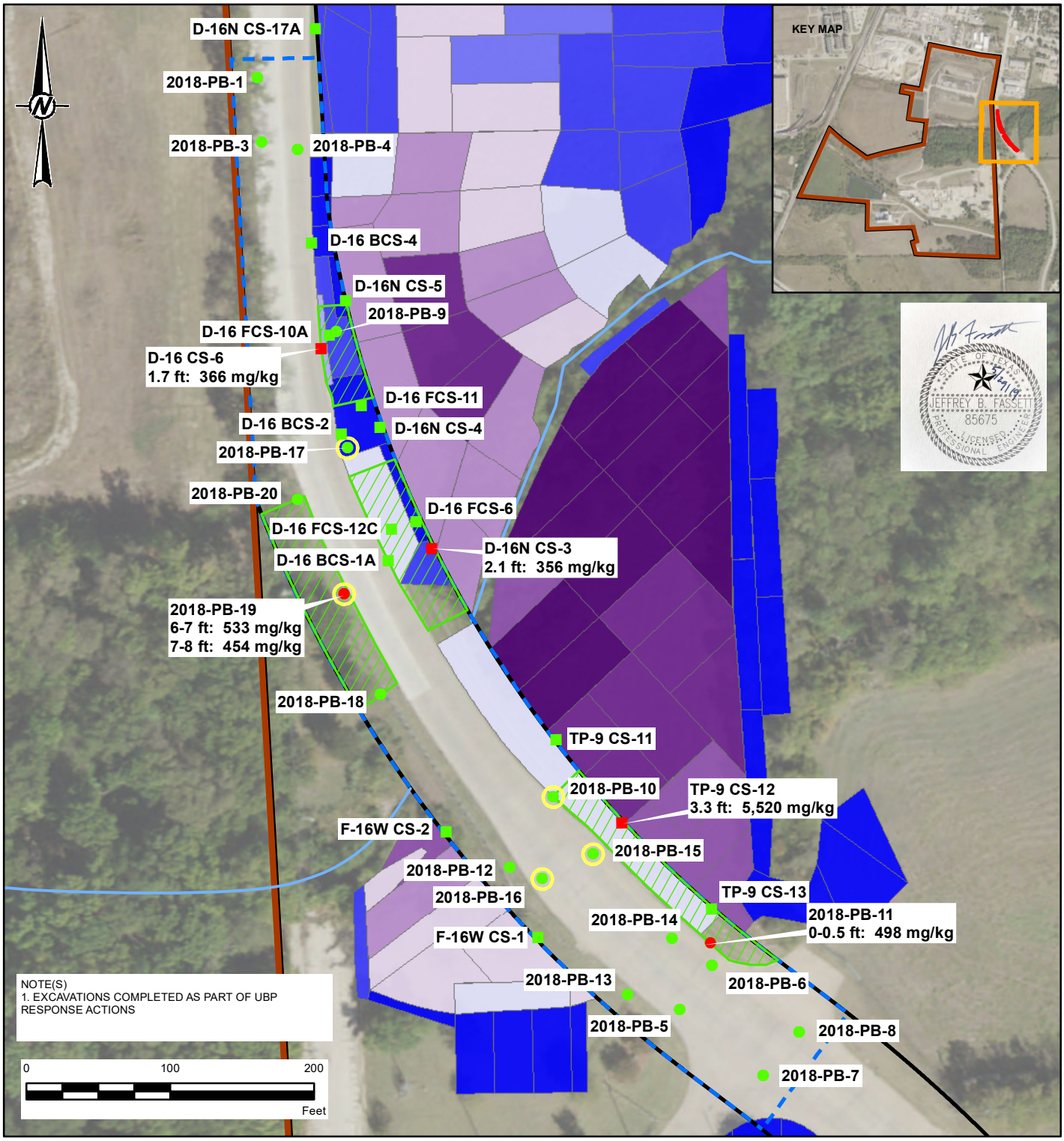
YYYY-MM-DD	2017-06-19
DESIGNED	PJJ
PREPARED	PJJ
REVIEWED	AMF
APPROVED	AMF

PROJECT
EXIDE TECHNOLOGIES FORMER OPERATING PLANT
RESPONSE ACTION PLAN

TITLE
SEDIMENT EXCAVATION - TYPICAL CROSS SECTION

PROJECT NO. 13-02086 | REV. A | FIGURE 2A-16

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A
1 in
0



- UBP sample lead concentration greater than 274.5 mg/kg
- UBP sample lead concentration less than 274.5 mg/kg
- Parkwood sample lead concentration greater than 274.5 mg/kg
- Parkwood sample lead concentration less than 274.5 mg/kg
- Parkwood Boulevard Cap
- Parkwood Parcel Investigation area
- Former Operating Plant Property Boundary
- Former Undeveloped Buffer Property (UBP)
- Debris noted in boring log
- Excavation Depth (0-0.5ft)
- Excavation Depth (0-1ft)
- Excavation Depth (0-1.5ft)
- Excavation Depth (0-1.7ft)
- Excavation Depth (1ft intervals to 2ft)
- Excavation Depth (1ft intervals to 3ft)
- Excavation Depth (1ft intervals to 4.5ft)
- Excavation Depth (1ft intervals to 5ft)
- Excavation Depth (1ft intervals to 6ft)
- Excavation Depth (1ft intervals to 7ft)

REFERENCE(S)

1. INVESTIGATION AREA AND LOCATIONS - GOLDER 2018
2. BACKGROUND IMAGERY - SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

CLIENT
EXIDE TECHNOLOGIES

PROJECT
RESPONSE ACTION PLAN

TITLE
PARKWOOD BOULEVARD CAP OVERVIEW MAP

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-29
DESIGNED	JWT
PREPARED	JWT
REVIEWED	EPW/THR
APPROVED	AMF

PROJECT NO.	CONTROL	REV.	FIGURE
130208606	1302086ZP037	0	2A-17

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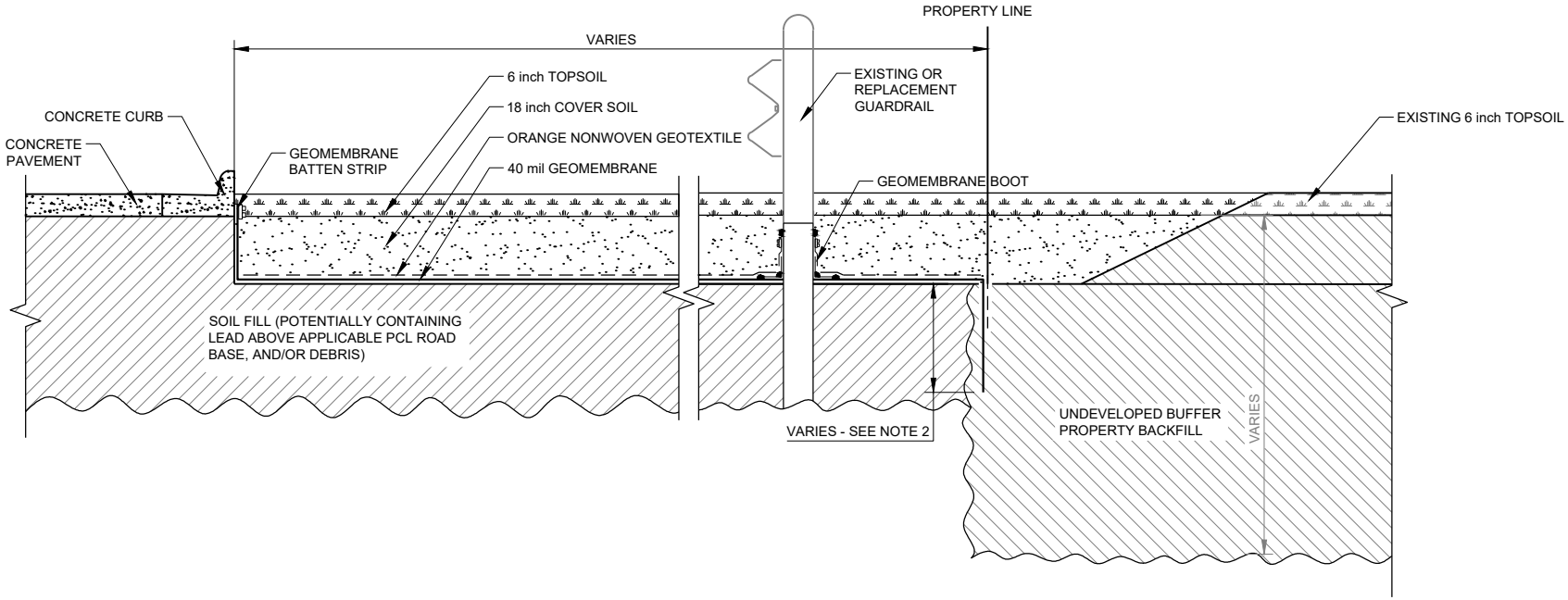
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A

Last Edited By: rsalazar Date: 2019-05-22 Time:10:07:25 AM | Printed By: RSalazar Date: 2019-05-22 Time:2:39:37 PM
Path: \\houston\drafting_non-houston projects\1302086 - exide\PRODUCTION\A - RCA Closure Plan\ | File Name: 1302086A014.dwg



NOTE(S)

1. DESIGN MAY BE MODIFIED TO INCORPORATE APPROPRIATE TRAFFIC CONTROL SAFETY MEASURES AS DETERMINED BY THE ROAD MAINTENANCE AUTHORITY.
2. GEOMEMBRANE TO EXTEND 1 ft BELOW DEPTH OF CONTAMINATION. SEE APPENDIX 3.3 OF RAP.

0 2 4
1" = 4' FEET

STATE OF TEXAS
JEFFREY B. FASSETT
85675
LICENSED
PROFESSIONAL ENGINEER
5/24/19

GOLDER ASSOCIATES INC.
Professional Engineering Firm
Registration Number F-2578

CLIENT
EXIDE TECHNOLOGIES
EXIDE FRISCO RECYCLING CENTER
FRISCO, TEXAS

CONSULTANT
GOLDER

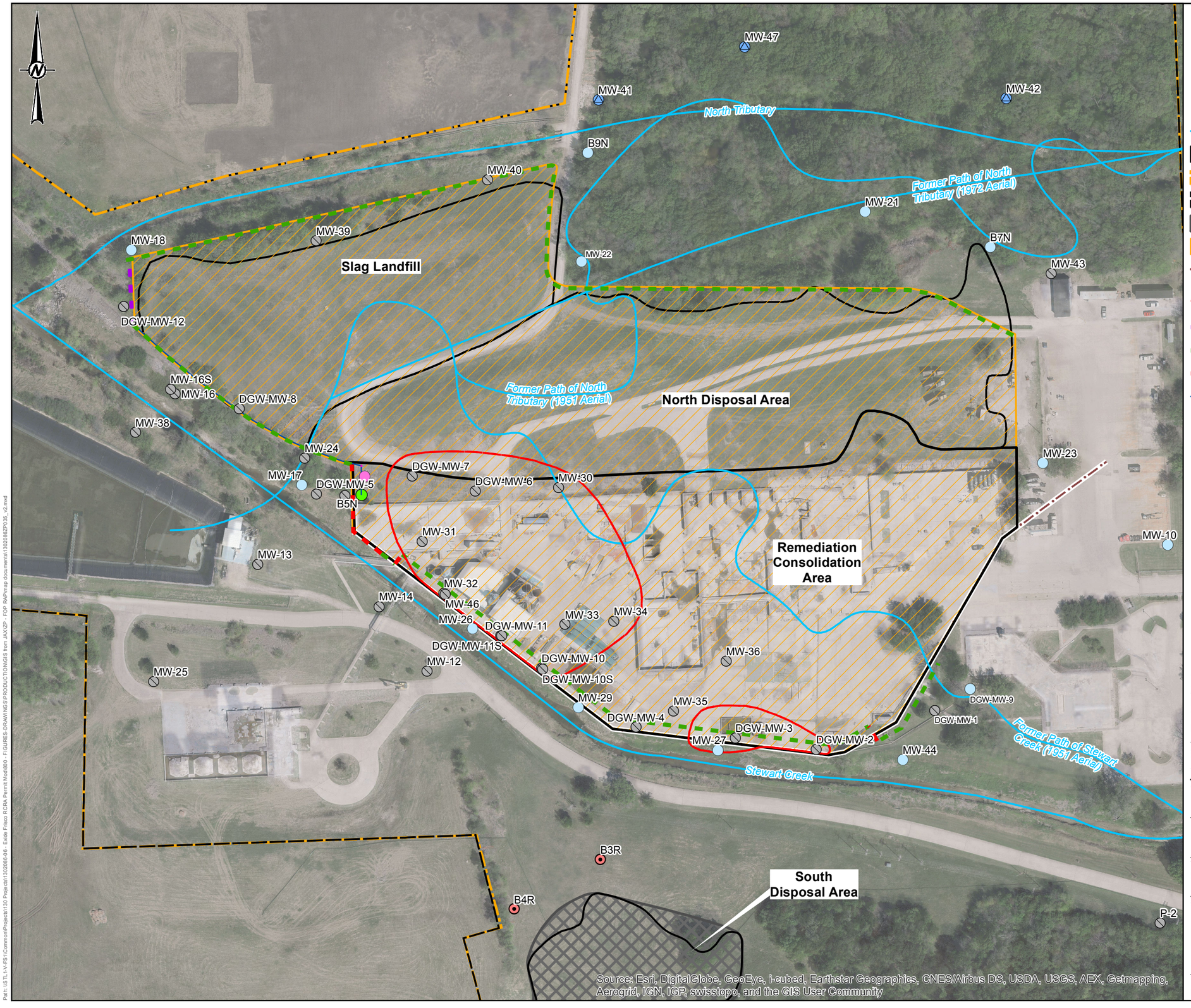
YYYY-MM-DD	2019-05-22
DESIGNED	JBF
PREPARED	RS
REVIEWED	JBF
APPROVED	JBF

PROJECT
RCRA PERMIT RENEWAL APPLICATION
RESPONSE ACTION PLAN
FRISCO, COLLIN COUNTY TEXAS

TITLE
PARKWOOD BOULEVARD CAP DETAIL

PROJECT NO.	SCALE	REV.	FIGURE
130208606	AS SHOWN	0	2A-18

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A
1 in
0



LEGEND

- North CAMU Corrective Action Monitoring Well
- SDA Detection Monitoring Well
- FOP Corrective Action Monitoring Well
- Existing Wells to be Decommissioned
- Surface Water Centerline
- Disposal Area
- Former Operating Plant Property Boundary
- Former Undeveloped Buffer Property
- Cap Supplement
- Engineered Cap
- Proposed Flood Wall
- Protective Concentration Level Exceedance (PCLE) Zone
- Proposed PRB (Gate) Location
- Proposed Slurry Wall Locations
- Proposed Sheet Pile (Funnel) Location
- Reactor Piping
- Manhole Cover
- Reactor Sump

STATE OF TEXAS
ANNE M FAETH-BOYD
GEOLOGY
12300
LICENSED
PROFESSIONAL GEOSCIENTIST
5-21-19

150 75 0 150 Feet

REFERENCE

1. SITE FEATURES - GOLDER, 2014
2. DGW-PDI MONITORING WELL LOCATIONS & CREEK ELEVATIONS - BRITTAIN & CRAWFORD, 05/22/2018
3. AERIAL IMAGERY - PROVIDED BY DALLAS AERIAL SURVEY, DATED APRIL, 2017.
4. RAP - RESPONSE ACTION PLAN.
5. DGW-MW-12 AND 2019-BH'S DRILLED AND SURVEYED IN JANUARY 2019.

CLIENT
EXIDE TECHNOLOGIES

PROJECT
RESPONSE ACTION PLAN 2019

TITLE
GROUNDWATER REMEDY LOCATION MAP

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-29
PREPARED	EFT
DESIGN	EPW
REVIEW	EPW
APPROVED	AMF/THR

PROJECT No.	CONTROL	Rev.	FIGURE
13-02086-06	1302086ZP035	0	**2A-19**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI B

1 in 0

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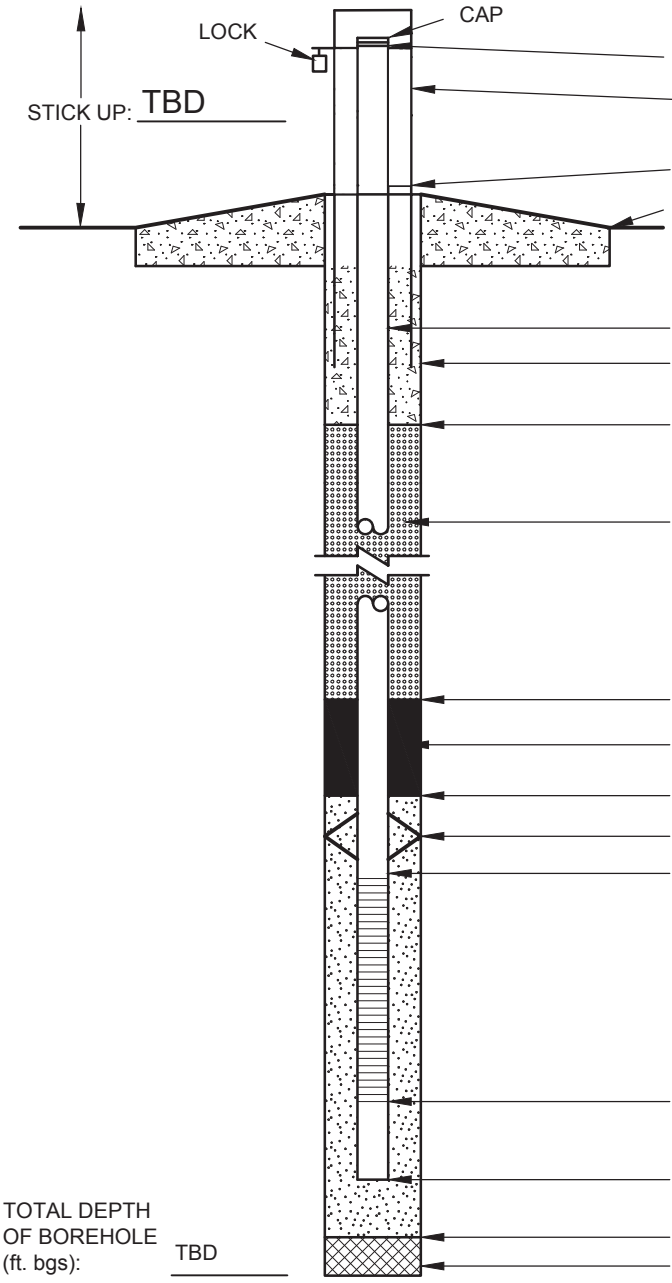
GOLDER

ABOVE GROUND WELL CONSTRUCTION LOG

**All proposed locations

PROJECT NAME: Exide - Frisco FOP RAP	PROJECT NUMBER: 130208606	
SITE NAME: Exide - Frisco	LOCATION: Varies	
CLIENT: Exide Technologies	SURFACE ELEVATION: TBD	
GEOLOGIST: TBD	NORTHING: TBD	EASTING: TBD
DRILLER: TBD	STATIC WATER LEVEL: TBD	COMPLETION DATE: TBD
DRILLING COMPANY: TBD	DRILLING METHODS: TBD	



TOP OF CASING ELEVATION: TBD

PROTECTIVE CASING (yes / no): TBD

WEEP HOLE

GROUND SURFACE ELEVATION: TBD

DIAMETER OF RISER PIPE (in.): 2 in ID

DIAMETER OF BOREHOLE (in.): TBD

CONCRETE SEAL DEPTH (ft. bgs): TBD

TYPE AND AMOUNT OF ANNULAR SEAL: TBD

TOP OF BENTONITE SEAL DEPTH (ft. bgs): TBD

TYPE AND AMOUNT OF BENTONITE SEAL: TBD

TOP OF SAND PACK DEPTH (ft. bgs): TBD

CENTRALIZER (yes / (no)) - TYPE: NA

TOP OF SCREEN DEPTH (ft. bgs): TBD

TYPE OF SCREEN: Schedule 40 PVC

SCREEN SLOT SIZE (in.): 0.010

SIZE OF SAND PACK: TBD

AMOUNT OF SAND: TBD

BOTTOM OF SCREEN DEPTH (ft. bgs): TBD

BOTTOM OF WELL DEPTH (ft. bgs): TBD

BOTTOM OF FILTER PACK (ft. bgs): TBD

TYPE AND AMOUNT OF BACKFILL: TBD

ADDITIONAL NOTES: TBD - to be determined; ft - feet; in - inches; ID - inner diameter; NA - not applicable; PVC - polyvinyl chloride

**Proposed monitoring well locations (PRB-MW-1 through PRB-MW-7, SR-MW-1, MW-48, and MW-49) and proposed piezometer locations (for water elevation purposes only [PZ-1 through PZ-6]) included as Response Action Plan, Attachment 5A, Figure 5A-1. Final monitoring well/piezometer locations are subject to change pending Site conditions and accessibility at the time of drilling and well installation. Current proposed location coordinates presented on Response Action Plan, Attachment 2B, Table 2B.

CHECKED BY: TBD

DATE CHECKED: TBD

PREPARED BY: TBD

Response Action Plan

Attachment M, Part B, RCRA Permit Renewal Application

Location	Northing	Easting
MW-48	7102539.578	2479635.042
MW-49	7102602.425	2479932.785
PRB-MW-1	7102396.155	2479347.532
PRB-MW-2	7102345.792	2479351.397
PRB-MW-3	7102403.013	2479328.565
PRB-MW-4	7102363.039	2479330.388
PRB-MW-5	7102382.701	2479285.466
PRB-MW-6	7102317.379	2479320.839
PRB-MW-7	7102320.307	2479268.983
PZ-1	7101709.459	2480258.175
PZ-2	7101888.816	2479893.322
PZ-3	7102024.561	2479727.664
PZ-4	7102509.558	2479659.003
PZ-5	7102393.585	2480014.621
PZ-6	7102389.903	2480471.614
SR-MP-1	7102103.838	2479707.558
SR-MW-1	7102074.324	2479664.372

Prepared by: EFT 05/28/2019
Checked by: EPW 05/28/2019
Reviewed by: AMF 05/29/2019

GOLDER

STATE OF TEXAS
ANNE M FAETH-BOYD
GEOLOGY
12300
LICENSED
PROFESSIONAL GEOSCIENTIST

REFERENCE

1. AERIAL IMAGERY - SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

200 100 0 200 Feet

- Background Well
- Observation Well
- APOE Well
- Attenuation Monitoring Point
- Abandoned Well
- APOE Well/POC

- Creek Centerline
- Corrective Action Management Unit
- Plume Management Zone (PMZ)
- Former Operating Plant Property Boundary
- Protective Concentration Level Exceedance (PCLE) Zone
- Groundwater Flow Direction

Permit Number: HW-50206
Solid Waste Registration Number: 30516
NOR Unit Number: 012
Unit Description: North Corrective Action Management Unit

NOTES

1. APOE - ALTERNATE POINT OF EXPOSURE
2. BGS - BELOW GROUND SURFACE
3. AAL - ATTENUATION ACTION LEVEL
4. POC - POINT OF COMPLIANCE
5. TD - TOTAL DEPTH

CLIENT
EXIDE TECHNOLOGIES

PROJECT
EXIDE TECHNOLOGIES FORMER OPERATING PLANT RESPONSE ACTION PLAN

TITLE
PLUME MANAGEMENT ZONE MAP

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-21
PREPARED	EFT
DESIGN	EPW
REVIEW	BEF
APPROVED	AMF

PROJECT No.	CONTROL	Rev.	FIGURE
13-02086-06	1302086ZP029.mxd	0	**2D-1**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI A

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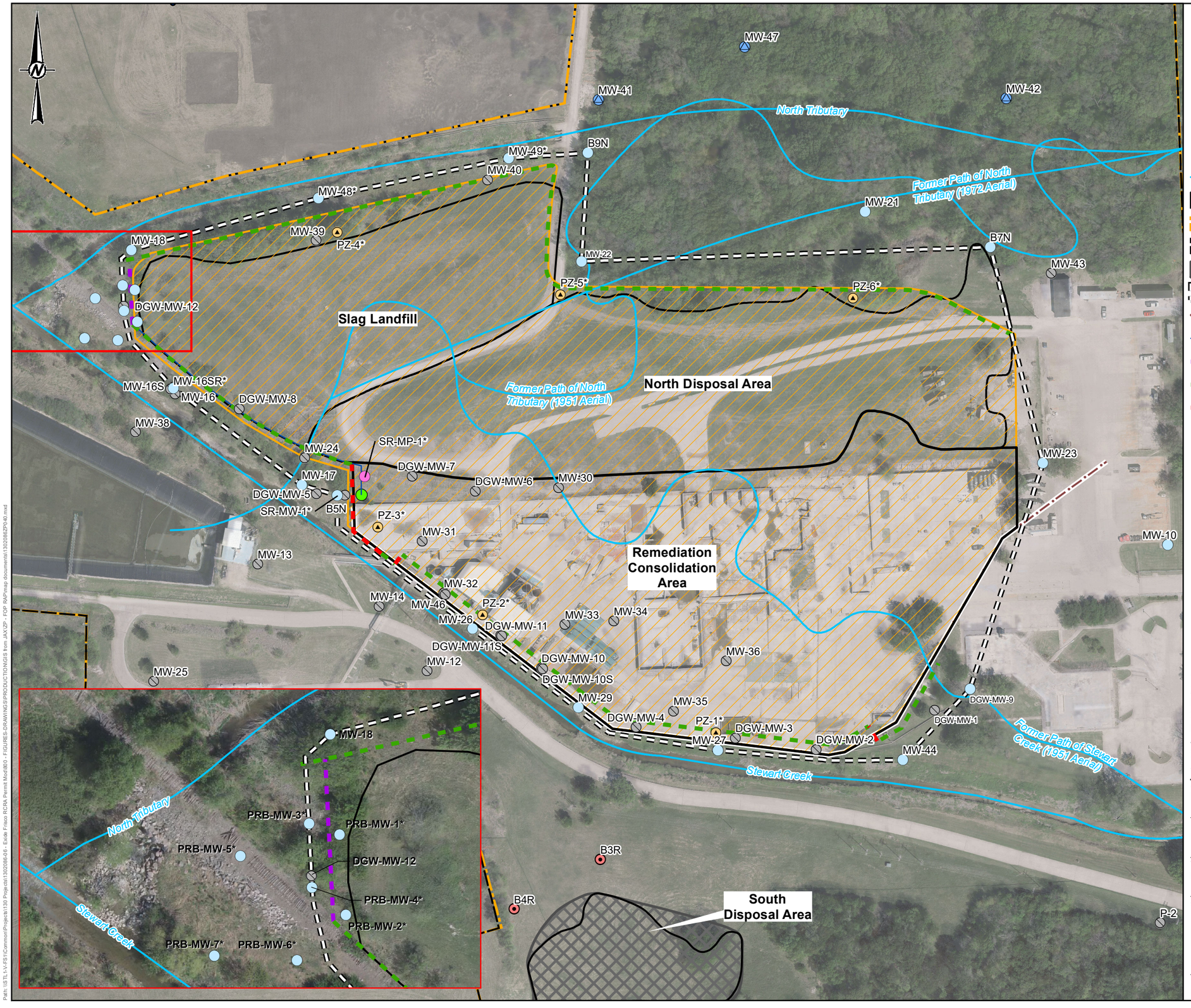

LEGEND

- North CAMU Corrective Action Monitoring Well
- SDA Detection Monitoring Well
- FOP Corrective Action Monitoring Well
- Existing Wells to be Decommissioned
- Piezometer Location
- Sump Reactor Monitoring Point
- Surface Water Centerline
- Disposal Area
- Former Operating Plant Property Boundary
- Former Undeveloped Buffer Property
- Cap Supplement
- Plume Management Zone
- Proposed Flood Wall
- Reactor Piping
- Proposed PRB (Gate) Location
- Proposed Slurry Wall Locations
- Proposed Sheet Pile (Funnel) Location
- Reactor Sump

STATE OF TEXAS
ANNE M FAETH-BOYD
GEOLOGY
12300
LICENSED
PROFESSIONAL GEOSCIENTIST

100 50 0 100
Feet

REFERENCE

1. SITE FEATURES - GOLDER, 2014
2. DGW-PDI MONITORING WELL LOCATIONS & CREEK ELEVATIONS - BRITTAIN & CRAWFORD, 05/22/2018
3. AERIAL IMAGERY - PROVIDED BY DALLAS AERIAL SURVEY, DATED APRIL, 2017.
4. RAP - RESPONSE ACTION PLAN.
5. DGW-MW-12 AND 2019-BH'S DRILLED AND SURVEYED IN JANUARY 2019.

CLIENT
EXIDE TECHNOLOGIES

PROJECT
RESPONSE ACTION PLAN

TITLE
PLUME MANAGEMENT ZONE MAP (FOP)

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-22
PREPARED	EFT
DESIGN	EPW
REVIEW	EPW
APPROVED	AMF/THR

PROJECT No. 13-02086-06 | CONTROL 1302086ZP040 | Rev. 0 | FIGURE **2D-2**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI B

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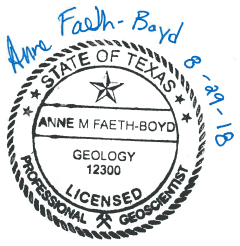
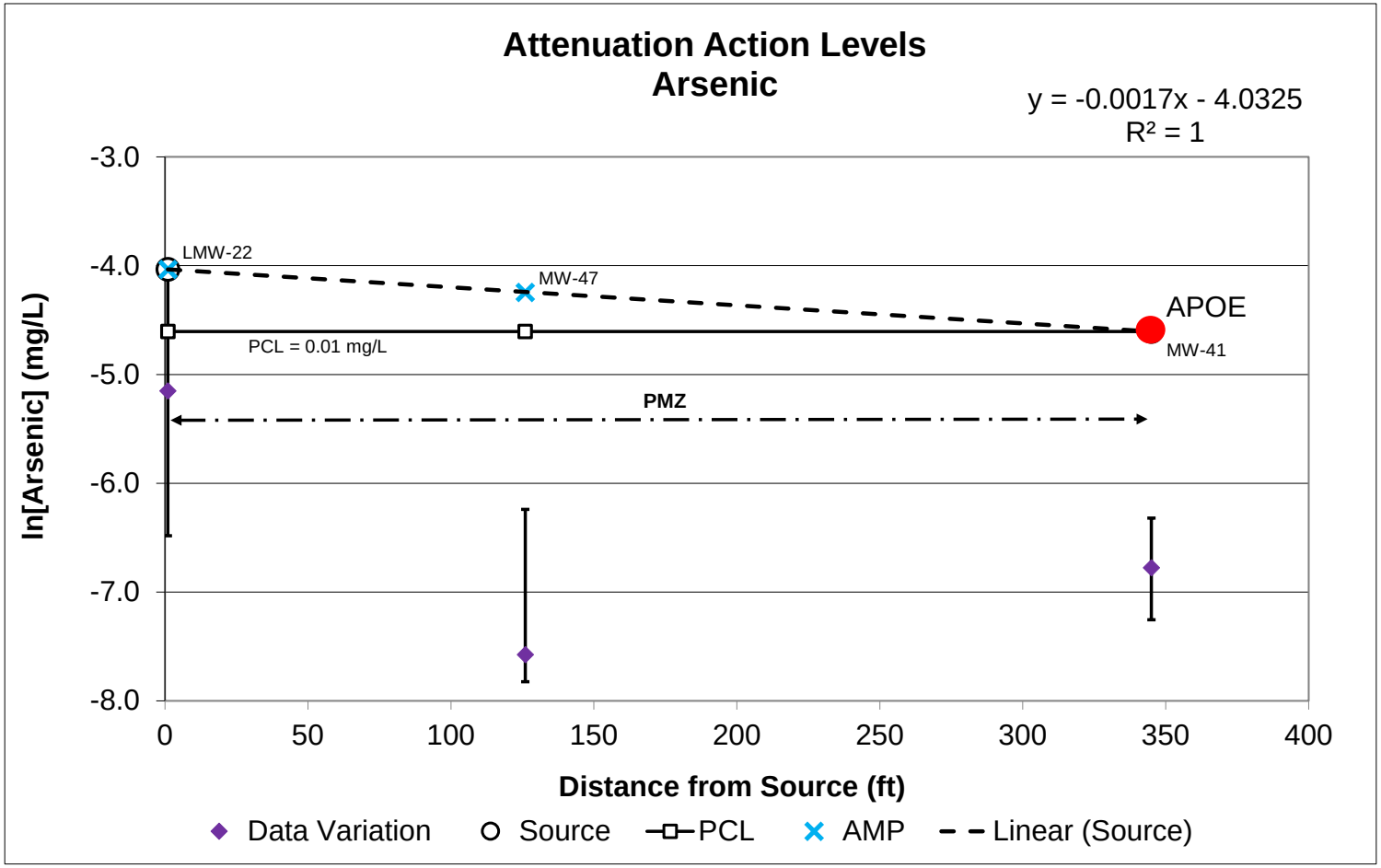
ATTACHMENT 2E
ATTENUATION ACTION LEVELS

Exide Technologies Frisco Recycling Center, Former Operating Plant

Attenuation Monitoring Point	Attenuation Action Level (mg/L)
LMW-22	0.018
MW-47	0.014





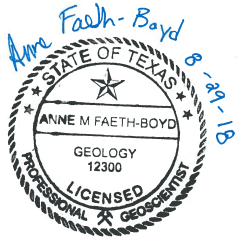
Notes:
1) All data from groundwater monitoring between June 2014 and June 2018.
2) Data values below detection limit were set to the sample detection limit for this analysis.
3) Attenuation Action Levels (AALs) calculated as per TCEQ Regulatory Guidance RG-366/TRRP-33.
mg/L - milligrams per liter

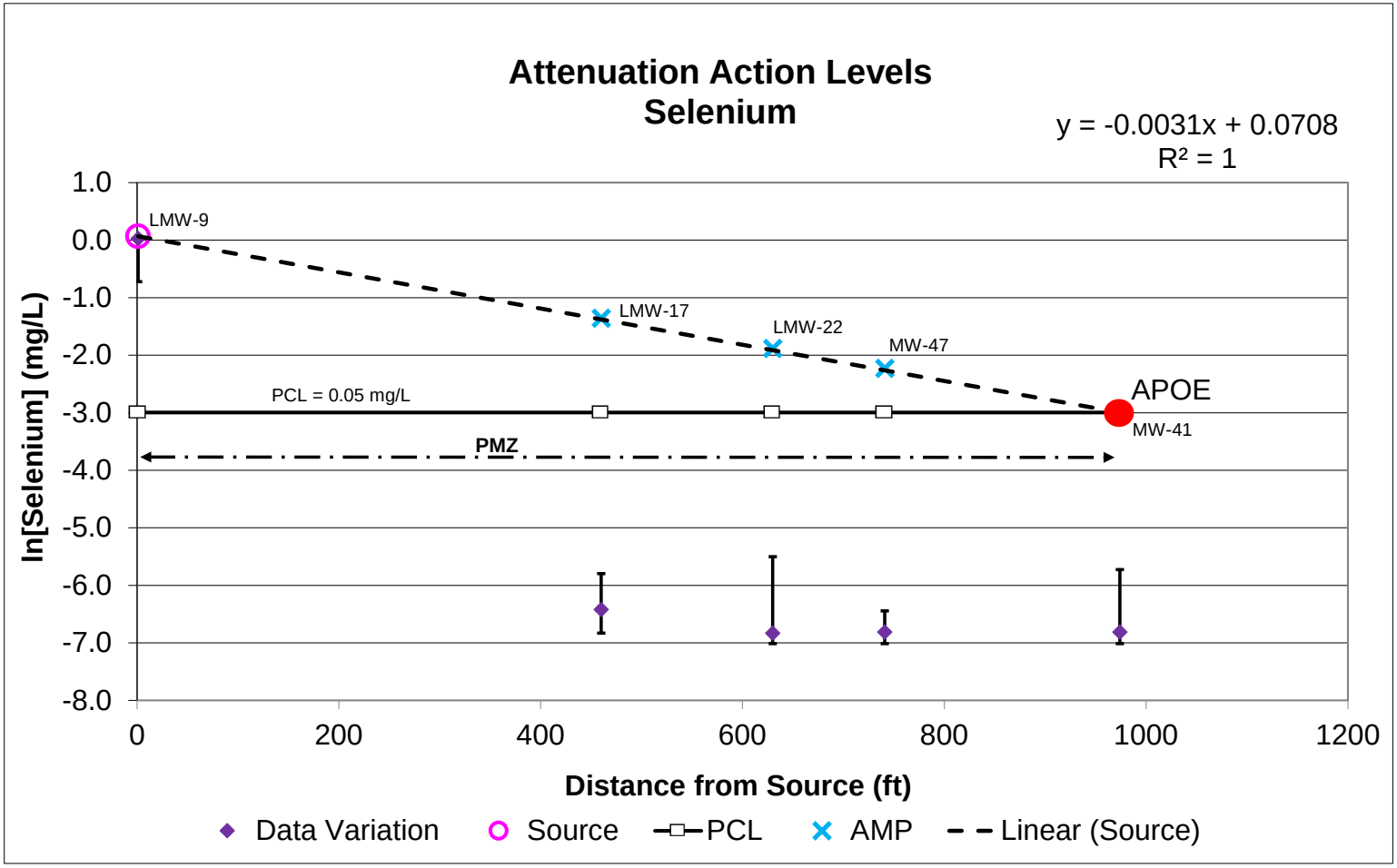
PCL - Protective Concentration Level
APOE - Alternate Point of Exposure
AMP - Attenuation Monitoring Point
PMZ - Plume Management Zone

ATTACHMENT 2E
ATTENUATION ACTION LEVELS

Exide Technologies Frisco Recycling Center, Former Operating Plant

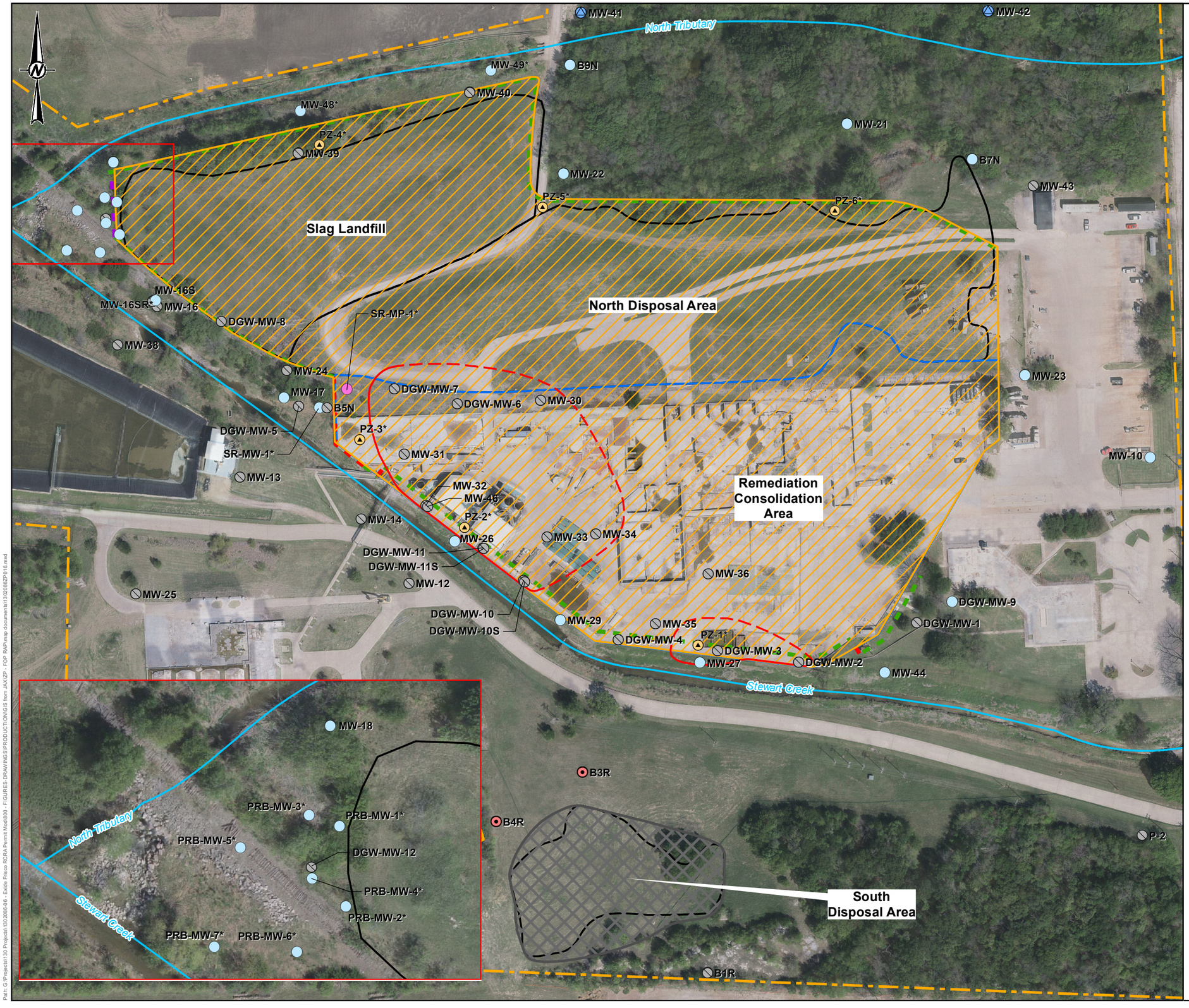
Attenuation Monitoring Point	Attenuation Action Level (mg/L)
LMW-17	0.26
LMW-22	0.15
MW-47	0.11





Notes:
1) All data from groundwater monitoring between June 2014 and June 2018.
2) Data values below detection limit were set to the sample detection limit for this analysis.
3) Attenuation Action Levels (AALs) calculated as per TCEQ Regulatory Guidance RG-366/TRRP-33.
mg/L - milligrams per liter

PCL - Protective Concentration Level
APOE - Alternate Point of Exposure
AMP - Attenuation Monitoring Point
PMZ - Plume Management Zone



LEGEND

- North CAMU Corrective Action Monitoring Well
- SDA Detection Monitoring Well
- FOP Corrective Action Monitoring Well
- Existing Wells to be Decommissioned
- Piezometer Location
- Sump Reactor Monitoring Point
- Surface Water Centerline
- Protective Concentration Level Exceedance (PCLE) Zone
- Approximate Former Operating Plant Boundary
- Disposal Area
- Remediation Consolidation Area
- Engineered Cap
- Cap Supplement
- Proposed PRB (Gate) Location
- Proposed Slurry Wall Locations
- Proposed Sheet Pile (Funnel) Location

STATE OF TEXAS
ANNE M FAETH-BOYD
GEOLOGY
12300
LICENSED
PROFESSIONAL GEOSCIENTIST
5-31-19

150 75 0 150
Feet

REFERENCE

1. SITE FEATURES - GOLDER, 2014.
2. AERIAL IMAGERY - SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY AND SITE AERIAL IMAGERY PROVIDED BY DALLAS AERIAL SURVEY DATED APRIL, 2017.
3. * - PROPOSED MONITORING WELL/PIEZOMETER LOCATION, NOT YET INSTALLED.

CLIENT
EXIDE TECHNOLOGIES

PROJECT
EXIDE TECHNOLOGIES FORMER OPERATING PLANT RESPONSE ACTION PLAN

TITLE
MAP OF PRAC MONITORING AND SAMPLING POINTS

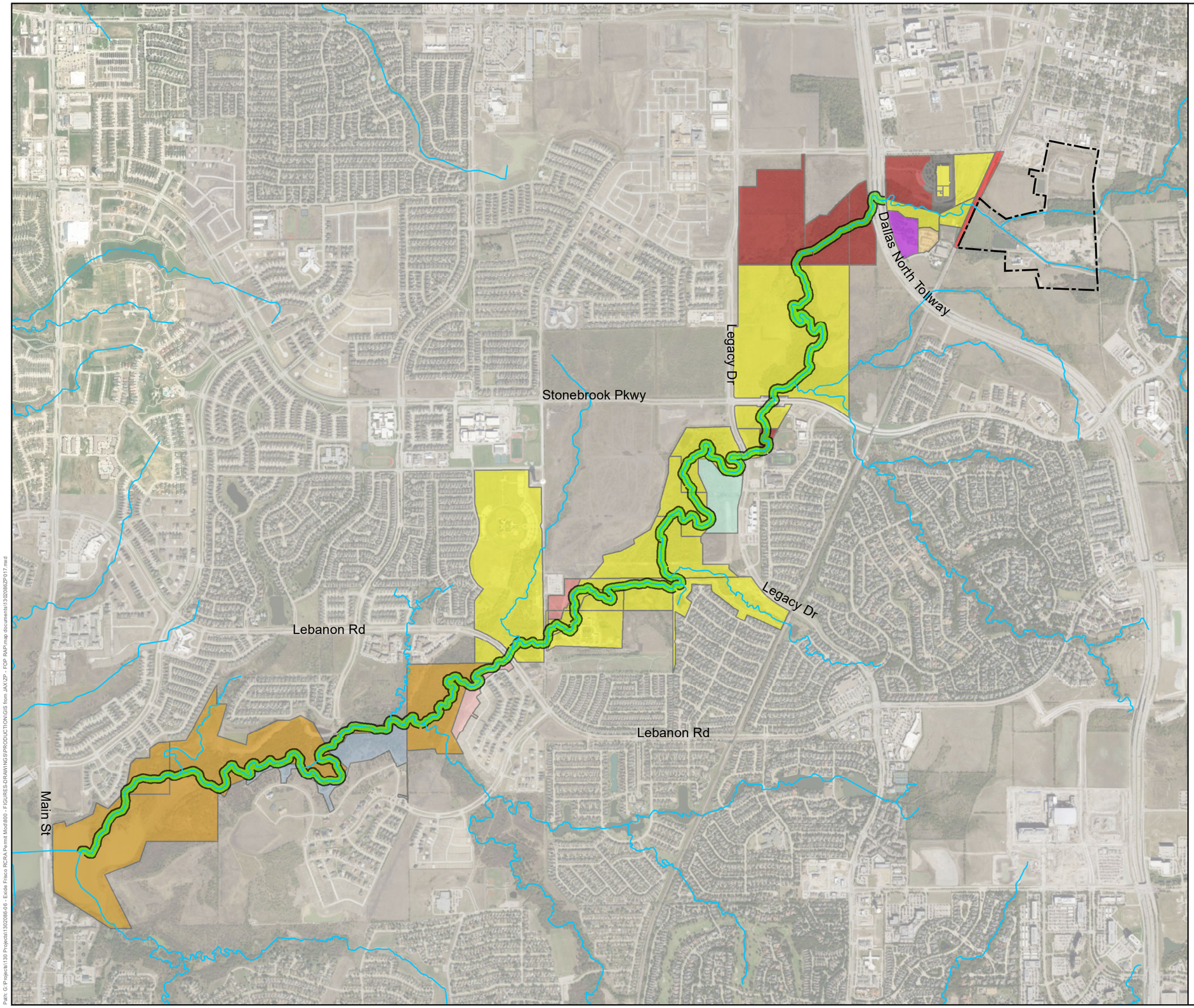
CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-31
PREPARED	EFT
DESIGN	BEF
REVIEW	EPW
APPROVED	AMF

PROJECT No.	CONTROL	Rev.	FIGURE
13-0208606	1302086ZP016.mxd	0	**5A-1**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI B

Path: G:\Projects\1302086-06 - Exide Frisco RCRA Permit Mod\800 - FIGURES-DRAWINGS\PRODUCTION\GIS from JAX\ZP - FOP RAP\mxd documents\1302086ZP016.mxd



LEGEND

- Creek Centerline
- Periodic Inspection and Removal Area
- Former Operating Plant
- Artistry Senior Residences at Edgestone LLC
- Bellevue Partners Ltd & Stewart Creek International Investors LP
- Burlington Northern Santa Fe RR Co Property Tax Department
- City of Frisco
- Frisco Community Development Corp (City of Frisco)
- GGH Kingswood Lots LLC
- Meritage Homes of Texas LLC
- Oncor Electric Delivery Company
- Owner Unknown
- Pirwig Properties LLC
- USACE

STATE OF TEXAS
ANNE M FAETH-BOYD
GEOLOGY
12300
LICENSED
5-31-19
PROFESSIONAL GEOSCIENTIST

REFERENCE

1. SITE FEATURES - GOLDER, 2014 AND 2016
2. AERIAL IMAGERY - SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY
3. PROPERTY INFORMATION UPDATED FROM COLLIN AND DENTON COUNTY APPRAISAL DISTRICT WEBSITES, MAY 2019.

0.35 0.175 0 0.35
Miles

CLIENT
EXIDE TECHNOLOGIES

PROJECT
EXIDE TECHNOLOGIES FORMER OPERATING PLANT
RESPONSE ACTION PLAN

TITLE
STEWART CREEK PERIODIC INSPECTION AND REMOVAL AREA

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-21
PREPARED	EFT
DESIGN	AM
REVIEW	EPW
APPROVED	AMF

PROJECT No.	CONTROL	Rev.	FIGURE
13-02086-06	1302086ZP017.mxd	0	**5A-2**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI B

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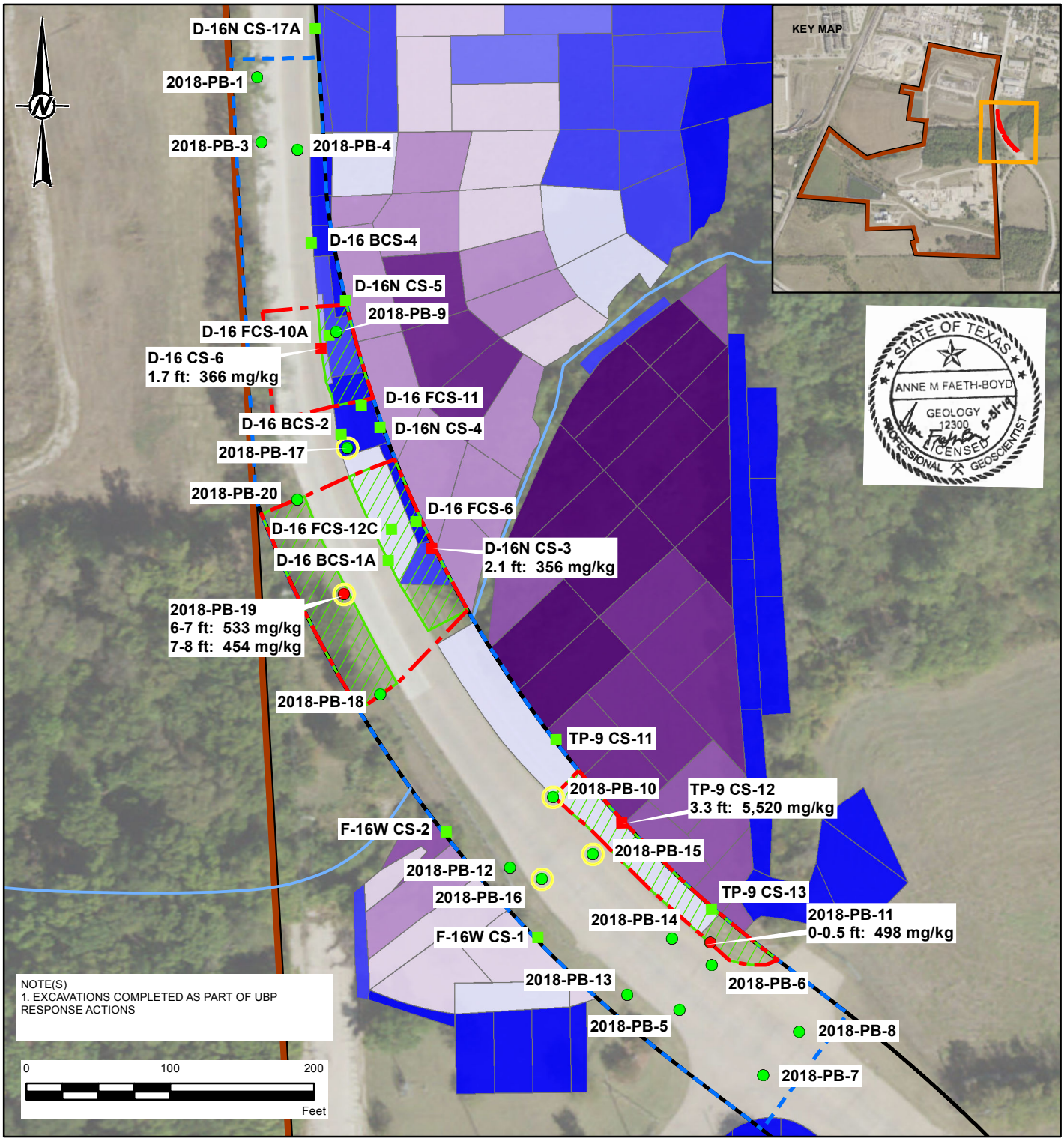
Path: G:\Projects\130 Projects\13202086-06 - Exide Frisco RCRA Permit Mod\800 - FIGURES-DRAWINGS\PRODUCTION\GIS from JAX\ZP - FOP RAP\map documents\1302086ZP017.mxd



- UBP sample lead concentration greater than 274.5 mg/kg
- UBP sample lead concentration less than 274.5 mg/kg
- Parkwood sample lead concentration greater than 274.5 mg/kg
- Parkwood sample lead concentration less than 274.5 mg/kg
- Parkwood Boulevard Cap
- Parkwood Parcel Investigation area
- Periodic Inspection Areas
- Former Operating Plant Property Boundary
- Former Undeveloped Buffer Property (UBP)
- Debris noted in boring log
- Excavation Depth (0-0.5ft)
- Excavation Depth (0-1ft)
- Excavation Depth (0-1.5ft)
- Excavation Depth (0-1.7ft)
- Excavation Depth (1ft intervals to 2ft)
- Excavation Depth (1ft intervals to 3ft)
- Excavation Depth (1ft intervals to 4.5ft)
- Excavation Depth (1ft intervals to 5ft)
- Excavation Depth (1ft intervals to 6ft)
- Excavation Depth (1ft intervals to 7ft)

REFERENCE(S)

1. INVESTIGATION AREA AND LOCATIONS - GOLDER 2018
2. BACKGROUND IMAGERY - SOURCE: ESRI, DIGITALGLOBE, GEOEYE, I-CUBED, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEX, GETMAPPING, AEROGRID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY

CLIENT
EXIDE TECHNOLOGIES

PROJECT
RESPONSE ACTION PLAN

TITLE
PARKWOOD BOULEVARD PERIODIC INSPECTION AREAS

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-29
DESIGNED	JWT
PREPARED	JWT
REVIEWED	EPW/THR
APPROVED	AMF

PROJECT NO.	CONTROL	REV.	FIGURE
130208606	1302086ZP041	0	5A-3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A

PATH: \\STL-1-FS1\Common\Projects\130\208606-06 - Exide Frisco RCRA Permit Mod\600 - FIGURES-DRAWINGS\PRODUCTION\GIS from JAX\ZP - FOP RAP\map documents\1302086ZP041.mxd - LAST SAVED ON: 2019-05-29 AT: 10:08:43 AM

Exide FOP Corrective Action Monitoring
Frisco, TX
RAP Cost Estimate 30-yr Post Closure Care
5/24/2019

item	description	qty	u.o.m.	unit price	total cost	subtotals	fqcy/30yr project	total task	capital or annual cost	notes
1	**NEW MONITORING WELL INSTALLATION**	**1**	**EA**			**$90,030**		**$90,030.00**	$90,030.00	18 wells
1a	Subcontractors					**$43,300**		**$43,300**		
	private utility locate	1	dy	$1,600.00	$1,600		1	$1,600		
	drilling and well installation, turn-key	18	ea	$2,200.00	$39,600		1	$39,600		
	surveying	1	dy	$2,100.00	$2,100		1	$2,100		
1b	Field Oversight of Monitoring Well Installation & Development					**$34,620**		**$34,620.00**		
	field work, incl. travel from Dallas, Level 2	252	hr	$105.00	$26,460		1	$26,460.00		
	meals & lodging	23	dy	$195.00	$4,485		1	$4,485.00		Rate based on FY 2019 Per Diem Rates produced by GSA
	pickup truck	3.5	wk	$400.00	$1,400		1	$1,400.00		
	misc. field expenses and equipment	3.5	wk	$650.00	$2,275		1	$2,275.00		
1c	Project Management & Professional Services					**$5,360**		**$5,360.00**		
	PM, planning, contracting, regulatory interface, etc., Level 3	20	hr	$115.00	$2,300		1	$2,300.00		
	admin support, Level B1	4	hr	$60.00	$240		1	$240.00		
	CADD services, Level D1	12	hr	$75.00	$900		1	$900.00		
	project oversight/senior review, Level 5	12	hr	$160.00	$1,920		1	$1,920.00		
1d	Waste Transportation & Disposal					**$6,750**		**$6,750.00**		
	wastewater transportation & disposal (1 drum per well)	18	ea	$375.00	$6,750		1	$6,750.00		
2	**GROUNDWATER MONITORING & REPORTING**	**30**	**YR**					**$2,102,151.00**	$70,071.70	
	(quarterly for 2 years, semi-annually for 28 years, 64 events total)									
2a	Labor and Labor Related Expenses					**$26,685**		**$1,707,840.00**		
	PM, planning, contracting, regulatory interface, etc., Level 3	16	hr	$115.00	$1,840		64	$117,760.00		16 hrs @ $115/hr (per event)
	sampling, incl. travel from Dallas, Level T3	120	hr	$90.00	$10,800		64	$691,200.00		120 hrs @ $90/hr (per event)
	meals & lodging	10	dy	$195.00	$1,950		64	$124,800.00		10 days, 10 nights (per event)
	pickup truck	1.5	wk	$400.00	$600		64	$38,400.00		
	misc. field expenses and equipment	1.5	wk	$650.00	$975		64	$62,400.00		
	reporting, data evaluation & validation, Level 2	80	hr	$105.00	$8,400		64	$537,600.00		80 hrs @ $105/hr (per event)
	admin support, Level B1	4	hr	$60.00	$240		64	$15,360.00		4 hrs @ $60/hr (per event)
	CADD services, Level D1	8	hr	$75.00	$600		64	$38,400.00		8 hrs @ $75/hr (per event)
	project oversight/senior review, Level 5	8	hr	$160.00	$1,280		64	$81,920.00		8 hrs @ $160/hr (per event)
2b	Laboratory Analytical Expenses: 33 wells and 4 QA/QC samples					**$1,184**		**$75,776.00**		
	groundwater analysis (5 metals) incl. QA/QC	37	ea	$32.00	$1,184		64	$75,776.00		incl. containers, shipping, & analysis
2c	Waste Transportation & Disposal					**$2,250**		**$144,000.00**		
	waste transportation & disposal (6 drums waste per event)	6	ea	$375.00	$2,250		64	$144,000.00		
2d	Monitoring Well Maintenance/Replacement					**$174,535**		**$174,535.00**		replace all wells once in 30 years
	plugging and abandonment	32	ea	$500.00	$16,000		1	$16,000.00		
	private utility locate	1	dy	$1,600.00	$1,600		1	$1,600		
	drilling and well installation, turn-key	32	ea	$2,200.00	$70,400		1	$70,400		
	surveying	2	dy	$2,100.00	$4,200		1	$4,200		
	field work, incl. travel from Dallas, Level 2	462	hr	$105.00	$48,510		1	$48,510.00		
	meals & lodging	39	dy	$195.00	$7,605		1	$7,605.00		Rate based on FY 2019 Per Diem Rates produced by GSA
	pickup truck	6	wk	$400.00	$2,400		1	$2,400.00		
	misc. field expenses and equipment	6	wk	$650.00	$3,900		1	$3,900.00		
	PM, planning, contracting, regulatory interface, etc., Level 3	32	hr	$115.00	$3,680		1	$3,680.00		
	admin support, Level B1	8	hr	$60.00	$480		1	$480.00		
	CADD services, Level D1	16	hr	$75.00	$1,200		1	$1,200.00		
	project oversight/senior review, Level 5	16	hr	$160.00	$2,560		1	$2,560.00		
	wastewater transportation & disposal (1 drum per well)	32	ea	$375.00	$12,000		1	$12,000.00		

Exide FOP Corrective Action Monitoring
Frisco, TX
RAP Cost Estimate 30-yr Post Closure Care
5/24/2019

item	description	qty	u.o.m.	unit price	total cost	subtotals	fqcy/30yr project	total task	capital or annual cost	notes
3	**INSPECTIONS AND REMOVAL OF SLAG AND BATTERY CASE FRAGMENTS ON STEWART CREEK**	**5**	**YR**			**$15,085**		**$150,850.00**	$5,028	
	(semi-annually for 5 years, 10 events total)									
3a	Labor and Labor Related Expenses					**$14,710**		**$147,100.00**		
	PM, planning, contracting, regulatory interface, etc., Level 3	8	hr	$115.00	$920		10	$9,200.00		8 hrs @ $115/hr (per event), reporting cost included in groundwater reporting cost (item 2a)
	field work, incl. travel from Dallas, Level T3	120	hr	$90.00	$10,800		10	$108,000.00		assume two Golder staff for field program, 60 hrs @ $90/hr (per event)
	meals & lodging	10	ea	$195.00	$1,950		10	$19,500.00		Rate based on FY 2019 Per Diem Rates provided by GSA
	pickup truck	1	wk	$400.00	$400		10	$4,000.00		1 week (per event)
	project oversight/senior review, Level 5	4	hr	$160.00	$640		10	$6,400.00		4 hrs @ $160/hr (per event)
3b	Waste Transportation & Disposal					**$375**		**$3,750.00**		
	sediment transportation & disposal (1 drum per event)	1	ea	$375.00	$375		10	$3,750.00		
4	**PRB REJUVENATION (e.g. acid wash)**	1	est	$35,000.00	$35,000		3	**$105,000.00**	$3,500.00	
	(three times in 30 years)									
									$90,030.00	total capital
									$78,599.70	total annual
								$2,448,031.00		

Exide FOP OM&M
Frisco, TX
RAP Cost Estimate 30-yr Post Closure Care
5/24/2019

item	description	qty	u.o.m.	unit price	total cost	subtotals	fqcy/30yr project	total task	capital or annual cost	notes
1	**ROUTINE SITE INSPECTIONS**	**30**	**YR**					**$243,600.00**	$8,120	
	(quarterly for 5 years, semi-annual for 25 years, 70 events total)									
1a	Labor and Labor Related Expenses					**$3,480**		**$243,600.00**		
	PM, planning, field work, travel, reporting, Level 3	20	hr	$115.00	$2,300		70	$161,000.00		20 hrs @ $115/hr (per event)
	meals & lodging	2	ea	$195.00	$390		70	$27,300.00		Rate based on FY 2019 Per Diem Rates produced by GSA
	rental car	2	dy	$75.00	$150		70	$10,500.00		
	project oversight/senior review, Level 5	4	hr	$160.00	$640		70	$44,800.00		4 hrs @ $160/hr (per event)
2	**MAINTENANCE OF CAP & MONITORING SYSTEMS**	**30**	**YR**					**$1,202,180.00**	$40,073	
2a	Cover Maintenance					**$21,500**		**$645,000.00**		
	soil replacement (due to erosion) furnished & installed	45	cy	$20.00	$900		30	$27,000.00		estimate 3 truckloads per year
	re-seeding - hydroseeding	2	ac	$3,500.00	$7,000		30	$210,000.00		estimate 1 acre minimum charge incurred each event - twice annually
	mowing	4	ea	$3,400.00	$13,600		30	$408,000.00		assume 4 mowing events per year, $50 per acre (68 acres)
2b	Fence, Sign & Benchmark Maintenance					**$194,600**		**$194,600.00**		
	fence replacement	9200	lf	$20.00	$184,000		1	$184,000.00		1 total replacement in 30 years
	sign replacement	92	ea	$50.00	$4,600		1	$4,600.00		
	verify benchmark location & elevation	6	event	$1,000.00	$6,000		1	$6,000.00		
2c	Storm Water Pond Cleanout					**$60,430**		**$362,580.00**		
	mobilization and equipment rental	1	event	$9,000.00	$9,000		6	$54,000.00		1 event every 5 years
	sludge removal labor and equipment	4	days	$10,000.00	$40,000		6	$240,000.00		1 event every 5 years
	vac box rental	90	days	$55.00	$4,950		6	$29,700.00		1 event every 5 years
	transportation	2	load	$1,100.00	$2,200		6	$13,200.00		1 event every 5 years
	waste characterization	1	sample	$650.00	$650		6	$3,900.00		1 event every 5 years
	non-hazardous Class 2 waste disposal	30	tons	$101.00	$3,030		6	$18,180.00		1 event every 5 years
	vacuum box washout	2	each	$300.00	$600		6	$3,600.00		1 event every 5 years
									$0	total capital
									$48,193	total annual
								$1,445,780.00		

Exide North CAMU Compliance Plan
Frisco, TX
RAP Cost Estimate 30-yr Post Closure Care
5/14/2019

item	description	qty	u.o.m.	unit price	total cost	subtotals	fqcy/30yr project	total task	capital or annual cost	notes
1	**NEW MONITORING WELL INSTALLATION**	**0**	**EA**			**$0**		**$0.00**	$0.00	
1a	Subcontractors					**$0**		**$0**		
	private utility locate	0	dy	$1,600.00	$0		0	$0		
	drilling and well installation, turn-key	0	ea	$2,200.00	$0		0	$0		
	surveying	0	dy	$2,100.00	$0		0	$0		
1b	Field Oversight of Monitoring Well Installation & Development					**$0**		**$0.00**		
	field work, incl. travel from Dallas, Level 2	0	hr	$105.00	$0		0	$0.00		
	meals & lodging	0	dy	$195.00	$0		0	$0.00		Rate based on FY 2019 Per Diem Rates produced by GSA
	pickup truck	0	wk	$400.00	$0		0	$0.00		
	misc. field expenses and equipment	0	wk	$650.00	$0		0	$0.00		
1c	Project Management & Professional Services					**$0**		**$0.00**		
	PM, planning, contracting, regulatory interface, etc., Level 3	0	hr	$115.00	$0		0	$0.00		
	admin support, Level B1	0	hr	$60.00	$0		0	$0.00		
	CADD services, Level D1	0	hr	$75.00	$0		0	$0.00		
	project oversight/senior review, Level 5	0	hr	$160.00	$0		0	$0.00		
1d	Waste Transportation & Disposal					**$0**		**$0.00**		
	wastewater transportation & disposal (1 drum per well)	0	ea	$375.00	$0		0	$0.00		
2	**GROUNDWATER MONITORING & REPORTING**	**30**	**YR**					**$181,984.00**	$6,066.13	
	(quarterly for 2 years, semi-annually for 28 years, 64 events total)									
2a	Labor and Labor Related Expenses					**$2,680**		**$171,520.00**		
	PM, planning, contracting, regulatory interface, etc., Level 3	2	hr	$115.00	$230		64	$14,720.00		2 hrs @ $115/hr (per event)
	sampling, incl. travel from Dallas, Level T3	5	hr	$90.00	$450		64	$28,800.00		5 hrs @ $90/hr (per event)
	meals & lodging	1	dy	$195.00	$195		64	$12,480.00		1 day, 1 night (per event)
	pickup truck	1	dy	$75.00	$75		64	$4,800.00		1 day (per event)
	misc. field expenses and equipment	1	ea	$300.00	$300		64	$19,200.00		
	reporting, data evaluation & validation, Level 2	8	hr	$105.00	$840		64	$53,760.00		8 hrs @ $105/hr (per event)
	admin support, Level B1	2	hr	$60.00	$120		64	$7,680.00		2 hrs @ $60/hr (per event)
	CADD services, Level D1	2	hr	$75.00	$150		64	$9,600.00		2 hrs @ $75/hr (per event)
	project oversight/senior review, Level 5	2	hr	$160.00	$320		64	$20,480.00		2 hrs @ $160/hr (per event)
2b	Laboratory Analytical Expenses: 3 wells					**$336**		**$10,464.00**		
	groundwater analysis (5 metals) incl. QA/QC	3	ea	$32.00	$96		34	$3,264.00		
	groundwater analysis (11 metals) incl. QA/QC	3	ea	$80.00	$240		30	$7,200.00		
2c	Waste Transportation & Disposal					**$0**		**$0.00**		
	waste transportation & disposal (N/A, included with other IDW)	0	ea	$375.00	$0		64	$0.00		
3	**MONITORING WELL MAINTENANCE/REPLACEMENT**	**30**	**YR**					**$22,355.00**	$745.17	
3a	Monitoring Well Maintenance/Replacement					**$22,355**		**$22,355.00**		replace all wells once in 30 years
	plugging and abandonment	3	ea	$500.00	$1,500		1	$1,500.00		
	private utility locate	1	dy	$1,600.00	$1,600		1	$1,600		
	drilling and well installation, turn-key	3	ea	$2,200.00	$6,600		1	$6,600		
	surveying	1	dy	$2,100.00	$2,100		1	$2,100		
	field work, incl. travel from Dallas, Level 2	48	hr	$105.00	$5,040		1	$5,040.00		
	meals & lodging	4	dy	$195.00	$780		1	$780.00		Rate based on FY 2019 Per Diem Rates produced by GSA
	pickup truck	1	wk	$400.00	$400		1	$400.00		
	misc. field expenses and equipment	1	wk	$650.00	$650		1	$650.00		
	PM, planning, contracting, regulatory interface, etc., Level 3	12	hr	$115.00	$1,380		1	$1,380.00		
	admin support, Level B1	4	hr	$60.00	$240		1	$240.00		
	CADD services, Level D1	4	hr	$75.00	$300		1	$300.00		
	project oversight/senior review, Level 5	4	hr	$160.00	$640		1	$640.00		
	wastewater transportation & disposal (1 drum per well)	3	ea	$375.00	$1,125		1	$1,125.00		
									$0.00	total capital
									$6,811.30	total annual
							Total for 30 Years	**$204,339.00**		

Exide North CAMU OM&M
Frisco, TX
RAP Cost Estimate 30-yr Post Closure Care
5/20/2019

item	description	qty	u.o.m.	unit price	total cost	subtotals	fqcy/30yr project	total task	capital or annual cost	notes
1	**NEW MONITORING WELL INSTALLATION**	**0**	**EA**			**$0**		**$0.00**	$0.00	No new wells needed
1a	Subcontractors					**$0**		**$0**		
	private utility locate	0	dy	$1,600.00	$0		0	$0		
	drilling and well installation, turn-key	0	ea	$2,200.00	$0		0	$0		
	surveying	0	dy	$2,100.00	$0		0	$0		
1b	Field Oversight of Monitoring Well Installation & Development					**$0**		**$0.00**		
	field work, incl. travel from Dallas, Level 2	0	hr	$105.00	$0		0	$0.00		
	meals & lodging	0	dy	$195.00	$0		0	$0.00		Rate based on FY 2019 Per Diem Rates produced by GSA
	pickup truck	0	wk	$400.00	$0		0	$0.00		
	misc. field expenses and equipment	0	wk	$650.00	$0		0	$0.00		
1c	Project Management & Professional Services					**$0**		**$0.00**		
	PM, planning, contracting, regulatory interface, etc., Level 3	0	hr	$115.00	$0		0	$0.00		
	admin support, Level B1	0	hr	$60.00	$0		0	$0.00		
	CADD services, Level D1	0	hr	$75.00	$0		0	$0.00		
	project oversight/senior review, Level 5	0	hr	$160.00	$0		0	$0.00		
1d	Waste Transportation & Disposal					**$0**		**$0.00**		
	wastewater transportation & disposal (1 drum per well)	0	ea	$375.00	$0		0	$0.00		
2	**GROUNDWATER MONITORING & REPORTING**	**30**	**YR**					**$667,200.00**	$22,240.00	
	(quarterly for 2 years, semi-annually for 28 years, 64 events total)									
2a	Labor and Labor Related Expenses					**$9,130**		**$584,320.00**	$19,477.33	
	PM, planning, contracting, regulatory interface, etc., Level 3	10	hr	$115.00	$1,150		64	$73,600.00		10 hrs @ $115/hr (per event)
	sampling, incl. travel from Dallas, Level T3	36	hr	$90.00	$3,240		64	$207,360.00		36 hrs @ $90/hr (per event)
	meals & lodging	3	dy	$195.00	$585		64	$37,440.00		3 days, 3 nights (per event)
	pickup truck	3	dy	$75.00	$225		64	$14,400.00		3 days (per event)
	misc. field expenses and equipment	1	ea	$650.00	$650		64	$41,600.00		
	reporting, data evaluation & validation, Level 2	20	hr	$105.00	$2,100		64	$134,400.00		20 hrs @ $105/hr (per event)
	admin support, Level B1	4	hr	$60.00	$240		64	$15,360.00		4 hrs @ $60/hr (per event)
	CADD services, Level D1	4	hr	$75.00	$300		64	$19,200.00		4 hrs @ $75/hr (per event)
	project oversight/senior review, Level 5	4	hr	$160.00	$640		64	$40,960.00		4 hrs @ $160/hr (per event)
2b	Laboratory Analytical Expenses: 9 wells and 1 QA/QC sample					**$1,120**		**$34,880.00**	$1,162.67	
	groundwater analysis (5 metals) incl. QA/QC	10	ea	$32.00	$320		34	$10,880.00		
	groundwater analysis (11 metals) incl. QA/QC	10	ea	$80.00	$800		30	$24,000.00		
2c	Waste Transportation & Disposal					**$750**		**$48,000.00**	$1,600.00	
	waste transportation & disposal (2 drums waste per event)	2	ea	$375.00	$750		64	$48,000.00		
3	**ROUTINE SITE INSPECTIONS**	**30**	**YR**					**$243,600.00**	$8,120.00	
	(quarterly for 5 years, semi-annual for 25 years, 70 events total)									
3a	Labor and Labor Related Expenses					**$3,480**		**$243,600.00**		
	PM, planning, field work, travel, reporting, Level 3	20	hr	$115.00	$2,300		70	$161,000.00		20 hrs @ $115/hr (per event)
	meals & lodging	2	ea	$195.00	$390		70	$27,300.00		Rate based on FY 2019 Per Diem Rates produced by GSA
	rental car	2	dy	$75.00	$150		70	$10,500.00		
	project oversight/senior review, Level 5	4	hr	$160.00	$640		70	$44,800.00		4 hrs @ $160/hr (per event)

Exide North CAMU OM&M
Frisco, TX
RAP Cost Estimate 30-yr Post Closure Care
5/20/2019

item	description	qty	u.o.m.	unit price	total cost	subtotals	fqcy/30yr project	total task	capital or annual cost	notes
4	**MAINTENANCE OF CAP & MONITORING SYSTEMS**	**30**	**YR**					**$627,010.00**	$20,900.33	
4a	Cover Maintenance					**$12,700**		**$381,000.00**		
	soil replacement (due to erosion) furnished & installed	45	cy	$20.00	$900		30	$27,000.00		estimate 3 truckloads per year
	re-seeding - hydroseeding	2	ac	$3,500.00	$7,000		30	$210,000.00		estimate 1 acre minimum charge incurred each event - twice annually
	mowing	4	ea	$1,200.00	$4,800		30	$144,000.00		assume 4 mowing events per year, $50 per acre (24 acres total, including areas around cap)
4b	Fence, Sign & Benchmark Maintenance					**$194,600**		**$194,600.00**		
	fence replacement	9200	lf	$20.00	$184,000		1	$184,000.00		1 total replacement in 30 years
	sign replacement	92	ea	$50.00	$4,600		1	$4,600.00		
	verify benchmark location & elevation	6	event	$1,000.00	$6,000		1	$6,000.00		
4c	Monitoring Well Maintenance/Replacement					**$51,410**		**$51,410.00**		replace all wells once in 30 years
	plugging and abandonment	9	ea	$500.00	$4,500		1	$4,500.00		
	private utility locate	1	dy	$1,600.00	$1,600		1	$1,600		
	drilling and well installation, turn-key	9	ea	$2,200.00	$19,800		1	$19,800		
	surveying	1	dy	$2,100.00	$2,100		1	$2,100		
	field work, incl. travel from Dallas, Level 2	126	hr	$105.00	$13,230		1	$13,230.00		
	meals & lodging	11	dy	$195.00	$2,145		1	$2,145.00		Rate based on FY 2019 Per Diem Rates produced by GSA
	pickup truck	2	wk	$400.00	$800		1	$800.00		
	misc. field expenses and equipment	2	wk	$650.00	$1,300		1	$1,300.00		
	PM, planning, contracting, regulatory interface, etc., Level 3	12	hr	$115.00	$1,380		1	$1,380.00		
	admin support, Level B1	4	hr	$60.00	$240		1	$240.00		
	CADD services, Level D1	4	hr	$75.00	$300		1	$300.00		
	project oversight/senior review, Level 5	4	hr	$160.00	$640		1	$640.00		
	wastewater transportation & disposal (1 drum per well)	9	ea	$375.00	$3,375		1	$3,375.00		
5	**North CAMU Leachate Disposal**	**30**	**YR**			**$4,200**		**$126,000.00**	$4,200.00	
	(annual leachate disposal cost: assume 12,000 gallons/yr. @ $0.35)	12,000	gal	$0.35	$4,200		30	$126,000.00		
									$0.00	total capital
									$55,460.33	total annual
							Total for 30 Years	**$1,663,810.00**		

CRYSTALLIZER POST-DEMOLITION SOIL SAMPLING

LEGEND

- Monitoring Well Location
- Soil Boring / Soil Sample Location
- Former Operating Plant
- Undeveloped Buffer Property

REFERENCE
1. SITE FEATURES - GOLDER, 2014
2. AERIAL IMAGERY - PLANT SITE, APRIL 2017

50 25 0 50
Feet

CLIENT
EXIDE TECHNOLOGIES

PROJECT
EXIDE TECHNOLOGIES FORMER OPERATING PLANT
RESPONSE ACTION PLAN

TITLE
CRYSTALLIZER UNIT SAMPLING LOCATIONS

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-07-05
PREPARED	JWT
DESIGN	JWT
REVIEW	AM
APPROVED	AMF

PROJECT No.	CONTROL	Rev.	FIGURE
13-02086	1302086ZP018.mxd	0	**A2-1**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI B

Path: \\Jacksonville\Drafting\File\2013\13-02086 Exide Frisco\ZP - FOP RAP\mxp documents\13020862P018.mxd

Crystallizer Post-Demolition
Soil Data Summary

Sample ID	Sample Date	Sample Depth (feet below ground surface)	Sulfate (mg/kg)	Antimony (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Lead (mg/kg)	Selenium (mg/kg)
Surface Soil Residential Assessment Level[1]:			NL	2.7	15.9	30	274.5	1.6
Surface Soil Critical PCL[2]:			NL	2.7	15.9	30	274.5	1.6
Crystallization Unit Area								
2016-CUFT-20 (0.5-1)	11/30/16	(0.5-1) below concrete	**3,820**	0.318 UJL	**10.9**	**0.110 J**	**18.4**	0.355 U
2016-CUFT-21 (0-0.5)	11/30/16	(0-0.5)	**112 J**	0.282 UJL	**8.18**	**0.407**	**69.3**	0.315 U
2016-CUFT-21 (0-0.5) (DUP 1)	11/30/16	(0-0.5)	**190 J**	0.287 UJL	**8.37**	**0.372**	**70.2**	0.321 U
2016-CUFT-22 (0-0.5)	11/30/16	(0-0.5)	**75.3**	0.273 UJL	**4.51**	**0.323**	**26.8**	0.304 U
2016-CUFT-23 (0.5-1)	11/30/16	(0.5-1) below concrete	**5,190**	0.313 UJL	**9.71**	**0.155 J**	**31.8**	0.349 U
2016-CUFT-24 (0-0.5)	11/30/16	(0-0.5)	**4,350**	0.299 UJL	**8.87**	**0.206 J**	**27.0**	0.333 U

Notes:
Detections are bolded.
1. [1] - The Residential Assessment Level (RAL) is the lower of the TRRP residential Tier 1 $^{Tot}Soil_{Comb}$ (applicable to surface soil only), $^{Air}Soil_{Inh\text{-}V}$ (applicable to mercury only), and Tier 1 or Tier 2 $^{GW}Soil_{Ing}$ PCLs for a 30-acre source area. More information on the TRRP protective concentration levels can be accessed at http://www.tceq.state.tx.us/remediation/trrp/trrppcls.html.
2. [2] - The critical PCL is the lower of the TRRP commercial-industrial Tier 1 $^{Tot}Soil_{Comb}$ (applicable to surface soil only), $^{Air}Soil_{Inh\text{-}V}$ (applicable to mercury only), and Tier 1 or Tier 2 $^{GW}Soil_{Ing}$ PCLs for a 30-acre source area. More information on the TRRP protective concentration levels can be accessed at http://www.tceq.state.tx.us/remediation/trrp/trrppcls.html.
3. Surface Soil = 0-15 feet bgs for residential land use and 0-5 feet bgs for commercial-industrial land use
4. bgs - below ground surface.
5. mg/kg - milligrams per kilogram.
6. SDL - Sample Detection Limit
7. MQL - Method Quantitation Limit
8. Detected results between the SDL and MQL (i.e., results with a laboratory J-flag) have been included in the above table since the reported concentration is below the calibration range.
9. J - Estimated data; the analyte was detected and identified. The associated numerical value (i.e., the reported sample concentration) is the approximate concentration of the analyte in the sample.
10. UJ - Estimated data; The analyte was not detected above the reported sample detection limit (SDL). The numerical value of the SDL is estimated and may be inaccurate.
11. L - Bias in sample result is likely to be low
12. NL - Not Listed

Prepared by: EPW 12/08/2016
Checked by: JX 12/08/2016, SJD 06/30/2017
Updated by: EPW 06/30/2017
Reviewed by: AMF 2/25/17

Data Usability Summary
TestAmerica Work Order: 600-140468-1

Sample Date:	November 30, 2016	**Project No.:**	1302086
Laboratory:	Test America (TLAP Certification T104704223-16-20)	**Client:**	Exide Technologies Inc.
Work Orders:	600-140468-1		
Intended Use:	Former Operating Plant (FOP) Response Action Plan (RAP)		
Site:	Exide Recycling Center, 7471 5th Street, Frisco, TX (Crystallization Unit Demolition)		

TESTS/METHODS

Metals (antimony, arsenic, cadmium, lead and selenium) by SW-846 6010B - Inductively Coupled Plasma-Atomic Emission Spectrometry

Sulfate by SW-846 9056A - Ion Chromatography

Percent Moisture by SM-20 2540B

SAMPLES

Five soil samples and one field duplicate were collected. See Table 1 for a complete cross-referenced listing of samples.

Golder completed a review of the above chemical analysis data for conformance with the requirements of the Texas Risk Reduction Program (TRRP) guidance document, Review and Reporting of COC Concentration Data (RG-366/TRRP-13 Revised May 2010) and for adherence to project objectives. The results of the review are discussed in this data usability summary (DUS).

Golder completed the review using the following laboratory and project submittals:

- Laboratory reportable data as defined in TRRP-13;
- Laboratory review checklists (LRC) with the associated exception reports;
- Laboratory Electronic Data Deliverable (EDD); and
- Project field notes from the sampling event.

The review of the reportable data included the quality control (QC) parameters listed below, as required per TRRP-13, using the applicable analytical method and project requirements:

- Data Completeness
- Chain-of-Custody Procedures

- Sample Condition - Holding Time, Preservation, and Containers
- Field Procedures
- Results Reporting Procedures
- Laboratory and Field QC Blanks
- Laboratory Control Spike and Matrix Spike Recoveries
- Surrogate Recoveries
- Laboratory and Field Duplicate Precision

Additionally, Golder used the LRC to evaluate the following QC parameters:

- Method Quantitation Limits (MQLs)
- Method Detection Limits (MDLs)
- Instrument Tuning, Calibration, and Performance
- Internal Standards

Criteria used for this data usability review are as follows:

- Soil Samples: + 3x MQL difference (if either result is less than 5x MQL) or 50% RPD (for field duplicates) as recommended in TRRP-13; and
- Inorganics: 70-130% spike recovery (and not less than 30% or data is rejected) and +MQL difference or 30% RPD (for laboratory duplicates) as recommended in TRRP-13.

If an item was found outside of the review criteria, the reviewer applied a data qualifier (DQ) and bias code to the results for the affected samples in accordance with TRRP-13. A list of all qualified results and definitions of the qualifier and bias codes are given in Table 2.

GLOSSARY OF TERMS

The following definitions apply for terms related to analyte reporting limits:

MDL (Method Detection Limit) – the minimum concentration of an analyte that the laboratory can measure and report with 99% confidence that the analyte concentration is greater than zero. The MDL is determined by the laboratory for each analyte in a given reagent matrix (water or soil) generally using the procedures specified in 40 CFR Part 136, Appendix B. It is a measure of the concentration an instrument can detect or 'see' in a given reagent matrix. TRRP-13 requires that the laboratory routinely check the MDL for reasonableness.

SDL (Sample Detection Limit) – the MDL adjusted to reflect sample-specific actions, such as dilution or use of smaller aliquot sizes than prescribed in the analytical method, and taking into account sample

characteristics, sample preparation, and analytical adjustments including dry-weight adjustments. It is a measure of the concentration an instrument can detect or 'see' in a given sample. For TRRP, non-detects are reported using the SDL. This term was originally called the SQL (Sample Quantitation Limit) before the TRRP rule revisions effective March 19, 2007.

Unadjusted MQL (Method Quantitation Limit) – the lowest non-zero concentration standard in the laboratory's initial calibration curve calculated using the normal aliquot sizes and final volumes prescribed in the analytical method. The unadjusted MQL is reported by the laboratory for each analyte in a given matrix (water or soil). It is a measure of the concentration an instrument can accurately measure in a typical sample. Per TRRP, the Unadjusted MQLs should be below the Levels of Required Performance (LORPs) for purposes of assessment as well as demonstration of conformance with critical Protective Concentration Levels (PCLs).

MQL – the unadjusted MQL adjusted to reflect sample-specific actions, such as dilution or use of smaller aliquot sizes than prescribed in the analytical method, and takes into account sample characteristics, sample preparation, and analytical adjustments including dry-weight adjustments. It is a measure of the concentration an instrument can accurately measure in a given sample. Analytes with concentrations above the SDL but below the MQL, though present in the sample, may not be accurately measured and are thus flagged as estimated (J).

LABORATORY CERTIFICATION

At the time the laboratory data were generated for this project, the laboratory was NELAC accredited under the Texas Laboratory Accreditation Program (TLAP) for the matrices, methods and parameters of analysis requested on the chain-of-custody forms.

USABILITY SUMMARY

1. Usability of Unqualified Non-Detects – Non-detects are reported at the sample detection limit (SDL) as required per TRRP. Additionally, according to the LRC, an MDL study was performed for each analyte and the MDLs were checked for reasonableness for each applicable analyte. The levels of required performance (LORPs) have been established by Golder as the Residential Assessment Levels (RALs), which are the minimum of the TRRP residential Tier 1 $^{Tot}Soil_{Comb}$ and Tier 1, 2 or 3 $^{GW}Soil_{Ing}$ PCLs for a 30-acre source area. As needed per TRRP, the Unadjusted MQL stated by the laboratory is at or below the LORP for each applicable analyte, and thus the analytical methods are appropriate and the results can be used to demonstrate conformance with the criteria.

2. Usability of Qualified Data – There are no major QC deficiencies, and thus all data is usable as qualified for the intended use. As shown in Table 2, the reviewer qualified some detects as estimated (J) due to minor QC deficiencies. Detects that are biased high can be used; however, the reported concentration may be high. Detects that are estimated may be either low or high. Results with a laboratory J-flag (i.e., at a concentration between the SDL and MQL) should be considered estimates. The actual value is not expected to exceed the sample MQL.

Reviewer: Jie Xu 1/3/2017

QUALITY CONTROL PARAMETERS AND OUTCOMES

Data Completeness

The laboratory data package contains all necessary data (i.e., the laboratory reportable data per TRRP-13) and the EDD contains all sample results in acceptable format. Minor revisions on the job description were required for the final report generated on 12/8/2016 for work order 600-140468-1. All revisions are detailed in the laboratory narrative.

Chain-of-Custody

Proper sample custody procedures were used, which confirms that the integrity of the samples was maintained. Additionally, the information on the custody records is complete and agrees with that in the field notes and laboratory reports.

Sample Condition

Samples were collected in appropriate containers, properly preserved in the field, and prepared and analyzed within the holding times as required in the analytical methods, which ensures that the samples were not affected by analyte degradation. According to the laboratory, samples were shipped to the Houston, TX laboratory for analysis.

- For 600-140468-1, the corrected temperature of the cooler at receipt in Houston was 2.6°C.

Field Procedures

The samples were collected and placed immediately into sterilized jars provided by the laboratory and then into a cooler with ice for overnight delivery to the laboratory. One field duplicate was collected with the investigative soil samples.

Results Reporting Procedures

The hardcopy analytical results include a Result, MQL (adjusted), and SDL. Equis format EDDs were provided, which includes the MDL, SDL (under the SQL column per previously used terminology) and the MQL, which is not adjusted for sample specific factors.

Results are reported in mg/kg with dry-weight correction for the metals. Non-detects are reported using the SDL as specified per TRRP and detects between the SDL and MQL are reported with a laboratory J-flag.

The concentration reported for detects between the SDL and MQL is below the calibration range and thus is considered estimated.

MQLs- The LORPs have been established by Golder/PBW as the Resident Assessment Levels (RALs), which are the minimum of the TRRP residential Tier 1 $^{Tot}Soil_{Comb}$ and Tier 1, 2 or 3 $^{GW}Soil_{Ing}$ PCLs for a 30-acre source area. The Unadjusted MQLs for the laboratory are at or below the LORPs for each applicable analyte.

MDLs- According to the LRC, an MDL study was performed for each analyte, and the MDLs were checked for reasonableness and either adjusted or supported by the analysis of detectability check standards (DCS) for each applicable analyte as required per TRRP-13. Results for the DCS are included in the data packages.

Laboratory Blanks

Results for samples prepared in the same QC batch as a contaminated method blank may be affected by laboratory contamination. There were no detections in the laboratory blanks.

Field QC Blanks

No field blank or equipment blank was collected as part of this sampling event.

Laboratory Control Sample

The laboratory prepared one laboratory control sample (LCS) for each analytical batch and reported recoveries for all of the analytes for each test. The LCS recoveries are within the TRRP recommended criteria, which indicates good accuracy for the preparation and analysis technique on a sample, free of matrix effects, except for the following:

- For analytical batch 202346:
  - Antimony was below the % recovery criteria of 70%-130% for LCS (61%). This has been qualified as “UJL” in Table 2 for affected batch samples.

Matrix Spike Recovery

The laboratory prepared one or more matrix spike (MS) and matrix spike duplicate (MSD) with each analytical batch. MS/MSD recoveries and relative percent difference (RPD) are reported for the same analytes as the LCS. Sample 600-140468-1 and 600-140468-10 were selected by the laboratory for site-specific MS/MSD analysis for sulfate. Other MS/MSD analyses for metals (antimony, arsenic, cadmium, lead and selenium) were conducted using samples unrelated to the project and were not evaluated.

The MS/MSD recoveries and RPDs are within the TRRP recommended criteria, which indicates good accuracy for the preparation and analysis technique on a sample free of matrix effects, except as follows:

- Batch 202177:
  - Sulfate was below the % recovery criteria for MS and MSD at 57% and 57%, respectively. However, as the spike amount is less than four times the result in the unspiked parent sample, the MS/MSD recovery check is waived and no qualification is necessary.
- Batch 202266:
  - Sulfate was below the % recovery criteria for MS and MSD at 53% and 54%, respectively. However, as the spike amount is less than four times the result in the unspiked parent sample, the MS/MSD recovery check is waived and no qualification is necessary.

Surrogate Recovery

Since organic analyses were not requested for these data packages, surrogate recoveries were not available for evaluation.

Laboratory Duplicate Precision

Since laboratory analytical duplicate recovery and precision data were not requested for these data packages, laboratory duplicate precision were not evaluated.

Field Duplicate Precision

One field duplicate was collected with the samples. Results are summarized in Table 3. The RPDs (or the absolute difference between results for concentrations <5x MQL and for non-detects) are within the TRRP criteria which indicates good precision for the sampling, preparation, and analysis technique on the given sample matrix. Qualifications are indicated on Table 3.

Instrument Tuning

According to the LRC, mass spectral tuning is not applicable.

Instrument Calibration

According to the LRC, initial and continuing calibration data met method requirements for all reported results, which indicates the instruments were properly calibrated to measure analyte concentrations.

Instrument Performance

According to the LRC, the serial dilution and ICP interference check samples met method requirements, which indicates that no significant matrix interference exists.

Internal Standards

According to the LRC, area counts and retention times are not applicable.

TABLE 1
CROSS REFERENCE OF FIELD SAMPLE IDENTIFICATIONS AND LABORATORY IDENTIFICATIONS

Lab Sample ID	Field Sample ID	Sample Date	Matrix	Comments
600-140468-1	2016-CUFT-20 (0.5-1)	11/30/2016	Solid	
600-140468-4	2016-CUFT-21 (0-0.5)	11/30/2016	Solid	
600-140468-7	2016-CUFT-22 (0-0.5)	11/30/2016	Solid	
600-140468-10	2016-CUFT-23 (0.5-1)	11/30/2016	Solid	
600-140468-13	2016-CUFT-24 (0-0.5)	11/30/2016	Solid	
600-140468-16	Dup-01	11/30/2016	Solid	Duplicate for 2016-CUFT-21 (0-0.5)

TABLE 2 - QUALIFIED DATA

Lab Sample ID	Field Sample ID	Analyte	Result	Units	Qualifer	Explanation
600-140468-1	2016-CUFT-20 (0.5-1)	Antimony	<0.318	mg/Kg	UJL	Laboratory control sample % recovery below specification, but greater than 30%.
600-140468-1	2016-CUFT-20 (0.5-1)	Cadmium	0.110	mg/Kg	J	Estimated concentration between SDL and MQL.
600-140468-4	2016-CUFT-21 (0-0.5)	Sulfate	112	mg/Kg	J	RPD with Dup-01 greater than 50%.
600-140468-4	2016-CUFT-21 (0-0.5)	Antimony	<0.282	mg/Kg	UJL	Laboratory control sample % recovery below specification, but greater than 30%.
600-140468-7	2016-CUFT-22 (0-0.5)	Antimony	<0.273	mg/Kg	UJL	Laboratory control sample % recovery below specification, but greater than 30%.
600-140468-10	2016-CUFT-23 (0.5-1)	Antimony	<0.313	mg/Kg	UJL	Laboratory control sample % recovery below specification, but greater than 30%.
600-140468-10	2016-CUFT-23 (0.5-1)	Cadmium	0.155	mg/Kg	J	Estimated concentration between SDL and MQL.
600-140468-13	2016-CUFT-24 (0-0.5)	Antimony	<0.299	mg/Kg	UJL	Laboratory control sample % recovery below specification, but greater than 30%.
600-140468-13	2016-CUFT-24 (0-0.5)	Cadmium	0.206	mg/Kg	J	Estimated concentration between SDL and MQL.
600-140468-16	Dup-01	Sulfate	190	mg/Kg	J	RPD with 2016-CUFT-21 (0-0.5), parent sample, greater than 50%.
600-140468-16	Dup-01	Antimony	0.287	mg/Kg	UJL	Laboratory control sample % recovery below specification, but greater than 30%.

Notes:
SDL - Sample Detection Limit
MQL - Method Quantitation Limit
Detected results between the SDL and MQL (i.e., results with a laboratory J-flag) have been included in the above table since the reported concentration is below the calibration range.
J - Estimated data; the analyte was detected and identified. The associated numerical value (i.e., the reported sample concentration) is the approximate concentration of the analyte in the sample.
UJ - Estimated data; The analyte was not detected above the reported sample detection limit (SDL). The numerical value of the SDL is estimated and may be inaccurate.
L - Bias in sample result is likely to be low.

TABLE 3 - FIELD DUPLICATE PRECISION CALCULATIONS

Duplicate and Parent Sample Field Identification	Analyte	Sample Result		Duplicate Result		RPD[a]	Accept or Reject	Qualifier Added
Dup-01 / 2016-CUFT-21 (0-0.5)	Sulfate	112		190		51.7	A	J
	Arsenic	8.18		8.37		2.3	A	-
	Cadmium	0.407		0.372		9.0	A	-
	Lead	69.3		70.2		1.3	A	-

Notes:

[a] Relative Percent Difference (RPD) = ((SR - DR)*200)/(SR + DR), where SR is the sample result and DR is the duplicate result.

A - Acceptable Data

The RPD test (<50%) applies if both results are greater than 5x MQL. Otherwise, the absolute difference test (< 2x MQL) applies.

J - Estimated data; the analyte was detected and identified. The associated numerical value (i.e., the reported sample concentration) is the approximate concentration of the analyte in the sample.

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Houston
6310 Rothway Street
Houston, TX 77040
Tel: (713)690-4444

TestAmerica Job ID: 600-140468-1
Client Project/Site: Exide - Crystallization Unit
Revision: 1

For:
Golder Associates Inc.
820 South Main Street
Suite 100
St. Charles, Missouri 63301

Attn: Anne Faeth-Boyd

Authorized for release by:
12/15/2016 11:26:13 AM

Cathy Upton, Project Manager I
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LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Appendix A
Laboratory Data Package Cover Page - Page 1 of 4

This data package is for TestAmerica Houston job number 600-140468-1 and consists of:

- ☑ R1 - Field chain-of-custody documentation;
- ☑ R2 - Sample identification cross-reference;
- ☑ R3 - Test reports (analytical data sheets) for each environmental sample that includes:
  a. Items consistent with NELAC Chapter 5,
  b. dilution factors,
  c. preparation methods,
  d. cleanup methods, and
  e. if required for the project, tentatively identified compounds (TICs).
- ☐ R4 - Surrogate recovery data including:
  a. Calculated recovery (%R), and
  b. The laboratory's surrogate QC limits.
- ☑ R5 - Test reports/summary forms for blank samples;
- ☑ R6 - Test reports/summary forms for laboratory control samples (LCSs) including:
  a. LCS spiking amounts,
  b. Calculated %R for each analyte, and
  c. The laboratory's LCS QC limits.
- ☑ R7 - Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  a. Samples associated with the MS/MSD clearly identified,
  b. MS/MSD spiking amounts,
  c. Concentration of each MS/MSD analyte measured in the parent and spiked samples,
  d. Calculated %Rs and relative percent differences (RPDs), and
  e. The laboratory's MS/MSD QC limits
- ☑ R8 - Laboratory analytical duplicate (if applicable) recovery and precision:
  a. The amount of analyte measured in the duplicate,
  b. The calculated RPD, and
  c. The laboratory's QC limits for analytical duplicates.
- ☑ R9 - List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
- ☑ R10 - Other problems or anomalies.

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Jeanette Castillo, for Cathy Upton		12/8/2016
Name (printed)	Signature	Date

Project Manager I
Official Title (printed)

Laboratory Review Checklist: Reportable Data - Page 2 of 4

Laboratory Name:	TestAmerica Houston	LRC Date:	12/8/2016
Project Name:	Exide Recycling Center - Main	Laboratory Job Number:	600-140468-1
Reviewer Name:	Jeanette Castillo, for Cathy Upton		

#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?	X				
		Were % moisture (or solids) reported for all soil and sediment samples?	X				
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
		If required for the project, are TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?			X		
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			R07C
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?	X				
		Were analytical duplicates analyzed at the appropriate frequency?	X				
		Were RPDs or relative standard deviations within the laboratory QC limits?		X			R08C
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review checklist: Supporting Data - Page 3 of 4

Laboratory Name:	TestAmerica Houston	LRC Date:	12/8/2016
Project Name:	Exide Recycling Center - Main	Laboratory Job Number:	600-140468-1
Reviewer Name:	Jeanette Castillo, for Cathy Upton		

#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICV and CCV) and continuing calibration blank (CCB):**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
S3	O	**Mass spectral tuning**					
		Was the appropriate compound for the method used for tuning?			X		
		Were ion abundance data within the method-required QC limits?			X		
S4	O	**Internal standards (IS)**					
		Were IS area counts and retention times within the method-required QC limits?			X		
S5	OI	**Raw data (NELAC Section 5.5.10)**					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs)**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods (NELAC Chapter 5)**					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs)**					
		Are laboratory SOPs current and on file for each method performed?	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
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Laboratory Review Checklist: Exception Reports - Page 4 of 4

Laboratory Name:	TestAmerica Houston	LRC Date:	12/8/2016
Project Name:	Exide Recycling Center - Main	Laboratory Job Number:	600-140468-1
Reviewer Name:	Jeanette Castillo, for Cathy Upton		

ER #[1]	Description
R07C	Method 6010B: 600-140175-A-7-C MS failed the recovery criteria for the following analyte: Antimony. Matrix interference is suspected. Method 9056A: 600-140468-1 MS/MSD failed the recovery criteria for the following analyte: Sulfate. Matrix interference is suspected. Method 9056A: 600-140468-10 MS/MSD failed the recovery criteria for the following analyte: Sulfate. Matrix interference is suspected.
R08C	Method 6010B: 600-140175-A-7-B DU failed the RPD criteria for the following analytes: Antimony and Cadmium.

1. Items identified by the letter “R” must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter “S” should be retained and made available upon request for the appropriate retention period.
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3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if “NR” or “No” is checked).

Matrix: Solid
Method: EPA 300 or SW-846 9056
Prep Method:
Date Analyzed: 10/29/2015
Job #: 600-119467
TALS Batch: 175054
Units: mg/Kg

Analyte	Instrument #	MDL	DCS Spike	Measured Result	MQL
Bromide	CHWC11	1.005	2.000	1.385	4
Chloride	CHWC11	0.534	4.000	4.905	4
Fluoride	CHWC11	0.601	2.000	2.177	2
Nitrate as N	CHWC11	0.251	2.000	2.569	2
Nitrite as N	CHWC11	0.297	2.000	2.558	2
Sulfate	CHWC11	0.957	4.000	2.885	5

DCS = Detection Check Standard
MQL = Method Quantitation Limit

Matrix:	Solid
Method:	6010B
Prep Method:	3050B
Date Analyzed:	8/25/2016
Job #:	600-133875
TALS Batch:	195548
Units:	mg/Kg

Analyte	Instrument #	MDL	DCS Spike	Measured Result	MQL
Ag	Thermo6500	0.119	0.200	0.200	0.4
Al	Thermo6500	0.300	0.500	1.435	25
As	Thermo6500	0.218	0.500	0.475	1
B	Thermo6500	0.386	0.600	0.665	20
Ba	Thermo6500	0.030	0.030	0.115	1
Be	Thermo6500	0.015	0.020	0.020	0.25
Ca	Thermo6500	0.864	2.500	2.020	100
Cd	Thermo6500	0.026	0.050	0.050	0.25
Co	Thermo6500	0.068	0.100	0.105	0.5
Cr	Thermo6500	0.051	0.100	0.090	0.5
Cu	Thermo6500	0.174	0.500	0.505	0.5
Fe	Thermo6500	2.530	4.000	4.340	20
K	Thermo6500	11.000	12.000	12.205	100
Li	Thermo6500	0.008	0.010	0.065	10
Mg	Thermo6500	1.920	3.000	2.695	100
Mn	Thermo6500	0.038	0.050	0.060	1.5
Mo	Thermo6500	0.136	0.350	0.355	0.5
Na	Thermo6500	0.886	2.400	2.970	100
Ni	Thermo6500	0.117	0.150	0.130	1
Pb	Thermo6500	0.105	0.200	0.225	0.5
Sb	Thermo6500	0.232	0.450	0.555	2.5
Se	Thermo6500	0.259	0.500	0.495	2
Si	Thermo6500	0.117	0.270	0.455	10
Sn	Thermo6500	0.087	0.150	0.120	1
Sr	Thermo6500	0.003	0.005	1.040	0.25
Ti	Thermo6500	0.015	0.030	0.010	0.5
Tl	Thermo6500	0.277	0.700	0.825	1.5
V	Thermo6500	0.079	0.150	0.145	0.5
Zn	Thermo6500	0.108	0.200	0.185	1.5

DCS = Detection Check Standard
MQL = Method Quantitation Limit

Case Narrative

Client: Golder Associates Inc.
Project/Site: Exide - Crystallization Unit

TestAmerica Job ID: 600-140468-1

Job ID: 600-140468-1

Laboratory: TestAmerica Houston

Narrative

Job Narrative
600-140468-1

Comments
The report was revised to change the job description per client request, replacing the final report generated on 12/8/16.

Receipt
The samples were received on 12/1/2016 10:46 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.6º C.

Method Summary

Client: Golder Associates Inc.
Project/Site: Exide - Crystallization Unit

TestAmerica Job ID: 600-140468-1

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	TAL HOU
6010B	Inductively Coupled Plasma - Atomic Emission Spectrometry	SW846	TAL HOU
2540B	Percent Moisture	SM20	TAL HOU

Protocol References:

SM20 = "Standard Methods For The Examination Of Water And Wastewater", 20th Edition."

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL HOU = TestAmerica Houston, 6310 Rothway Street, Houston, TX 77040, TEL (713)690-4444

Sample Summary

Client: Golder Associates Inc.
Project/Site: Exide - Crystallization Unit

TestAmerica Job ID: 600-140468-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
600-140468-1	2016-CUFT-20 (0.5-1)	Solid	11/30/16 14:05	12/01/16 10:46
600-140468-4	2016-CUFT-21 (0-0.5)	Solid	11/30/16 14:34	12/01/16 10:46
600-140468-7	2016-CUFT-22 (0-0.5)	Solid	11/30/16 16:10	12/01/16 10:46
600-140468-10	2016-CUFT-23 (0.5-1)	Solid	11/30/16 15:39	12/01/16 10:46
600-140468-13	2016-CUFT-24 (0-0.5)	Solid	11/30/16 16:56	12/01/16 10:46
600-140468-16	Dup-01	Solid	11/30/16 00:00	12/01/16 10:46

Client Sample ID: 2016-CUFT-20 (0.5-1)

Lab Sample ID: 600-140468-1
Date Collected: 11/30/16 14:05
Matrix: Solid
Date Received: 12/01/16 10:46
Percent Solids: 72.2

Method: 9056A - Anions, Ion Chromatography - Soluble

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**3820**		70.0	13.4	mg/Kg	☼		12/05/16 21:10	10

Method: 6010B - Inductively Coupled Plasma - Atomic Emission Spectrometry

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.318	U	3.43	0.318	mg/Kg	☼	12/06/16 12:46	12/07/16 13:08	1
Arsenic	**10.9**		1.37	0.299	mg/Kg	☼	12/06/16 12:46	12/07/16 13:08	1
Cadmium	**0.110**	**J**	0.343	0.0351	mg/Kg	☼	12/06/16 12:46	12/07/16 13:08	1
Lead	**18.4**		0.686	0.144	mg/Kg	☼	12/06/16 12:46	12/07/16 13:08	1
Selenium	0.355	U	2.74	0.355	mg/Kg	☼	12/06/16 12:46	12/07/16 13:08	1

General Chemistry

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**27.8**		1.0	1.0	%			12/02/16 14:51	1
Percent Solids	**72.2**		1.0	1.0	%			12/02/16 14:51	1

Client Sample ID: 2016-CUFT-21 (0-0.5)

Lab Sample ID: 600-140468-4
Date Collected: 11/30/16 14:34
Matrix: Solid
Date Received: 12/01/16 10:46
Percent Solids: 79.1

Method: 9056A - Anions, Ion Chromatography - Soluble

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**112**		6.23	1.19	mg/Kg	☼		12/05/16 22:10	1

Method: 6010B - Inductively Coupled Plasma - Atomic Emission Spectrometry

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.282	U	3.04	0.282	mg/Kg	☼	12/06/16 12:46	12/07/16 12:54	1
Arsenic	**8.18**		1.22	0.265	mg/Kg	☼	12/06/16 12:46	12/07/16 12:54	1
Cadmium	**0.407**		0.304	0.0311	mg/Kg	☼	12/06/16 12:46	12/07/16 12:54	1
Lead	**69.3**		0.608	0.128	mg/Kg	☼	12/06/16 12:46	12/07/16 12:54	1
Selenium	0.315	U	2.43	0.315	mg/Kg	☼	12/06/16 12:46	12/07/16 12:54	1

General Chemistry

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**20.9**		1.0	1.0	%			12/02/16 14:51	1
Percent Solids	**79.1**		1.0	1.0	%			12/02/16 14:51	1

Client Sample ID: 2016-CUFT-22 (0-0.5)

Lab Sample ID: 600-140468-7
Date Collected: 11/30/16 16:10
Matrix: Solid
Date Received: 12/01/16 10:46
Percent Solids: 80.3

Method: 9056A - Anions, Ion Chromatography - Soluble

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**75.3**		6.12	1.17	mg/Kg	☼		12/05/16 22:30	1

Method: 6010B - Inductively Coupled Plasma - Atomic Emission Spectrometry

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.273	U	2.94	0.273	mg/Kg	☼	12/06/16 12:46	12/07/16 12:56	1
Arsenic	**4.51**		1.17	0.256	mg/Kg	☼	12/06/16 12:46	12/07/16 12:56	1
Cadmium	**0.323**		0.294	0.0301	mg/Kg	☼	12/06/16 12:46	12/07/16 12:56	1
Lead	**26.8**		0.587	0.123	mg/Kg	☼	12/06/16 12:46	12/07/16 12:56	1
Selenium	0.304	U	2.35	0.304	mg/Kg	☼	12/06/16 12:46	12/07/16 12:56	1

General Chemistry

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	19.7		1.0	1.0	%			12/02/16 14:51	1
Percent Solids	80.3		1.0	1.0	%			12/02/16 14:51	1

Client Sample ID: 2016-CUFT-23 (0.5-1)

Lab Sample ID: 600-140468-10

Date Collected: 11/30/16 15:39
Matrix: Solid
Date Received: 12/01/16 10:46
Percent Solids: 72.0

Method: 9056A - Anions, Ion Chromatography - Soluble

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	5190		69.7	13.3	mg/Kg	☼		12/06/16 22:09	10

Method: 6010B - Inductively Coupled Plasma - Atomic Emission Spectrometry

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.313	U	3.37	0.313	mg/Kg	☼	12/06/16 12:46	12/07/16 12:58	1
Arsenic	9.71		1.35	0.294	mg/Kg	☼	12/06/16 12:46	12/07/16 12:58	1
Cadmium	0.155	J	0.337	0.0345	mg/Kg	☼	12/06/16 12:46	12/07/16 12:58	1
Lead	31.8		0.674	0.142	mg/Kg	☼	12/06/16 12:46	12/07/16 12:58	1
Selenium	0.349	U	2.70	0.349	mg/Kg	☼	12/06/16 12:46	12/07/16 12:58	1

General Chemistry

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	28.0		1.0	1.0	%			12/02/16 14:51	1
Percent Solids	72.0		1.0	1.0	%			12/02/16 14:51	1

Client Sample ID: 2016-CUFT-24 (0-0.5)

Lab Sample ID: 600-140468-13

Date Collected: 11/30/16 16:56
Matrix: Solid
Date Received: 12/01/16 10:46
Percent Solids: 74.0

Method: 9056A - Anions, Ion Chromatography - Soluble

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	4350		67.4	12.9	mg/Kg	☼		12/05/16 23:10	10

Method: 6010B - Inductively Coupled Plasma - Atomic Emission Spectrometry

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.299	U	3.22	0.299	mg/Kg	☼	12/06/16 12:46	12/07/16 13:10	1
Arsenic	8.87		1.29	0.281	mg/Kg	☼	12/06/16 12:46	12/07/16 13:10	1
Cadmium	0.206	J	0.322	0.0330	mg/Kg	☼	12/06/16 12:46	12/07/16 13:10	1
Lead	27.0		0.644	0.135	mg/Kg	☼	12/06/16 12:46	12/07/16 13:10	1
Selenium	0.333	U	2.57	0.333	mg/Kg	☼	12/06/16 12:46	12/07/16 13:10	1

General Chemistry

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	26.0		1.0	1.0	%			12/02/16 15:27	1
Percent Solids	74.0		1.0	1.0	%			12/02/16 15:27	1

Client Sample ID: Dup-01

Lab Sample ID: 600-140468-16

Date Collected: 11/30/16 00:00
Matrix: Solid
Date Received: 12/01/16 10:46
Percent Solids: 79.1

Method: 9056A - Anions, Ion Chromatography - Soluble

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	190		6.37	1.22	mg/Kg	☼		12/05/16 23:30	1

Client Sample ID: Dup-01
Date Collected: 11/30/16 00:00
Date Received: 12/01/16 10:46

Lab Sample ID: 600-140468-16
Matrix: Solid
Percent Solids: 79.1

Method: 6010B - Inductively Coupled Plasma - Atomic Emission Spectrometry

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.287	U	3.10	0.287	mg/Kg	☼	12/06/16 12:46	12/07/16 13:12	1
Arsenic	**8.37**		1.24	0.270	mg/Kg	☼	12/06/16 12:46	12/07/16 13:12	1
Cadmium	**0.372**		0.310	0.0317	mg/Kg	☼	12/06/16 12:46	12/07/16 13:12	1
Lead	**70.2**		0.619	0.130	mg/Kg	☼	12/06/16 12:46	12/07/16 13:12	1
Selenium	0.321	U	2.48	0.321	mg/Kg	☼	12/06/16 12:46	12/07/16 13:12	1

General Chemistry

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**20.9**		1.0	1.0	%			12/02/16 14:51	1
Percent Solids	**79.1**		1.0	1.0	%			12/02/16 14:51	1

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
N1	MS, MSD: Spike recovery exceeds upper or lower control limits.
E	Result is greater then the UQL and the concentration is an estimated value.
U	Analyte was not detected at or above the SDL.

Metals

Qualifier	Qualifier Description
F	Duplicate RPD exceeds the control limit
U	Analyte was not detected at or above the SDL.
N1	MS, MSD: Spike recovery exceeds upper or lower control limits.
J	Result is less than the MQL but greater than or equal to the SDL and the concentration is an estimated value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 600-202175/1-A
Matrix: Solid
Analysis Batch: 202177

Client Sample ID: Method Blank
Prep Type: Soluble

Analyte	MB Result	MB Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	0.957	U	5.00	0.957	mg/Kg			12/05/16 20:30	1

Lab Sample ID: LCS 600-202175/2-A
Matrix: Solid
Analysis Batch: 202177

Client Sample ID: Lab Control Sample
Prep Type: Soluble

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	200	180.3		mg/Kg		90	90 - 110

Lab Sample ID: 600-140468-1 MS
Matrix: Solid
Analysis Batch: 202177

Client Sample ID: 2016-CUFT-20 (0.5-1)
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	3820		1400	4621	N1	mg/Kg	☼	57	80 - 120

Lab Sample ID: 600-140468-1 MSD
Matrix: Solid
Analysis Batch: 202177

Client Sample ID: 2016-CUFT-20 (0.5-1)
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	3820		1400	4613	N1	mg/Kg	☼	57	80 - 120	0	20

Lab Sample ID: MB 600-202265/1-A
Matrix: Solid
Analysis Batch: 202266

Client Sample ID: Method Blank
Prep Type: Soluble

Analyte	MB Result	MB Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	0.957	U	5.00	0.957	mg/Kg			12/06/16 21:29	1

Lab Sample ID: LCS 600-202265/2-A
Matrix: Solid
Analysis Batch: 202266

Client Sample ID: Lab Control Sample
Prep Type: Soluble

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	200	188.6		mg/Kg		94	90 - 110

Lab Sample ID: 600-140468-10 MS
Matrix: Solid
Analysis Batch: 202266

Client Sample ID: 2016-CUFT-23 (0.5-1)
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	5190		1390	5928	E N1	mg/Kg	☼	53	80 - 120

Lab Sample ID: 600-140468-10 MSD
Matrix: Solid
Analysis Batch: 202266

Client Sample ID: 2016-CUFT-23 (0.5-1)
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	5190		1390	5933	E N1	mg/Kg	☼	54	80 - 120	0	20

Method: 6010B - Inductively Coupled Plasma - Atomic Emission Spectrometry

Lab Sample ID: MB 600-202256/1-A
Matrix: Solid
Analysis Batch: 202346

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 202256

Analyte	MB Result	MB Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.232	U	2.50	0.232	mg/Kg		12/06/16 12:46	12/07/16 12:05	1
Arsenic	0.218	U	1.00	0.218	mg/Kg		12/06/16 12:46	12/07/16 12:05	1
Cadmium	0.0256	U	0.250	0.0256	mg/Kg		12/06/16 12:46	12/07/16 12:05	1
Lead	0.105	U	0.500	0.105	mg/Kg		12/06/16 12:46	12/07/16 12:05	1
Selenium	0.259	U	2.00	0.259	mg/Kg		12/06/16 12:46	12/07/16 12:05	1

Lab Sample ID: LCSSRM 600-202256/2-A
Matrix: Solid
Analysis Batch: 202346

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 202256

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	86.5	52.80		mg/Kg		61.0	0.8 - 198.8
Arsenic	97.5	99.09		mg/Kg		101.6	69.2 - 145.6
Cadmium	76.6	76.62		mg/Kg		100.0	73.2 - 126.8
Lead	96.7	100.0		mg/Kg		103.4	81.7 - 117.9
Selenium	161	162.7		mg/Kg		101.1	77.6 - 123.0

Lab Sample ID: 600-140175-A-7-C MS
Matrix: Solid
Analysis Batch: 202346

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 202256

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	10.3		59.3	28.87	N1	mg/Kg	☼	31	75 - 125
Arsenic	16.0		59.3	79.01		mg/Kg	☼	106	75 - 125
Cadmium	13.7		29.7	42.86		mg/Kg	☼	98	75 - 125
Selenium	0.301	U	59.3	59.73		mg/Kg	☼	101	75 - 125

Lab Sample ID: 600-140175-A-7-B DU
Matrix: Solid
Analysis Batch: 202346

Client Sample ID: Duplicate
Prep Type: Total/NA
Prep Batch: 202256

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Antimony	10.3		12.99		mg/Kg	☼	23	20
Arsenic	16.0		14.12		mg/Kg	☼	12	20
Cadmium	13.7		10.14	F	mg/Kg	☼	30	20
Selenium	0.301	U	0.296	U	mg/Kg	☼	NC	20

Method: 2540B - Percent Moisture

Lab Sample ID: 600-140407-F-7 DU
Matrix: Solid
Analysis Batch: 202053

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Percent Moisture	19.6		19.5		%		0.8	20

Method: 2540B - Percent Moisture (Continued)

Lab Sample ID: 600-140407-F-7 DU
Matrix: Solid
Analysis Batch: 202053

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Percent Solids	80.4			80.5		%				0.2	20

Lab Sample ID: 600-140433-B-3 DU
Matrix: Solid
Analysis Batch: 202053

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Percent Moisture	11.2			9.7		%				14	20
Percent Solids	88.8			90.3		%				2	20

Unadjusted Detection Limits

Client: Golder Associates Inc.
Project/Site: Exide - Crystallization Unit

TestAmerica Job ID: 600-140468-1

Method: 9056A - Anions, Ion Chromatography - Soluble

Leach: DI Leach

Analyte	MQL	MDL	Units	Method
Sulfate	5.00	0.957	mg/Kg	9056A

Method: 6010B - Inductively Coupled Plasma - Atomic Emission Spectrometry

Prep: 3050B

Analyte	MQL	MDL	Units	Method
Antimony	2.50	0.232	mg/Kg	6010B
Arsenic	1.00	0.218	mg/Kg	6010B
Cadmium	0.250	0.0256	mg/Kg	6010B
Lead	0.500	0.105	mg/Kg	6010B
Selenium	2.00	0.259	mg/Kg	6010B

General Chemistry

Analyte	MQL	MDL	Units	Method
Percent Moisture	1.0	1.0	%	2540B
Percent Solids	1.0	1.0	%	2540B

HPLC/IC

Leach Batch: 202175

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-140468-1	2016-CUFT-20 (0.5-1)	Soluble	Solid	DI Leach	
600-140468-4	2016-CUFT-21 (0-0.5)	Soluble	Solid	DI Leach	
600-140468-7	2016-CUFT-22 (0-0.5)	Soluble	Solid	DI Leach	
600-140468-13	2016-CUFT-24 (0-0.5)	Soluble	Solid	DI Leach	
600-140468-16	Dup-01	Soluble	Solid	DI Leach	
MB 600-202175/1-A	Method Blank	Soluble	Solid	DI Leach	
LCS 600-202175/2-A	Lab Control Sample	Soluble	Solid	DI Leach	
600-140468-1 MS	2016-CUFT-20 (0.5-1)	Soluble	Solid	DI Leach	
600-140468-1 MSD	2016-CUFT-20 (0.5-1)	Soluble	Solid	DI Leach	

Analysis Batch: 202177

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-140468-1	2016-CUFT-20 (0.5-1)	Soluble	Solid	9056A	202175
600-140468-4	2016-CUFT-21 (0-0.5)	Soluble	Solid	9056A	202175
600-140468-7	2016-CUFT-22 (0-0.5)	Soluble	Solid	9056A	202175
600-140468-13	2016-CUFT-24 (0-0.5)	Soluble	Solid	9056A	202175
600-140468-16	Dup-01	Soluble	Solid	9056A	202175
MB 600-202175/1-A	Method Blank	Soluble	Solid	9056A	202175
LCS 600-202175/2-A	Lab Control Sample	Soluble	Solid	9056A	202175
600-140468-1 MS	2016-CUFT-20 (0.5-1)	Soluble	Solid	9056A	202175
600-140468-1 MSD	2016-CUFT-20 (0.5-1)	Soluble	Solid	9056A	202175

Leach Batch: 202265

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-140468-10	2016-CUFT-23 (0.5-1)	Soluble	Solid	DI Leach	
MB 600-202265/1-A	Method Blank	Soluble	Solid	DI Leach	
LCS 600-202265/2-A	Lab Control Sample	Soluble	Solid	DI Leach	
600-140468-10 MS	2016-CUFT-23 (0.5-1)	Soluble	Solid	DI Leach	
600-140468-10 MSD	2016-CUFT-23 (0.5-1)	Soluble	Solid	DI Leach	

Analysis Batch: 202266

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-140468-10	2016-CUFT-23 (0.5-1)	Soluble	Solid	9056A	202265
MB 600-202265/1-A	Method Blank	Soluble	Solid	9056A	202265
LCS 600-202265/2-A	Lab Control Sample	Soluble	Solid	9056A	202265
600-140468-10 MS	2016-CUFT-23 (0.5-1)	Soluble	Solid	9056A	202265
600-140468-10 MSD	2016-CUFT-23 (0.5-1)	Soluble	Solid	9056A	202265

Metals

Prep Batch: 202256

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-140468-1	2016-CUFT-20 (0.5-1)	Total/NA	Solid	3050B	
600-140468-4	2016-CUFT-21 (0-0.5)	Total/NA	Solid	3050B	
600-140468-7	2016-CUFT-22 (0-0.5)	Total/NA	Solid	3050B	
600-140468-10	2016-CUFT-23 (0.5-1)	Total/NA	Solid	3050B	
600-140468-13	2016-CUFT-24 (0-0.5)	Total/NA	Solid	3050B	
600-140468-16	Dup-01	Total/NA	Solid	3050B	
MB 600-202256/1-A	Method Blank	Total/NA	Solid	3050B	
LCSSRM 600-202256/2-A	Lab Control Sample	Total/NA	Solid	3050B	

Metals (Continued)

Prep Batch: 202256 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-140175-A-7-C MS	Matrix Spike	Total/NA	Solid	3050B	
600-140175-A-7-B DU	Duplicate	Total/NA	Solid	3050B	

Analysis Batch: 202346

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-140468-1	2016-CUFT-20 (0.5-1)	Total/NA	Solid	6010B	202256
600-140468-4	2016-CUFT-21 (0-0.5)	Total/NA	Solid	6010B	202256
600-140468-7	2016-CUFT-22 (0-0.5)	Total/NA	Solid	6010B	202256
600-140468-10	2016-CUFT-23 (0.5-1)	Total/NA	Solid	6010B	202256
600-140468-13	2016-CUFT-24 (0-0.5)	Total/NA	Solid	6010B	202256
600-140468-16	Dup-01	Total/NA	Solid	6010B	202256
MB 600-202256/1-A	Method Blank	Total/NA	Solid	6010B	202256
LCSSRM 600-202256/2-A	Lab Control Sample	Total/NA	Solid	6010B	202256
600-140175-A-7-C MS	Matrix Spike	Total/NA	Solid	6010B	202256
600-140175-A-7-B DU	Duplicate	Total/NA	Solid	6010B	202256

General Chemistry

Analysis Batch: 202053

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-140468-1	2016-CUFT-20 (0.5-1)	Total/NA	Solid	2540B	
600-140468-4	2016-CUFT-21 (0-0.5)	Total/NA	Solid	2540B	
600-140468-7	2016-CUFT-22 (0-0.5)	Total/NA	Solid	2540B	
600-140468-10	2016-CUFT-23 (0.5-1)	Total/NA	Solid	2540B	
600-140468-13	2016-CUFT-24 (0-0.5)	Total/NA	Solid	2540B	
600-140468-16	Dup-01	Total/NA	Solid	2540B	
600-140407-F-7 DU	Duplicate	Total/NA	Solid	2540B	
600-140433-B-3 DU	Duplicate	Total/NA	Solid	2540B	

Lab Chronicle

Client: Golder Associates Inc.
Project/Site: Exide - Crystallization Unit

TestAmerica Job ID: 600-140468-1

Client Sample ID: 2016-CUFT-20 (0.5-1)
Date Collected: 11/30/16 14:05
Date Received: 12/01/16 10:46

Lab Sample ID: 600-140468-1
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2540B		1			202053	12/02/16 14:51	B1K	TAL HOU

Client Sample ID: 2016-CUFT-20 (0.5-1)
Date Collected: 11/30/16 14:05
Date Received: 12/01/16 10:46

Lab Sample ID: 600-140468-1
Matrix: Solid
Percent Solids: 72.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Soluble	Leach	DI Leach			4.95 g	50 mL	202175	12/05/16 15:50	DAW	TAL HOU
Soluble	Analysis	9056A		10			202177	12/05/16 21:10	DAW	TAL HOU
Total/NA	Prep	3050B			1.01 g	50 mL	202256	12/06/16 12:46	DCL	TAL HOU
Total/NA	Analysis	6010B		1			202346	12/07/16 13:08	DCL	TAL HOU

Client Sample ID: 2016-CUFT-21 (0-0.5)
Date Collected: 11/30/16 14:34
Date Received: 12/01/16 10:46

Lab Sample ID: 600-140468-4
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2540B		1			202053	12/02/16 14:51	B1K	TAL HOU

Client Sample ID: 2016-CUFT-21 (0-0.5)
Date Collected: 11/30/16 14:34
Date Received: 12/01/16 10:46

Lab Sample ID: 600-140468-4
Matrix: Solid
Percent Solids: 79.1

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Soluble	Leach	DI Leach			5.07 g	50 mL	202175	12/05/16 15:50	DAW	TAL HOU
Soluble	Analysis	9056A		1			202177	12/05/16 22:10	DAW	TAL HOU
Total/NA	Prep	3050B			1.04 g	50 mL	202256	12/06/16 12:46	DCL	TAL HOU
Total/NA	Analysis	6010B		1			202346	12/07/16 12:54	DCL	TAL HOU

Client Sample ID: 2016-CUFT-22 (0-0.5)
Date Collected: 11/30/16 16:10
Date Received: 12/01/16 10:46

Lab Sample ID: 600-140468-7
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2540B		1			202053	12/02/16 14:51	B1K	TAL HOU

Client Sample ID: 2016-CUFT-22 (0-0.5)
Date Collected: 11/30/16 16:10
Date Received: 12/01/16 10:46

Lab Sample ID: 600-140468-7
Matrix: Solid
Percent Solids: 80.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Soluble	Leach	DI Leach			5.09 g	50 mL	202175	12/05/16 15:50	DAW	TAL HOU

Lab Chronicle

Client: Golder Associates Inc.
Project/Site: Exide - Crystallization Unit

TestAmerica Job ID: 600-140468-1

Client Sample ID: 2016-CUFT-22 (0-0.5)

Lab Sample ID: 600-140468-7
Date Collected: 11/30/16 16:10
Matrix: Solid
Date Received: 12/01/16 10:46
Percent Solids: 80.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Soluble	Analysis	9056A		1			202177	12/05/16 22:30	DAW	TAL HOU
Total/NA	Prep	3050B			1.06 g	50 mL	202256	12/06/16 12:46	DCL	TAL HOU
Total/NA	Analysis	6010B		1			202346	12/07/16 12:56	DCL	TAL HOU

Client Sample ID: 2016-CUFT-23 (0.5-1)

Lab Sample ID: 600-140468-10
Date Collected: 11/30/16 15:39
Matrix: Solid
Date Received: 12/01/16 10:46

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2540B		1			202053	12/02/16 14:51	B1K	TAL HOU

Client Sample ID: 2016-CUFT-23 (0.5-1)

Lab Sample ID: 600-140468-10
Date Collected: 11/30/16 15:39
Matrix: Solid
Date Received: 12/01/16 10:46
Percent Solids: 72.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Soluble	Leach	DI Leach			4.98 g	50 mL	202265	12/06/16 14:19	DAW	TAL HOU
Soluble	Analysis	9056A		10			202266	12/06/16 22:09	DAW	TAL HOU
Total/NA	Prep	3050B			1.03 g	50 mL	202256	12/06/16 12:46	DCL	TAL HOU
Total/NA	Analysis	6010B		1			202346	12/07/16 12:58	DCL	TAL HOU

Client Sample ID: 2016-CUFT-24 (0-0.5)

Lab Sample ID: 600-140468-13
Date Collected: 11/30/16 16:56
Matrix: Solid
Date Received: 12/01/16 10:46

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2540B		1			202053	12/02/16 15:27	B1K	TAL HOU

Client Sample ID: 2016-CUFT-24 (0-0.5)

Lab Sample ID: 600-140468-13
Date Collected: 11/30/16 16:56
Matrix: Solid
Date Received: 12/01/16 10:46
Percent Solids: 74.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Soluble	Leach	DI Leach			5.01 g	50 mL	202175	12/05/16 15:50	DAW	TAL HOU
Soluble	Analysis	9056A		10			202177	12/05/16 23:10	DAW	TAL HOU
Total/NA	Prep	3050B			1.05 g	50 mL	202256	12/06/16 12:46	DCL	TAL HOU
Total/NA	Analysis	6010B		1			202346	12/07/16 13:10	DCL	TAL HOU

Lab Chronicle

Client: Golder Associates Inc.
Project/Site: Exide - Crystallization Unit

TestAmerica Job ID: 600-140468-1

Client Sample ID: Dup-01
Date Collected: 11/30/16 00:00
Date Received: 12/01/16 10:46

Lab Sample ID: 600-140468-16
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2540B		1			202053	12/02/16 14:51	B1K	TAL HOU

Client Sample ID: Dup-01
Date Collected: 11/30/16 00:00
Date Received: 12/01/16 10:46

Lab Sample ID: 600-140468-16
Matrix: Solid
Percent Solids: 79.1

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Soluble	Leach	DI Leach			4.96 g	50 mL	202175	12/05/16 15:50	DAW	TAL HOU
Soluble	Analysis	9056A		1			202177	12/05/16 23:30	DAW	TAL HOU
Total/NA	Prep	3050B			1.02 g	50 mL	202256	12/06/16 12:46	DCL	TAL HOU
Total/NA	Analysis	6010B		1			202346	12/07/16 13:12	DCL	TAL HOU

Laboratory References:

TAL HOU = TestAmerica Houston, 6310 Rothway Street, Houston, TX 77040, TEL (713)690-4444

Certification Summary

Client: Golder Associates Inc.
Project/Site: Exide - Crystallization Unit

TestAmerica Job ID: 600-140468-1

Laboratory: TestAmerica Houston

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Texas	NELAP	6	T104704223-16-20	10-31-17

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
2540B		Solid	Percent Moisture
2540B		Solid	Percent Solids

TestAmerica Houston
6310 Rothway Street
Houston, TX 77040
Phone (713) 690-4444 Fax (713) 690-5646

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Abby Maslow	Lab PM: Upton, Cathy L	Carrier Tracking No(s):	COC No: 600-47096-14399.1
Client Contact: Anne Faeth-Boyd	Phone: 281-822-1-6868	E-Mail: cathy.upton@testamericainc.com		Page: Page 1 of 2
Company: Golder Associates Inc.		Analysis Requested		Job #: 1302086
Address: 820 South Main Street Suite 100	Due Date Requested:			Preservation Codes:
City: St. Charles	TAT Requested (days): Standard ~~Rush~~			A - HCL; B - NaOH; C - Zn Acetate; D - Nitric Acid; E - NaHSO4; F - MeOH; G - Amchlor; H - Ascorbic Acid; I - Ice; J - DI Water; K - EDTA; L - EDA; M - Hexane; N - None; O - AsNaO2; P - Na2O4S; Q - Na2SO3; R - Na2S2O3; S - H2SO4; T - TSP Dodecahydrate; U - Acetone; V - MCAA; W - pH 4-5; Z - other (specify)
State, Zip: MO, 63301	PO #: Exide1302086			Other:
Phone:	WO #:			
Email: anne_faeth-boyd@golder.com	Project #: 60004831			
Project Name: Exide Recycling Center	SSOW#:			
Site: Rush Soils				

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=wasteoil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010B - CUSTOM LIST (As, Cd, Pb, Sb, Se)	MOISTURE	Soil State	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N		
2016-CWFT-20 (0.5-1)	11-30-16	1405	G	Solid			X	X	X	1	
2016-CWFT-20 (1-2)		1408	G	Solid			X	X	X		Hold
2016-CWFT-20 (2-3)		1410	G	Solid			X	X	X		Hold
2016-CWFT-21 (0-0.5)		1434	G	Solid			X	X	X		
2016-CWFT-21 (1-2)		1450	G	Solid			X	X	X		Hold
2016-CWFT-21 (2-3)		1456	G	Solid		Y	X	X	X		Hold
2016-CWFT-21 (2-3) MS		1456	G	Solid			X	X	X		Hold
2016-CWFT-21 (2-3) MSD		1456	G	Solid			X	X	X		Hold
2016-CWFT-22 (0-0.5)		1610	G	Solid			X	X	X		
2016-CWFT-22 (1-2)		1615	G	Solid			X	X	X		Hold
2016-CWFT-22 (2-3)		1622	G	Solid			X	X	X		Hold

600-140468 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
[signature]	11-30-16 1642	Golder	[signature]	12/01/16 1046	
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

TestAmerica Houston
6310 Rothway Street
Houston, TX 77040
Phone (713) 690-4444 Fax (713) 690-5646

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Abby Marlow	Lab PM: Upton, Cathy L	Carrier Tracking No(s):	COC No: 600-47096-14399.1
Client Contact: Anne Faeth-Boyd	Phone: 281 82 6863	E-Mail: cathy.upton@testamericainc.com		Page: Page 2 of 2
Company: Golder Associates Inc.		Analysis Requested		Job #: 1302686
Address: 820 South Main Street Suite 100	Due Date Requested:			Preservation Codes:
City: St. Charles	TAT Requested (days): Standard ~~2 DAY RUSH~~			A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
State, Zip: MO, 63301	PO #: Exide1302086			Other:
Phone:	WO #:			
Email: anne_faeth-boyd@golder.com	Project #: 60004831			
Project Name: Exide Recycling Center	SSOW#:			
Site: Rush Soils				

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010B - CUSTOM LIST (As, Cd, Pb, Sb, Se)	MOISTURE	SVI Fate	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N		
2016-CWFT-23 (0.5-1)	11-30-16	1539	G	Solid			X	X	X		
2016-CWFT-23 (1-2)		1545	G	Solid			X	X	X		Hold
2016-CWFT-23 (2-3)		1551	G	Solid			X	X	X		Hold
2016-CWFT-24 (0-0.5)		1656	G	Solid			X	X	X		
2016-CWFT-24 (1-2)		1703	G	Solid			X	X	X		Hold
2016-CWFT-24 (2-3)		1710	G	Solid			X	X	X		Hold
Dup-01		-	G	Solid			X	X	X		
			G	Solid							
			G	Solid							
			G	Solid							
			G	Solid							

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
	11-3-16 1142	Golder		12/1/16 1646	
Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Relinquished by	Date/Time	Company	Received by	Date/Time	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

TestAmerica Houston

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sample Receipt Checklist

Loc: 600
140468

JOB NUMBER: ____

Date/Time Received: _____

CLIENT: Elder

UNPACKED BY: _____

CARRIER/DRIVER: FE

Custody Seal Present: ☒ YES ☐ NO

Number of Coolers Received: 1

Cooler ID	Temp Blank	Trip Blank	Observed Temp (°C)	Therm ID	Them CF	Corrected Temp (°C)
FW	Y / N	Y / N	2.3	5H	0.3	2.6
	Y / N	Y / N				
	Y / N	Y / N				
	Y / N	Y / N				
	Y / N	Y / N				
	Y / N	Y / N				
	Y / N	Y / N				
	Y / N	Y / N				
	Y / N	Y / N				

CF = correction factor

Samples received on ice? ☒ YES ☐ NO

LABORATORY PRESERVATION OF SAMPLES REQUIRED: ☒ NO ☐ YES

Base samples are>pH 12: ☐ YES ☐ NO Acid preserved are<pH 2: ☐ YES ☐ NO

pH paper Lot #_____

VOA headspace acceptable (5-6mm): ☐ YES ☐ NO ☐ NA

	YES	NO
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	☒	☐

C FedEx
TRK# 0221 6025 5771 1373
THU – 01 DEC 3:00P
STANDARD OVERNIGHT

AB LKSA

77040
TX – US IAH

HS-SA-WI-013

Rev. 3; 07/01/2014

Login Sample Receipt Checklist

Client: Golder Associates Inc.

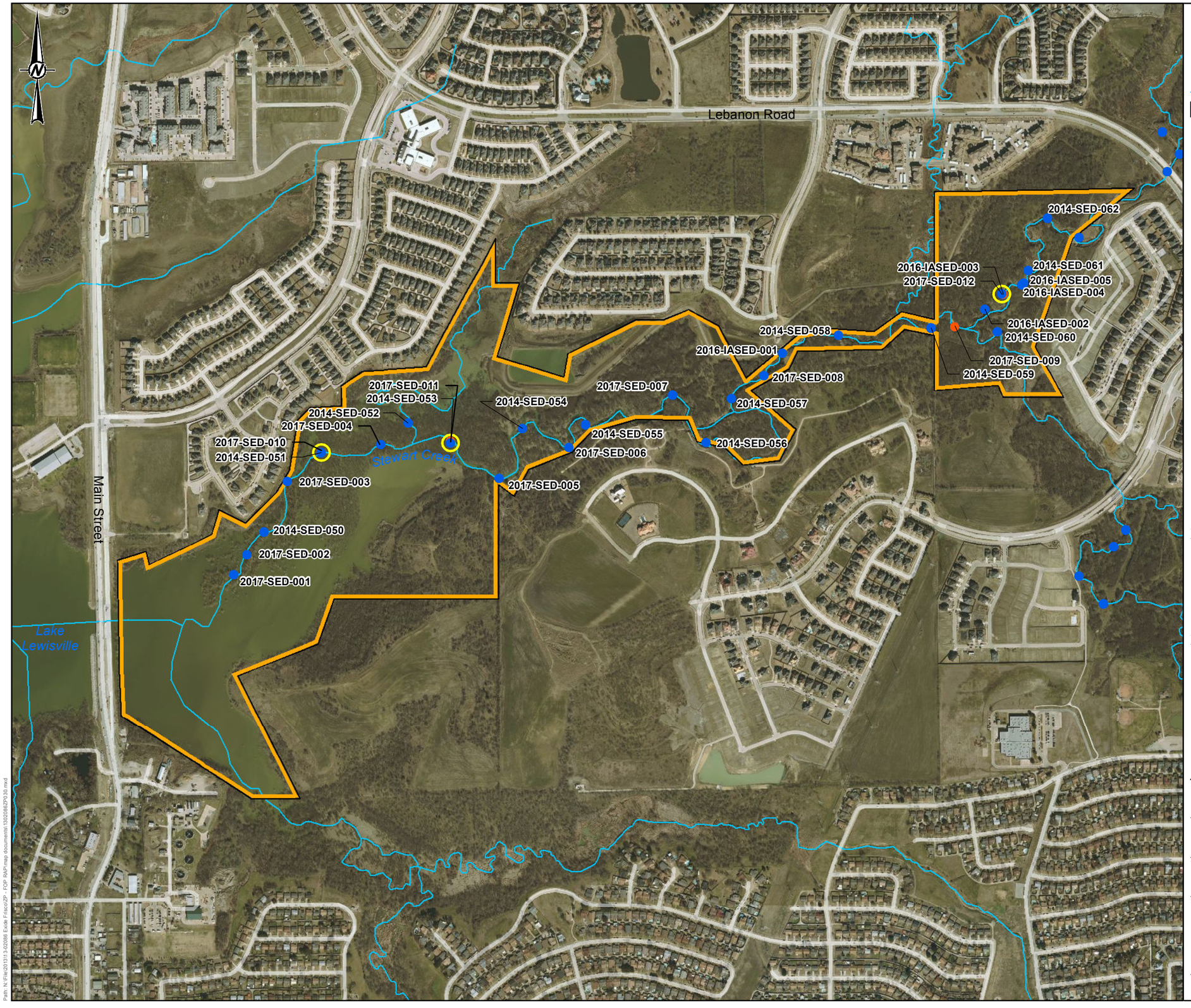
Job Number: 600-140468-1

Login Number: 140468
List Number: 1
Creator: Capps, Dana R

List Source: TestAmerica Houston

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	2.6
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	Check done at department level as required.

STEWART CREEK SEDIMENT SAMPLING OF USACE PROPERTY



LEGEND

- Resampled Location (See Note 2)
- No PCL Exceedance
- PCL Exceedance (Resample Location)
- Creek Centerline
- USACE Properties

NOTES

1. PCL - PROTECTIVE CONCENTRATION LEVEL
2. 2014 SAMPLES 2014-SED-051, 2014-SED-053, AND 2016-IASED-003 WERE RESAMPLED AS 2017-SED-010, 2017-SED-011, AND 2017-SED-012, RESPECTIVELY. THE 2014 RESULTS EXCEEDED THE PCL. THE 2017 CONFIRMATION SAMPLES RESULTS WERE BELOW THE PCL.

REFERENCE

1. SITE FEATURES - GOLDER, 2014
2. AERIAL IMAGERY - NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS VAI ESRI ARCGIS ONLINE, 2016

1,000 500 0 1,000 Feet

CLIENT
EXIDE TECHNOLOGIES

PROJECT
EXIDE TECHNOLOGIES FORMER OPERATING PLANT
RESPONSE ACTION PLAN

TITLE
USACE SEDIMENT SAMPLING LOCATIONS

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-07-28
PREPARED	JWT
DESIGN	JWT
REVIEW	AMF
APPROVED	AMF

PROJECT No.	CONTROL	Rev.	FIGURE
13-02086	1302086ZP030.mxd	0	**A2-2**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI B

Path: N:\Fw\2013\13-02086 Exide Frisco\ZP - FOP RAP\map documents\1302086ZP030.mxd

Stewart Creek Sediment Sampling Summary
USACE Property
April 2017

		Metals (mg/kg)			TOC (%)	Grain Size (%)			
		Arsenic	Cadmium	Lead		Gravel	Sand	Silt	Clay
TRRP Freshwater Ecological Benchmark (RG-263)[1]		9.79	0.99	35.8	--	--	--	--	--
TRRP Freshwater Ecological Second Effects Level		33.0	4.98	128	--	--	--	--	--
TRRP Freshwater Ecological Sediment PCL (mid-		21.4	2.99	82	--	--	--	--	--
TRRP Tier 1 Human Health $^{Tot}Sed_{Comb}$ PCL[2]		110	1,100	500	--	--	--	--	--
FishSed PCL adjusted for incidental fishery[3]		NB	28.9	NB	--	--	--	--	--
Background Upper Prediction Limit[4]		39.7	--	--	--	--	--	--	--
TRRP Critical Sediment PCL		39.7	2.99	82	--	--	--	--	--
Sample ID	Date Sampled								
2017-SED-001	4/5/2017	8.47 JL	0.549	16.0	0.741	4.7	47.9	13.9	33.5
2017-SED-002	4/5/2017	13.5 JL	0.392	13.7	0.501	9.1	76.1	6.3	8.6
2017-SED-003	4/5/2017	28.1 JL	0.547	15.4	0.245	16.5	76.9	3.3	3.3
2017-SED-004	4/5/2017	25.2 JL	0.435	10.5	0.223	52.2	39.8	4	4
2017-SED-005	4/5/2017	35.4 JL	0.873	15.9	0.137	64.8	27.8	4.5	2.9
2017-SED-006	4/5/2017	17.3 JL	0.331	8.71	0.193	24.3	70.4	2.2	3.1
2017-SED-007	4/5/2017	23.1 JL	0.541	13.9	0.269	25.4	62.6	6.5	5.5
2017-SED-009	4/6/2017	51.9 JL	0.308	13.7	0.146	46.8	51.8	0.6	0.8
2017-SED-008	4/6/2017	27.7 JL	0.400	13.8	0.185	41.9	44	11.4	2.7
DUP-01 (2017-SED-008)	4/6/2017	19.9 JL	0.562	11.8	0.208	42.9	44.2	9.5	3.4
2017-SED-010	4/5/2017	24.4 JL	0.826	13.1	0.154	45.3	27.6	16	11.1
2017-SED-011	4/5/2017	6.51 JL	0.383	13.9	0.543	4.2	46.6	18.5	30.7
2017-SED-012	4/6/2017	16.6 JL	0.535	15.1	0.353	36.2	45.3	8.2	10.3
DUP-02 (2017-SED-012)	4/6/2017	17.7 JL	0.489	16.2	0.291	31.5	51.1	8.9	8.5

Stewart Creek Sediment Sampling Summary
USACE Property
April 2017

Notes:

1. [1]The sources and derivations for the TRRP ecological benchmarks are described in the TCEQ's "Supporting Documentation for the TCEQ's Ecological Benchmark Tables," dated January 2017, which also includes a link to the Benchmark Tables.
2. [2]The direct human contact sediment PCLs are listed in the Tier 1 PCLs table dated March 2006 and published on the TCEQ website. Refer to "Determining PCLs for Surface Water and Sediment" (i.e., RG-366/TRRP-24) for a complete discussion of the basis and application of these PCLs.
3. [3]The calculation of this PCL is included in Appendix 9 of the 2014 Affected Property Assessment Report for the Exide Frisco Recycling Facility, which was approved by TCEQ in a letter dated February 3, 2017.
4. [4]The derivation of the background upper prediction limit is described in the Pastor, Behling & Wheeler report "Rationale for Use of a Background Upper Prediction Limit (UPL) in Lieu of Biologically-Derived Protective Concentration Level (PCL)" dated August 30, 2016.
5. Values highlighted yellow exceed the PCL.
6. mg/kg - milligrams per kilogram
7. NB - Arsenic and lead are not bioaccumulative in sediment per TCEQ RG-263, dated January 2017.
8. PCL - protective concentration level
9. TCEQ - Texas Commission on Environmental Quality
10. TOC - total organic carbon
11. TRRP - Texas Risk Reduction Program
12. J - Estimated data; the analyte was detected and identified. The associated numerical value (i.e., the reported sample concentration) is the approximate concentration of the analyte in the sample.
13. L - Bias in sample result is likely to be low.

Prepared by: GS 04/24/2017
Updated by: EPW 06/30/2017
Checked by: ANM 04/24/2017, SJD 06/30/2017
Reviewed by: AMF 04/25/2017

Data Usability Summary
TestAmerica Work Order: J146375-1

Sample Dates:	April 5 and 6, 2017	**Project No.:**	1302086
Laboratory:	TestAmerica (TLAP Certification T104704223-17-21)	**Client:**	Exide Technologies Inc.
Work Orders:	J146375-1		
Intended Use:	Stewart Creek Response Action Plan (RAP)		
Site:	Exide Recycling Center, 7471 5th Street, Frisco, TX (Stewart Creek)		

TESTS/METHODS

Metals (arsenic, cadmium and lead only) by SW-846 6010B - Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP)

Percent moisture/percent solids/total organic carbon (general chemistry)

SAMPLES

14 sediment samples (including two field duplicates) and one equipment blank were collected. See Table 1 for a complete cross-referenced listing of samples.

Golder completed a review of the above chemical analysis data for conformance with the requirements of the Texas Risk Reduction Program (TRRP) guidance document, Review and Reporting of COC Concentration Data (RG-366/TRRP-13 Revised May 2010) and for adherence to project objectives. The results of the review are discussed in this data usability summary (DUS).

Golder completed the review using the following laboratory and project submittals:

- Laboratory reportable data as defined in TRRP-13;
- Laboratory review checklists (LRC) with the associated exception reports;
- Laboratory Electronic Data Deliverable (EDD); and
- Project field notes from the sampling event.

The review of the reportable data included the quality control (QC) parameters listed below, as required per TRRP-13, using the applicable analytical method and project requirements:

- Data Completeness
- Chain-of-Custody Procedures
- Sample Condition - Holding Time, Preservation, and Containers
- Field Procedures

- Results Reporting Procedures
- Laboratory and Field QC Blanks
- Laboratory Control Spike and Matrix Spike Recoveries
- Surrogate Recoveries
- Laboratory and Field Duplicate Precision

Additionally, Golder used the LRC to evaluate the following QC parameters:

- Method Quantitation Limits (MQLs)
- Method Detection Limits (MDLs)
- Instrument Tuning, Calibration, and Performance
- Internal Standards

Criteria used for this data usability review are as follows:

- Aqueous Samples: ± 2x MQL difference (if either result is less than 5x MQL) or 30% RPD (for field duplicates) as recommended in TRRP-13;
- Inorganics: 70-130% spike recovery (and not less than 30% or data is rejected) and +MQL difference or 30% RPD (for laboratory duplicates) as recommended in TRRP-13;
- Organics: 60-140% spike recovery (and not less than 10% or data is rejected) and +MQL difference or 40% RPD (for laboratory duplicates) as recommended in TRRP-13; and
- Soil Samples: + 3x MQL difference (if either result is less than 5x MQL) or 50% RPD (for field duplicates) as recommended in TRRP-13.

If an item was found outside of the review criteria, the reviewer applied a data qualifier (DQ) and bias code to the results for the affected samples in accordance with TRRP-13. A list of all qualified results and definitions of the qualifier and bias codes are given in Table 2.

GLOSSARY OF TERMS

The following definitions apply for terms related to analyte reporting limits:

MDL (Method Detection Limit) – the minimum concentration of an analyte that the laboratory can measure and report with 99% confidence that the analyte concentration is greater than zero. The MDL is determined by the laboratory for each analyte in a given reagent matrix (water or soil) generally using the procedures specified in 40 CFR Part 136, Appendix B. It is a measure of the concentration an instrument can detect or 'see' in a given reagent matrix. TRRP-13 requires that the laboratory routinely check the MDL for reasonableness.

SDL (Sample Detection Limit) – the MDL adjusted to reflect sample-specific actions, such as dilution or use of smaller aliquot sizes than prescribed in the analytical method, and taking into account sample characteristics, sample preparation, and analytical adjustments including dry-weight adjustments. It is a measure of the concentration an instrument can detect or 'see' in a given sample. For TRRP, non-detects are reported using the SDL. This term was originally called the SQL (Sample Quantitation Limit) before the TRRP rule revisions effective March 19, 2007.

Unadjusted MQL (Method Quantitation Limit) – the lowest non-zero concentration standard in the laboratory's initial calibration curve calculated using the normal aliquot sizes and final volumes prescribed in the analytical method. The unadjusted MQL is reported by the laboratory for each analyte in a given matrix (water or soil). It is a measure of the concentration an instrument can accurately measure in a typical sample. Per TRRP, the Unadjusted MQLs should be below the Levels of Required Performance (LORPs) for purposes of assessment as well as demonstration of conformance with critical Protective Concentration Levels (PCLs).

MQL – the unadjusted MQL adjusted to reflect sample-specific actions, such as dilution or use of smaller aliquot sizes than prescribed in the analytical method, and takes into account sample characteristics, sample preparation, and analytical adjustments including dry-weight adjustments. It is a measure of the concentration an instrument can accurately measure in a given sample. Analytes with concentrations above the SDL but below the MQL, though present in the sample, may not be accurately measured and are thus flagged as estimated (J).

LABORATORY CERTIFICATION

At the time the laboratory data were generated for this project, the laboratory was NELAC accredited under the Texas Laboratory Accreditation Program (TLAP) for the matrices, methods and parameters of analysis requested on the chain-of-custody forms.

USABILITY SUMMARY

1. Usability of Unqualified Non-Detects – Non-detects are reported at the sample detection limit (SDL) as required per TRRP. Additionally, according to the LRC, an MDL study was performed for each analyte and the MDLs were checked for reasonableness for each applicable analyte. The levels of required performance (LORPs) have been established by Golder/PBW as the Residential Assessment Levels (RALs), which are the minimum of the TRRP residential Tier 1 $^{Tot}Soil_{Comb}$ and Tier 1, 2 or 3 $^{GW}Soil_{Ing}$ PCLs for a 30-acre source area. As needed per TRRP, the unadjusted MQL stated by the laboratory is at or below the LORP for each applicable analyte, and thus the analytical methods are appropriate and the results can be used to demonstrate conformance with the criteria.

2. Usability of Qualified Data – There are no major QC deficiencies, and thus all data is usable as qualified for the intended use. As shown in Table 2, the reviewer qualified some detects as estimated (J) due to minor QC deficiencies. Detects that are biased high can be used;

however, the reported concentration may be high. Detects that are estimated may be either low or high. Results with a laboratory J-flag (i.e., at a concentration between the SDL and MQL) should be considered estimates. The actual value is not expected to exceed the sample MQL.

Reviewer: Jie Xu 6/22/2017

QUALITY CONTROL PARAMETERS AND OUTCOMES

Data Completeness

The laboratory data package contains all necessary data (i.e., the laboratory reportable data per TRRP-13) and the EDD contains all sample results in acceptable format.

Chain-of-Custody

Proper sample custody procedures were used, which confirms that the integrity of the samples was maintained. Additionally, the information on the custody records is complete and agrees with that in the field notes and laboratory reports, with the following exceptions:

- Method 6020 was marked on the COC for the equipment blank (EB). Per confirmation with Golder, this sample was analyzed by method 6010B. Additionally, the sample date on page 2 of the COC was incorrectly listed as 3-6-17. The date was corrected by the laboratory to 4-6-17.

Sample Condition

Samples were collected in appropriate containers, properly preserved in the field, and prepared and analyzed within the holding times as required in the analytical methods, which ensures that the samples were not affected by analyte degradation.

- For 600-146375-1, the corrected temperature of the cooler at receipt in Houston was 2.9°C.

Field Procedures

The samples were collected and placed immediately into sterilized jars provided by the laboratory and then into a cooler with ice for overnight delivery to the laboratory. Two field duplicate samples were analyzed with the investigative sediment samples.

Results Reporting Procedures

The hardcopy analytical results include a Result, MQL (adjusted), and SDL. The EDD includes the MDL, SDL (under the SQL column per previously used terminology) and the MQL, which is not adjusted for sample specific factors.

Results are reported in mg/kg with dry-weight correction for the metals. Non-detects are reported using the SDL as specified per TRRP and detects between the SDL and MQL are reported with a laboratory J-flag. The concentration reported for detects between the SDL and MQL is below the calibration range and thus is considered estimated.

MQLs- The LORPs have been established by Golder/PBW as the Residential Assessment Levels (RALs), which are the minimum of the TRRP residential Tier 1 $^{Tot}Soil_{Comb}$ and Tier 1, 2 or 3 $^{GW}Soil_{Ing}$ PCLs for a 30-acre source area. The Unadjusted MQLs for the laboratory are at or below the LORPs for each applicable analyte.

MDLs- According to the LRC, an MDL study was performed for each analyte, and the MDLs were checked for reasonableness and either adjusted or supported by the analysis of detectability check standards (DCS) for each applicable analyte as required per TRRP-13. Results for the DCS are included in the data packages.

Laboratory Blanks

Results for samples prepared in the same QC batch as a contaminated method blank may be affected by laboratory contamination. No analytes were detected in the laboratory blanks.

Field QC Blanks

One equipment rinsate blank was collected to document sufficient field decontamination procedures for soil sampling devices. Results for samples collected with a contaminated rinsate blank may be affected by field contamination. However, no analytes were detected in the rinsate blank, and thus there is no effect on data quality.

Laboratory Control Sample

The laboratory prepared one laboratory control sample (LCS) for each analytical batch and reported recoveries for all of the analytes for each test. The LCS recoveries are within the TRRP recommended criteria, which indicates good accuracy for the preparation and analysis technique on a sample, free of matrix effects.

Matrix Spike Recovery

The laboratory prepared one or more matrix spike (MS) and matrix spike duplicate (MSD) with each analytical batch. MS/MSD recoveries and relative percent difference (RPD) are reported for the same analytes as the LCS using a sample from the preparation batch. Samples 600-146375-1 and 600-146375-12 were selected by the laboratory for site-specific MS/MSD analysis. Other MS/MSD analyses for metals

(arsenic, cadmium and lead) were conducted using samples unrelated to the project and were not evaluated.

The MS/MSD recoveries and RPDs are within the TRRP recommended criteria, which indicates good accuracy for the preparation and analysis technique on a sample free of matrix effects, except as follows:

- Batch 211106: Arsenic was slightly below the % recovery criteria for MS and the RPD was above the QC limit. Arsenic detections associated with this batch have been qualified as appropriate in Table 2.

Surrogate Recovery

Since organic analyses were not requested for this data package, surrogate recoveries were not available for evaluation.

Laboratory Duplicate Precision

Since laboratory analytical duplicate recovery and precision data were not requested for these data packages, laboratory duplicate precision were not evaluated.

Field Duplicate Precision

Two field duplicate samples were collected with the samples. Results are summarized in Table 3. The RPDs (or the absolute difference between results for concentrations <5x MQL and for non-detects) are within the TRRP criteria, which indicates good precision for the sampling, preparation, and analysis technique on the given sample matrix.

Instrument Tuning

According to the LRC, instrument tuning met method requirements for the samples, which indicates the instrument was properly set up to identify analytes.

Instrument Calibration

According to the LRC, initial and continuing calibration data met method requirements for all reported results, which indicates the instruments were properly calibrated to measure analyte concentrations.

Instrument Performance

According to the LRC, the serial dilution and ICP interference check samples met method requirements, which indicates that no significant matrix interference exists.

Internal Standards

According to the LRC, area counts and retention times were within method requirements.

TABLE 1
CROSS REFERENCE OF FIELD SAMPLE IDENTIFICATIONS AND LABORATORY IDENTIFICATIONS

Lab Sample ID	Field Sample ID	Sample Date	Matrix	Comments
600-146375-1	2017-SED-001	04/05/2017	Solid	
600-146375-2	2017-SED-002	04/05/2017	Solid	
600-146375-3	2017-SED-003	04/05/2017	Solid	
600-146375-4	2017-SED-004	04/05/2017	Solid	
600-146375-5	2017-SED-010	04/05/2017	Solid	
600-146375-6	2017-SED-011	04/05/2017	Solid	
600-146375-7	2017-SED-005	04/05/2017	Solid	
600-146375-8	EB-1	04/05/2017	Water	
600-146375-9	2017-SED-006	04/05/2017	Solid	
600-146375-10	2017-SED-007	04/06/2017	Solid	
600-146375-11	2017-SED-009	04/06/2017	Solid	
600-146375-12	2017-SED-008	04/06/2017	Solid	MS/MSD
600-146375-13	2017-SED-012	04/06/2017	Solid	
600-146375-14	DUP-01	04/06/2017	Solid	Duplicate for 2017-SED-008
600-146375-15	DUP-02	04/06/2017	Solid	Duplicate for 2017-SED-012

TABLE 2 - QUALIFIED DATA

Lab Sample ID	Field Sample ID	Analyte	Result	Units	Qualifier	Explanation
600-146375-1	2017-SED-001	Arsenic	8.47	mg/Kg	JL	MS %Rec below specification and MS/MSD RPD above QC limit.
600-146375-2	2017-SED-002	Arsenic	13.5	mg/Kg	JL	MS %Rec below specification and MS/MSD RPD above QC limit.
600-146375-3	2017-SED-003	Arsenic	28.1	mg/Kg	JL	MS %Rec below specification and MS/MSD RPD above QC limit.
600-146375-4	2017-SED-004	Arsenic	25.2	mg/Kg	JL	MS %Rec below specification and MS/MSD RPD above QC limit.
600-146375-5	2017-SED-010	Arsenic	24.4	mg/Kg	JL	MS %Rec below specification and MS/MSD RPD above QC limit.
600-146375-6	2017-SED-011	Arsenic	6.51	mg/Kg	JL	MS %Rec below specification and MS/MSD RPD above QC limit.
600-146375-7	2017-SED-005	Arsenic	35.4	mg/Kg	JL	MS %Rec below specification and MS/MSD RPD above QC limit.
600-146375-9	2017-SED-006	Arsenic	17.3	mg/Kg	JL	MS %Rec below specification and MS/MSD RPD above QC limit.
600-146375-10	2017-SED-007	Arsenic	23.1	mg/Kg	JL	MS %Rec below specification and MS/MSD RPD above QC limit.
600-146375-11	2017-SED-009	Arsenic	51.9	mg/Kg	JL	MS %Rec below specification and MS/MSD RPD above QC limit.
600-146375-12	2017-SED-008	Arsenic	27.7	mg/Kg	JL	MS %Rec below specification and MS/MSD RPD above QC limit.
600-146375-13	2017-SED-012	Arsenic	16.6	mg/Kg	JL	MS %Rec below specification and MS/MSD RPD above QC limit.
600-146375-14	DUP-01	Arsenic	19.9	mg/Kg	JL	MS %Rec below specification and MS/MSD RPD above QC limit.
600-146375-15	DUP-02	Arsenic	17.7	mg/Kg	JL	MS %Rec below specification and MS/MSD RPD above QC limit.

Notes:
MS - Matrix Spike
MSD - Matrix Spike Duplicate
RPD - Relative Percent Difference
J - Estimated data; the analyte was detected and identified. The associated numerical value (i.e., the reported sample concentration) is the approximate concentration of the analyte in the sample.
L - Bias in sample result is likely to be low.
mg/Kg - milligrams per kilogram

TABLE 3 - FIELD DUPLICATE PRECISION CALCULATIONS

Duplicate and Parent Sample Field Identification	Analyte	Sample Result		Duplicate Result		RPD[a]	Accept or Reject	Qualifier Added
Dup-01 / 2017-SED-008	Arsenic	27.7		19.9		32.8	A	-
	Cadmium	0.400		0.562		33.7	A	-
	Lead	13.8		11.8		15.6	A	-
Dup-02 / 2017-SED-012	Arsenic	16.6		17.7		6.4	A	-
	Cadmium	0.535		0.489		9.0	A	-
	Lead	15.1		16.2		7.0	A	-

Notes:

[a] Relative Percent Difference (RPD) = ((SR - DR)*200)/(SR + DR), where SR is the sample result and DR is the duplicate result.

A - Acceptable Data

The RPD test (<50%) applies if both results are greater than 5x MQL. Otherwise, the absolute difference test (< 3x MQL) applies.

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Houston
6310 Rothway Street
Houston, TX 77040
Tel: (713)690-4444

TestAmerica Job ID: 600-146375-1
Client Project/Site: Exide Sediment Samples

For:
Golder Associates Inc.
820 South Main Street
Suite 100
St. Charles, Missouri 63301

Attn: Anne Faeth-Boyd

Authorized for release by:
4/21/2017 4:51:15 PM

Cathy Upton, Project Manager I
(713)690-4444
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LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Appendix A
Laboratory Data Package Cover Page - Page 1 of 4

This data package is for TestAmerica Houston job number 600-146375-1 and consists of:

- ☑ R1 - Field chain-of-custody documentation;
- ☑ R2 - Sample identification cross-reference;
- ☑ R3 - Test reports (analytical data sheets) for each environmental sample that includes:
  a. Items consistent with NELAC Chapter 5,
  b. dilution factors,
  c. preparation methods,
  d. cleanup methods, and
  e. if required for the project, tentatively identified compounds (TICs).
- ☐ R4 - Surrogate recovery data including:
  a. Calculated recovery (%R), and
  b. The laboratory's surrogate QC limits.
- ☑ R5 - Test reports/summary forms for blank samples;
- ☑ R6 - Test reports/summary forms for laboratory control samples (LCSs) including:
  a. LCS spiking amounts,
  b. Calculated %R for each analyte, and
  c. The laboratory's LCS QC limits.
- ☑ R7 - Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  a. Samples associated with the MS/MSD clearly identified,
  b. MS/MSD spiking amounts,
  c. Concentration of each MS/MSD analyte measured in the parent and spiked samples,
  d. Calculated %Rs and relative percent differences (RPDs), and
  e. The laboratory's MS/MSD QC limits
- ☑ R8 - Laboratory analytical duplicate (if applicable) recovery and precision:
  a. The amount of analyte measured in the duplicate,
  b. The calculated RPD, and
  c. The laboratory's QC limits for analytical duplicates.
- ☑ R9 - List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
- ☑ R10 - Other problems or anomalies.

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Jeanette Castillo, for Cathy Upton		4/20/2017
Name (printed)	Signature	Date

Project Manager I
Official Title (printed)

Laboratory Review Checklist: Reportable Data - Page 2 of 4

Laboratory Name:	TestAmerica Houston	LRC Date:	4/20/2017
Project Name:	Exide Sediment Samples	Laboratory Job Number:	600-146375-1
Reviewer Name:	Jeanette Castillo, for Cathy Upton		

#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?		X			R01A
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?	X				
		Were % moisture (or solids) reported for all soil and sediment samples?	X				
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
		If required for the project, are TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?			X		
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			R07C
		Were MS/MSD RPDs within laboratory QC limits?		X			R07D
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?	X				
		Were analytical duplicates analyzed at the appropriate frequency?	X				
		Were RPDs or relative standard deviations within the laboratory QC limits?	X				
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review checklist: Supporting Data - Page 3 of 4

Laboratory Name:	TestAmerica Houston	LRC Date:	4/20/2017
Project Name:	Exide Sediment Samples	Laboratory Job Number:	600-146375-1
Reviewer Name:	Jeanette Castillo, for Cathy Upton		

#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICV and CCV) and continuing calibration blank (CCB):**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
S3	O	**Mass spectral tuning**					
		Was the appropriate compound for the method used for tuning?			X		
		Were ion abundance data within the method-required QC limits?			X		
S4	O	**Internal standards (IS)**					
		Were IS area counts and retention times within the method-required QC limits?			X		
S5	OI	**Raw data (NELAC Section 5.5.10)**					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs)**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods (NELAC Chapter 5)**					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs)**					
		Are laboratory SOPs current and on file for each method performed?	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports - Page 4 of 4

Laboratory Name:	TestAmerica Houston	LRC Date:	4/20/2017
Project Name:	Exide Sediment Samples	Laboratory Job Number:	600-146375-1
Reviewer Name:	Jeanette Castillo, for Cathy Upton		

ER #[1]	Description
R01A	The Chain-of-Custody (COC) was incomplete as received and/or improperly completed. The 6020 method was on the COC for the EB. Per confirmation from the client, this sample can be analyzed by 6010B like the soil samples. Additionally, the sample date on the second page is supposed to be 4-6-17 instead of 3-6-17 as listed.
R07C	Method 6010B: 600-146375-12 MS failed the recovery criteria for the following analyte: Arsenic. Matrix interference is suspected.
R07D	Method 6010B: 600-146375-12 MSD failed the RPD criteria for the following analyte: Arsenic.

1. Items identified by the letter “R” must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter “S” should be retained and made available upon request for the appropriate retention period.
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if “NR” or “No” is checked).

Matrix:	Water
Method:	6010B
Prep Method:	3010A
Date Analyzed:	3/28/2017
Job #:	600-142993
TALS Batch:	209473
Units:	mg/L

Analyte	Instrument #	MDL	DCS Spike	Measured Result	MQL
Ag	Thermo6500	0.001	0.003	0.002	0.01
Al	Thermo6500	0.093	0.020	0.024	0.5
As	Thermo6500	0.003	0.005	0.005	0.01
B	Thermo6500	0.012	0.020	0.018	0.2
Ba	Thermo6500	0.001	0.001	0.006	0.02
Be	Thermo6500	0.000	0.001	0.004	0.005
Ca	Thermo6500	0.024	0.050	0.055	1
Cd	Thermo6500	0.000	0.001	0.001	0.005
Co	Thermo6500	0.000	0.001	0.001	0.01
Cr	SPECTRO1	0.002	0.002	0.004	0.01
Cu	SPECTRO1	0.008	0.001	0.006	0.01
Fe	Thermo6500	0.027	0.050	0.072	0.4
K	Thermo6500	0.037	0.050	0.095	1
Li	Thermo6500	0.002	0.003	0.008	0.2
Mg	Thermo6500	0.056	0.025	0.009	1
Mn	Thermo6500	0.000	0.001	0.001	0.01
Mo	Thermo6500	0.001	0.001	0.005	0.01
Na	Thermo6500	0.021	0.050	0.078	1
Ni	Thermo6500	0.001	0.001	0.001	0.01
Pb	Thermo6500	0.002	0.005	0.005	0.01
Sb	Thermo6500	0.004	0.010	0.011	0.05
Se	Thermo6500	0.003	0.005	0.012	0.04
Si	Thermo6500	0.035	0.020	0.022	0.2
Sn	Thermo6500	0.001	0.001	0.005	0.01
Sr	Thermo6500	0.000	0.001	0.001	0.005
Ti	Thermo6500	0.001	0.001	0.002	0.01
Tl	Thermo6500	0.004	0.010	0.021	0.03
V	Thermo6500	0.000	0.001	0.004	0.01
Zn	Thermo6500	0.004	0.002	0.003	0.03

DCS = Detection Check Standard
MQL = Method Quantitation Limit

Matrix: Solid
Method: WALKLEY_BLACK
Prep Method: No Prep
Date Analyzed: 2/17/2017
Job #: 600-142999
TALS Batch: 206958
Units: %

Analyte	Instrument #	MDL	DCS Spike	Measured Result	MQL
Total Organic Carbon	NOEQUIP	0.042	0.097	0.078	0.1

DCS = Detection Check Standard
MQL = Method Quantitation Limit

Job ID: 600-146375-1

Laboratory: TestAmerica Houston

Narrative

Job Narrative
600-146375-1

Comments
No additional comments.

Receipt
The samples were received on 4/7/2017 9:36 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.9º C.

Receipt Exceptions

The Chain-of-Custody (COC) was incomplete as received and/or improperly completed. The 6020 method was on the COC for the EB. Per confirmation from the client, this sample can be analyzed by 6010B like the soil samples. Additionally, the sample date on the second page is supposed to be 4-6-17 instead of 3-6-17 as listed.

Method Summary

Client: Golder Associates Inc.
Project/Site: Exide Sediment Samples

TestAmerica Job ID: 600-146375-1

Method	Method Description	Protocol	Laboratory
6010B	Metals (ICP)	SW846	TAL HOU
6010B	Inductively Coupled Plasma - Atomic Emission Spectrometry	SW846	TAL HOU
Moisture	Percent Moisture	EPA	TAL HOU
WALKLEY BLACK	Organic Carbon, Total (TOC)	MSA	TAL HOU

Protocol References:

EPA = US Environmental Protection Agency

MSA = "Methods Of Soil Analysis, Chemical And Microbiological Properties", Part 2, 2nd Ed., 1982 And Subsequent Revisions.

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL HOU = TestAmerica Houston, 6310 Rothway Street, Houston, TX 77040, TEL (713)690-4444

Sample Summary

Client: Golder Associates Inc.
Project/Site: Exide Sediment Samples

TestAmerica Job ID: 600-146375-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
600-146375-1	2017-SED-001	Solid	04/05/17 12:00	04/07/17 09:36
600-146375-2	2017-SED-002	Solid	04/05/17 12:30	04/07/17 09:36
600-146375-3	2017-SED-003	Solid	04/05/17 13:45	04/07/17 09:36
600-146375-4	2017-SED-004	Solid	04/05/17 13:10	04/07/17 09:36
600-146375-5	2017-SED-010	Solid	04/05/17 13:35	04/07/17 09:36
600-146375-6	2017-SED-011	Solid	04/05/17 14:30	04/07/17 09:36
600-146375-7	2017-SED-005	Solid	04/05/17 15:00	04/07/17 09:36
600-146375-8	EB-1	Water	04/05/17 18:13	04/07/17 09:36
600-146375-9	2017-SED-006	Solid	04/05/17 16:20	04/07/17 09:36
600-146375-10	2017-SED-007	Solid	04/06/17 17:05	04/07/17 09:36
600-146375-11	2017-SED-009	Solid	04/06/17 09:30	04/07/17 09:36
600-146375-12	2017-SED-008	Solid	04/06/17 08:50	04/07/17 09:36
600-146375-13	2017-SED-012	Solid	04/06/17 10:00	04/07/17 09:36
600-146375-14	DUP-01	Solid	04/06/17 00:00	04/07/17 09:36
600-146375-15	DUP-02	Solid	04/06/17 00:00	04/07/17 09:36

Client Sample ID: 2017-SED-001
Lab Sample ID: 600-146375-1
Date Collected: 04/05/17 12:00
Matrix: Solid
Date Received: 04/07/17 09:36

General Chemistry

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	35.4		1.0	1.0	%			04/07/17 16:34	1
Percent Solids	64.6		1.0	1.0	%			04/07/17 16:34	1
TOC	0.741		0.100	0.0415	%			04/19/17 13:30	1

Client Sample ID: 2017-SED-001
Lab Sample ID: 600-146375-1
Date Collected: 04/05/17 12:00
Matrix: Solid
Date Received: 04/07/17 09:36
Percent Solids: 64.6

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	8.47		1.55	0.337	mg/Kg	☼	04/19/17 12:13	04/19/17 15:20	1
Cadmium	0.549		0.387	0.0396	mg/Kg	☼	04/19/17 12:13	04/19/17 15:20	1
Lead	16.0		0.773	0.162	mg/Kg	☼	04/19/17 12:13	04/19/17 15:20	1

Client Sample ID: 2017-SED-002
Lab Sample ID: 600-146375-2
Date Collected: 04/05/17 12:30
Matrix: Solid
Date Received: 04/07/17 09:36

General Chemistry

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	27.2		1.0	1.0	%			04/07/17 17:18	1
Percent Solids	72.8		1.0	1.0	%			04/07/17 17:18	1
TOC	0.501		0.100	0.0415	%			04/19/17 13:30	1

Client Sample ID: 2017-SED-002
Lab Sample ID: 600-146375-2
Date Collected: 04/05/17 12:30
Matrix: Solid
Date Received: 04/07/17 09:36
Percent Solids: 72.8

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	13.5		1.21	0.263	mg/Kg	☼	04/19/17 12:13	04/19/17 15:27	1
Cadmium	0.392		0.301	0.0309	mg/Kg	☼	04/19/17 12:13	04/19/17 15:27	1
Lead	13.7		0.603	0.127	mg/Kg	☼	04/19/17 12:13	04/19/17 15:27	1

Client Sample ID: 2017-SED-003
Lab Sample ID: 600-146375-3
Date Collected: 04/05/17 13:45
Matrix: Solid
Date Received: 04/07/17 09:36

General Chemistry

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	10.4		1.0	1.0	%			04/07/17 17:18	1
Percent Solids	89.6		1.0	1.0	%			04/07/17 17:18	1
TOC	0.245		0.100	0.0415	%			04/19/17 13:30	1

Client Sample ID: 2017-SED-003
Lab Sample ID: 600-146375-3
Date Collected: 04/05/17 13:45
Matrix: Solid
Date Received: 04/07/17 09:36
Percent Solids: 89.6

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	28.1		1.03	0.225	mg/Kg	☼	04/19/17 12:13	04/19/17 15:29	1
Cadmium	0.547		0.258	0.0264	mg/Kg	☼	04/19/17 12:13	04/19/17 15:29	1
Lead	15.4		0.516	0.108	mg/Kg	☼	04/19/17 12:13	04/19/17 15:29	1

Client Sample ID: 2017-SED-004
Lab Sample ID: 600-146375-4
Date Collected: 04/05/17 13:10
Matrix: Solid
Date Received: 04/07/17 09:36

General Chemistry

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	11.5		1.0	1.0	%			04/07/17 17:18	1
Percent Solids	88.5		1.0	1.0	%			04/07/17 17:18	1
TOC	0.223		0.100	0.0415	%			04/19/17 13:30	1

Client Sample ID: 2017-SED-004
Lab Sample ID: 600-146375-4
Date Collected: 04/05/17 13:10
Matrix: Solid
Date Received: 04/07/17 09:36
Percent Solids: 88.5

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	25.2		0.966	0.211	mg/Kg	☼	04/19/17 12:13	04/19/17 15:31	1
Cadmium	0.435		0.242	0.0247	mg/Kg	☼	04/19/17 12:13	04/19/17 15:31	1
Lead	10.5		0.483	0.101	mg/Kg	☼	04/19/17 12:13	04/19/17 15:31	1

Client Sample ID: 2017-SED-010
Lab Sample ID: 600-146375-5
Date Collected: 04/05/17 13:35
Matrix: Solid
Date Received: 04/07/17 09:36

General Chemistry

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	4.1		1.0	1.0	%			04/07/17 16:34	1
Percent Solids	95.9		1.0	1.0	%			04/07/17 16:34	1
TOC	0.154		0.100	0.0415	%			04/19/17 13:30	1

Client Sample ID: 2017-SED-010
Lab Sample ID: 600-146375-5
Date Collected: 04/05/17 13:35
Matrix: Solid
Date Received: 04/07/17 09:36
Percent Solids: 95.9

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	24.4		0.966	0.211	mg/Kg	☼	04/19/17 12:13	04/19/17 15:33	1
Cadmium	0.826		0.241	0.0247	mg/Kg	☼	04/19/17 12:13	04/19/17 15:33	1
Lead	13.1		0.483	0.101	mg/Kg	☼	04/19/17 12:13	04/19/17 15:33	1

Client Sample ID: 2017-SED-011
Lab Sample ID: 600-146375-6
Date Collected: 04/05/17 14:30
Matrix: Solid
Date Received: 04/07/17 09:36

General Chemistry

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	30.8		1.0	1.0	%			04/07/17 16:34	1

Client Sample ID: 2017-SED-011
Lab Sample ID: 600-146375-6
Date Collected: 04/05/17 14:30
Matrix: Solid
Date Received: 04/07/17 09:36

General Chemistry (Continued)

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	69.2		1.0	1.0	%			04/07/17 16:34	1
TOC	0.543		0.100	0.0415	%			04/19/17 13:30	1

Client Sample ID: 2017-SED-011
Lab Sample ID: 600-146375-6
Date Collected: 04/05/17 14:30
Matrix: Solid
Date Received: 04/07/17 09:36
Percent Solids: 69.2

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	6.51		1.26	0.274	mg/Kg	☼	04/19/17 12:13	04/19/17 15:36	1
Cadmium	0.383		0.314	0.0322	mg/Kg	☼	04/19/17 12:13	04/19/17 15:36	1
Lead	13.9		0.628	0.132	mg/Kg	☼	04/19/17 12:13	04/19/17 15:36	1

Client Sample ID: 2017-SED-005
Lab Sample ID: 600-146375-7
Date Collected: 04/05/17 15:00
Matrix: Solid
Date Received: 04/07/17 09:36

General Chemistry

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	6.5		1.0	1.0	%			04/07/17 17:18	1
Percent Solids	93.5		1.0	1.0	%			04/07/17 17:18	1
TOC	0.137		0.100	0.0415	%			04/19/17 13:30	1

Client Sample ID: 2017-SED-005
Lab Sample ID: 600-146375-7
Date Collected: 04/05/17 15:00
Matrix: Solid
Date Received: 04/07/17 09:36
Percent Solids: 93.5

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	35.4		1.01	0.220	mg/Kg	☼	04/19/17 12:13	04/19/17 15:44	1
Cadmium	0.873		0.252	0.0258	mg/Kg	☼	04/19/17 12:13	04/19/17 15:44	1
Lead	15.9		0.504	0.106	mg/Kg	☼	04/19/17 12:13	04/19/17 15:44	1

Client Sample ID: EB-1
Lab Sample ID: 600-146375-8
Date Collected: 04/05/17 18:13
Matrix: Water
Date Received: 04/07/17 09:36

Method: 6010B - Inductively Coupled Plasma - Atomic Emission Spectrometry

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.00285	U	0.0100	0.00285	mg/L		04/18/17 11:02	04/19/17 13:07	1
Cadmium	0.000280	U	0.00500	0.000280	mg/L		04/18/17 11:02	04/19/17 13:07	1
Lead	0.00219	U	0.0100	0.00219	mg/L		04/18/17 11:02	04/19/17 13:07	1

Client Sample ID: 2017-SED-006
Lab Sample ID: 600-146375-9
Date Collected: 04/05/17 16:20
Matrix: Solid
Date Received: 04/07/17 09:36

General Chemistry

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	15.8		1.0	1.0	%			04/07/17 17:18	1
Percent Solids	84.2		1.0	1.0	%			04/07/17 17:18	1

Client Sample ID: 2017-SED-006
Lab Sample ID: 600-146375-9
Date Collected: 04/05/17 16:20
Matrix: Solid
Date Received: 04/07/17 09:36

General Chemistry (Continued)

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
TOC	0.193		0.100	0.0415	%			04/19/17 13:30	1

Client Sample ID: 2017-SED-006
Lab Sample ID: 600-146375-9
Date Collected: 04/05/17 16:20
Matrix: Solid
Date Received: 04/07/17 09:36
Percent Solids: 84.2

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	17.3		1.05	0.229	mg/Kg	☼	04/19/17 12:13	04/19/17 15:46	1
Cadmium	0.331		0.263	0.0269	mg/Kg	☼	04/19/17 12:13	04/19/17 15:46	1
Lead	8.71		0.525	0.110	mg/Kg	☼	04/19/17 12:13	04/19/17 15:46	1

Client Sample ID: 2017-SED-007
Lab Sample ID: 600-146375-10
Date Collected: 04/06/17 17:05
Matrix: Solid
Date Received: 04/07/17 09:36

General Chemistry

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	20.1		1.0	1.0	%			04/07/17 17:18	1
Percent Solids	79.9		1.0	1.0	%			04/07/17 17:18	1
TOC	0.269		0.100	0.0415	%			04/19/17 13:30	1

Client Sample ID: 2017-SED-007
Lab Sample ID: 600-146375-10
Date Collected: 04/06/17 17:05
Matrix: Solid
Date Received: 04/07/17 09:36
Percent Solids: 79.9

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	23.1		1.20	0.262	mg/Kg	☼	04/19/17 12:13	04/19/17 15:48	1
Cadmium	0.541		0.301	0.0308	mg/Kg	☼	04/19/17 12:13	04/19/17 15:48	1
Lead	13.9		0.601	0.126	mg/Kg	☼	04/19/17 12:13	04/19/17 15:48	1

Client Sample ID: 2017-SED-009
Lab Sample ID: 600-146375-11
Date Collected: 04/06/17 09:30
Matrix: Solid
Date Received: 04/07/17 09:36

General Chemistry

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	3.8		1.0	1.0	%			04/07/17 17:18	1
Percent Solids	96.2		1.0	1.0	%			04/07/17 17:18	1
TOC	0.146		0.100	0.0415	%			04/19/17 13:30	1

Client Sample ID: 2017-SED-009
Lab Sample ID: 600-146375-11
Date Collected: 04/06/17 09:30
Matrix: Solid
Date Received: 04/07/17 09:36
Percent Solids: 96.2

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	51.9		1.01	0.220	mg/Kg	☼	04/19/17 12:13	04/19/17 15:50	1
Cadmium	0.308		0.252	0.0258	mg/Kg	☼	04/19/17 12:13	04/19/17 15:50	1
Lead	13.7		0.505	0.106	mg/Kg	☼	04/19/17 12:13	04/19/17 15:50	1

Client Sample ID: 2017-SED-008
Lab Sample ID: 600-146375-12
Date Collected: 04/06/17 08:50
Matrix: Solid
Date Received: 04/07/17 09:36

General Chemistry

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	8.7		1.0	1.0	%			04/07/17 17:18	1
Percent Solids	91.3		1.0	1.0	%			04/07/17 17:18	1
TOC	0.185		0.100	0.0415	%			04/19/17 13:30	1

Client Sample ID: 2017-SED-008
Lab Sample ID: 600-146375-12
Date Collected: 04/06/17 08:50
Matrix: Solid
Date Received: 04/07/17 09:36
Percent Solids: 91.3

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	27.7		0.987	0.215	mg/Kg	☼	04/19/17 12:13	04/19/17 15:52	1
Cadmium	0.400		0.247	0.0253	mg/Kg	☼	04/19/17 12:13	04/19/17 15:52	1
Lead	13.8		0.493	0.104	mg/Kg	☼	04/19/17 12:13	04/19/17 15:52	1

Client Sample ID: 2017-SED-012
Lab Sample ID: 600-146375-13
Date Collected: 04/06/17 10:00
Matrix: Solid
Date Received: 04/07/17 09:36

General Chemistry

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	23.2		1.0	1.0	%			04/07/17 17:18	1
Percent Solids	76.8		1.0	1.0	%			04/07/17 17:18	1
TOC	0.353		0.100	0.0415	%			04/19/17 13:30	1

Client Sample ID: 2017-SED-012
Lab Sample ID: 600-146375-13
Date Collected: 04/06/17 10:00
Matrix: Solid
Date Received: 04/07/17 09:36
Percent Solids: 76.8

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	16.6		1.16	0.253	mg/Kg	☼	04/19/17 12:13	04/19/17 15:59	1
Cadmium	0.535		0.291	0.0298	mg/Kg	☼	04/19/17 12:13	04/19/17 15:59	1
Lead	15.1		0.581	0.122	mg/Kg	☼	04/19/17 12:13	04/19/17 15:59	1

Client Sample ID: DUP-01
Lab Sample ID: 600-146375-14
Date Collected: 04/06/17 00:00
Matrix: Solid
Date Received: 04/07/17 09:36

General Chemistry

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	3.6		1.0	1.0	%			04/07/17 16:34	1
Percent Solids	96.4		1.0	1.0	%			04/07/17 16:34	1
TOC	0.208		0.100	0.0415	%			04/19/17 13:30	1

Client Sample ID: DUP-01

Lab Sample ID: 600-146375-14
Date Collected: 04/06/17 00:00
Matrix: Solid
Date Received: 04/07/17 09:36
Percent Solids: 96.4

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	19.9		0.978	0.213	mg/Kg	☼	04/19/17 12:13	04/19/17 16:01	1
Cadmium	0.562		0.245	0.0250	mg/Kg	☼	04/19/17 12:13	04/19/17 16:01	1
Lead	11.8		0.489	0.103	mg/Kg	☼	04/19/17 12:13	04/19/17 16:01	1

Client Sample ID: DUP-02

Lab Sample ID: 600-146375-15
Date Collected: 04/06/17 00:00
Matrix: Solid
Date Received: 04/07/17 09:36

General Chemistry

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	24.3		1.0	1.0	%			04/07/17 16:34	1
Percent Solids	75.7		1.0	1.0	%			04/07/17 16:34	1
TOC	0.291		0.100	0.0415	%			04/19/17 13:30	1

Client Sample ID: DUP-02

Lab Sample ID: 600-146375-15
Date Collected: 04/06/17 00:00
Matrix: Solid
Date Received: 04/07/17 09:36
Percent Solids: 75.7

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	17.7		1.27	0.277	mg/Kg	☼	04/19/17 12:13	04/19/17 16:03	1
Cadmium	0.489		0.318	0.0325	mg/Kg	☼	04/19/17 12:13	04/19/17 16:03	1
Lead	16.2		0.635	0.133	mg/Kg	☼	04/19/17 12:13	04/19/17 16:03	1

Qualifiers

Metals

Qualifier	Qualifier Description
N1	MS, MSD: Spike recovery exceeds upper or lower control limits.
N2	RPD of the MS and MSD exceeds the control limits
U	Analyte was not detected at or above the SDL.

General Chemistry

Qualifier	Qualifier Description
F	Duplicate RPD exceeds the control limit
U	Analyte was not detected at or above the SDL.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Method: 6010B - Metals (ICP)

Lab Sample ID: MB 600-211087/1-A
Matrix: Solid
Analysis Batch: 211106

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 211087

Analyte	MB Result	MB Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.218	U	1.00	0.218	mg/Kg		04/19/17 12:13	04/19/17 15:16	1
Cadmium	0.0256	U	0.250	0.0256	mg/Kg		04/19/17 12:13	04/19/17 15:16	1
Lead	0.105	U	0.500	0.105	mg/Kg		04/19/17 12:13	04/19/17 15:16	1

Lab Sample ID: LCSSRM 600-211087/2-A
Matrix: Solid
Analysis Batch: 211106

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 211087

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	97.5	95.30		mg/Kg		97.7	69.2 - 145.6
Cadmium	76.6	72.92		mg/Kg		95.2	73.2 - 126.8
Lead	96.7	92.69		mg/Kg		95.9	81.7 - 117.9

Lab Sample ID: 600-146375-1 MS
Matrix: Solid
Analysis Batch: 211106

Client Sample ID: 2017-SED-001
Prep Type: Total/NA
Prep Batch: 211087

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	8.47		73.0	85.74		mg/Kg	☼	106	75 - 125
Cadmium	0.549		36.5	36.31		mg/Kg	☼	98	75 - 125
Lead	16.0		73.0	84.65		mg/Kg	☼	94	75 - 125

Lab Sample ID: 600-146375-12 MS
Matrix: Solid
Analysis Batch: 211106

Client Sample ID: 2017-SED-008
Prep Type: Total/NA
Prep Batch: 211087

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	27.7		49.3	57.37	N1	mg/Kg	☼	60	75 - 125
Cadmium	0.400		24.7	23.91		mg/Kg	☼	95	75 - 125
Lead	13.8		49.3	58.35		mg/Kg	☼	90	75 - 125

Lab Sample ID: 600-146375-12 MSD
Matrix: Solid
Analysis Batch: 211106

Client Sample ID: 2017-SED-008
Prep Type: Total/NA
Prep Batch: 211087

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	27.7		50.7	75.74	N2	mg/Kg	☼	95	75 - 125	28	20
Cadmium	0.400		25.3	25.62		mg/Kg	☼	99	75 - 125	7	20
Lead	13.8		50.7	64.23		mg/Kg	☼	99	75 - 125	10	20

Lab Sample ID: 600-146375-1 DU
Matrix: Solid
Analysis Batch: 211106

Client Sample ID: 2017-SED-001
Prep Type: Total/NA
Prep Batch: 211087

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Arsenic	8.47		9.048		mg/Kg	☼	7	20
Cadmium	0.549		0.4615		mg/Kg	☼	17	20

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: 600-146375-1 DU
Matrix: Solid
Analysis Batch: 211106

Client Sample ID: 2017-SED-001
Prep Type: Total/NA
Prep Batch: 211087

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Lead	16.0		15.13		mg/Kg	☼	6	20

Method: 6010B - Inductively Coupled Plasma - Atomic Emission Spectrometry

Lab Sample ID: MB 600-210987/1-A
Matrix: Water
Analysis Batch: 211101

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 210987

Analyte	MB Result	MB Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.00285	U	0.0100	0.00285	mg/L		04/18/17 11:02	04/19/17 13:03	1
Cadmium	0.000280	U	0.00500	0.000280	mg/L		04/18/17 11:02	04/19/17 13:03	1
Lead	0.00219	U	0.0100	0.00219	mg/L		04/18/17 11:02	04/19/17 13:03	1

Lab Sample ID: LCS 600-210987/2-A
Matrix: Water
Analysis Batch: 211101

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 210987

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	1.00	1.022		mg/L		102	80 - 120
Cadmium	0.500	0.5118		mg/L		102	80 - 120
Lead	1.00	1.038		mg/L		104	80 - 120

Lab Sample ID: 600-146582-A-8-C MS
Matrix: Water
Analysis Batch: 211101

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 210987

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	0.0253		1.00	1.071		mg/L		105	75 - 125
Cadmium	0.000280	U	0.500	0.5107		mg/L		102	75 - 125
Lead	0.00219	U	1.00	1.044		mg/L		104	75 - 125

Lab Sample ID: 600-146582-A-8-D MSD
Matrix: Water
Analysis Batch: 211101

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 210987

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	0.0253		1.00	1.072		mg/L		105	75 - 125	0	20
Cadmium	0.000280	U	0.500	0.5177		mg/L		104	75 - 125	1	20
Lead	0.00219	U	1.00	1.061		mg/L		106	75 - 125	2	20

Lab Sample ID: 600-146582-A-8-B DU
Matrix: Water
Analysis Batch: 211101

Client Sample ID: Duplicate
Prep Type: Total/NA
Prep Batch: 210987

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Arsenic	0.0253		0.02737		mg/L		8	20
Cadmium	0.000280	U	0.000280	U	mg/L		NC	20
Lead	0.00219	U	0.00219	U	mg/L		NC	20

Method: Moisture - Percent Moisture

Lab Sample ID: 600-146375-4 DU
Matrix: Solid
Analysis Batch: 210305

Client Sample ID: 2017-SED-004
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Percent Moisture	11.5			8.8	F	%				26	20
Percent Solids	88.5			91.2		%				3	20

Lab Sample ID: 600-146375-13 DU
Matrix: Solid
Analysis Batch: 210305

Client Sample ID: 2017-SED-012
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Percent Moisture	23.2			22.6		%				3	20
Percent Solids	76.8			77.4		%				0.8	20

Method: WALKLEY BLACK - Organic Carbon, Total (TOC)

Lab Sample ID: MB 600-211126/1
Matrix: Solid
Analysis Batch: 211126

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
TOC	0.0415	U	0.100	0.0415	%			04/19/17 13:30	1

Lab Sample ID: LCS 600-211126/2
Matrix: Solid
Analysis Batch: 211126

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
TOC			2.34	2.120		%		91	80 - 120		

Lab Sample ID: 600-146375-1 DU
Matrix: Solid
Analysis Batch: 211126

Client Sample ID: 2017-SED-001
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
TOC	0.741			0.7320		%				1	20

Lab Sample ID: 600-146375-11 DU
Matrix: Solid
Analysis Batch: 211126

Client Sample ID: 2017-SED-009
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
TOC	0.146			0.1700		%				15	20

Unadjusted Detection Limits

Client: Golder Associates Inc.
Project/Site: Exide Sediment Samples

TestAmerica Job ID: 600-146375-1

Method: 6010B - Inductively Coupled Plasma - Atomic Emission Spectrometry

Prep: 3010A

Analyte	MQL	MDL	Units	Method
Arsenic	0.0100	0.00285	mg/L	6010B
Cadmium	0.00500	0.000280	mg/L	6010B
Lead	0.0100	0.00219	mg/L	6010B

Method: 6010B - Metals (ICP)

Prep: 3050B

Analyte	MQL	MDL	Units	Method
Arsenic	1.00	0.218	mg/Kg	6010B
Cadmium	0.250	0.0256	mg/Kg	6010B
Lead	0.500	0.105	mg/Kg	6010B

General Chemistry

Analyte	MQL	MDL	Units	Method
Percent Moisture	1.0	1.0	%	Moisture
Percent Solids	1.0	1.0	%	Moisture
TOC	0.100	0.0415	%	WALKLEY BLACK

Metals

Prep Batch: 210987

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-146375-8	EB-1	Total/NA	Water	3010A	
MB 600-210987/1-A	Method Blank	Total/NA	Water	3010A	
LCS 600-210987/2-A	Lab Control Sample	Total/NA	Water	3010A	
600-146582-A-8-C MS	Matrix Spike	Total/NA	Water	3010A	
600-146582-A-8-D MSD	Matrix Spike Duplicate	Total/NA	Water	3010A	
600-146582-A-8-B DU	Duplicate	Total/NA	Water	3010A	

Prep Batch: 211087

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-146375-1	2017-SED-001	Total/NA	Solid	3050B	
600-146375-2	2017-SED-002	Total/NA	Solid	3050B	
600-146375-3	2017-SED-003	Total/NA	Solid	3050B	
600-146375-4	2017-SED-004	Total/NA	Solid	3050B	
600-146375-5	2017-SED-010	Total/NA	Solid	3050B	
600-146375-6	2017-SED-011	Total/NA	Solid	3050B	
600-146375-7	2017-SED-005	Total/NA	Solid	3050B	
600-146375-9	2017-SED-006	Total/NA	Solid	3050B	
600-146375-10	2017-SED-007	Total/NA	Solid	3050B	
600-146375-11	2017-SED-009	Total/NA	Solid	3050B	
600-146375-12	2017-SED-008	Total/NA	Solid	3050B	
600-146375-13	2017-SED-012	Total/NA	Solid	3050B	
600-146375-14	DUP-01	Total/NA	Solid	3050B	
600-146375-15	DUP-02	Total/NA	Solid	3050B	
MB 600-211087/1-A	Method Blank	Total/NA	Solid	3050B	
LCSSRM 600-211087/2-A	Lab Control Sample	Total/NA	Solid	3050B	
600-146375-1 MS	2017-SED-001	Total/NA	Solid	3050B	
600-146375-12 MS	2017-SED-008	Total/NA	Solid	3050B	
600-146375-12 MSD	2017-SED-008	Total/NA	Solid	3050B	
600-146375-1 DU	2017-SED-001	Total/NA	Solid	3050B	

Analysis Batch: 211101

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-146375-8	EB-1	Total/NA	Water	6010B	210987
MB 600-210987/1-A	Method Blank	Total/NA	Water	6010B	210987
LCS 600-210987/2-A	Lab Control Sample	Total/NA	Water	6010B	210987
600-146582-A-8-C MS	Matrix Spike	Total/NA	Water	6010B	210987
600-146582-A-8-D MSD	Matrix Spike Duplicate	Total/NA	Water	6010B	210987
600-146582-A-8-B DU	Duplicate	Total/NA	Water	6010B	210987

Analysis Batch: 211106

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-146375-1	2017-SED-001	Total/NA	Solid	6010B	211087
600-146375-2	2017-SED-002	Total/NA	Solid	6010B	211087
600-146375-3	2017-SED-003	Total/NA	Solid	6010B	211087
600-146375-4	2017-SED-004	Total/NA	Solid	6010B	211087
600-146375-5	2017-SED-010	Total/NA	Solid	6010B	211087
600-146375-6	2017-SED-011	Total/NA	Solid	6010B	211087
600-146375-7	2017-SED-005	Total/NA	Solid	6010B	211087
600-146375-9	2017-SED-006	Total/NA	Solid	6010B	211087
600-146375-10	2017-SED-007	Total/NA	Solid	6010B	211087
600-146375-11	2017-SED-009	Total/NA	Solid	6010B	211087

Metals (Continued)

Analysis Batch: 211106 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-146375-12	2017-SED-008	Total/NA	Solid	6010B	211087
600-146375-13	2017-SED-012	Total/NA	Solid	6010B	211087
600-146375-14	DUP-01	Total/NA	Solid	6010B	211087
600-146375-15	DUP-02	Total/NA	Solid	6010B	211087
MB 600-211087/1-A	Method Blank	Total/NA	Solid	6010B	211087
LCSSRM 600-211087/2-A	Lab Control Sample	Total/NA	Solid	6010B	211087
600-146375-1 MS	2017-SED-001	Total/NA	Solid	6010B	211087
600-146375-12 MS	2017-SED-008	Total/NA	Solid	6010B	211087
600-146375-12 MSD	2017-SED-008	Total/NA	Solid	6010B	211087
600-146375-1 DU	2017-SED-001	Total/NA	Solid	6010B	211087

General Chemistry

Analysis Batch: 210305

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-146375-1	2017-SED-001	Total/NA	Solid	Moisture	
600-146375-2	2017-SED-002	Total/NA	Solid	Moisture	
600-146375-3	2017-SED-003	Total/NA	Solid	Moisture	
600-146375-4	2017-SED-004	Total/NA	Solid	Moisture	
600-146375-5	2017-SED-010	Total/NA	Solid	Moisture	
600-146375-6	2017-SED-011	Total/NA	Solid	Moisture	
600-146375-7	2017-SED-005	Total/NA	Solid	Moisture	
600-146375-9	2017-SED-006	Total/NA	Solid	Moisture	
600-146375-10	2017-SED-007	Total/NA	Solid	Moisture	
600-146375-11	2017-SED-009	Total/NA	Solid	Moisture	
600-146375-12	2017-SED-008	Total/NA	Solid	Moisture	
600-146375-13	2017-SED-012	Total/NA	Solid	Moisture	
600-146375-14	DUP-01	Total/NA	Solid	Moisture	
600-146375-15	DUP-02	Total/NA	Solid	Moisture	
600-146375-12 MS	2017-SED-008	Total/NA	Solid	Moisture	
600-146375-12 MSD	2017-SED-008	Total/NA	Solid	Moisture	
600-146375-4 DU	2017-SED-004	Total/NA	Solid	Moisture	
600-146375-13 DU	2017-SED-012	Total/NA	Solid	Moisture	

Analysis Batch: 211126

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-146375-1	2017-SED-001	Total/NA	Solid	WALKLEY BLACK	
600-146375-2	2017-SED-002	Total/NA	Solid	WALKLEY BLACK	
600-146375-3	2017-SED-003	Total/NA	Solid	WALKLEY BLACK	
600-146375-4	2017-SED-004	Total/NA	Solid	WALKLEY BLACK	
600-146375-5	2017-SED-010	Total/NA	Solid	WALKLEY BLACK	
600-146375-6	2017-SED-011	Total/NA	Solid	WALKLEY BLACK	
600-146375-7	2017-SED-005	Total/NA	Solid	WALKLEY BLACK	
600-146375-9	2017-SED-006	Total/NA	Solid	WALKLEY BLACK	

General Chemistry (Continued)

Analysis Batch: 211126 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-146375-10	2017-SED-007	Total/NA	Solid	WALKLEY BLACK	
600-146375-11	2017-SED-009	Total/NA	Solid	WALKLEY BLACK	
600-146375-12	2017-SED-008	Total/NA	Solid	WALKLEY BLACK	
600-146375-13	2017-SED-012	Total/NA	Solid	WALKLEY BLACK	
600-146375-14	DUP-01	Total/NA	Solid	WALKLEY BLACK	
600-146375-15	DUP-02	Total/NA	Solid	WALKLEY BLACK	
MB 600-211126/1	Method Blank	Total/NA	Solid	WALKLEY BLACK	
LCS 600-211126/2	Lab Control Sample	Total/NA	Solid	WALKLEY BLACK	
600-146375-1 DU	2017-SED-001	Total/NA	Solid	WALKLEY BLACK	
600-146375-11 DU	2017-SED-009	Total/NA	Solid	WALKLEY BLACK	

Lab Chronicle

Client: Golder Associates Inc.
Project/Site: Exide Sediment Samples

TestAmerica Job ID: 600-146375-1

Client Sample ID: 2017-SED-001
Date Collected: 04/05/17 12:00
Date Received: 04/07/17 09:36

Lab Sample ID: 600-146375-1
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			210305	04/07/17 16:34	B1K	TAL HOU
Total/NA	Analysis	WALKLEY BLACK		1	2.1600 g	2.1600 g	211126	04/19/17 13:30	EC1	TAL HOU

Client Sample ID: 2017-SED-001
Date Collected: 04/05/17 12:00
Date Received: 04/07/17 09:36

Lab Sample ID: 600-146375-1
Matrix: Solid
Percent Solids: 64.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.00 g	50 mL	211087	04/19/17 12:13	JAH	TAL HOU
Total/NA	Analysis	6010B		1			211106	04/19/17 15:20	DCL	TAL HOU

Client Sample ID: 2017-SED-002
Date Collected: 04/05/17 12:30
Date Received: 04/07/17 09:36

Lab Sample ID: 600-146375-2
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			210305	04/07/17 17:18	B1K	TAL HOU
Total/NA	Analysis	WALKLEY BLACK		1	2.5000 g	2.5000 g	211126	04/19/17 13:30	EC1	TAL HOU

Client Sample ID: 2017-SED-002
Date Collected: 04/05/17 12:30
Date Received: 04/07/17 09:36

Lab Sample ID: 600-146375-2
Matrix: Solid
Percent Solids: 72.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.14 g	50 mL	211087	04/19/17 12:13	JAH	TAL HOU
Total/NA	Analysis	6010B		1			211106	04/19/17 15:27	DCL	TAL HOU

Client Sample ID: 2017-SED-003
Date Collected: 04/05/17 13:45
Date Received: 04/07/17 09:36

Lab Sample ID: 600-146375-3
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			210305	04/07/17 17:18	B1K	TAL HOU
Total/NA	Analysis	WALKLEY BLACK		1	2.5200 g	2.5200 g	211126	04/19/17 13:30	EC1	TAL HOU

Lab Chronicle

Client: Golder Associates Inc.
Project/Site: Exide Sediment Samples

TestAmerica Job ID: 600-146375-1

Client Sample ID: 2017-SED-003
Date Collected: 04/05/17 13:45
Date Received: 04/07/17 09:36

Lab Sample ID: 600-146375-3
Matrix: Solid
Percent Solids: 89.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.08 g	50 mL	211087	04/19/17 12:13	JAH	TAL HOU
Total/NA	Analysis	6010B		1			211106	04/19/17 15:29	DCL	TAL HOU

Client Sample ID: 2017-SED-004
Date Collected: 04/05/17 13:10
Date Received: 04/07/17 09:36

Lab Sample ID: 600-146375-4
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			210305	04/07/17 17:18	B1K	TAL HOU
Total/NA	Analysis	WALKLEY BLACK		1	2.5100 g	2.5100 g	211126	04/19/17 13:30	EC1	TAL HOU

Client Sample ID: 2017-SED-004
Date Collected: 04/05/17 13:10
Date Received: 04/07/17 09:36

Lab Sample ID: 600-146375-4
Matrix: Solid
Percent Solids: 88.5

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.17 g	50 mL	211087	04/19/17 12:13	JAH	TAL HOU
Total/NA	Analysis	6010B		1			211106	04/19/17 15:31	DCL	TAL HOU

Client Sample ID: 2017-SED-010
Date Collected: 04/05/17 13:35
Date Received: 04/07/17 09:36

Lab Sample ID: 600-146375-5
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			210305	04/07/17 16:34	B1K	TAL HOU
Total/NA	Analysis	WALKLEY BLACK		1	2.5100 g	2.5100 g	211126	04/19/17 13:30	EC1	TAL HOU

Client Sample ID: 2017-SED-010
Date Collected: 04/05/17 13:35
Date Received: 04/07/17 09:36

Lab Sample ID: 600-146375-5
Matrix: Solid
Percent Solids: 95.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.08 g	50 mL	211087	04/19/17 12:13	JAH	TAL HOU
Total/NA	Analysis	6010B		1			211106	04/19/17 15:33	DCL	TAL HOU

Client Sample ID: 2017-SED-011
Date Collected: 04/05/17 14:30
Date Received: 04/07/17 09:36

Lab Sample ID: 600-146375-6
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			210305	04/07/17 16:34	B1K	TAL HOU

Lab Chronicle

Client: Golder Associates Inc.
Project/Site: Exide Sediment Samples

TestAmerica Job ID: 600-146375-1

Client Sample ID: 2017-SED-011
Date Collected: 04/05/17 14:30
Date Received: 04/07/17 09:36

Lab Sample ID: 600-146375-6
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	WALKLEY BLACK		1	2.5200 g	2.5200 g	211126	04/19/17 13:30	EC1	TAL HOU

Client Sample ID: 2017-SED-011
Date Collected: 04/05/17 14:30
Date Received: 04/07/17 09:36

Lab Sample ID: 600-146375-6
Matrix: Solid
Percent Solids: 69.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.15 g	50 mL	211087	04/19/17 12:13	JAH	TAL HOU
Total/NA	Analysis	6010B		1			211106	04/19/17 15:36	DCL	TAL HOU

Client Sample ID: 2017-SED-005
Date Collected: 04/05/17 15:00
Date Received: 04/07/17 09:36

Lab Sample ID: 600-146375-7
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			210305	04/07/17 17:18	B1K	TAL HOU
Total/NA	Analysis	WALKLEY BLACK		1	2.5300 g	2.5300 g	211126	04/19/17 13:30	EC1	TAL HOU

Client Sample ID: 2017-SED-005
Date Collected: 04/05/17 15:00
Date Received: 04/07/17 09:36

Lab Sample ID: 600-146375-7
Matrix: Solid
Percent Solids: 93.5

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.06 g	50 mL	211087	04/19/17 12:13	JAH	TAL HOU
Total/NA	Analysis	6010B		1			211106	04/19/17 15:44	DCL	TAL HOU

Client Sample ID: EB-1
Date Collected: 04/05/17 18:13
Date Received: 04/07/17 09:36

Lab Sample ID: 600-146375-8
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			50 mL	50 mL	210987	04/18/17 11:02	JAH	TAL HOU
Total/NA	Analysis	6010B		1			211101	04/19/17 13:07	DCL	TAL HOU

Client Sample ID: 2017-SED-006
Date Collected: 04/05/17 16:20
Date Received: 04/07/17 09:36

Lab Sample ID: 600-146375-9
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			210305	04/07/17 17:18	B1K	TAL HOU

Client Sample ID: 2017-SED-006
Date Collected: 04/05/17 16:20
Date Received: 04/07/17 09:36

Lab Sample ID: 600-146375-9
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	WALKLEY BLACK		1	2.5900 g	2.5900 g	211126	04/19/17 13:30	EC1	TAL HOU

Client Sample ID: 2017-SED-006
Date Collected: 04/05/17 16:20
Date Received: 04/07/17 09:36

Lab Sample ID: 600-146375-9
Matrix: Solid
Percent Solids: 84.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.13 g	50 mL	211087	04/19/17 12:13	JAH	TAL HOU
Total/NA	Analysis	6010B		1			211106	04/19/17 15:46	DCL	TAL HOU

Client Sample ID: 2017-SED-007
Date Collected: 04/06/17 17:05
Date Received: 04/07/17 09:36

Lab Sample ID: 600-146375-10
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			210305	04/07/17 17:18	B1K	TAL HOU
Total/NA	Analysis	WALKLEY BLACK		1	2.7200 g	2.7200 g	211126	04/19/17 13:30	EC1	TAL HOU

Client Sample ID: 2017-SED-007
Date Collected: 04/06/17 17:05
Date Received: 04/07/17 09:36

Lab Sample ID: 600-146375-10
Matrix: Solid
Percent Solids: 79.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.04 g	50 mL	211087	04/19/17 12:13	JAH	TAL HOU
Total/NA	Analysis	6010B		1			211106	04/19/17 15:48	DCL	TAL HOU

Client Sample ID: 2017-SED-009
Date Collected: 04/06/17 09:30
Date Received: 04/07/17 09:36

Lab Sample ID: 600-146375-11
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			210305	04/07/17 17:18	B1K	TAL HOU
Total/NA	Analysis	WALKLEY BLACK		1	2.5000 g	2.5000 g	211126	04/19/17 13:30	EC1	TAL HOU

Client Sample ID: 2017-SED-009
Date Collected: 04/06/17 09:30
Date Received: 04/07/17 09:36

Lab Sample ID: 600-146375-11
Matrix: Solid
Percent Solids: 96.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.03 g	50 mL	211087	04/19/17 12:13	JAH	TAL HOU

Lab Chronicle

Client: Golder Associates Inc.
Project/Site: Exide Sediment Samples

TestAmerica Job ID: 600-146375-1

Client Sample ID: 2017-SED-009
Date Collected: 04/06/17 09:30
Date Received: 04/07/17 09:36

Lab Sample ID: 600-146375-11
Matrix: Solid
Percent Solids: 96.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	6010B		1			211106	04/19/17 15:50	DCL	TAL HOU

Client Sample ID: 2017-SED-008
Date Collected: 04/06/17 08:50
Date Received: 04/07/17 09:36

Lab Sample ID: 600-146375-12
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			210305	04/07/17 17:18	B1K	TAL HOU
Total/NA	Analysis	WALKLEY BLACK		1	2.6000 g	2.6000 g	211126	04/19/17 13:30	EC1	TAL HOU

Client Sample ID: 2017-SED-008
Date Collected: 04/06/17 08:50
Date Received: 04/07/17 09:36

Lab Sample ID: 600-146375-12
Matrix: Solid
Percent Solids: 91.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.11 g	50 mL	211087	04/19/17 12:13	JAH	TAL HOU
Total/NA	Analysis	6010B		1			211106	04/19/17 15:52	DCL	TAL HOU

Client Sample ID: 2017-SED-012
Date Collected: 04/06/17 10:00
Date Received: 04/07/17 09:36

Lab Sample ID: 600-146375-13
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			210305	04/07/17 17:18	B1K	TAL HOU
Total/NA	Analysis	WALKLEY BLACK		1	2.5700 g	2.5700 g	211126	04/19/17 13:30	EC1	TAL HOU

Client Sample ID: 2017-SED-012
Date Collected: 04/06/17 10:00
Date Received: 04/07/17 09:36

Lab Sample ID: 600-146375-13
Matrix: Solid
Percent Solids: 76.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.12 g	50 mL	211087	04/19/17 12:13	JAH	TAL HOU
Total/NA	Analysis	6010B		1			211106	04/19/17 15:59	DCL	TAL HOU

Client Sample ID: DUP-01
Date Collected: 04/06/17 00:00
Date Received: 04/07/17 09:36

Lab Sample ID: 600-146375-14
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			210305	04/07/17 16:34	B1K	TAL HOU

Lab Chronicle

Client: Golder Associates Inc.
Project/Site: Exide Sediment Samples

TestAmerica Job ID: 600-146375-1

Client Sample ID: DUP-01
Date Collected: 04/06/17 00:00
Date Received: 04/07/17 09:36

Lab Sample ID: 600-146375-14
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	WALKLEY BLACK		1	2.5000 g	2.5000 g	211126	04/19/17 13:30	EC1	TAL HOU

Client Sample ID: DUP-01
Date Collected: 04/06/17 00:00
Date Received: 04/07/17 09:36

Lab Sample ID: 600-146375-14
Matrix: Solid
Percent Solids: 96.4

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.06 g	50 mL	211087	04/19/17 12:13	JAH	TAL HOU
Total/NA	Analysis	6010B		1			211106	04/19/17 16:01	DCL	TAL HOU

Client Sample ID: DUP-02
Date Collected: 04/06/17 00:00
Date Received: 04/07/17 09:36

Lab Sample ID: 600-146375-15
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			210305	04/07/17 16:34	B1K	TAL HOU
Total/NA	Analysis	WALKLEY BLACK		1	2.5200 g	2.5200 g	211126	04/19/17 13:30	EC1	TAL HOU

Client Sample ID: DUP-02
Date Collected: 04/06/17 00:00
Date Received: 04/07/17 09:36

Lab Sample ID: 600-146375-15
Matrix: Solid
Percent Solids: 75.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.04 g	50 mL	211087	04/19/17 12:13	JAH	TAL HOU
Total/NA	Analysis	6010B		1			211106	04/19/17 16:03	DCL	TAL HOU

Laboratory References:
TAL HOU = TestAmerica Houston, 6310 Rothway Street, Houston, TX 77040, TEL (713)690-4444

Accreditation/Certification Summary

Client: Golder Associates Inc.
Project/Site: Exide Sediment Samples

TestAmerica Job ID: 600-146375-1

Laboratory: TestAmerica Houston

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
Texas	NELAP	6	T104704223-17-21	10-31-17

The following analytes are included in this report, but accreditation/certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
Moisture		Solid	Percent Moisture
Moisture		Solid	Percent Solids

TestAmerica Houston
6310 Rothway Street
Houston, TX 77040
Phone (713) 690-4444 Fax (713) 690-5646

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: A. Marlow	Lab PM: Upton, Cathy L	Carrier Tracking No(s):
Client Contact: Ms. Abby Marlow	Phone: 303 664-4302	E-Mail: cathy.upton@testamericainc.com	COC No: 600-52241-15406.2
Company: Golder Associates Inc.			Page: Page 1 of 2
Address: 500 Century Plaza Drive Suite 190	Due Date Requested:		Job #:
City: Houston	TAT Requested (days): Standard		
State, Zip: TX, 77073			
Phone:	PO #: Exide1302086		
Email: abby_marlow@golder.com	WO #:		
Project Name: Exide Recycling Center - Main	Project #: 60004831		
Site:	SSOW#:		

Analysis Requested

Dallas . Ft Worth

560501

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	D422 - Grain Size (Routine List)	6010B - Metals (As,Cd,Pb)	Moisture	WALKLEY_BLACK - TOC	6020 Total Cd Pb As	Total Number of containers	Special Instructions/Note:
Preservation Code:							N	N	N	N			
2017-SED-001	4-5-17	1200	G	Solid			X	X	X	X		2	
2017-SED-002		1230		Solid			X	X	X	X			
2017-SED-003		1345		Solid			X	X	X	X			
2017-SED-004		1310		Solid			X	X	X	X			
2017-SED-010		1335		Solid			X	X	X	X			
2017-SED-011		1430		Solid			X	X	X	X			
2017-SED-005		1500		Solid			X	X	X	X			
EB1		1813		~~Water~~ Solid							X		
2017-SED-006	4-5-17	1620		Solid			X	X	X	X			
2017-SED-007		1705		Solid			X	X	X	X			
2017-SED-009	4-6-17	0930		Solid			X	X	X	X			

600-146375 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
Relinquished by:	Date/Time: 3-26-17 1100	Company	Received by: Sherry Justus
Relinquished by:	Date/Time:	Company	Received by:
Relinquished by:	Date/Time:	Company	Received by:

Date/Time: 4/7/17 0930 Company

Custody Seals Intact: △ Yes △ No

Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

TestAmerica Houston
6310 Rothway Street
Houston, TX 77040
Phone (713) 690-4444 Fax (713) 690-5646

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: A. Marlow	Lab PM: Upton, Cathy L	Carrier Tracking No(s):	COC No: 600-52241-15406.2
Client Contact: Ms. Abby Marlow	Phone: 303-664-4302	E-Mail: cathy.upton@testamericainc.com		Page: Page 2 of 2
Company: Golder Associates Inc.				Job #:
Address: 500 Century Plaza Drive Suite 190	Due Date Requested:			
City: Houston	TAT Requested (days): Standard			
State, Zip: TX, 77073				
Phone:	PO #: Exide1302086			
Email: abby_marlow@golder.com	WO #:			
Project Name: Exide Recycling Center - Main	Project #: 60004831			
Site:	SSOW#:			

Dallas . Ft Worth

560501

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	D422 - Grain Size (Routine List)	6010B - Metals (As,Cd,Pb)	Moisture	WALKLEY_BLACK - TOC	Total Number of containers	Special Instructions/Note:
				Preservation Code:			N	N	N	N		
2017-SED-008	3-6-17	0850	G	Solid		X	X	X	X	X	2	
2017-SED-008 MS				Solid			X	X	X	X		
2017-SED-008 MSD				Solid			X	X	X	X		
2017-SED-012		1000		Solid			X	X	X	X		
Dup-01		"		Solid			X	X	X	X		
Dup-02		"		Solid			X	X	X	X		
				Solid								
				Solid								
				Solid								
				Solid								
				Solid								

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		3-26-17 1100	Golder	Shirley Justus	4/7/17 0936	TAL
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

TestAmerica Houston

Loc: 600
146375

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sample Receipt Checklist

Date/Time Received: '17 APR 7 9:36

JOB NUMBER: _____ CLIENT: Golder

UNPACKED BY: SJ CARRIER/DRIVER: F/E

Custody Seal Present: ☒ YES ☐ NO Number of Coolers Received: 1

Cooler ID	Temp Blank	Trip Blank	Observed Temp (°C)	Therm ID	Them CF	Corrected Temp (°C)
B/W	Y / N	Y / N	3.1	6025	-.2	2.9
	Y / N	Y / N				
	Y / N	Y / N				
	Y / N	Y / N	SJ			
	Y / N	Y / N				
	Y / N	Y / N				
	Y / N	Y / N				
	Y / N	Y / N				
	Y / N	Y / N				
	Y / N	Y / N				

CF = correction factor

Samples received on ice? ☒ YES ☐ NO

LABORATORY PRESERVATION OF SAMPLES REQUIRED: ☒ NO ☐ YES

Base samples are>pH 12: ☐ YES ☐ NO Acid preserved are<pH 2: ☐ YES ☐ NO

pH paper Lot #_____

VOA headspace acceptable (5-6mm): ☐ YES ☐ NO ☒ NA

	YES	NO
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X	

COMMENTS:

FedEx
TRK# 0221 6025 5771 6879
AB LKSA

SJ
4/7/17

HS-SA-WI-013 Rev. 3; 07/01/2014

TestAmerica Houston
6310 Rothway Street
Houston, TX 77040
Phone (713) 690-4444 Fax (713) 690-5646

Chain of Custody Record

600-146375 Chain of Custody

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Upton, Cathy L		COC No: 600-26363.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: cathy.upton@testamericainc.com	State of Origin: Texas	Page: Page 1 of 2
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Texas		Job #: 600-146375-1
Address: 30 Community Drive, Suite 11,	Due Date Requested: 4/19/2017			
City: South Burlington	TAT Requested (days):			
State, Zip: VT, 05403				
Phone: 802-660-1990(Tel) 802-660-1919(Fax)	PO #:			
Email:	WO #:			
Project Name: Exide Sediment Samples	Project #: 60004831			
Site:	SSOW#:			

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	D422/ D422 - Grain Size (Routine List)	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
2017-SED-001 (600-146375-1)	4/5/17	12:00 Central		Solid			X	1	
2017-SED-002 (600-146375-2)	4/5/17	12:30 Central		Solid			X	1	
2017-SED-003 (600-146375-3)	4/5/17	13:45 Central		Solid			X	1	
2017-SED-004 (600-146375-4)	4/5/17	13:10 Central		Solid			X	1	
2017-SED-010 (600-146375-5)	4/5/17	13:35 Central		Solid			X	1	
2017-SED-011 (600-146375-6)	4/5/17	14:30 Central		Solid			X	1	
2017-SED-005 (600-146375-7)	4/5/17	15:00 Central		Solid			X	1	
2017-SED-006 (600-146375-9)	4/5/17	16:20 Central		Solid			X	1	
2017-SED-007 (600-146375-10)	4/6/17	17:05 Central		Solid			X	1	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification *Unconfirmed*	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For _____ Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by: Sherry Justus	Date/Time: 4/10/17 1700	Company TAL	Received by:	Date/Time: 4/11/17 1015	Company TA Burl.
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: ∆ Yes ∆ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 2.6C

TestAmerica Houston
6310 Rothway Street
Houston, TX 77040
Phone (713) 690-4444 Fax (713) 690-5646

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Upton, Cathy L	Carrier Tracking No(s):	COC No: 600-26363.2
Client Contact: Shipping/Receiving	Phone:	E-Mail: cathy.upton@testamericainc.com	State of Origin: Texas	Page: Page 2 of 2
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Texas		Job #: 600-146375-1
Address: 30 Community Drive, Suite 11,	Due Date Requested: 4/19/2017			
City: South Burlington	TAT Requested (days):			
State, Zip: VT, 05403				
Phone: 802-660-1990(Tel) 802-660-1919(Fax)	PO #:			
Email:	WO #:			
Project Name: Exide Sediment Samples	Project #: 60004831			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	D422/ D422 - Grain Size (Routine List)	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
2017-SED-009 (600-146375-11)	4/6/17	09:30 Central		Solid			X	1	
2017-SED-008 (600-146375-12)	4/6/17	08:50 Central		Solid			X	1	
2017-SED-008 (600-146375-12MS)	4/6/17	08:50 Central	MS	Solid			X	1	
2017-SED-008 (600-146375-12MSD)	4/6/17	08:50 Central	MSD	Solid			X	1	
2017-SED-012 (600-146375-13)	4/6/17	10:00 Central		Solid			X	1	
DUP-01 (600-146375-14)	4/6/17	Central		Solid			X	1	
DUP-02 (600-146375-15)	4/6/17	Central		Solid			X	1	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. I

Possible Hazard Identification *Unconfirmed*	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For _____ Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by: Sherry Justus	Date/Time: 4/10/17 1700	Company TAL	Received by:	Date/Time: 4/11/17 1015	Company TA Burl
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 2.6°C

4/21/2017

FedEx Ship Manager - Print Your Label(s)

ORIGIN ID:LKSA (713) 690-4444
SAMPLE ADMIN
TESTAMERICA
6310 ROTHWAY
SUITE 130
HOUSTON, TX 77040
UNITED STATES US

SHIP DATE: 10APR17
ACTWGT: 25.00 LB
CAD: 104870166/INET3850
DIMS: 19x12x18 IN

BILL SENDER

TO SAMPLE RECEIVING
TESTAMERICA BURLINGTON
30 COMMUNITY DR
SUITE 11
SOUTH BURLINGTON VT 05403
(802) 660-1990 REF:
INV:
PO: DEPT:

546J2/CFD6/53C1

FedEx Express

TUE - 11 APR 3:00P
STANDARD OVERNIGHT

TRK# 0201 7788 6804 8385

NA BTVA

05403
VT-US BTV

4/10/2017

After printing this label:

Login Sample Receipt Checklist

Client: Golder Associates Inc.

Job Number: 600-146375-1

Login Number: 146375
List Number: 1
Creator: Justus, Sherry E

List Source: TestAmerica Houston

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	2.9
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	Check done at department level as required.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

Job Number: 600-146375-2

Job Description: Exide Sediment Samples Grain Size

For:
Golder Associates Inc.
820 South Main Street
Suite 100
St. Charles, MO 63301

Attention: Anne Faeth-Boyd

Approved for release.
Cathy L Upton
Project Manager I
4/21/2017 4:46 PM

Cathy L Upton, Project Manager I
6310 Rothway Street, Houston, TX, 77040
(713)690-4444
cathy.upton@testamericainc.com
04/21/2017

cc: Brett Forthaus
Ms. Abby Marlow
Mr. Scott Outwater
Mr. Jim Thomas
Emily White

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Job Narrative
600-146375-2

Comments
No additional comments.

Receipt
The samples were received on 4/7/2017 9:36 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.9º C.

Geotechnical
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

EXECUTIVE SUMMARY - Detections

Client: Golder Associates Inc. Job Number: 600-146375-2

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
600-146375-1	**2017-SED-001**					
Gravel		4.7			%	D422
Sieve Size 3 inch		0.0			%	D422
Hydrometer Reading 1 - Particle Size		28.6			um	D422
Sand		47.9			%	D422
Sieve Size 2 inch		0.0			%	D422
Hydrometer Reading 2 - Particle Size		18.6			um	D422
Coarse Sand		9.1			%	D422
Sieve Size 1.5 inch		0.0			%	D422
Hydrometer Reading 3 - Particle Size		11.1			um	D422
Medium Sand		13.2			%	D422
Sieve Size 1 inch		0.0			%	D422
Hydrometer Reading 4 - Particle Size		8.0			um	D422
Fine Sand		25.6			%	D422
Sieve Size 0.75 inch		0.0			%	D422
Hydrometer Reading 5 - Particle Size		5.8			um	D422
Silt		13.9			%	D422
Sieve Size 0.375 inch		0.0			%	D422
Hydrometer Reading 6 - Particle Size		2.9			um	D422
Clay		33.5			%	D422
Sieve Size #4		4.7			%	D422
Hydrometer Reading 7 - Particle Size		1.2			um	D422
Sieve Size #10		9.1			%	D422
Sieve Size #20		7.5			%	D422
Sieve Size #40		5.7			%	D422
Sieve Size #60		13.9			%	D422
Sieve Size #80		2.5			%	D422
Sieve Size #100		2.2			%	D422
Sieve Size #200		7.0			%	D422
Hydrometer Reading 1		0.3			%	D422
Hydrometer Reading 2		3.9			%	D422
Hydrometer Reading 3		3.9			%	D422
Hydrometer Reading 4		2.9			%	D422
Hydrometer Reading 5		2.9			%	D422
Hydrometer Reading 6		5.1			%	D422
Hydrometer Reading 7		5.7			%	D422

EXECUTIVE SUMMARY - Detections

Client: Golder Associates Inc. Job Number: 600-146375-2

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
600-146375-2	**2017-SED-002**					
Gravel		9.1			%	D422
Sieve Size 3 inch		0.0			%	D422
Hydrometer Reading 1 - Particle Size		33.8			um	D422
Sand		76.1			%	D422
Sieve Size 2 inch		0.0			%	D422
Hydrometer Reading 2 - Particle Size		21.6			um	D422
Coarse Sand		25.9			%	D422
Sieve Size 1.5 inch		0.0			%	D422
Hydrometer Reading 3 - Particle Size		12.5			um	D422
Medium Sand		44.8			%	D422
Sieve Size 1 inch		0.0			%	D422
Hydrometer Reading 4 - Particle Size		9.1			um	D422
Fine Sand		5.4			%	D422
Sieve Size 0.75 inch		0.0			%	D422
Hydrometer Reading 5 - Particle Size		6.5			um	D422
Silt		6.3			%	D422
Sieve Size 0.375 inch		1.6			%	D422
Hydrometer Reading 6 - Particle Size		3.2			um	D422
Clay		8.6			%	D422
Sieve Size #4		7.5			%	D422
Hydrometer Reading 7 - Particle Size		1.3			um	D422
Sieve Size #10		25.9			%	D422
Sieve Size #20		32.0			%	D422
Sieve Size #40		12.8			%	D422
Sieve Size #60		2.8			%	D422
Sieve Size #80		0.8			%	D422
Sieve Size #100		0.6			%	D422
Sieve Size #200		1.2			%	D422
Hydrometer Reading 1		2.9			%	D422
Hydrometer Reading 2		1.1			%	D422
Hydrometer Reading 3		0.6			%	D422
Hydrometer Reading 4		0.5			%	D422
Hydrometer Reading 5		1.1			%	D422
Hydrometer Reading 6		1.8			%	D422
Hydrometer Reading 7		2.1			%	D422

EXECUTIVE SUMMARY - Detections

Client: Golder Associates Inc. Job Number: 600-146375-2

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
600-146375-3	**2017-SED-003**					
Gravel		16.5			%	D422
Sieve Size 3 inch		0.0			%	D422
Hydrometer Reading 1 - Particle Size		35.9			um	D422
Sand		76.9			%	D422
Sieve Size 2 inch		0.0			%	D422
Hydrometer Reading 2 - Particle Size		22.8			um	D422
Coarse Sand		41.9			%	D422
Sieve Size 1.5 inch		0.0			%	D422
Hydrometer Reading 3 - Particle Size		13.2			um	D422
Medium Sand		27.3			%	D422
Sieve Size 1 inch		0.0			%	D422
Hydrometer Reading 4 - Particle Size		9.5			um	D422
Fine Sand		7.6			%	D422
Sieve Size 0.75 inch		0.0			%	D422
Hydrometer Reading 5 - Particle Size		6.5			um	D422
Silt		3.3			%	D422
Sieve Size 0.375 inch		0.0			%	D422
Hydrometer Reading 6 - Particle Size		3.3			um	D422
Clay		3.3			%	D422
Sieve Size #4		16.5			%	D422
Hydrometer Reading 7 - Particle Size		1.4			um	D422
Sieve Size #10		41.9			%	D422
Sieve Size #20		22.0			%	D422
Sieve Size #40		5.3			%	D422
Sieve Size #60		6.6			%	D422
Sieve Size #80		0.4			%	D422
Sieve Size #100		0.2			%	D422
Sieve Size #200		0.4			%	D422
Hydrometer Reading 1		1.8			%	D422
Hydrometer Reading 2		0.5			%	D422
Hydrometer Reading 3		0.0			%	D422
Hydrometer Reading 4		0.5			%	D422
Hydrometer Reading 5		0.5			%	D422
Hydrometer Reading 6		0.6			%	D422
Hydrometer Reading 7		1			%	D422

EXECUTIVE SUMMARY - Detections

Client: Golder Associates Inc. Job Number: 600-146375-2

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
600-146375-4	**2017-SED-004**					
Gravel		52.2			%	D422
Sieve Size 3 inch		0.0			%	D422
Hydrometer Reading 1 - Particle Size		35.4			um	D422
Sand		39.8			%	D422
Sieve Size 2 inch		0.0			%	D422
Hydrometer Reading 2 - Particle Size		22.5			um	D422
Coarse Sand		26.1			%	D422
Sieve Size 1.5 inch		0.0			%	D422
Hydrometer Reading 3 - Particle Size		13.0			um	D422
Medium Sand		13.2			%	D422
Sieve Size 1 inch		0.0			%	D422
Hydrometer Reading 4 - Particle Size		9.1			um	D422
Fine Sand		0.5			%	D422
Sieve Size 0.75 inch		0.0			%	D422
Hydrometer Reading 5 - Particle Size		6.6			um	D422
Silt		4.0			%	D422
Sieve Size 0.375 inch		13.1			%	D422
Hydrometer Reading 6 - Particle Size		3.3			um	D422
Clay		4.0			%	D422
Sieve Size #4		39.1			%	D422
Hydrometer Reading 7 - Particle Size		1.4			um	D422
Sieve Size #10		26.1			%	D422
Sieve Size #20		11.8			%	D422
Sieve Size #40		1.5			%	D422
Sieve Size #60		0.1			%	D422
Sieve Size #80		0.2			%	D422
Sieve Size #100		0.09			%	D422
Sieve Size #200		0.1			%	D422
Hydrometer Reading 1		2.7			%	D422
Hydrometer Reading 2		0.4			%	D422
Hydrometer Reading 3		0.4			%	D422
Hydrometer Reading 4		0.4			%	D422
Hydrometer Reading 5		0.0			%	D422
Hydrometer Reading 6		0.9			%	D422
Hydrometer Reading 7		1.2			%	D422

EXECUTIVE SUMMARY - Detections

Client: Golder Associates Inc. Job Number: 600-146375-2

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
600-146375-5	**2017-SED-010**					
Gravel		45.3			%	D422
Sieve Size 3 inch		0.0			%	D422
Hydrometer Reading 1 - Particle Size		29.5			um	D422
Sand		27.6			%	D422
Sieve Size 2 inch		0.0			%	D422
Hydrometer Reading 2 - Particle Size		19.0			um	D422
Coarse Sand		20.1			%	D422
Sieve Size 1.5 inch		0.0			%	D422
Hydrometer Reading 3 - Particle Size		11.2			um	D422
Medium Sand		2.1			%	D422
Sieve Size 1 inch		0.0			%	D422
Hydrometer Reading 4 - Particle Size		7.9			um	D422
Fine Sand		5.4			%	D422
Sieve Size 0.75 inch		1.7			%	D422
Hydrometer Reading 5 - Particle Size		5.8			um	D422
Silt		16.0			%	D422
Sieve Size 0.375 inch		19.5			%	D422
Hydrometer Reading 6 - Particle Size		3.0			um	D422
Clay		11.1			%	D422
Sieve Size #4		24.1			%	D422
Hydrometer Reading 7 - Particle Size		1.3			um	D422
Sieve Size #10		20.1			%	D422
Sieve Size #20		1.9			%	D422
Sieve Size #40		0.2			%	D422
Sieve Size #60		3.7			%	D422
Sieve Size #80		0.3			%	D422
Sieve Size #100		0.3			%	D422
Sieve Size #200		1.1			%	D422
Hydrometer Reading 1		12.4			%	D422
Hydrometer Reading 2		1.0			%	D422
Hydrometer Reading 3		1.0			%	D422
Hydrometer Reading 4		1.0			%	D422
Hydrometer Reading 5		0.6			%	D422
Hydrometer Reading 6		1.4			%	D422
Hydrometer Reading 7		2.6			%	D422

EXECUTIVE SUMMARY - Detections

Client: Golder Associates Inc. Job Number: 600-146375-2

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
600-146375-6	**2017-SED-011**					
Gravel		4.2			%	D422
Sieve Size 3 inch		0.0			%	D422
Hydrometer Reading 1 - Particle Size		26.2			um	D422
Sand		46.6			%	D422
Sieve Size 2 inch		0.0			%	D422
Hydrometer Reading 2 - Particle Size		17.2			um	D422
Coarse Sand		5.6			%	D422
Sieve Size 1.5 inch		0.0			%	D422
Hydrometer Reading 3 - Particle Size		10.3			um	D422
Medium Sand		13.2			%	D422
Sieve Size 1 inch		0.0			%	D422
Hydrometer Reading 4 - Particle Size		7.3			um	D422
Fine Sand		27.8			%	D422
Sieve Size 0.75 inch		0.0			%	D422
Hydrometer Reading 5 - Particle Size		5.4			um	D422
Silt		18.5			%	D422
Sieve Size 0.375 inch		1.1			%	D422
Hydrometer Reading 6 - Particle Size		2.7			um	D422
Clay		30.7			%	D422
Sieve Size #4		3.1			%	D422
Hydrometer Reading 7 - Particle Size		1.2			um	D422
Sieve Size #10		5.6			%	D422
Sieve Size #20		12.4			%	D422
Sieve Size #40		0.8			%	D422
Sieve Size #60		1.3			%	D422
Sieve Size #80		3.5			%	D422
Sieve Size #100		5.7			%	D422
Sieve Size #200		17.3			%	D422
Hydrometer Reading 1		8.1			%	D422
Hydrometer Reading 2		2.8			%	D422
Hydrometer Reading 3		3.5			%	D422
Hydrometer Reading 4		2.0			%	D422
Hydrometer Reading 5		2.1			%	D422
Hydrometer Reading 6		4.3			%	D422
Hydrometer Reading 7		3.3			%	D422

EXECUTIVE SUMMARY - Detections

Client: Golder Associates Inc. Job Number: 600-146375-2

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
600-146375-7	**2017-SED-005**					
Gravel		64.8			%	D422
Sieve Size 3 inch		0.0			%	D422
Hydrometer Reading 1 - Particle Size		35.2			um	D422
Sand		27.8			%	D422
Sieve Size 2 inch		0.0			%	D422
Hydrometer Reading 2 - Particle Size		22.4			um	D422
Coarse Sand		19.9			%	D422
Sieve Size 1.5 inch		0.0			%	D422
Hydrometer Reading 3 - Particle Size		13.0			um	D422
Medium Sand		3.7			%	D422
Sieve Size 1 inch		0.0			%	D422
Hydrometer Reading 4 - Particle Size		8.9			um	D422
Fine Sand		4.2			%	D422
Sieve Size 0.75 inch		4.6			%	D422
Hydrometer Reading 5 - Particle Size		6.6			um	D422
Silt		4.5			%	D422
Sieve Size 0.375 inch		21.3			%	D422
Hydrometer Reading 6 - Particle Size		3.2			um	D422
Clay		2.9			%	D422
Sieve Size #4		38.9			%	D422
Hydrometer Reading 7 - Particle Size		1.4			um	D422
Sieve Size #10		19.9			%	D422
Sieve Size #20		3.3			%	D422
Sieve Size #40		0.4			%	D422
Sieve Size #60		3.4			%	D422
Sieve Size #80		0.2			%	D422
Sieve Size #100		0.2			%	D422
Sieve Size #200		0.4			%	D422
Hydrometer Reading 1		3.2			%	D422
Hydrometer Reading 2		0.3			%	D422
Hydrometer Reading 3		0.3			%	D422
Hydrometer Reading 4		0.3			%	D422
Hydrometer Reading 5		0.3			%	D422
Hydrometer Reading 6		0.4			%	D422
Hydrometer Reading 7		0.6			%	D422

EXECUTIVE SUMMARY - Detections

Client: Golder Associates Inc. Job Number: 600-146375-2

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
600-146375-9	**2017-SED-006**					
Gravel		24.3			%	D422
Sieve Size 3 inch		0.0			%	D422
Hydrometer Reading 1 - Particle Size		35.6			um	D422
Sand		70.4			%	D422
Sieve Size 2 inch		0.0			%	D422
Hydrometer Reading 2 - Particle Size		22.5			um	D422
Coarse Sand		43.4			%	D422
Sieve Size 1.5 inch		0.0			%	D422
Hydrometer Reading 3 - Particle Size		13.1			um	D422
Medium Sand		26.5			%	D422
Sieve Size 1 inch		0.0			%	D422
Hydrometer Reading 4 - Particle Size		9.3			um	D422
Fine Sand		0.5			%	D422
Sieve Size 0.75 inch		0.0			%	D422
Hydrometer Reading 5 - Particle Size		6.5			um	D422
Silt		2.2			%	D422
Sieve Size 0.375 inch		3.3			%	D422
Hydrometer Reading 6 - Particle Size		3.3			um	D422
Clay		3.1			%	D422
Sieve Size #4		21.0			%	D422
Hydrometer Reading 7 - Particle Size		1.4			um	D422
Sieve Size #10		43.4			%	D422
Sieve Size #20		24.3			%	D422
Sieve Size #40		2.2			%	D422
Sieve Size #60		0.3			%	D422
Sieve Size #80		0.04			%	D422
Sieve Size #100		0.05			%	D422
Sieve Size #200		0.2			%	D422
Hydrometer Reading 1		0.4			%	D422
Hydrometer Reading 2		0.0			%	D422
Hydrometer Reading 3		0.9			%	D422
Hydrometer Reading 4		0.4			%	D422
Hydrometer Reading 5		0.4			%	D422
Hydrometer Reading 6		0.5			%	D422
Hydrometer Reading 7		0.8			%	D422

EXECUTIVE SUMMARY - Detections

Client: Golder Associates Inc. Job Number: 600-146375-2

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
600-146375-10	**2017-SED-007**					
Gravel		25.4			%	D422
Sieve Size 3 inch		0.0			%	D422
Hydrometer Reading 1 - Particle Size		34.0			um	D422
Sand		62.6			%	D422
Sieve Size 2 inch		0.0			%	D422
Hydrometer Reading 2 - Particle Size		21.6			um	D422
Coarse Sand		32.9			%	D422
Sieve Size 1.5 inch		0.0			%	D422
Hydrometer Reading 3 - Particle Size		12.6			um	D422
Medium Sand		23.0			%	D422
Sieve Size 1 inch		0.0			%	D422
Hydrometer Reading 4 - Particle Size		9.0			um	D422
Fine Sand		6.7			%	D422
Sieve Size 0.75 inch		0.0			%	D422
Hydrometer Reading 5 - Particle Size		6.6			um	D422
Silt		6.5			%	D422
Sieve Size 0.375 inch		5.9			%	D422
Hydrometer Reading 6 - Particle Size		3.2			um	D422
Clay		5.5			%	D422
Sieve Size #4		19.5			%	D422
Hydrometer Reading 7 - Particle Size		1.4			um	D422
Sieve Size #10		32.9			%	D422
Sieve Size #20		17.2			%	D422
Sieve Size #40		5.8			%	D422
Sieve Size #60		5.2			%	D422
Sieve Size #80		0.5			%	D422
Sieve Size #100		0.3			%	D422
Sieve Size #200		0.7			%	D422
Hydrometer Reading 1		3.7			%	D422
Hydrometer Reading 2		0.4			%	D422
Hydrometer Reading 3		0.8			%	D422
Hydrometer Reading 4		0.8			%	D422
Hydrometer Reading 5		0.8			%	D422
Hydrometer Reading 6		1.3			%	D422
Hydrometer Reading 7		1.2			%	D422

EXECUTIVE SUMMARY - Detections

Client: Golder Associates Inc. Job Number: 600-146375-2

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
600-146375-11	**2017-SED-009**					
Gravel		46.8			%	D422
Sieve Size 3 inch		0.0			%	D422
Hydrometer Reading 1 - Particle Size		36.9			um	D422
Sand		51.8			%	D422
Sieve Size 2 inch		0.0			%	D422
Hydrometer Reading 2 - Particle Size		23.3			um	D422
Coarse Sand		33.1			%	D422
Sieve Size 1.5 inch		0.0			%	D422
Hydrometer Reading 3 - Particle Size		13.5			um	D422
Medium Sand		18.2			%	D422
Sieve Size 1 inch		0.0			%	D422
Hydrometer Reading 4 - Particle Size		9.6			um	D422
Fine Sand		0.6			%	D422
Sieve Size 0.75 inch		3.9			%	D422
Hydrometer Reading 5 - Particle Size		6.6			um	D422
Silt		0.6			%	D422
Sieve Size 0.375 inch		9.8			%	D422
Hydrometer Reading 6 - Particle Size		3.4			um	D422
Clay		0.8			%	D422
Sieve Size #4		33.1			%	D422
Hydrometer Reading 7 - Particle Size		1.4			um	D422
Sieve Size #10		33.1			%	D422
Sieve Size #20		16.3			%	D422
Sieve Size #40		1.8			%	D422
Sieve Size #60		0.2			%	D422
Sieve Size #80		0.2			%	D422
Sieve Size #100		0.09			%	D422
Sieve Size #200		0.06			%	D422
Hydrometer Reading 1		0.3			%	D422
Hydrometer Reading 2		0.0			%	D422
Hydrometer Reading 3		0.0			%	D422
Hydrometer Reading 4		0.3			%	D422
Hydrometer Reading 5		0.0			%	D422
Hydrometer Reading 6		0.06			%	D422
Hydrometer Reading 7		0.3			%	D422

EXECUTIVE SUMMARY - Detections

Client: Golder Associates Inc. Job Number: 600-146375-2

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
600-146375-12	**2017-SED-008**					
Gravel		41.9			%	D422
Sieve Size 3 inch		0.0			%	D422
Hydrometer Reading 1 - Particle Size		34.9			um	D422
Sand		44.0			%	D422
Sieve Size 2 inch		0.0			%	D422
Hydrometer Reading 2 - Particle Size		22.3			um	D422
Coarse Sand		20.8			%	D422
Sieve Size 1.5 inch		0.0			%	D422
Hydrometer Reading 3 - Particle Size		12.9			um	D422
Medium Sand		17.2			%	D422
Sieve Size 1 inch		0.0			%	D422
Hydrometer Reading 4 - Particle Size		9.0			um	D422
Fine Sand		6.0			%	D422
Sieve Size 0.75 inch		3.0			%	D422
Hydrometer Reading 5 - Particle Size		6.7			um	D422
Silt		11.4			%	D422
Sieve Size 0.375 inch		14.7			%	D422
Hydrometer Reading 6 - Particle Size		3.4			um	D422
Clay		2.7			%	D422
Sieve Size #4		24.2			%	D422
Hydrometer Reading 7 - Particle Size		1.4			um	D422
Sieve Size #10		20.8			%	D422
Sieve Size #20		10.7			%	D422
Sieve Size #40		6.5			%	D422
Sieve Size #60		4.7			%	D422
Sieve Size #80		0.5			%	D422
Sieve Size #100		0.3			%	D422
Sieve Size #200		0.5			%	D422
Hydrometer Reading 1		9.6			%	D422
Hydrometer Reading 2		0.6			%	D422
Hydrometer Reading 3		0.3			%	D422
Hydrometer Reading 4		0.3			%	D422
Hydrometer Reading 5		0.6			%	D422
Hydrometer Reading 6		0.6			%	D422
Hydrometer Reading 7		0.5			%	D422

EXECUTIVE SUMMARY - Detections

Client: Golder Associates Inc. Job Number: 600-146375-2

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
600-146375-13	**2017-SED-012**					
Gravel		36.2			%	D422
Sieve Size 3 inch		0.0			%	D422
Hydrometer Reading 1 - Particle Size		32.2			um	D422
Sand		45.3			%	D422
Sieve Size 2 inch		0.0			%	D422
Hydrometer Reading 2 - Particle Size		20.7			um	D422
Coarse Sand		22.4			%	D422
Sieve Size 1.5 inch		0.0			%	D422
Hydrometer Reading 3 - Particle Size		12.2			um	D422
Medium Sand		19.1			%	D422
Sieve Size 1 inch		0.0			%	D422
Hydrometer Reading 4 - Particle Size		8.7			um	D422
Fine Sand		3.8			%	D422
Sieve Size 0.75 inch		4.4			%	D422
Hydrometer Reading 5 - Particle Size		6.3			um	D422
Silt		8.2			%	D422
Sieve Size 0.375 inch		16.3			%	D422
Hydrometer Reading 6 - Particle Size		3.1			um	D422
Clay		10.3			%	D422
Sieve Size #4		15.5			%	D422
Hydrometer Reading 7 - Particle Size		1.3			um	D422
Sieve Size #10		22.4			%	D422
Sieve Size #20		13.0			%	D422
Sieve Size #40		6.1			%	D422
Sieve Size #60		1.7			%	D422
Sieve Size #80		0.6			%	D422
Sieve Size #100		0.4			%	D422
Sieve Size #200		1.1			%	D422
Hydrometer Reading 1		3.3			%	D422
Hydrometer Reading 2		1.5			%	D422
Hydrometer Reading 3		1.5			%	D422
Hydrometer Reading 4		0.9			%	D422
Hydrometer Reading 5		1.0			%	D422
Hydrometer Reading 6		2.4			%	D422
Hydrometer Reading 7		2.0			%	D422

EXECUTIVE SUMMARY - Detections

Client: Golder Associates Inc. Job Number: 600-146375-2

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
600-146375-14	**DUP-01**					
Gravel		42.9			%	D422
Sieve Size 3 inch		0.0			%	D422
Hydrometer Reading 1 - Particle Size		34.7			um	D422
Sand		44.2			%	D422
Sieve Size 2 inch		0.0			%	D422
Hydrometer Reading 2 - Particle Size		22.2			um	D422
Coarse Sand		22.0			%	D422
Sieve Size 1.5 inch		0.0			%	D422
Hydrometer Reading 3 - Particle Size		12.9			um	D422
Medium Sand		18.5			%	D422
Sieve Size 1 inch		0.0			%	D422
Hydrometer Reading 4 - Particle Size		9.2			um	D422
Fine Sand		3.7			%	D422
Sieve Size 0.75 inch		0.0			%	D422
Hydrometer Reading 5 - Particle Size		6.6			um	D422
Silt		9.5			%	D422
Sieve Size 0.375 inch		11.1			%	D422
Hydrometer Reading 6 - Particle Size		3.2			um	D422
Clay		3.4			%	D422
Sieve Size #4		31.8			%	D422
Hydrometer Reading 7 - Particle Size		1.4			um	D422
Sieve Size #10		22.0			%	D422
Sieve Size #20		10.7			%	D422
Sieve Size #40		7.8			%	D422
Sieve Size #60		2.3			%	D422
Sieve Size #80		0.6			%	D422
Sieve Size #100		0.3			%	D422
Sieve Size #200		0.5			%	D422
Hydrometer Reading 1		7.7			%	D422
Hydrometer Reading 2		0.6			%	D422
Hydrometer Reading 3		0.3			%	D422
Hydrometer Reading 4		0.3			%	D422
Hydrometer Reading 5		0.6			%	D422
Hydrometer Reading 6		0.9			%	D422
Hydrometer Reading 7		0.6			%	D422

EXECUTIVE SUMMARY - Detections

Client: Golder Associates Inc. Job Number: 600-146375-2

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
600-146375-15	**DUP-02**					
Gravel		31.5			%	D422
Sieve Size 3 inch		0.0			%	D422
Hydrometer Reading 1 - Particle Size		32.2			um	D422
Sand		51.1			%	D422
Sieve Size 2 inch		0.0			%	D422
Hydrometer Reading 2 - Particle Size		20.6			um	D422
Coarse Sand		27.7			%	D422
Sieve Size 1.5 inch		0.0			%	D422
Hydrometer Reading 3 - Particle Size		12.0			um	D422
Medium Sand		20.8			%	D422
Sieve Size 1 inch		0.0			%	D422
Hydrometer Reading 4 - Particle Size		8.8			um	D422
Fine Sand		2.6			%	D422
Sieve Size 0.75 inch		0.0			%	D422
Hydrometer Reading 5 - Particle Size		6.3			um	D422
Silt		8.9			%	D422
Sieve Size 0.375 inch		9.5			%	D422
Hydrometer Reading 6 - Particle Size		3.1			um	D422
Clay		8.5			%	D422
Sieve Size #4		22.0			%	D422
Hydrometer Reading 7 - Particle Size		1.3			um	D422
Sieve Size #10		27.7			%	D422
Sieve Size #20		15.2			%	D422
Sieve Size #40		5.6			%	D422
Sieve Size #60		1.4			%	D422
Sieve Size #80		0.4			%	D422
Sieve Size #100		0.2			%	D422
Sieve Size #200		0.6			%	D422
Hydrometer Reading 1		4.9			%	D422
Hydrometer Reading 2		0.8			%	D422
Hydrometer Reading 3		0.4			%	D422
Hydrometer Reading 4		2.0			%	D422
Hydrometer Reading 5		0.8			%	D422
Hydrometer Reading 6		2.0			%	D422
Hydrometer Reading 7		2.8			%	D422

METHOD SUMMARY

Client: Golder Associates Inc. Job Number: 600-146375-2

Description	Lab Location	Method	Preparation Method
Matrix: Solid			
Grain Size	TAL BUR	ASTM D422	

Lab References:

TAL BUR = TestAmerica Burlington

Method References:

ASTM = ASTM International

METHOD / ANALYST SUMMARY

Client: Golder Associates Inc. Job Number: 600-146375-2

Method	Analyst	Analyst ID
ASTM D422	Peterson, Mark A	MAP

SAMPLE SUMMARY

Client: Golder Associates Inc. Job Number: 600-146375-2

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
600-146375-1	2017-SED-001	Solid	04/05/2017 1200	04/07/2017 0936
600-146375-2	2017-SED-002	Solid	04/05/2017 1230	04/07/2017 0936
600-146375-3	2017-SED-003	Solid	04/05/2017 1345	04/07/2017 0936
600-146375-4	2017-SED-004	Solid	04/05/2017 1310	04/07/2017 0936
600-146375-5	2017-SED-010	Solid	04/05/2017 1335	04/07/2017 0936
600-146375-6	2017-SED-011	Solid	04/05/2017 1430	04/07/2017 0936
600-146375-7	2017-SED-005	Solid	04/05/2017 1500	04/07/2017 0936
600-146375-9	2017-SED-006	Solid	04/05/2017 1620	04/07/2017 0936
600-146375-10	2017-SED-007	Solid	04/06/2017 1705	04/07/2017 0936
600-146375-11	2017-SED-009	Solid	04/06/2017 0930	04/07/2017 0936
600-146375-12	2017-SED-008	Solid	04/06/2017 0850	04/07/2017 0936
600-146375-13	2017-SED-012	Solid	04/06/2017 1000	04/07/2017 0936
600-146375-14	DUP-01	Solid	04/06/2017 0000	04/07/2017 0936
600-146375-15	DUP-02	Solid	04/06/2017 0000	04/07/2017 0936

SAMPLE RESULTS

Anne Faeth-Boyd
Golder Associates Inc.
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Job Number: 600-146375-2

Client Sample ID: **2017-SED-001**
Lab Sample ID: **600-146375-1**

Date Sampled: 04/05/2017 1200
Date Received: 04/07/2017 0936
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	NONE	NONE	Dilution
Method: D422			Date Analyzed:	04/12/2017 2012	
Hydrometer Reading 1 - Particle Size	28.6	um			1.0
Sieve Size 3 inch	0.0	%			1.0
Gravel	4.7	%			1.0
Hydrometer Reading 2 - Particle Size	18.6	um			1.0
Sand	47.9	%			1.0
Sieve Size 2 inch	0.0	%			1.0
Coarse Sand	9.1	%			1.0
Sieve Size 1.5 inch	0.0	%			1.0
Hydrometer Reading 3 - Particle Size	11.1	um			1.0
Hydrometer Reading 4 - Particle Size	8.0	um			1.0
Sieve Size 1 inch	0.0	%			1.0
Medium Sand	13.2	%			1.0
Hydrometer Reading 5 - Particle Size	5.8	um			1.0
Sieve Size 0.75 inch	0.0	%			1.0
Fine Sand	25.6	%			1.0
Hydrometer Reading 6 - Particle Size	2.9	um			1.0
Silt	13.9	%			1.0
Sieve Size 0.375 inch	0.0	%			1.0
Hydrometer Reading 7 - Particle Size	1.2	um			1.0
Sieve Size #4	4.7	%			1.0
Clay	33.5	%			1.0
Sieve Size #10	9.1	%			1.0
Sieve Size #20	7.5	%			1.0
Sieve Size #40	5.7	%			1.0
Sieve Size #60	13.9	%			1.0
Sieve Size #80	2.5	%			1.0
Sieve Size #100	2.2	%			1.0
Sieve Size #200	7.0	%			1.0
Hydrometer Reading 1	0.3	%			1.0
Hydrometer Reading 2	3.9	%			1.0
Hydrometer Reading 3	3.9	%			1.0
Hydrometer Reading 4	2.9	%			1.0
Hydrometer Reading 5	2.9	%			1.0
Hydrometer Reading 6	5.1	%			1.0
Hydrometer Reading 7	5.7	%			1.0

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Job Number: 600-146375-2

Client Sample ID: **2017-SED-002**
Lab Sample ID: **600-146375-2**

Date Sampled: 04/05/2017 1230
Date Received: 04/07/2017 0936
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	NONE	NONE	Dilution
Method: D422			Date Analyzed:	04/12/2017 2015	
Hydrometer Reading 1 - Particle Size	33.8	um			1.0
Sieve Size 3 inch	0.0	%			1.0
Gravel	9.1	%			1.0
Sand	76.1	%			1.0
Sieve Size 2 inch	0.0	%			1.0
Hydrometer Reading 2 - Particle Size	21.6	um			1.0
Hydrometer Reading 3 - Particle Size	12.5	um			1.0
Sieve Size 1.5 inch	0.0	%			1.0
Coarse Sand	25.9	%			1.0
Hydrometer Reading 4 - Particle Size	9.1	um			1.0
Medium Sand	44.8	%			1.0
Sieve Size 1 inch	0.0	%			1.0
Sieve Size 0.75 inch	0.0	%			1.0
Hydrometer Reading 5 - Particle Size	6.5	um			1.0
Fine Sand	5.4	%			1.0
Silt	6.3	%			1.0
Sieve Size 0.375 inch	1.6	%			1.0
Hydrometer Reading 6 - Particle Size	3.2	um			1.0
Sieve Size #4	7.5	%			1.0
Clay	8.6	%			1.0
Hydrometer Reading 7 - Particle Size	1.3	um			1.0
Sieve Size #10	25.9	%			1.0
Sieve Size #20	32.0	%			1.0
Sieve Size #40	12.8	%			1.0
Sieve Size #60	2.8	%			1.0
Sieve Size #80	0.8	%			1.0
Sieve Size #100	0.6	%			1.0
Sieve Size #200	1.2	%			1.0
Hydrometer Reading 1	2.9	%			1.0
Hydrometer Reading 2	1.1	%			1.0
Hydrometer Reading 3	0.6	%			1.0
Hydrometer Reading 4	0.5	%			1.0
Hydrometer Reading 5	1.1	%			1.0
Hydrometer Reading 6	1.8	%			1.0
Hydrometer Reading 7	2.1	%			1.0

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Job Number: 600-146375-2

Client Sample ID: **2017-SED-003**
Lab Sample ID: **600-146375-3**

Date Sampled: 04/05/2017 1345
Date Received: 04/07/2017 0936
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	NONE	NONE	Dilution
Method: D422			Date Analyzed:	04/12/2017 2017	
Hydrometer Reading 1 - Particle Size	35.9	um			1.0
Sieve Size 3 inch	0.0	%			1.0
Gravel	16.5	%			1.0
Hydrometer Reading 2 - Particle Size	22.8	um			1.0
Sand	76.9	%			1.0
Sieve Size 2 inch	0.0	%			1.0
Coarse Sand	41.9	%			1.0
Sieve Size 1.5 inch	0.0	%			1.0
Hydrometer Reading 3 - Particle Size	13.2	um			1.0
Hydrometer Reading 4 - Particle Size	9.5	um			1.0
Medium Sand	27.3	%			1.0
Sieve Size 1 inch	0.0	%			1.0
Hydrometer Reading 5 - Particle Size	6.5	um			1.0
Sieve Size 0.75 inch	0.0	%			1.0
Fine Sand	7.6	%			1.0
Sieve Size 0.375 inch	0.0	%			1.0
Silt	3.3	%			1.0
Hydrometer Reading 6 - Particle Size	3.3	um			1.0
Clay	3.3	%			1.0
Hydrometer Reading 7 - Particle Size	1.4	um			1.0
Sieve Size #4	16.5	%			1.0
Sieve Size #10	41.9	%			1.0
Sieve Size #20	22.0	%			1.0
Sieve Size #40	5.3	%			1.0
Sieve Size #60	6.6	%			1.0
Sieve Size #80	0.4	%			1.0
Sieve Size #100	0.2	%			1.0
Sieve Size #200	0.4	%			1.0
Hydrometer Reading 1	1.8	%			1.0
Hydrometer Reading 2	0.5	%			1.0
Hydrometer Reading 3	0.0	%			1.0
Hydrometer Reading 4	0.5	%			1.0
Hydrometer Reading 5	0.5	%			1.0
Hydrometer Reading 6	0.6	%			1.0
Hydrometer Reading 7	1	%			1.0

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Job Number: 600-146375-2

Client Sample ID: **2017-SED-004**
Lab Sample ID: **600-146375-4**

Date Sampled: 04/05/2017 1310
Date Received: 04/07/2017 0936
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	NONE	NONE	Dilution
Method: D422			Date Analyzed:	04/12/2017 2023	
Hydrometer Reading 1 - Particle Size	35.4	um			1.0
Sieve Size 3 inch	0.0	%			1.0
Gravel	52.2	%			1.0
Hydrometer Reading 2 - Particle Size	22.5	um			1.0
Sand	39.8	%			1.0
Sieve Size 2 inch	0.0	%			1.0
Hydrometer Reading 3 - Particle Size	13.0	um			1.0
Coarse Sand	26.1	%			1.0
Sieve Size 1.5 inch	0.0	%			1.0
Hydrometer Reading 4 - Particle Size	9.1	um			1.0
Medium Sand	13.2	%			1.0
Sieve Size 1 inch	0.0	%			1.0
Hydrometer Reading 5 - Particle Size	6.6	um			1.0
Sieve Size 0.75 inch	0.0	%			1.0
Fine Sand	0.5	%			1.0
Silt	4.0	%			1.0
Sieve Size 0.375 inch	13.1	%			1.0
Hydrometer Reading 6 - Particle Size	3.3	um			1.0
Hydrometer Reading 7 - Particle Size	1.4	um			1.0
Clay	4.0	%			1.0
Sieve Size #4	39.1	%			1.0
Sieve Size #10	26.1	%			1.0
Sieve Size #20	11.8	%			1.0
Sieve Size #40	1.5	%			1.0
Sieve Size #60	0.1	%			1.0
Sieve Size #80	0.2	%			1.0
Sieve Size #100	0.09	%			1.0
Sieve Size #200	0.1	%			1.0
Hydrometer Reading 1	2.7	%			1.0
Hydrometer Reading 2	0.4	%			1.0
Hydrometer Reading 3	0.4	%			1.0
Hydrometer Reading 4	0.4	%			1.0
Hydrometer Reading 5	0.0	%			1.0
Hydrometer Reading 6	0.9	%			1.0
Hydrometer Reading 7	1.2	%			1.0

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Job Number: 600-146375-2

Client Sample ID: **2017-SED-010**
Lab Sample ID: **600-146375-5**

Date Sampled: 04/05/2017 1335
Date Received: 04/07/2017 0936
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	NONE	NONE	Dilution
Method: D422			Date Analyzed:	04/12/2017 2026	
Hydrometer Reading 1 - Particle Size	29.5	um			1.0
Sieve Size 3 inch	0.0	%			1.0
Gravel	45.3	%			1.0
Hydrometer Reading 2 - Particle Size	19.0	um			1.0
Sand	27.6	%			1.0
Sieve Size 2 inch	0.0	%			1.0
Sieve Size 1.5 inch	0.0	%			1.0
Hydrometer Reading 3 - Particle Size	11.2	um			1.0
Coarse Sand	20.1	%			1.0
Hydrometer Reading 4 - Particle Size	7.9	um			1.0
Sieve Size 1 inch	0.0	%			1.0
Medium Sand	2.1	%			1.0
Sieve Size 0.75 inch	1.7	%			1.0
Fine Sand	5.4	%			1.0
Hydrometer Reading 5 - Particle Size	5.8	um			1.0
Silt	16.0	%			1.0
Sieve Size 0.375 inch	19.5	%			1.0
Hydrometer Reading 6 - Particle Size	3.0	um			1.0
Sieve Size #4	24.1	%			1.0
Clay	11.1	%			1.0
Hydrometer Reading 7 - Particle Size	1.3	um			1.0
Sieve Size #10	20.1	%			1.0
Sieve Size #20	1.9	%			1.0
Sieve Size #40	0.2	%			1.0
Sieve Size #60	3.7	%			1.0
Sieve Size #80	0.3	%			1.0
Sieve Size #100	0.3	%			1.0
Sieve Size #200	1.1	%			1.0
Hydrometer Reading 1	12.4	%			1.0
Hydrometer Reading 2	1.0	%			1.0
Hydrometer Reading 3	1.0	%			1.0
Hydrometer Reading 4	1.0	%			1.0
Hydrometer Reading 5	0.6	%			1.0
Hydrometer Reading 6	1.4	%			1.0
Hydrometer Reading 7	2.6	%			1.0

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Job Number: 600-146375-2

Client Sample ID: **2017-SED-011**
Lab Sample ID: **600-146375-6**

Date Sampled: 04/05/2017 1430
Date Received: 04/07/2017 0936
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	NONE	NONE	Dilution
Method: D422			Date Analyzed:	04/12/2017 2037	
Hydrometer Reading 1 - Particle Size	26.2	um			1.0
Gravel	4.2	%			1.0
Sieve Size 3 inch	0.0	%			1.0
Hydrometer Reading 2 - Particle Size	17.2	um			1.0
Sand	46.6	%			1.0
Sieve Size 2 inch	0.0	%			1.0
Hydrometer Reading 3 - Particle Size	10.3	um			1.0
Coarse Sand	5.6	%			1.0
Sieve Size 1.5 inch	0.0	%			1.0
Medium Sand	13.2	%			1.0
Sieve Size 1 inch	0.0	%			1.0
Hydrometer Reading 4 - Particle Size	7.3	um			1.0
Sieve Size 0.75 inch	0.0	%			1.0
Hydrometer Reading 5 - Particle Size	5.4	um			1.0
Fine Sand	27.8	%			1.0
Sieve Size 0.375 inch	1.1	%			1.0
Hydrometer Reading 6 - Particle Size	2.7	um			1.0
Silt	18.5	%			1.0
Hydrometer Reading 7 - Particle Size	1.2	um			1.0
Clay	30.7	%			1.0
Sieve Size #4	3.1	%			1.0
Sieve Size #10	5.6	%			1.0
Sieve Size #20	12.4	%			1.0
Sieve Size #40	0.8	%			1.0
Sieve Size #60	1.3	%			1.0
Sieve Size #80	3.5	%			1.0
Sieve Size #100	5.7	%			1.0
Sieve Size #200	17.3	%			1.0
Hydrometer Reading 1	8.1	%			1.0
Hydrometer Reading 2	2.8	%			1.0
Hydrometer Reading 3	3.5	%			1.0
Hydrometer Reading 4	2.0	%			1.0
Hydrometer Reading 5	2.1	%			1.0
Hydrometer Reading 6	4.3	%			1.0
Hydrometer Reading 7	3.3	%			1.0

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Job Number: 600-146375-2

Client Sample ID: **2017-SED-005**
Lab Sample ID: **600-146375-7**

Date Sampled: 04/05/2017 1500
Date Received: 04/07/2017 0936
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	NONE	NONE	Dilution
Method: D422			Date Analyzed:	04/12/2017 2040	
Hydrometer Reading 1 - Particle Size	35.2	um			1.0
Sieve Size 3 inch	0.0	%			1.0
Gravel	64.8	%			1.0
Hydrometer Reading 2 - Particle Size	22.4	um			1.0
Sand	27.8	%			1.0
Sieve Size 2 inch	0.0	%			1.0
Hydrometer Reading 3 - Particle Size	13.0	um			1.0
Coarse Sand	19.9	%			1.0
Sieve Size 1.5 inch	0.0	%			1.0
Hydrometer Reading 4 - Particle Size	8.9	um			1.0
Sieve Size 1 inch	0.0	%			1.0
Medium Sand	3.7	%			1.0
Sieve Size 0.75 inch	4.6	%			1.0
Hydrometer Reading 5 - Particle Size	6.6	um			1.0
Fine Sand	4.2	%			1.0
Hydrometer Reading 6 - Particle Size	3.2	um			1.0
Silt	4.5	%			1.0
Sieve Size 0.375 inch	21.3	%			1.0
Hydrometer Reading 7 - Particle Size	1.4	um			1.0
Clay	2.9	%			1.0
Sieve Size #4	38.9	%			1.0
Sieve Size #10	19.9	%			1.0
Sieve Size #20	3.3	%			1.0
Sieve Size #40	0.4	%			1.0
Sieve Size #60	3.4	%			1.0
Sieve Size #80	0.2	%			1.0
Sieve Size #100	0.2	%			1.0
Sieve Size #200	0.4	%			1.0
Hydrometer Reading 1	3.2	%			1.0
Hydrometer Reading 2	0.3	%			1.0
Hydrometer Reading 3	0.3	%			1.0
Hydrometer Reading 4	0.3	%			1.0
Hydrometer Reading 5	0.3	%			1.0
Hydrometer Reading 6	0.4	%			1.0
Hydrometer Reading 7	0.6	%			1.0

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Job Number: 600-146375-2

Client Sample ID: **2017-SED-006**
Lab Sample ID: **600-146375-9**

Date Sampled: 04/05/2017 1620
Date Received: 04/07/2017 0936
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	NONE	NONE	Dilution
Method: D422			Date Analyzed:	04/12/2017 2041	
Gravel	24.3	%			1.0
Sieve Size 3 inch	0.0	%			1.0
Hydrometer Reading 1 - Particle Size	35.6	um			1.0
Sand	70.4	%			1.0
Sieve Size 2 inch	0.0	%			1.0
Hydrometer Reading 2 - Particle Size	22.5	um			1.0
Coarse Sand	43.4	%			1.0
Hydrometer Reading 3 - Particle Size	13.1	um			1.0
Sieve Size 1.5 inch	0.0	%			1.0
Medium Sand	26.5	%			1.0
Sieve Size 1 inch	0.0	%			1.0
Hydrometer Reading 4 - Particle Size	9.3	um			1.0
Sieve Size 0.75 inch	0.0	%			1.0
Hydrometer Reading 5 - Particle Size	6.5	um			1.0
Fine Sand	0.5	%			1.0
Silt	2.2	%			1.0
Hydrometer Reading 6 - Particle Size	3.3	um			1.0
Sieve Size 0.375 inch	3.3	%			1.0
Clay	3.1	%			1.0
Hydrometer Reading 7 - Particle Size	1.4	um			1.0
Sieve Size #4	21.0	%			1.0
Sieve Size #10	43.4	%			1.0
Sieve Size #20	24.3	%			1.0
Sieve Size #40	2.2	%			1.0
Sieve Size #60	0.3	%			1.0
Sieve Size #80	0.04	%			1.0
Sieve Size #100	0.05	%			1.0
Sieve Size #200	0.2	%			1.0
Hydrometer Reading 1	0.4	%			1.0
Hydrometer Reading 2	0.0	%			1.0
Hydrometer Reading 3	0.9	%			1.0
Hydrometer Reading 4	0.4	%			1.0
Hydrometer Reading 5	0.4	%			1.0
Hydrometer Reading 6	0.5	%			1.0
Hydrometer Reading 7	0.8	%			1.0

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Job Number: 600-146375-2

Client Sample ID: **2017-SED-007**
Lab Sample ID: **600-146375-10**

Date Sampled: 04/06/2017 1705
Date Received: 04/07/2017 0936
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	NONE	NONE	Dilution
Method: D422			Date Analyzed:	04/12/2017 2044	
Hydrometer Reading 1 - Particle Size	34.0	um			1.0
Gravel	25.4	%			1.0
Sieve Size 3 inch	0.0	%			1.0
Sieve Size 2 inch	0.0	%			1.0
Sand	62.6	%			1.0
Hydrometer Reading 2 - Particle Size	21.6	um			1.0
Sieve Size 1.5 inch	0.0	%			1.0
Coarse Sand	32.9	%			1.0
Hydrometer Reading 3 - Particle Size	12.6	um			1.0
Hydrometer Reading 4 - Particle Size	9.0	um			1.0
Medium Sand	23.0	%			1.0
Sieve Size 1 inch	0.0	%			1.0
Hydrometer Reading 5 - Particle Size	6.6	um			1.0
Sieve Size 0.75 inch	0.0	%			1.0
Fine Sand	6.7	%			1.0
Sieve Size 0.375 inch	5.9	%			1.0
Silt	6.5	%			1.0
Hydrometer Reading 6 - Particle Size	3.2	um			1.0
Sieve Size #4	19.5	%			1.0
Clay	5.5	%			1.0
Hydrometer Reading 7 - Particle Size	1.4	um			1.0
Sieve Size #10	32.9	%			1.0
Sieve Size #20	17.2	%			1.0
Sieve Size #40	5.8	%			1.0
Sieve Size #60	5.2	%			1.0
Sieve Size #80	0.5	%			1.0
Sieve Size #100	0.3	%			1.0
Sieve Size #200	0.7	%			1.0
Hydrometer Reading 1	3.7	%			1.0
Hydrometer Reading 2	0.4	%			1.0
Hydrometer Reading 3	0.8	%			1.0
Hydrometer Reading 4	0.8	%			1.0
Hydrometer Reading 5	0.8	%			1.0
Hydrometer Reading 6	1.3	%			1.0
Hydrometer Reading 7	1.2	%			1.0

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Job Number: 600-146375-2

Client Sample ID: **2017-SED-009**
Lab Sample ID: **600-146375-11**

Date Sampled: 04/06/2017 0930
Date Received: 04/07/2017 0936
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	NONE	NONE	Dilution
Method: D422			Date Analyzed:	04/12/2017 2046	
Hydrometer Reading 1 - Particle Size	36.9	um			1.0
Sieve Size 3 inch	0.0	%			1.0
Gravel	46.8	%			1.0
Hydrometer Reading 2 - Particle Size	23.3	um			1.0
Sand	51.8	%			1.0
Sieve Size 2 inch	0.0	%			1.0
Coarse Sand	33.1	%			1.0
Hydrometer Reading 3 - Particle Size	13.5	um			1.0
Sieve Size 1.5 inch	0.0	%			1.0
Hydrometer Reading 4 - Particle Size	9.6	um			1.0
Medium Sand	18.2	%			1.0
Sieve Size 1 inch	0.0	%			1.0
Hydrometer Reading 5 - Particle Size	6.6	um			1.0
Fine Sand	0.6	%			1.0
Sieve Size 0.75 inch	3.9	%			1.0
Hydrometer Reading 6 - Particle Size	3.4	um			1.0
Silt	0.6	%			1.0
Sieve Size 0.375 inch	9.8	%			1.0
Clay	0.8	%			1.0
Hydrometer Reading 7 - Particle Size	1.4	um			1.0
Sieve Size #4	33.1	%			1.0
Sieve Size #10	33.1	%			1.0
Sieve Size #20	16.3	%			1.0
Sieve Size #40	1.8	%			1.0
Sieve Size #60	0.2	%			1.0
Sieve Size #80	0.2	%			1.0
Sieve Size #100	0.09	%			1.0
Sieve Size #200	0.06	%			1.0
Hydrometer Reading 1	0.3	%			1.0
Hydrometer Reading 2	0.0	%			1.0
Hydrometer Reading 3	0.0	%			1.0
Hydrometer Reading 4	0.3	%			1.0
Hydrometer Reading 5	0.0	%			1.0
Hydrometer Reading 6	0.06	%			1.0
Hydrometer Reading 7	0.3	%			1.0

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Job Number: 600-146375-2

Client Sample ID: **2017-SED-008**
Lab Sample ID: **600-146375-12**

Date Sampled: 04/06/2017 0850
Date Received: 04/07/2017 0936
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	NONE	NONE	Dilution
Method: D422			Date Analyzed:	04/12/2017 2048	
Hydrometer Reading 1 - Particle Size	34.9	um			1.0
Sieve Size 3 inch	0.0	%			1.0
Gravel	41.9	%			1.0
Sand	44.0	%			1.0
Hydrometer Reading 2 - Particle Size	22.3	um			1.0
Sieve Size 2 inch	0.0	%			1.0
Coarse Sand	20.8	%			1.0
Hydrometer Reading 3 - Particle Size	12.9	um			1.0
Sieve Size 1.5 inch	0.0	%			1.0
Hydrometer Reading 4 - Particle Size	9.0	um			1.0
Sieve Size 1 inch	0.0	%			1.0
Medium Sand	17.2	%			1.0
Fine Sand	6.0	%			1.0
Hydrometer Reading 5 - Particle Size	6.7	um			1.0
Sieve Size 0.75 inch	3.0	%			1.0
Silt	11.4	%			1.0
Sieve Size 0.375 inch	14.7	%			1.0
Hydrometer Reading 6 - Particle Size	3.4	um			1.0
Clay	2.7	%			1.0
Hydrometer Reading 7 - Particle Size	1.4	um			1.0
Sieve Size #4	24.2	%			1.0
Sieve Size #10	20.8	%			1.0
Sieve Size #20	10.7	%			1.0
Sieve Size #40	6.5	%			1.0
Sieve Size #60	4.7	%			1.0
Sieve Size #80	0.5	%			1.0
Sieve Size #100	0.3	%			1.0
Sieve Size #200	0.5	%			1.0
Hydrometer Reading 1	9.6	%			1.0
Hydrometer Reading 2	0.6	%			1.0
Hydrometer Reading 3	0.3	%			1.0
Hydrometer Reading 4	0.3	%			1.0
Hydrometer Reading 5	0.6	%			1.0
Hydrometer Reading 6	0.6	%			1.0
Hydrometer Reading 7	0.5	%			1.0

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Job Number: 600-146375-2

Client Sample ID: **2017-SED-012**
Lab Sample ID: **600-146375-13**

Date Sampled: 04/06/2017 1000
Date Received: 04/07/2017 0936
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	NONE	NONE	Dilution
Method: D422			Date Analyzed:	04/12/2017 2212	
Gravel	36.2	%			1.0
Sieve Size 3 inch	0.0	%			1.0
Hydrometer Reading 1 - Particle Size	32.2	um			1.0
Hydrometer Reading 2 - Particle Size	20.7	um			1.0
Sand	45.3	%			1.0
Sieve Size 2 inch	0.0	%			1.0
Hydrometer Reading 3 - Particle Size	12.2	um			1.0
Coarse Sand	22.4	%			1.0
Sieve Size 1.5 inch	0.0	%			1.0
Hydrometer Reading 4 - Particle Size	8.7	um			1.0
Sieve Size 1 inch	0.0	%			1.0
Medium Sand	19.1	%			1.0
Sieve Size 0.75 inch	4.4	%			1.0
Hydrometer Reading 5 - Particle Size	6.3	um			1.0
Fine Sand	3.8	%			1.0
Silt	8.2	%			1.0
Sieve Size 0.375 inch	16.3	%			1.0
Hydrometer Reading 6 - Particle Size	3.1	um			1.0
Clay	10.3	%			1.0
Hydrometer Reading 7 - Particle Size	1.3	um			1.0
Sieve Size #4	15.5	%			1.0
Sieve Size #10	22.4	%			1.0
Sieve Size #20	13.0	%			1.0
Sieve Size #40	6.1	%			1.0
Sieve Size #60	1.7	%			1.0
Sieve Size #80	0.6	%			1.0
Sieve Size #100	0.4	%			1.0
Sieve Size #200	1.1	%			1.0
Hydrometer Reading 1	3.3	%			1.0
Hydrometer Reading 2	1.5	%			1.0
Hydrometer Reading 3	1.5	%			1.0
Hydrometer Reading 4	0.9	%			1.0
Hydrometer Reading 5	1.0	%			1.0
Hydrometer Reading 6	2.4	%			1.0
Hydrometer Reading 7	2.0	%			1.0

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Job Number: 600-146375-2

Client Sample ID: **DUP-01**
Lab Sample ID: **600-146375-14**

Date Sampled: 04/06/2017 0000
Date Received: 04/07/2017 0936
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	NONE	NONE	Dilution
Method: D422		Date Analyzed:	04/12/2017 2218		
Sieve Size 3 inch	0.0	%			1.0
Gravel	42.9	%			1.0
Hydrometer Reading 1 - Particle Size	34.7	um			1.0
Hydrometer Reading 2 - Particle Size	22.2	um			1.0
Sieve Size 2 inch	0.0	%			1.0
Sand	44.2	%			1.0
Coarse Sand	22.0	%			1.0
Sieve Size 1.5 inch	0.0	%			1.0
Hydrometer Reading 3 - Particle Size	12.9	um			1.0
Hydrometer Reading 4 - Particle Size	9.2	um			1.0
Sieve Size 1 inch	0.0	%			1.0
Medium Sand	18.5	%			1.0
Hydrometer Reading 5 - Particle Size	6.6	um			1.0
Sieve Size 0.75 inch	0.0	%			1.0
Fine Sand	3.7	%			1.0
Hydrometer Reading 6 - Particle Size	3.2	um			1.0
Silt	9.5	%			1.0
Sieve Size 0.375 inch	11.1	%			1.0
Hydrometer Reading 7 - Particle Size	1.4	um			1.0
Clay	3.4	%			1.0
Sieve Size #4	31.8	%			1.0
Sieve Size #10	22.0	%			1.0
Sieve Size #20	10.7	%			1.0
Sieve Size #40	7.8	%			1.0
Sieve Size #60	2.3	%			1.0
Sieve Size #80	0.6	%			1.0
Sieve Size #100	0.3	%			1.0
Sieve Size #200	0.5	%			1.0
Hydrometer Reading 1	7.7	%			1.0
Hydrometer Reading 2	0.6	%			1.0
Hydrometer Reading 3	0.3	%			1.0
Hydrometer Reading 4	0.3	%			1.0
Hydrometer Reading 5	0.6	%			1.0
Hydrometer Reading 6	0.9	%			1.0
Hydrometer Reading 7	0.6	%			1.0

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Job Number: 600-146375-2

Client Sample ID: **DUP-02**
Lab Sample ID: **600-146375-15**

Date Sampled: 04/06/2017 0000
Date Received: 04/07/2017 0936
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	NONE	NONE	Dilution
Method: D422		Date Analyzed:	04/12/2017 2220		
Hydrometer Reading 1 - Particle Size	32.2	um			1.0
Gravel	31.5	%			1.0
Sieve Size 3 inch	0.0	%			1.0
Sand	51.1	%			1.0
Sieve Size 2 inch	0.0	%			1.0
Hydrometer Reading 2 - Particle Size	20.6	um			1.0
Hydrometer Reading 3 - Particle Size	12.0	um			1.0
Coarse Sand	27.7	%			1.0
Sieve Size 1.5 inch	0.0	%			1.0
Hydrometer Reading 4 - Particle Size	8.8	um			1.0
Sieve Size 1 inch	0.0	%			1.0
Medium Sand	20.8	%			1.0
Hydrometer Reading 5 - Particle Size	6.3	um			1.0
Fine Sand	2.6	%			1.0
Sieve Size 0.75 inch	0.0	%			1.0
Hydrometer Reading 6 - Particle Size	3.1	um			1.0
Silt	8.9	%			1.0
Sieve Size 0.375 inch	9.5	%			1.0
Hydrometer Reading 7 - Particle Size	1.3	um			1.0
Clay	8.5	%			1.0
Sieve Size #4	22.0	%			1.0
Sieve Size #10	27.7	%			1.0
Sieve Size #20	15.2	%			1.0
Sieve Size #40	5.6	%			1.0
Sieve Size #60	1.4	%			1.0
Sieve Size #80	0.4	%			1.0
Sieve Size #100	0.2	%			1.0
Sieve Size #200	0.6	%			1.0
Hydrometer Reading 1	4.9	%			1.0
Hydrometer Reading 2	0.8	%			1.0
Hydrometer Reading 3	0.4	%			1.0
Hydrometer Reading 4	2.0	%			1.0
Hydrometer Reading 5	0.8	%			1.0
Hydrometer Reading 6	2.0	%			1.0
Hydrometer Reading 7	2.8	%			1.0

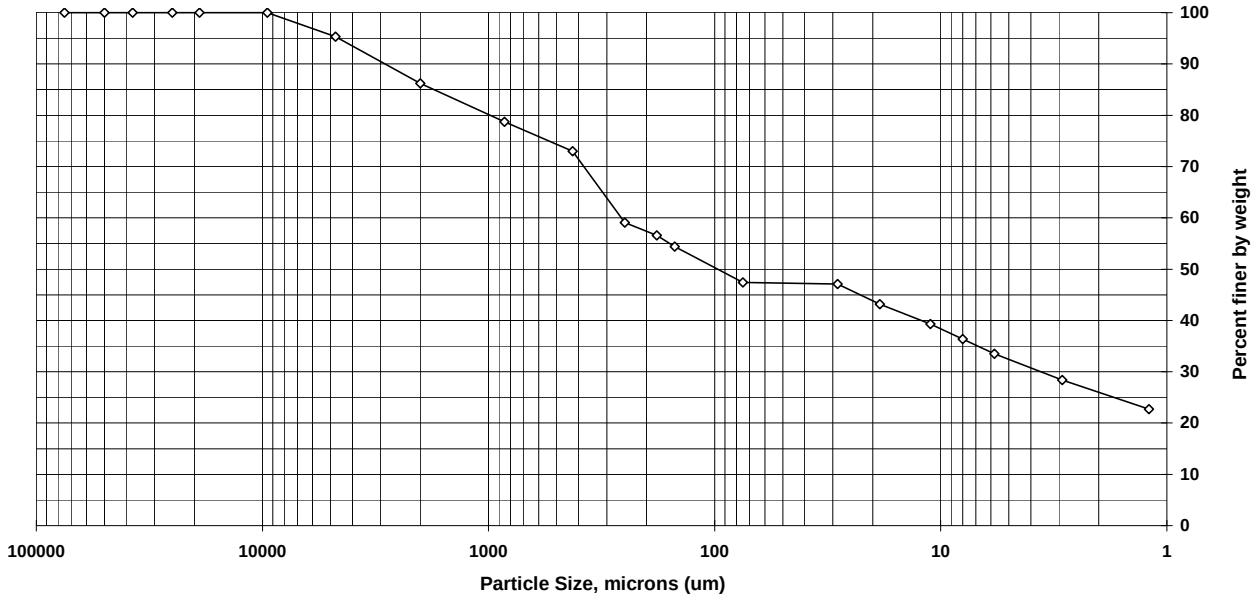
Particle Size of Soils by ASTM D422

				Date Received:	4/7/2017
Sample ID:	2017-SED-001	**Percent Solids:**	58.5%	**Start Date:**	4/12/2017
Lab ID:	600-146375-B-1	**Specific Gravity:**	2.650	**End Date:**	4/17/2017

Shape (> #10): subrounded

Non-soil material: plant,shell

Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	95.3	4.7
#10	2000	86.2	9.1
#20	850	78.7	7.5
#40	425	73.0	5.7
#60	250	59.1	13.9
#80	180	56.6	2.5
#100	150	54.4	2.2
#200	75	47.4	7.0
Hyd1	28.6	47.1	0.3
Hyd2	18.6	43.2	3.9
Hyd3	11.1	39.3	3.9
Hyd4	8	36.4	2.9
Hyd5	5.8	33.5	2.9
Hyd6	2.9	28.4	5.1
Hyd7	1.2	22.7	5.7

Soil Classification	Percent of sample
Gravel	4.7
Sand	47.9
Coarse Sand	9.1
Medium Sand	13.2
Fine Sand	25.6
Silt	13.9
Clay	33.5

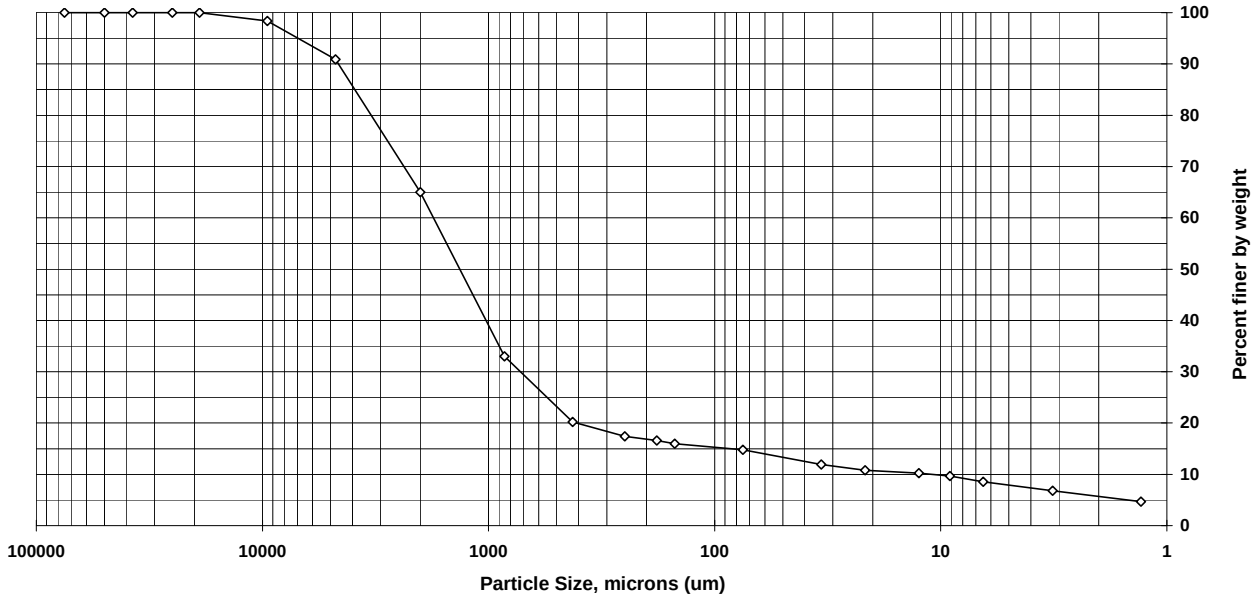
Particle Size of Soils by ASTM D422

				Date Received:	4/7/2017
Sample ID:	2017-SED-002	**Percent Solids:**	75.0%	**Start Date:**	4/12/2017
Lab ID:	600-146375-B-2	**Specific Gravity:**	2.650	**End Date:**	4/17/2017

Shape (> #10): subrounded

Non-soil material: shell

Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	98.4	1.6
#4	4750	90.9	7.5
#10	2000	65.0	25.9
#20	850	33.0	32.0
#40	425	20.2	12.8
#60	250	17.4	2.8
#80	180	16.6	0.8
#100	150	16.0	0.6
#200	75	14.8	1.2
Hyd1	33.8	11.9	2.9
Hyd2	21.6	10.8	1.1
Hyd3	12.5	10.2	0.6
Hyd4	9.1	9.7	0.5
Hyd5	6.5	8.6	1.1
Hyd6	3.2	6.8	1.8
Hyd7	1.3	4.7	2.1

Soil Classification	Percent of sample
Gravel	9.1
Sand	76.1
Coarse Sand	25.9
Medium Sand	44.8
Fine Sand	5.4
Silt	6.3
Clay	8.6

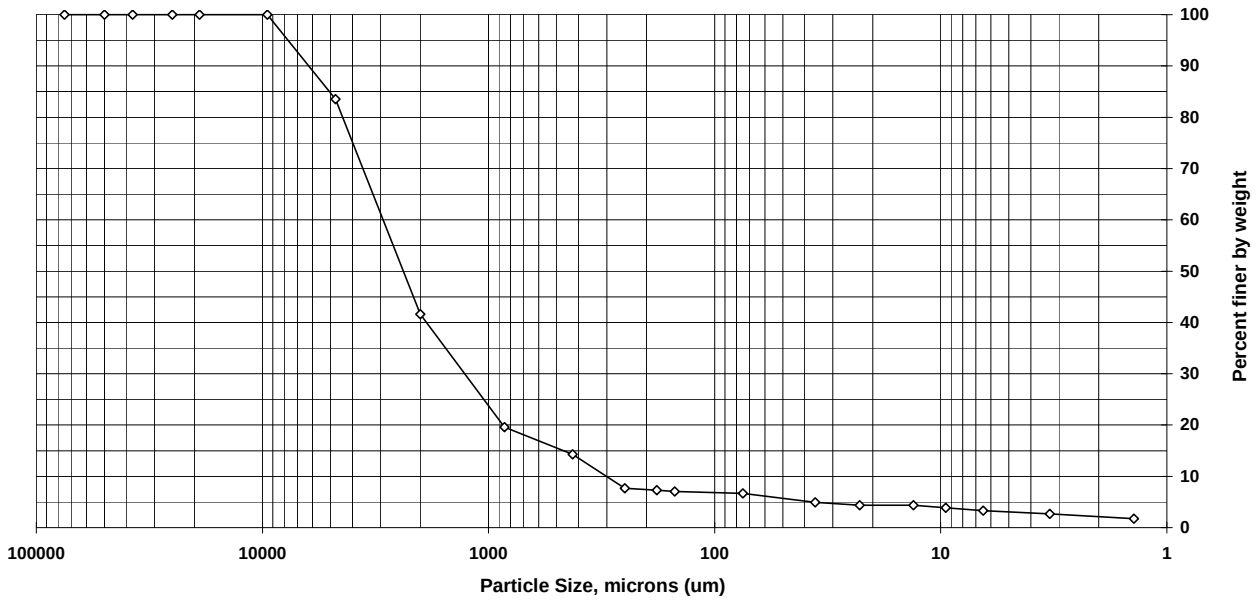
Particle Size of Soils by ASTM D422

				Date Received:	4/7/2017
Sample ID:	2017-SED-003	**Percent Solids:**	86.8%	**Start Date:**	4/12/2017
Lab ID:	600-146375-B-3	**Specific Gravity:**	2.650	**End Date:**	4/17/2017

Shape (> #10): subrounded

Non-soil material: shell

Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	83.5	16.5
#10	2000	41.6	41.9
#20	850	19.6	22.0
#40	425	14.3	5.3
#60	250	7.7	6.6
#80	180	7.3	0.4
#100	150	7.1	0.2
#200	75	6.7	0.4
Hyd1	35.9	4.9	1.8
Hyd2	22.8	4.4	0.5
Hyd3	13.2	4.4	0.0
Hyd4	9.5	3.9	0.5
Hyd5	6.5	3.3	0.5
Hyd6	3.3	2.7	0.6
Hyd7	1.4	1.8	1.0

Soil Classification	Percent of sample
Gravel	16.5
Sand	76.9
Coarse Sand	41.9
Medium Sand	27.3
Fine Sand	7.6
Silt	3.3
Clay	3.3

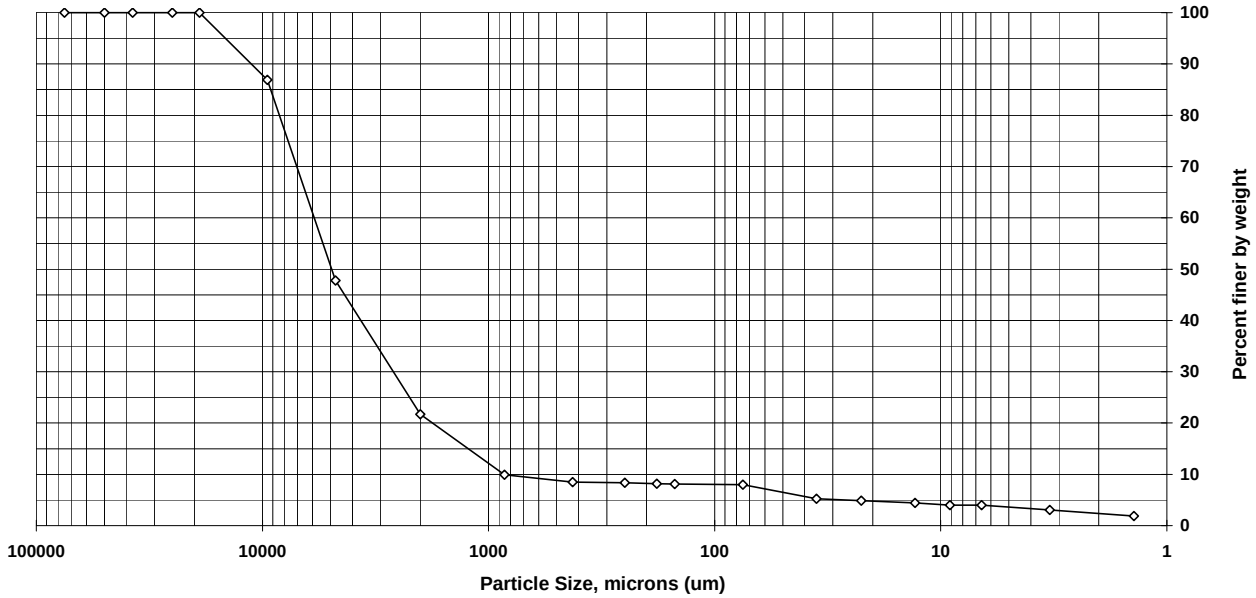
Particle Size of Soils by ASTM D422

				Date Received:	4/7/2017
Sample ID:	2017-SED-004	**Percent Solids:**	88.3%	**Start Date:**	4/12/2017
Lab ID:	600-146375-B-4	**Specific Gravity:**	2.650	**End Date:**	4/17/2017

Shape (> #10): subrounded

Non-soil material: shell

Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	86.9	13.1
#4	4750	47.8	39.1
#10	2000	21.7	26.1
#20	850	9.9	11.8
#40	425	8.5	1.5
#60	250	8.3	0.1
#80	180	8.2	0.2
#100	150	8.1	0.1
#200	75	8.0	0.1
Hyd1	35.4	5.3	2.7
Hyd2	22.5	4.8	0.4
Hyd3	13	4.4	0.4
Hyd4	9.1	4.0	0.4
Hyd5	6.6	4.0	0.0
Hyd6	3.3	3.1	0.9
Hyd7	1.4	1.9	1.2

Soil Classification	Percent of sample
Gravel	52.2
Sand	39.8
Coarse Sand	26.1
Medium Sand	13.2
Fine Sand	0.5
Silt	4.0
Clay	4.0

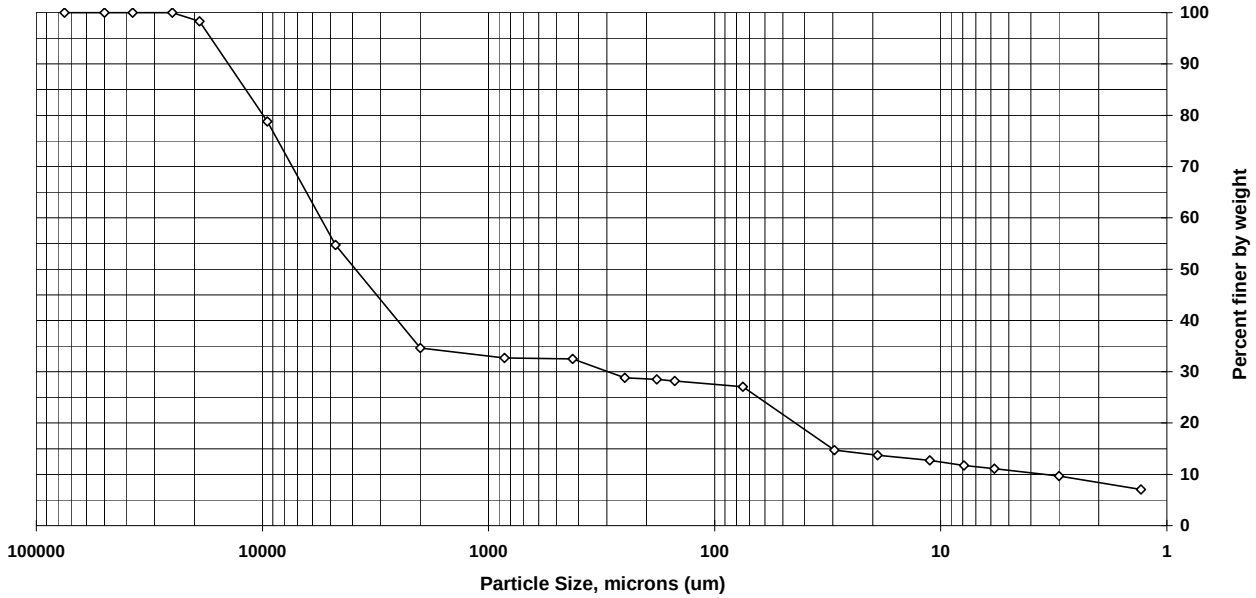
Particle Size of Soils by ASTM D422

				Date Received:	4/7/2017
Sample ID:	2017-SED-010	**Percent Solids:**	89.1%	**Start Date:**	4/12/2017
Lab ID:	600-146375-B-5	**Specific Gravity:**	2.650	**End Date:**	4/17/2017

Shape (> #10): subrounded

Non-soil material: plant

Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	98.3	1.7
3/8 inch	9500	78.8	19.5
#4	4750	54.7	24.1
#10	2000	34.6	20.1
#20	850	32.7	1.9
#40	425	32.5	0.2
#60	250	28.8	3.7
#80	180	28.5	0.3
#100	150	28.2	0.3
#200	75	27.1	1.1
Hyd1	29.5	14.7	12.4
Hyd2	19	13.7	1.0
Hyd3	11.2	12.7	1.0
Hyd4	7.9	11.7	1.0
Hyd5	5.8	11.1	0.6
Hyd6	3	9.7	1.4
Hyd7	1.3	7.1	2.6

Soil Classification	Percent of sample
Gravel	45.3
Sand	27.6
Coarse Sand	20.1
Medium Sand	2.1
Fine Sand	5.4
Silt	16.0
Clay	11.1

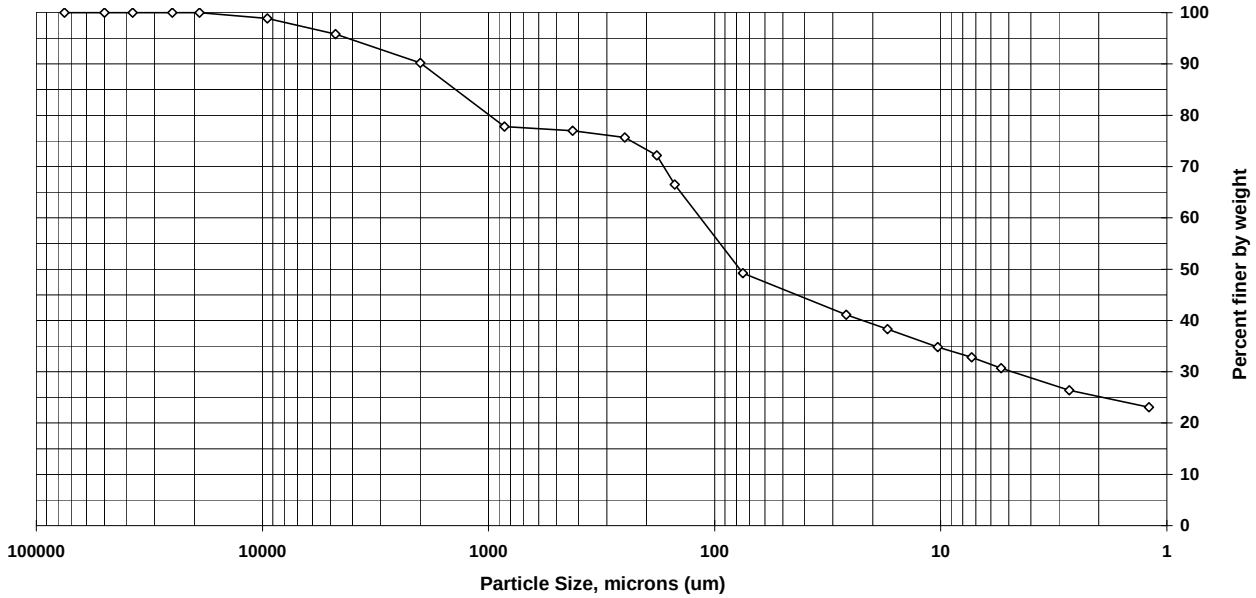
Particle Size of Soils by ASTM D422

				Date Received:	4/7/2017
Sample ID:	2017-SED-011	**Percent Solids:**	70.2%	**Start Date:**	4/12/2017
Lab ID:	600-146375-B-6	**Specific Gravity:**	2.650	**End Date:**	4/17/2017

Shape (> #10): subrounded

Non-soil material: plant

Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	98.9	1.1
#4	4750	95.8	3.1
#10	2000	90.2	5.6
#20	850	77.8	12.4
#40	425	77.0	0.8
#60	250	75.7	1.3
#80	180	72.2	3.5
#100	150	66.5	5.7
#200	75	49.2	17.3
Hyd1	26.2	41.1	8.1
Hyd2	17.2	38.3	2.8
Hyd3	10.3	34.8	3.5
Hyd4	7.3	32.8	2.0
Hyd5	5.4	30.7	2.1
Hyd6	2.7	26.4	4.3
Hyd7	1.2	23.1	3.3

Soil Classification	Percent of sample
Gravel	4.2
Sand	46.6
Coarse Sand	5.6
Medium Sand	13.2
Fine Sand	27.8
Silt	18.5
Clay	30.7

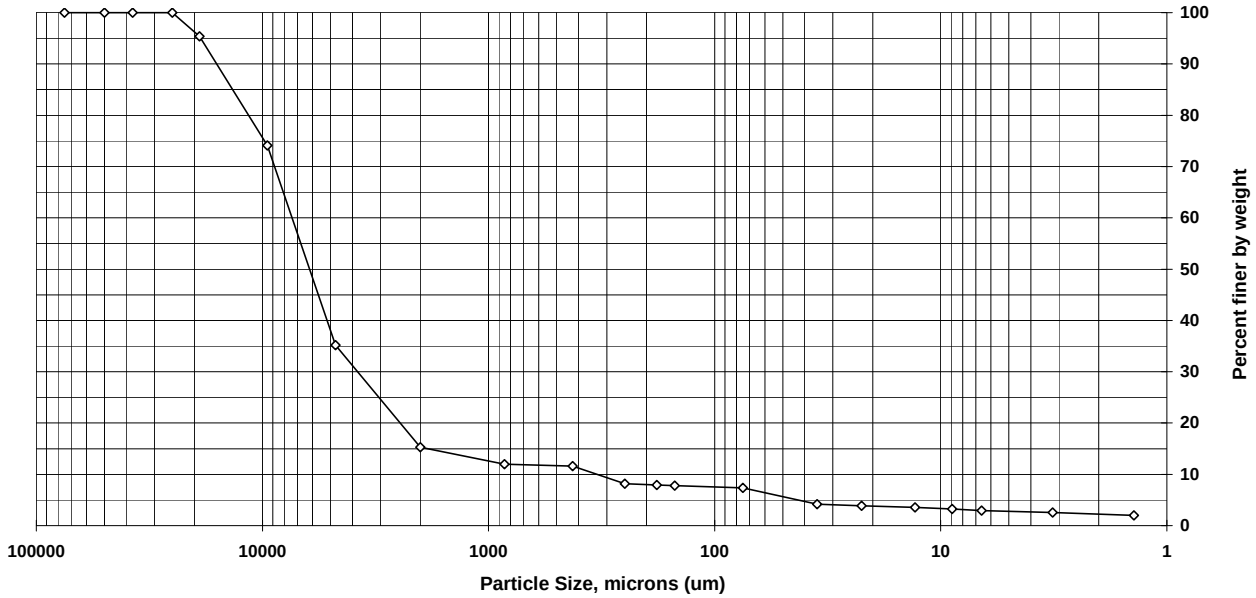
Particle Size of Soils by ASTM D422

				Date Received:	4/7/2017
Sample ID:	2017-SED-005	**Percent Solids:**	93.3%	**Start Date:**	4/12/2017
Lab ID:	600-146375-B-7	**Specific Gravity:**	2.650	**End Date:**	4/17/2017

Shape (> #10): subrounded

Non-soil material: n/a

Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	95.4	4.6
3/8 inch	9500	74.1	21.3
#4	4750	35.2	38.9
#10	2000	15.3	19.9
#20	850	12.0	3.3
#40	425	11.6	0.4
#60	250	8.2	3.4
#80	180	7.9	0.2
#100	150	7.8	0.2
#200	75	7.4	0.4
Hyd1	35.2	4.2	3.2
Hyd2	22.4	3.9	0.3
Hyd3	13	3.5	0.3
Hyd4	8.9	3.2	0.3
Hyd5	6.6	2.9	0.3
Hyd6	3.2	2.6	0.4
Hyd7	1.4	2.0	0.6

Soil Classification	Percent of sample
Gravel	64.8
Sand	27.8
Coarse Sand	19.9
Medium Sand	3.7
Fine Sand	4.2
Silt	4.5
Clay	2.9

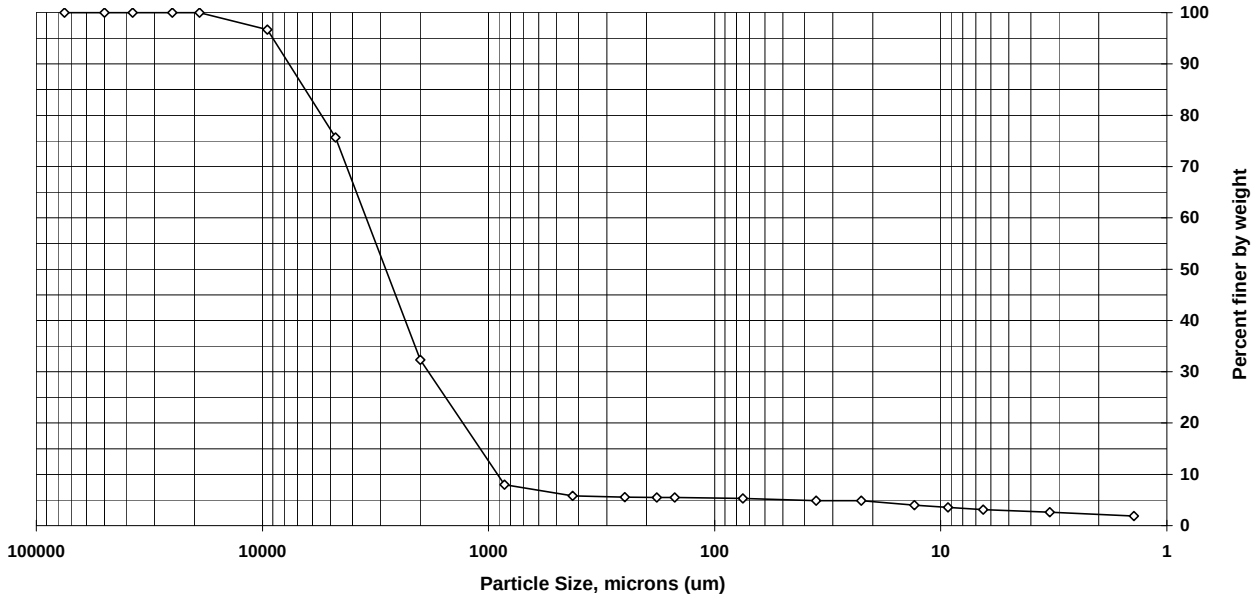
Particle Size of Soils by ASTM D422

				Date Received:	4/7/2017
Sample ID:	2017-SED-006	**Percent Solids:**	84.5%	**Start Date:**	4/12/2017
Lab ID:	600-146375-B-9	**Specific Gravity:**	2.650	**End Date:**	4/17/2017

Shape (> #10): subrounded

Non-soil material: n/a

Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	96.7	3.3
#4	4750	75.7	21.0
#10	2000	32.3	43.4
#20	850	8.0	24.3
#40	425	5.8	2.2
#60	250	5.6	0.3
#80	180	5.5	0.0
#100	150	5.5	0.0
#200	75	5.3	0.2
Hyd1	35.6	4.8	0.4
Hyd2	22.5	4.8	0.0
Hyd3	13.1	4.0	0.9
Hyd4	9.3	3.6	0.4
Hyd5	6.5	3.1	0.4
Hyd6	3.3	2.6	0.5
Hyd7	1.4	1.9	0.8

Soil Classification	Percent of sample
Gravel	24.3
Sand	70.4
Coarse Sand	43.4
Medium Sand	26.5
Fine Sand	0.5
Silt	2.2
Clay	3.1

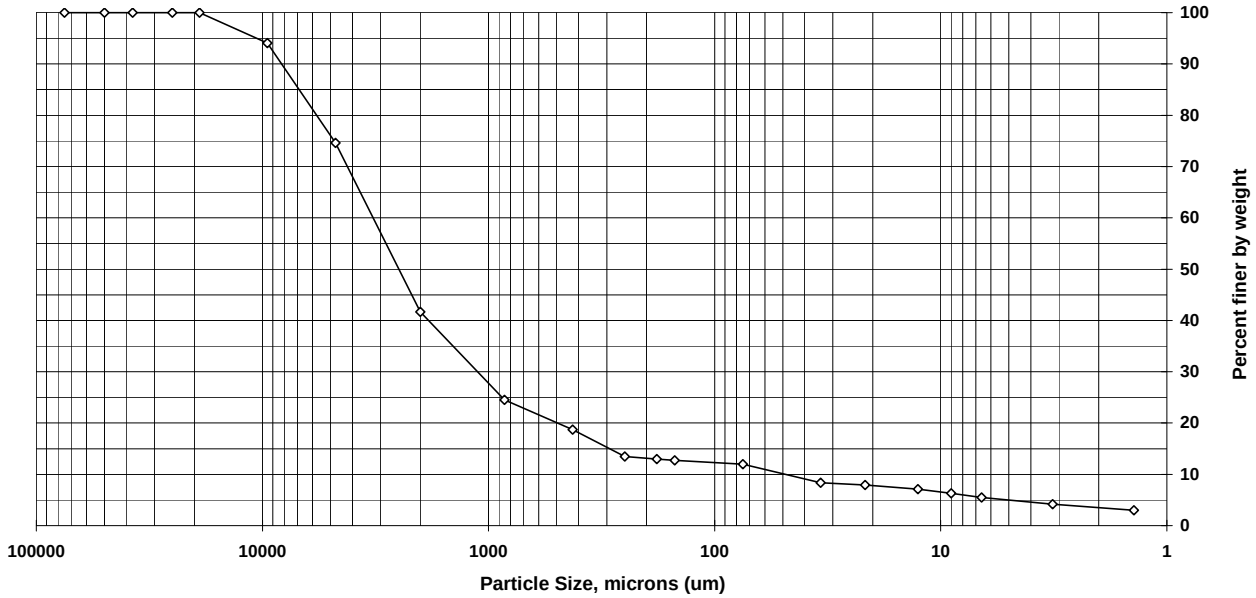
Particle Size of Soils by ASTM D422

				Date Received:	4/7/2017
Sample ID:	2017-SED-007	**Percent Solids:**	81.9%	**Start Date:**	4/12/2017
Lab ID:	600-146375-B-10	**Specific Gravity:**	2.650	**End Date:**	4/17/2017

Shape (> #10): subrounded

Non-soil material: shell

Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	94.1	5.9
#4	4750	74.6	19.5
#10	2000	41.7	32.9
#20	850	24.5	17.2
#40	425	18.7	5.8
#60	250	13.5	5.2
#80	180	13.0	0.5
#100	150	12.7	0.3
#200	75	12.0	0.7
Hyd1	34	8.3	3.7
Hyd2	21.6	7.9	0.4
Hyd3	12.6	7.1	0.8
Hyd4	9	6.3	0.8
Hyd5	6.6	5.5	0.8
Hyd6	3.2	4.2	1.3
Hyd7	1.4	3.0	1.2

Soil Classification	Percent of sample
Gravel	25.4
Sand	62.6
Coarse Sand	32.9
Medium Sand	23.0
Fine Sand	6.7
Silt	6.5
Clay	5.5

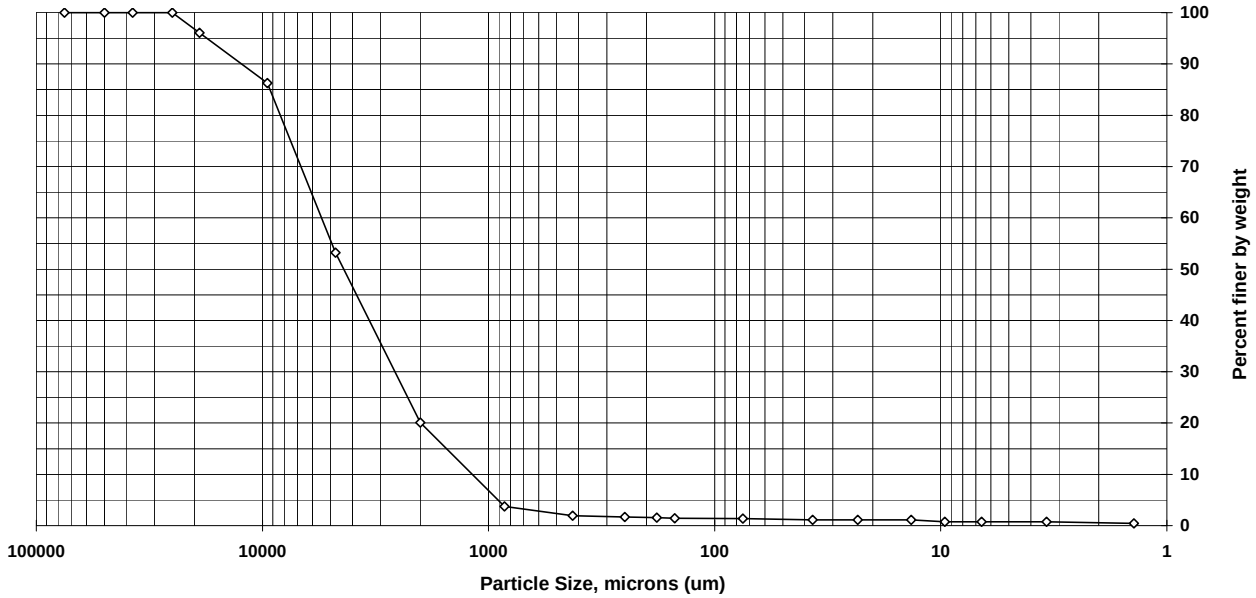
Particle Size of Soils by ASTM D422

				Date Received:	4/7/2017
Sample ID:	2017-SED-009	**Percent Solids:**	88.9%	**Start Date:**	4/12/2017
Lab ID:	600-146375-B-11	**Specific Gravity:**	2.650	**End Date:**	4/17/2017

Shape (> #10): subrounded

Non-soil material: n/a

Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	96.1	3.9
3/8 inch	9500	86.3	9.8
#4	4750	53.2	33.1
#10	2000	20.1	33.1
#20	850	3.8	16.3
#40	425	2.0	1.8
#60	250	1.7	0.2
#80	180	1.5	0.2
#100	150	1.5	0.1
#200	75	1.4	0.1
Hyd1	36.9	1.1	0.3
Hyd2	23.3	1.1	0.0
Hyd3	13.5	1.1	0.0
Hyd4	9.6	0.8	0.3
Hyd5	6.6	0.8	0.0
Hyd6	3.4	0.7	0.1
Hyd7	1.4	0.4	0.3

Soil Classification	Percent of sample
Gravel	46.8
Sand	51.8
Coarse Sand	33.1
Medium Sand	18.2
Fine Sand	0.6
Silt	0.6
Clay	0.8

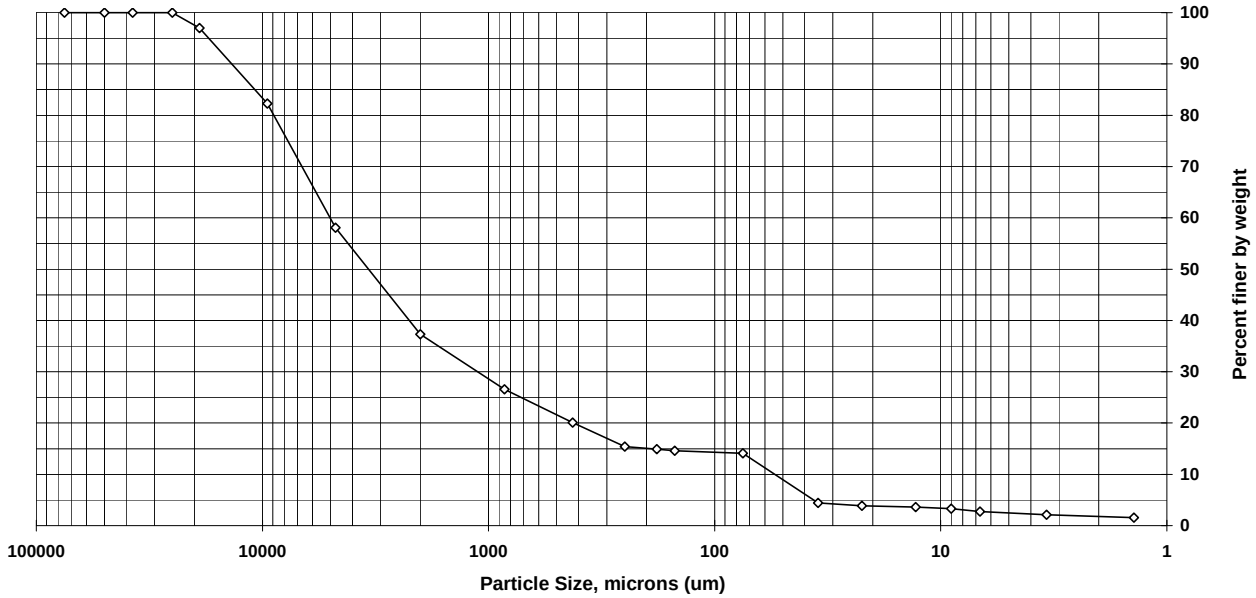
Particle Size of Soils by ASTM D422

				Date Received:	4/7/2017
Sample ID:	2017-SED-008	**Percent Solids:**	89.5%	**Start Date:**	4/12/2017
Lab ID:	600-146375-B-12	**Specific Gravity:**	2.650	**End Date:**	4/17/2017

Shape (> #10): subrounded

Non-soil material: shell

Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	97.0	3.0
3/8 inch	9500	82.3	14.7
#4	4750	58.1	24.2
#10	2000	37.3	20.8
#20	850	26.6	10.7
#40	425	20.1	6.5
#60	250	15.4	4.7
#80	180	14.9	0.5
#100	150	14.6	0.3
#200	75	14.1	0.5
Hyd1	34.9	4.5	9.6
Hyd2	22.3	3.9	0.6
Hyd3	12.9	3.6	0.3
Hyd4	9	3.3	0.3
Hyd5	6.7	2.7	0.6
Hyd6	3.4	2.1	0.6
Hyd7	1.4	1.6	0.5

Soil Classification	Percent of sample
Gravel	41.9
Sand	44.0
Coarse Sand	20.8
Medium Sand	17.2
Fine Sand	6.0
Silt	11.4
Clay	2.7

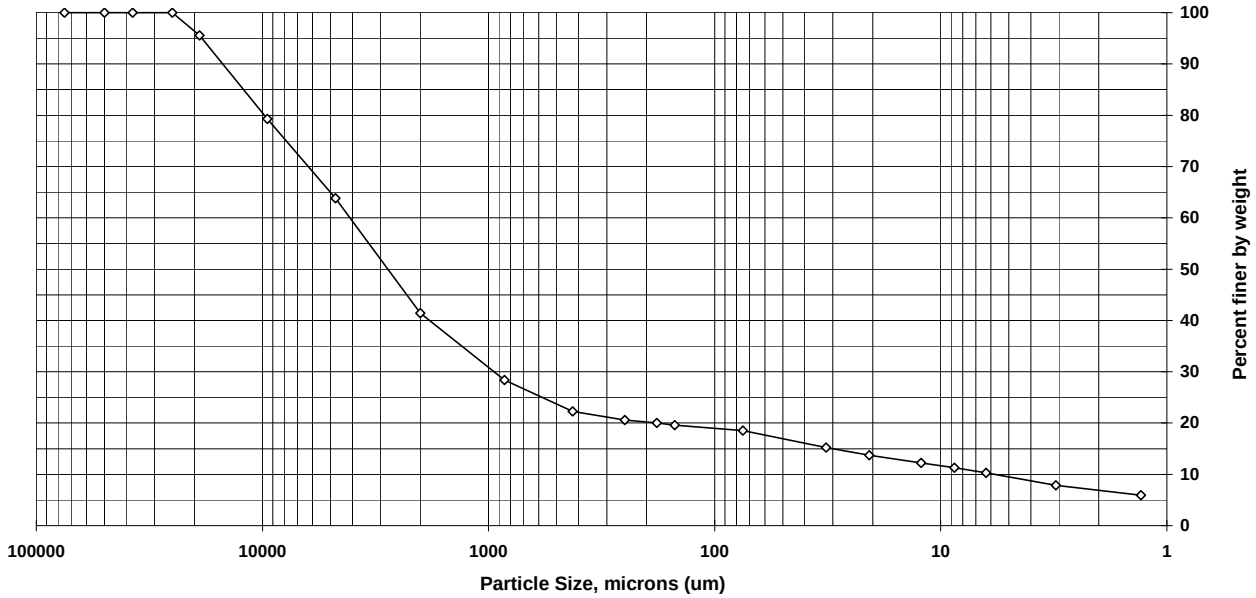
Particle Size of Soils by ASTM D422

				Date Received:	4/7/2017
Sample ID:	2017-SED-012	**Percent Solids:**	76.0%	**Start Date:**	4/12/2017
Lab ID:	600-146375-B-13	**Specific Gravity:**	2.650	**End Date:**	4/20/2017

Shape (> #10): subangular

Non-soil material: na

Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	95.6	4.4
3/8 inch	9500	79.3	16.3
#4	4750	63.8	15.5
#10	2000	41.4	22.4
#20	850	28.4	13.0
#40	425	22.3	6.1
#60	250	20.6	1.7
#80	180	20.0	0.6
#100	150	19.6	0.4
#200	75	18.5	1.1
Hyd1	32.2	15.2	3.3
Hyd2	20.7	13.7	1.5
Hyd3	12.2	12.2	1.5
Hyd4	8.7	11.3	0.9
Hyd5	6.3	10.3	1.0
Hyd6	3.1	7.9	2.4
Hyd7	1.3	5.9	2.0

Soil Classification	Percent of sample
Gravel	36.2
Sand	45.3
Coarse Sand	22.4
Medium Sand	19.1
Fine Sand	3.8
Silt	8.2
Clay	10.3

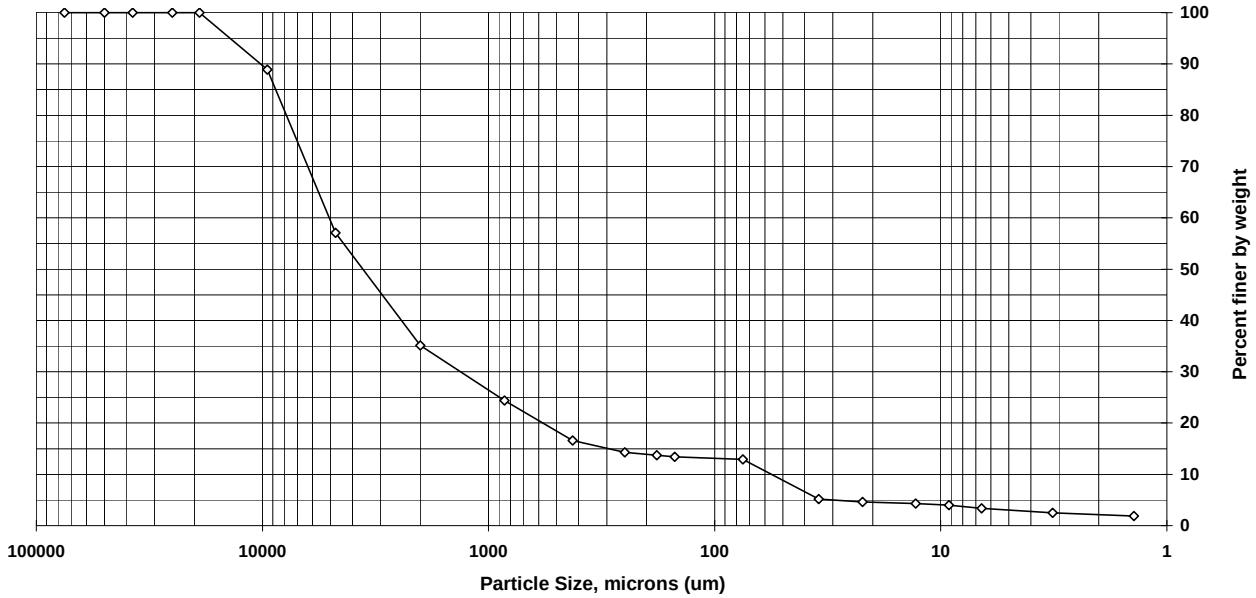
Particle Size of Soils by ASTM D422

				Date Received:	4/7/2017
Sample ID:	DUP-01	**Percent Solids:**	84.1%	**Start Date:**	4/12/2017
Lab ID:	600-146375-B-14	**Specific Gravity:**	2.650	**End Date:**	4/20/2017

Shape (> #10): subangular

Non-soil material: shell

Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	88.9	11.1
#4	4750	57.1	31.8
#10	2000	35.1	22.0
#20	850	24.4	10.7
#40	425	16.6	7.8
#60	250	14.3	2.3
#80	180	13.7	0.6
#100	150	13.4	0.3
#200	75	12.9	0.5
Hyd1	34.7	5.2	7.7
Hyd2	22.2	4.6	0.6
Hyd3	12.9	4.3	0.3
Hyd4	9.2	4.0	0.3
Hyd5	6.6	3.4	0.6
Hyd6	3.2	2.5	0.9
Hyd7	1.4	1.9	0.6

Soil Classification	Percent of sample
Gravel	42.9
Sand	44.2
Coarse Sand	22.0
Medium Sand	18.5
Fine Sand	3.7
Silt	9.5
Clay	3.4

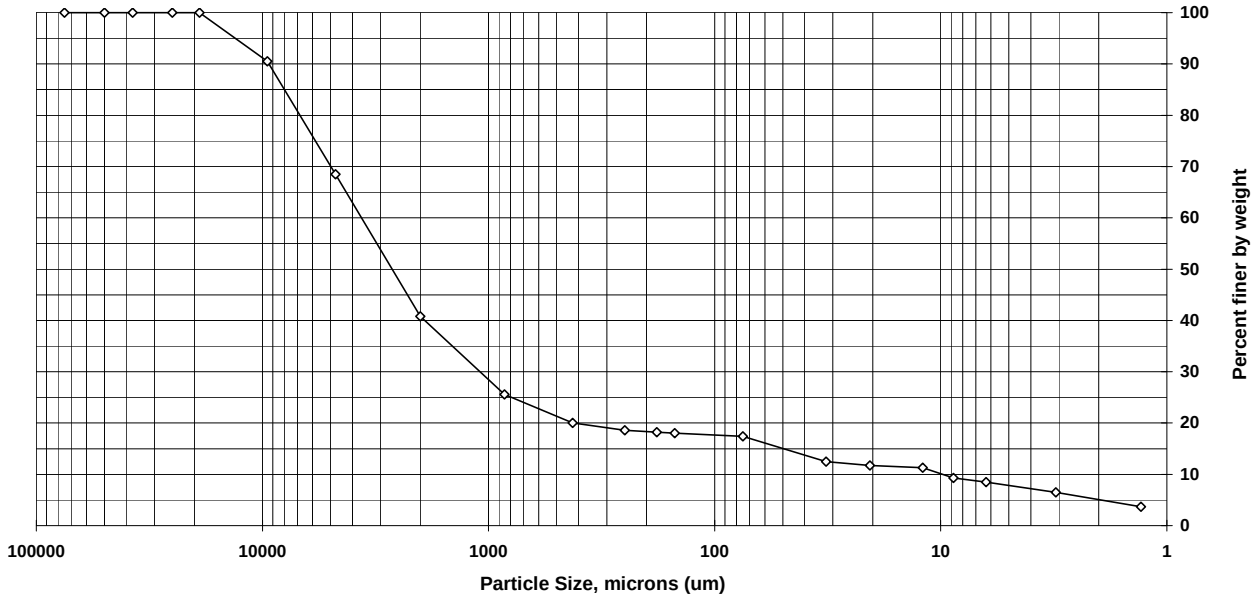
Particle Size of Soils by ASTM D422

				Date Received:	4/7/2017
Sample ID:	DUP-02	**Percent Solids:**	80.4%	**Start Date:**	4/12/2017
Lab ID:	600-146375-B-15	**Specific Gravity:**	2.650	**End Date:**	4/20/2017

Shape (> #10): subangular

Non-soil material: na

Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	90.5	9.5
#4	4750	68.5	22.0
#10	2000	40.8	27.7
#20	850	25.6	15.2
#40	425	20.0	5.6
#60	250	18.6	1.4
#80	180	18.2	0.4
#100	150	18.0	0.2
#200	75	17.4	0.6
Hyd1	32.2	12.5	4.9
Hyd2	20.6	11.7	0.8
Hyd3	12	11.3	0.4
Hyd4	8.8	9.3	2.0
Hyd5	6.3	8.5	0.8
Hyd6	3.1	6.5	2.0
Hyd7	1.3	3.7	2.8

Soil Classification	Percent of sample
Gravel	31.5
Sand	51.1
Coarse Sand	27.7
Medium Sand	20.8
Fine Sand	2.6
Silt	8.9
Clay	8.5

Sediment Grain Size - D422

Client	
Client Sample ID	2017-SED-001
Lab Sample ID	600-146375-B-1

Date Received	4/7/2017
Start Date	04/12/2017 20:12
End Date	04/17/2017 18:35

Dry Weight Determination

Tin Weight	1.02	g
Wet Sample + Tin	22.65	g
Dry Sample + Tin	13.68	g
% Moisture	41.47	%

Non-soil material:	plant,shell
Shape (> #10):	subrounded
Hardness (> #10):	hard

Date/Time in oven	04/12/2017 20:15
Date/Time out of oven	04/13/2017 18:53

Sample Weights	Tare (g)	Pan+Samp (g)	Samp (g)
Sample Weight (Wet)	44.68	185.48	140.8
Sample Weight (Oven Dried)			82.4

Sample Split (oven dried)	Tare (g)	Pan+Samp (g)	Samp (g)
Sample >=#10			11.4
Sample <#10			71
% Passing #10			50.4

Hydrometer Data

Serial Number	503315
Calib. Date (mm/dd/yyyy)	07/18/2016
Low Temp (C)	17.0
Reading at Low Temp	1.0040
High Temp (C)	23.0
Reading at High Temp	1.0030
Hydrometer Cal Slope	-0.000166667
Hydrometer Cal Intercept	1.006833333
Default Soil Gravity	2.6500

Gravel/Sand Fraction (Sieves)

Sample Fraction	Size (um)	Pan Tare (g)	Pan+Sample (g)	Sample		% Finer	Classification	Sub Class
3 inch	75000			0.00	g	100.0	Gravel	
2 inch	50000			0.00	g	100.0	Gravel	
1.5 inch	37500			0.00	g	100.0	Gravel	
1 inch	25000			0.00	g	100.0	Gravel	
3/4 inch	19000			0.00	g	100.0	Gravel	
3/8 inch	9500			0.00	g	100.0	Gravel	
#4	4750	488.09	492.00	3.91	g	95.3	Gravel	
#10	2000	462.65	470.11	7.46	g	86.2	Sand	Coarse
#20	850	376.72	382.91	6.19	g	78.7	Sand	Medium
#40	425	364.82	369.48	4.66	g	73.0	Sand	Medium
#60	250	328.76	340.22	11.46	g	59.1	Sand	Fine
#80	180	320.01	322.09	2.08	g	56.6	Sand	Fine
#100	150	328.56	330.36	1.80	g	54.4	Sand	Fine
#200	75	314.92	320.66	5.74	g	47.4	Sand	Fine
				0.00	g	47.4		

Adjusted Hydrometer Sample Mass

Hydrometer Sample Mass (g)	82.4

Silt/Clay Fraction (Hydrometer Test)

Hydrometer Test Time (min)	Actual	Spec. Gravity	Temp C	Particle Size (Micron)	% Finer	Classification	Sub Class
2	2	1.0275	21.0	28.6	47.1	Silt	
5	5	1.0255	21.0	18.6	43.2	Silt	
15	15	1.0235	21.0	11.1	39.3	Silt	
30	30	1.0220	21.0	8	36.4	Silt	
60	58	1.0205	21.0	5.8	33.5	Silt	
250	256	1.0180	20.5	2.9	28.4	Clay	
1440	1440	1.0150	21.0	1.2	22.7	Clay	

Sediment Grain Size - D422

Client	
Client Sample ID	2017-SED-002
Lab Sample ID	600-146375-B-2

Date Received	4/7/2017
Start Date	04/12/2017 20:15
End Date	04/17/2017 18:46

Dry Weight Determination

Tin Weight	1.01	g
Wet Sample + Tin	31.68	g
Dry Sample + Tin	24.00	g
% Moisture	25.04	%

Non-soil material:	shell
Shape (> #10):	subrounded
Hardness (> #10):	hard

Date/Time in oven	04/12/2017 20:17
Date/Time out of oven	04/13/2017 18:54

Sample Weights	Tare (g)	Pan+Samp (g)	Samp (g)
Sample Weight (Wet)	44.73	236.81	192.08
Sample Weight (Oven Dried)			144

Sample Split (oven dried)	Tare (g)	Pan+Samp (g)	Samp (g)
Sample >=#10			50.3
Sample <#10			93.7
% Passing #10			48.8

Hydrometer Data

Serial Number	503315
Calib. Date (mm/dd/yyyy)	07/18/2016
Low Temp (C)	17.0
Reading at Low Temp	1.0040
High Temp (C)	23.0
Reading at High Temp	1.0030
Hydrometer Cal Slope	-0.000166667
Hydrometer Cal Intercept	1.006833333
Default Soil Gravity	2.6500

Gravel/Sand Fraction (Sieves)

Sample Fraction	Size (um)	Pan Tare (g)	Pan+Sample (g)	Sample		% Finer	Classification	Sub Class
3 inch	75000			0.00	g	100.0	Gravel	
2 inch	50000			0.00	g	100.0	Gravel	
1.5 inch	37500			0.00	g	100.0	Gravel	
1 inch	25000			0.00	g	100.0	Gravel	
3/4 inch	19000			0.00	g	100.0	Gravel	
3/8 inch	9500	447.33	449.58	2.25	g	98.4	Gravel	
#4	4750	488.09	498.83	10.74	g	90.9	Gravel	
#10	2000	462.65	499.93	37.28	g	65.0	Sand	Coarse
#20	850	363.31	409.36	46.05	g	33.0	Sand	Medium
#40	425	355.46	373.94	18.48	g	20.2	Sand	Medium
#60	250	326.01	330.04	4.03	g	17.4	Sand	Fine
#80	180	321.17	322.39	1.22	g	16.6	Sand	Fine
#100	150	325.79	326.60	0.81	g	16.0	Sand	Fine
#200	75	312.79	314.48	1.69	g	14.8	Sand	Fine
				0.00	g	14.8		

Adjusted Hydrometer Sample Mass

Hydrometer Sample Mass (g)	144

Silt/Clay Fraction (Hydrometer Test)

Hydrometer Test Time (min)	Actual	Spec. Gravity	Temp C	Particle Size (Micron)	% Finer	Classification	Sub Class
2	2	1.0140	21.0	33.8	11.9	Silt	
5	5	1.0130	21.0	21.6	10.8	Silt	
15	15	1.0125	21.0	12.5	10.2	Silt	
30	29	1.0120	21.0	9.1	9.67	Silt	
60	58	1.0110	21.0	6.5	8.55	Silt	
250	250	1.0095	20.5	3.2	6.78	Clay	
1440	1434	1.0075	21.0	1.3	4.65	Clay	

Sediment Grain Size - D422

Client	
Client Sample ID	2017-SED-003
Lab Sample ID	600-146375-B-3

Date Received	4/7/2017
Start Date	04/12/2017 20:17
End Date	04/17/2017 18:50

Dry Weight Determination

Tin Weight	1.01	g
Wet Sample + Tin	30.13	g
Dry Sample + Tin	26.28	g
% Moisture	13.22	%

Non-soil material:	shell
Shape (> #10):	subrounded
Hardness (> #10):	hard

Date/Time in oven	04/12/2017 20:18
Date/Time out of oven	04/13/2017 18:54

Sample Weights	Tare (g)	Pan+Samp (g)	Samp (g)
Sample Weight (Wet)	44.87	220.67	175.8
Sample Weight (Oven Dried)			153

Sample Split (oven dried)	Tare (g)	Pan+Samp (g)	Samp (g)
Sample >=#10			89.3
Sample <#10			63.7
% Passing #10			36.2

Hydrometer Data	
Serial Number	503315
Calib. Date (mm/dd/yyyy)	07/18/2016
Low Temp (C)	17.0
Reading at Low Temp	1.0040
High Temp (C)	23.0
Reading at High Temp	1.0030
Hydrometer Cal Slope	-0.000166667
Hydrometer Cal Intercept	1.006833333
Default Soil Gravity	2.6500

Gravel/Sand Fraction (Sieves)

Sample Fraction	Size (um)	Pan Tare (g)	Pan+Sample (g)	Sample		% Finer	Classification	Sub Class
3 inch	75000			0.00	g	100.0	Gravel	
2 inch	50000			0.00	g	100.0	Gravel	
1.5 inch	37500			0.00	g	100.0	Gravel	
1 inch	25000			0.00	g	100.0	Gravel	
3/4 inch	19000			0.00	g	100.0	Gravel	
3/8 inch	9500			0.00	g	100.0	Gravel	
#4	4750	488.09	513.36	25.27	g	83.5	Gravel	
#10	2000	462.65	526.69	64.04	g	41.6	Sand	Coarse
#20	850	376.72	410.43	33.71	g	19.6	Sand	Medium
#40	425	364.82	372.88	8.06	g	14.3	Sand	Medium
#60	250	328.76	338.90	10.14	g	7.7	Sand	Fine
#80	180	320.01	320.57	0.56	g	7.3	Sand	Fine
#100	150	328.56	328.89	0.33	g	7.1	Sand	Fine
#200	75	314.92	315.58	0.66	g	6.7	Sand	Fine
				0.00	g	6.7		

Adjusted Hydrometer Sample Mass

Hydrometer Sample Mass (g)	153

Silt/Clay Fraction (Hydrometer Test)

Hydrometer Test Time (min)	Actual	Spec. Gravity	Temp C	Particle Size (Micron)	% Finer	Classification	Sub Class
2	2	1.0080	21.0	35.9	4.9	Silt	
5	5	1.0075	21.0	22.8	4.37	Silt	
15	15	1.0075	21.0	13.2	4.37	Silt	
30	29	1.0070	21.0	9.5	3.85	Silt	
60	63	1.0065	21.0	6.5	3.32	Silt	
250	250	1.0060	20.5	3.3	2.71	Clay	
1440	1434	1.0050	21.0	1.4	1.75	Clay	

Sediment Grain Size - D422

Client	
Client Sample ID	2017-SED-004
Lab Sample ID	600-146375-B-4

Date Received	4/7/2017
Start Date	04/12/2017 20:23
End Date	04/17/2017 20:06

Dry Weight Determination

Tin Weight	1.07	g
Wet Sample + Tin	24.30	g
Dry Sample + Tin	21.57	g
% Moisture	11.75	%

Non-soil material:	shell
Shape (> #10):	subrounded
Hardness (> #10):	hard

Date/Time in oven	04/12/2017 20:25
Date/Time out of oven	04/13/2017 18:54

Sample Weights	Tare (g)	Pan+Samp (g)	Samp (g)
Sample Weight (Wet)	44.68	258.01	213.33
Sample Weight (Oven Dried)			188

Sample Split (oven dried)	Tare (g)	Pan+Samp (g)	Samp (g)
Sample >=#10			147
Sample <#10			41
% Passing #10			19.2

Hydrometer Data

Serial Number	503315
Calib. Date (mm/dd/yyyy)	07/18/2016
Low Temp (C)	17.0
Reading at Low Temp	1.0040
High Temp (C)	23.0
Reading at High Temp	1.0030
Hydrometer Cal Slope	-0.000166667
Hydrometer Cal Intercept	1.006833333
Default Soil Gravity	2.6500

Gravel/Sand Fraction (Sieves)

Sample Fraction	Size (um)	Pan Tare (g)	Pan+Sample (g)	Sample		% Finer	Classification	Sub Class
3 inch	75000			0.00	g	100.0	Gravel	
2 inch	50000			0.00	g	100.0	Gravel	
1.5 inch	37500			0.00	g	100.0	Gravel	
1 inch	25000			0.00	g	100.0	Gravel	
3/4 inch	19000			0.00	g	100.0	Gravel	
3/8 inch	9500	447.33	472.02	24.69	g	86.9	Gravel	
#4	4750	488.09	561.58	73.49	g	47.8	Gravel	
#10	2000	462.65	511.68	49.03	g	21.7	Sand	Coarse
#20	850	363.31	385.42	22.11	g	9.9	Sand	Medium
#40	425	355.46	358.22	2.76	g	8.5	Sand	Medium
#60	250	326.01	326.25	0.24	g	8.3	Sand	Fine
#80	180	320.85	321.13	0.28	g	8.2	Sand	Fine
#100	150	325.61	325.78	0.17	g	8.1	Sand	Fine
#200	75	312.79	312.97	0.18	g	8.0	Sand	Fine
				0.00	g	8.0		

Adjusted Hydrometer Sample Mass

Hydrometer Sample Mass (g)	188

Silt/Clay Fraction (Hydrometer Test)

Hydrometer Test Time (min)	Actual	Spec. Gravity	Temp C	Particle Size (Micron)	% Finer	Classification	Sub Class
2	2	1.0095	21.0	35.4	5.27	Silt	
5	5	1.0090	21.0	22.5	4.84	Silt	
15	15	1.0085	21.0	13	4.41	Silt	
30	31	1.0080	21.0	9.1	3.99	Silt	
60	60	1.0080	21.0	6.6	3.99	Silt	
250	240	1.0070	20.5	3.3	3.06	Clay	
1440	1424	1.0055	21.0	1.4	1.85	Clay	

Sediment Grain Size - D422

Client	
Client Sample ID	2017-SED-010
Lab Sample ID	600-146375-B-5

Date Received	4/7/2017
Start Date	04/12/2017 20:26
End Date	04/17/2017 20:10

Dry Weight Determination

Tin Weight	1.06	g
Wet Sample + Tin	21.82	g
Dry Sample + Tin	19.55	g
% Moisture	10.93	%

Non-soil material:	plant
Shape (> #10):	subrounded
Hardness (> #10):	hard

Date/Time in oven	04/12/2017 20:27
Date/Time out of oven	04/13/2017 18:55

Sample Weights	Tare (g)	Pan+Samp (g)	Samp (g)
Sample Weight (Wet)	44.74	316.32	271.58
Sample Weight (Oven Dried)			242

Sample Split (oven dried)	Tare (g)	Pan+Samp (g)	Samp (g)
Sample >=#10			158
Sample <#10			84
% Passing #10			30.9

Hydrometer Data

Serial Number	503315
Calib. Date (mm/dd/yyyy)	07/18/2016
Low Temp (C)	17.0
Reading at Low Temp	1.0040
High Temp (C)	23.0
Reading at High Temp	1.0030
Hydrometer Cal Slope	-0.000166667
Hydrometer Cal Intercept	1.006833333
Default Soil Gravity	2.6500

Gravel/Sand Fraction (Sieves)

Sample Fraction	Size (um)	Pan Tare (g)	Pan+Sample (g)	Sample		% Finer	Classification	Sub Class
3 inch	75000			0.00	g	100.0	Gravel	
2 inch	50000			0.00	g	100.0	Gravel	
1.5 inch	37500			0.00	g	100.0	Gravel	
1 inch	25000			0.00	g	100.0	Gravel	
3/4 inch	19000	457.77	461.81	4.04	g	98.3	Gravel	
3/8 inch	9500	447.33	494.44	47.11	g	78.8	Gravel	
#4	4750	488.09	546.48	58.39	g	54.7	Gravel	
#10	2000	462.65	511.34	48.69	g	34.6	Sand	Coarse
#20	850	376.72	381.31	4.59	g	32.7	Sand	Medium
#40	425	364.82	365.39	0.57	g	32.5	Sand	Medium
#60	250	328.76	337.76	9.00	g	28.8	Sand	Fine
#80	180	320.01	320.79	0.78	g	28.5	Sand	Fine
#100	150	328.56	329.26	0.70	g	28.2	Sand	Fine
#200	75	314.92	317.50	2.58	g	27.1	Sand	Fine
				0.00	g	27.1		

Adjusted Hydrometer Sample Mass

Hydrometer Sample Mass (g)	242

Silt/Clay Fraction (Hydrometer Test)

Hydrometer Test Time (min)	Actual	Spec. Gravity	Temp C	Particle Size (Micron)	% Finer	Classification	Sub Class
2	2	1.0255	21.0	29.5	14.7	Silt	
5	5	1.0240	21.0	19	13.7	Silt	
15	15	1.0225	21.0	11.2	12.7	Silt	
30	31	1.0210	21.0	7.9	11.7	Silt	
60	59	1.0200	21.0	5.8	11.1	Silt	
250	234	1.0180	20.5	3	9.68	Clay	
1440	1418	1.0140	21.0	1.3	7.08	Clay	

Sediment Grain Size - D422

Client	
Client Sample ID	2017-SED-011
Lab Sample ID	600-146375-B-6

Date Received	4/7/2017
Start Date	04/12/2017 20:37
End Date	04/17/2017 20:20

Dry Weight Determination

Tin Weight	1.02	g
Wet Sample + Tin	24.51	g
Dry Sample + Tin	17.52	g
% Moisture	29.76	%

Non-soil material:	plant
Shape (> #10):	subrounded
Hardness (> #10):	hard

Date/Time in oven	04/12/2017 20:39
Date/Time out of oven	04/13/2017 18:55

Sample Weights	Tare (g)	Pan+Samp (g)	Samp (g)
Sample Weight (Wet)	44.73	209.38	164.65
Sample Weight (Oven Dried)			116

Sample Split (oven dried)	Tare (g)	Pan+Samp (g)	Samp (g)
Sample >=#10			11.4
Sample <#10			105
% Passing #10			63.8

Hydrometer Data	
Serial Number	503315
Calib. Date (mm/dd/yyyy)	07/18/2016
Low Temp (C)	17.0
Reading at Low Temp	1.0040
High Temp (C)	23.0
Reading at High Temp	1.0030
Hydrometer Cal Slope	-0.000166667
Hydrometer Cal Intercept	1.006833333
Default Soil Gravity	2.6500

Gravel/Sand Fraction (Sieves)

Sample Fraction	Size (um)	Pan Tare (g)	Pan+Sample (g)	Sample		% Finer	Classification	Sub Class
3 inch	75000			0.00	g	100.0	Gravel	
2 inch	50000			0.00	g	100.0	Gravel	
1.5 inch	37500			0.00	g	100.0	Gravel	
1 inch	25000			0.00	g	100.0	Gravel	
3/4 inch	19000			0.00	g	100.0	Gravel	
3/8 inch	9500	447.33	448.55	1.22	g	98.9	Gravel	
#4	4750	488.09	491.70	3.61	g	95.8	Gravel	
#10	2000	462.65	469.17	6.52	g	90.2	Sand	Coarse
#20	850	363.31	377.64	14.33	g	77.8	Sand	Medium
#40	425	355.46	356.44	0.98	g	77.0	Sand	Medium
#60	250	326.01	327.51	1.50	g	75.7	Sand	Fine
#80	180	321.17	325.23	4.06	g	72.2	Sand	Fine
#100	150	325.79	332.39	6.60	g	66.5	Sand	Fine
#200	75	312.79	332.88	20.09	g	49.2	Sand	Fine
				0.00	g	49.2		

Adjusted Hydrometer Sample Mass

Hydrometer Sample Mass (g)	116

Silt/Clay Fraction (Hydrometer Test)

Hydrometer Test Time (min)	Actual	Spec. Gravity	Temp C	Particle Size (Micron)	% Finer	Classification	Sub Class
2	2	1.0330	21.0	26.2	41.1	Silt	
5	5	1.0310	21.0	17.2	38.3	Silt	
15	15	1.0285	21.0	10.3	34.8	Silt	
30	31	1.0270	21.0	7.3	32.8	Silt	
60	59	1.0255	21.0	5.4	30.7	Silt	
250	265	1.0225	20.5	2.7	26.4	Clay	
1440	1412	1.0200	21.0	1.2	23.1	Clay	

Sediment Grain Size - D422

Client	
Client Sample ID	2017-SED-005
Lab Sample ID	600-146375-B-7

Date Received	4/7/2017
Start Date	04/12/2017 20:40
End Date	04/17/2017 20:23

Dry Weight Determination

Tin Weight	1.00	g
Wet Sample + Tin	27.42	g
Dry Sample + Tin	25.65	g
% Moisture	6.70	%

Non-soil material:	n/a
Shape (> #10):	subrounded
Hardness (> #10):	hard

Date/Time in oven	04/12/2017 20:41
Date/Time out of oven	04/13/2017 18:56

Sample Weights	Tare (g)	Pan+Samp (g)	Samp (g)
Sample Weight (Wet)	44.64	320.26	275.62
Sample Weight (Oven Dried)			257

Sample Split (oven dried)	Tare (g)	Pan+Samp (g)	Samp (g)
Sample >=#10			217
Sample <#10			40
% Passing #10			14.5

Hydrometer Data

Serial Number	503315
Calib. Date (mm/dd/yyyy)	07/18/2016
Low Temp (C)	17.0
Reading at Low Temp	1.0040
High Temp (C)	23.0
Reading at High Temp	1.0030
Hydrometer Cal Slope	-0.000166667
Hydrometer Cal Intercept	1.006833333
Default Soil Gravity	2.6500

Gravel/Sand Fraction (Sieves)

Sample Fraction	Size (um)	Pan Tare (g)	Pan+Sample (g)	Sample		% Finer	Classification	Sub Class
3 inch	75000			0.00	g	100.0	Gravel	
2 inch	50000			0.00	g	100.0	Gravel	
1.5 inch	37500			0.00	g	100.0	Gravel	
1 inch	25000			0.00	g	100.0	Gravel	
3/4 inch	19000	457.77	469.48	11.71	g	95.4	Gravel	
3/8 inch	9500	447.33	502.01	54.68	g	74.1	Gravel	
#4	4750	488.09	587.97	99.88	g	35.2	Gravel	
#10	2000	462.65	513.72	51.07	g	15.3	Sand	Coarse
#20	850	376.72	385.27	8.55	g	12.0	Sand	Medium
#40	425	364.82	365.90	1.08	g	11.6	Sand	Medium
#60	250	328.76	337.58	8.82	g	8.2	Sand	Fine
#80	180	320.01	320.61	0.60	g	7.9	Sand	Fine
#100	150	328.56	328.97	0.41	g	7.8	Sand	Fine
#200	75	314.92	315.92	1.00	g	7.4	Sand	Fine
				0.00	g	7.4		

Adjusted Hydrometer Sample Mass

Hydrometer Sample Mass (g)	257

Silt/Clay Fraction (Hydrometer Test)

Hydrometer Test Time (min)	Actual	Spec. Gravity	Temp C	Particle Size (Micron)	% Finer	Classification	Sub Class
2	2	1.0100	21.0	35.2	4.17	Silt	
5	5	1.0095	21.0	22.4	3.85	Silt	
15	15	1.0090	21.0	13	3.54	Silt	
30	32	1.0085	21.0	8.9	3.23	Silt	
60	60	1.0080	21.0	6.6	2.92	Silt	
250	259	1.0075	20.5	3.2	2.55	Clay	
1440	1406	1.0065	21.0	1.4	1.98	Clay	

Sediment Grain Size - D422

Client	
Client Sample ID	2017-SED-006
Lab Sample ID	600-146375-B-9

Date Received	4/7/2017
Start Date	04/12/2017 20:41
End Date	04/17/2017 20:34

Dry Weight Determination

Tin Weight	1.02	g
Wet Sample + Tin	32.05	g
Dry Sample + Tin	27.23	g
% Moisture	15.53	%

Non-soil material:	n/a
Shape (> #10):	subrounded
Hardness (> #10):	hard

Date/Time in oven	04/12/2017 20:43
Date/Time out of oven	04/13/2017 18:56

Sample Weights	Tare (g)	Pan+Samp (g)	Samp (g)
Sample Weight (Wet)	44.74	267.37	222.63
Sample Weight (Oven Dried)			188

Sample Split (oven dried)	Tare (g)	Pan+Samp (g)	Samp (g)
Sample >=#10			127
Sample <#10			61
% Passing #10			27.4

Hydrometer Data

Serial Number	503315
Calib. Date (mm/dd/yyyy)	07/18/2016
Low Temp (C)	17.0
Reading at Low Temp	1.0040
High Temp (C)	23.0
Reading at High Temp	1.0030
Hydrometer Cal Slope	-0.000166667
Hydrometer Cal Intercept	1.006833333
Default Soil Gravity	2.6500

Gravel/Sand Fraction (Sieves)

Sample Fraction	Size (um)	Pan Tare (g)	Pan+Sample (g)	Sample		% Finer	Classification	Sub Class
3 inch	75000			0.00	g	100.0	Gravel	
2 inch	50000			0.00	g	100.0	Gravel	
1.5 inch	37500			0.00	g	100.0	Gravel	
1 inch	25000			0.00	g	100.0	Gravel	
3/4 inch	19000			0.00	g	100.0	Gravel	
3/8 inch	9500	447.33	453.45	6.12	g	96.7	Gravel	
#4	4750	488.09	527.55	39.46	g	75.7	Gravel	
#10	2000	462.65	544.19	81.54	g	32.3	Sand	Coarse
#20	850	363.31	409.00	45.69	g	8.0	Sand	Medium
#40	425	355.46	359.56	4.10	g	5.8	Sand	Medium
#60	250	326.01	326.49	0.48	g	5.6	Sand	Fine
#80	180	321.17	321.25	0.08	g	5.5	Sand	Fine
#100	150	325.79	325.88	0.09	g	5.5	Sand	Fine
#200	75	312.79	313.15	0.36	g	5.3	Sand	Fine
				0.00	g	5.3		

Adjusted Hydrometer Sample Mass

Hydrometer Sample Mass (g)	188

Silt/Clay Fraction (Hydrometer Test)

Hydrometer Test Time (min)	Actual	Spec. Gravity	Temp C	Particle Size (Micron)	% Finer	Classification	Sub Class
2	2	1.0090	21.0	35.6	4.84	Silt	
5	5	1.0090	21.0	22.5	4.84	Silt	
15	15	1.0080	21.0	13.1	3.99	Silt	
30	30	1.0075	21.0	9.3	3.56	Silt	
60	63	1.0070	21.0	6.5	3.13	Silt	
250	253	1.0065	20.5	3.3	2.63	Clay	
1440	1400	1.0055	21.0	1.4	1.85	Clay	

Sediment Grain Size - D422

Client	
Client Sample ID	2017-SED-007
Lab Sample ID	600-146375-B-10

Date Received	4/7/2017
Start Date	04/12/2017 20:44
End Date	04/17/2017 20:40

Dry Weight Determination

Tin Weight	1.04	g
Wet Sample + Tin	28.59	g
Dry Sample + Tin	23.59	g
% Moisture	18.15	%

Non-soil material:	shell
Shape (> #10):	subrounded
Hardness (> #10):	hard

Date/Time in oven	04/12/2017 20:45
Date/Time out of oven	04/13/2017 18:56

Sample Weights	Tare (g)	Pan+Samp (g)	Samp (g)
Sample Weight (Wet)	44.68	284.70	240.02
Sample Weight (Oven Dried)			196

Sample Split (oven dried)	Tare (g)	Pan+Samp (g)	Samp (g)
Sample >=#10			114
Sample <#10			82
% Passing #10			34.2

Hydrometer Data

Serial Number	503315
Calib. Date (mm/dd/yyyy)	07/18/2016
Low Temp (C)	17.0
Reading at Low Temp	1.0040
High Temp (C)	23.0
Reading at High Temp	1.0030
Hydrometer Cal Slope	-0.000166667
Hydrometer Cal Intercept	1.006833333
Default Soil Gravity	2.6500

Gravel/Sand Fraction (Sieves)

Sample Fraction	Size (um)	Pan Tare (g)	Pan+Sample (g)	Sample		% Finer	Classification	Sub Class
3 inch	75000			0.00	g	100.0	Gravel	
2 inch	50000			0.00	g	100.0	Gravel	
1.5 inch	37500			0.00	g	100.0	Gravel	
1 inch	25000			0.00	g	100.0	Gravel	
3/4 inch	19000			0.00	g	100.0	Gravel	
3/8 inch	9500	447.33	458.94	11.61	g	94.1	Gravel	
#4	4750	488.09	526.26	38.17	g	74.6	Gravel	
#10	2000	462.65	527.07	64.42	g	41.7	Sand	Coarse
#20	850	376.72	410.42	33.70	g	24.5	Sand	Medium
#40	425	364.82	376.23	11.41	g	18.7	Sand	Medium
#60	250	328.76	338.97	10.21	g	13.5	Sand	Fine
#80	180	320.01	320.94	0.93	g	13.0	Sand	Fine
#100	150	328.56	329.20	0.64	g	12.7	Sand	Fine
#200	75	314.92	316.24	1.32	g	12.0	Sand	Fine
				0.00	g	12.0		

Adjusted Hydrometer Sample Mass

Hydrometer Sample Mass (g)	196

Silt/Clay Fraction (Hydrometer Test)

Hydrometer Test Time (min)	Actual	Spec. Gravity	Temp C	Particle Size (Micron)	% Finer	Classification	Sub Class
2	2	1.0135	21.0	34	8.33	Silt	
5	5	1.0130	21.0	21.6	7.92	Silt	
15	15	1.0120	21.0	12.6	7.1	Silt	
30	30	1.0110	21.0	9	6.28	Silt	
60	57	1.0100	21.0	6.6	5.46	Silt	
250	247	1.0085	20.5	3.2	4.17	Clay	
1440	1394	1.0070	21.0	1.4	3	Clay	

Sediment Grain Size - D422

Client	
Client Sample ID	2017-SED-009
Lab Sample ID	600-146375-B-11

Date Received	4/7/2017
Start Date	04/12/2017 20:46
End Date	04/17/2017 20:53

Dry Weight Determination

Tin Weight	1.03	g
Wet Sample + Tin	36.37	g
Dry Sample + Tin	32.43	g
% Moisture	11.15	%

Non-soil material:	n/a
Shape (> #10):	subrounded
Hardness (> #10):	hard

Date/Time in oven	04/12/2017 20:47
Date/Time out of oven	04/13/2017 18:57

Sample Weights	Tare (g)	Pan+Samp (g)	Samp (g)
Sample Weight (Wet)	44.82	316.36	271.54
Sample Weight (Oven Dried)			241

Sample Split (oven dried)	Tare (g)	Pan+Samp (g)	Samp (g)
Sample >=#10			192
Sample <#10			49
% Passing #10			18

Hydrometer Data

Serial Number	503315
Calib. Date (mm/dd/yyyy)	07/18/2016
Low Temp (C)	17.0
Reading at Low Temp	1.0040
High Temp (C)	23.0
Reading at High Temp	1.0030
Hydrometer Cal Slope	-0.000166667
Hydrometer Cal Intercept	1.006833333
Default Soil Gravity	2.6500

Gravel/Sand Fraction (Sieves)

Sample Fraction	Size (um)	Pan Tare (g)	Pan+Sample (g)	Sample		% Finer	Classification	Sub Class
3 inch	75000			0.00	g	100.0	Gravel	
2 inch	50000			0.00	g	100.0	Gravel	
1.5 inch	37500			0.00	g	100.0	Gravel	
1 inch	25000			0.00	g	100.0	Gravel	
3/4 inch	19000	457.77	467.05	9.28	g	96.1	Gravel	
3/8 inch	9500	447.33	470.84	23.51	g	86.3	Gravel	
#4	4750	488.09	567.82	79.73	g	53.2	Gravel	
#10	2000	462.65	542.39	79.74	g	20.1	Sand	Coarse
#20	850	363.31	402.69	39.38	g	3.8	Sand	Medium
#40	425	355.46	359.82	4.36	g	2.0	Sand	Medium
#60	250	326.01	326.59	0.58	g	1.7	Sand	Fine
#80	180	320.76	321.17	0.41	g	1.5	Sand	Fine
#100	150	325.54	325.76	0.22	g	1.5	Sand	Fine
#200	75	312.79	312.94	0.15	g	1.4	Sand	Fine
				0.00	g	1.4		

Adjusted Hydrometer Sample Mass

Hydrometer Sample Mass (g)	241

Silt/Clay Fraction (Hydrometer Test)

Hydrometer Test Time (min)	Actual	Spec. Gravity	Temp C	Particle Size (Micron)	% Finer	Classification	Sub Class
2	2	1.0050	21.0	36.9	1.11	Silt	
5	5	1.0050	21.0	23.3	1.11	Silt	
15	15	1.0050	21.0	13.5	1.11	Silt	
30	30	1.0045	21.0	9.6	0.777	Silt	
60	63	1.0045	21.0	6.6	0.777	Silt	
250	241	1.0045	20.5	3.4	0.722	Clay	
1440	1388	1.0040	21.0	1.4	0.444	Clay	

Sediment Grain Size - D422

Client	
Client Sample ID	2017-SED-008
Lab Sample ID	600-146375-B-12

Date Received	4/7/2017
Start Date	04/12/2017 20:48
End Date	04/17/2017 20:57

Dry Weight Determination

Tin Weight	1.01	g
Wet Sample + Tin	35.37	g
Dry Sample + Tin	31.76	g
% Moisture	10.51	%

Non-soil material:	shell
Shape (> #10):	subrounded
Hardness (> #10):	hard

Date/Time in oven	04/12/2017 20:50
Date/Time out of oven	04/13/2017 18:57

Sample Weights	Tare (g)	Pan+Samp (g)	Samp (g)
Sample Weight (Wet)	44.95	353.14	308.19
Sample Weight (Oven Dried)			276

Sample Split (oven dried)	Tare (g)	Pan+Samp (g)	Samp (g)
Sample >=#10			173
Sample <#10			103
% Passing #10			33.4

Hydrometer Data

Serial Number	503315
Calib. Date (mm/dd/yyyy)	07/18/2016
Low Temp (C)	17.0
Reading at Low Temp	1.0040
High Temp (C)	23.0
Reading at High Temp	1.0030
Hydrometer Cal Slope	-0.000166667
Hydrometer Cal Intercept	1.006833333
Default Soil Gravity	2.6500

Gravel/Sand Fraction (Sieves)

Sample Fraction	Size (um)	Pan Tare (g)	Pan+Sample (g)	Sample		% Finer	Classification	Sub Class
3 inch	75000			0.00	g	100.0	Gravel	
2 inch	50000			0.00	g	100.0	Gravel	
1.5 inch	37500			0.00	g	100.0	Gravel	
1 inch	25000			0.00	g	100.0	Gravel	
3/4 inch	19000	457.77	465.98	8.21	g	97.0	Gravel	
3/8 inch	9500	447.33	488.03	40.70	g	82.3	Gravel	
#4	4750	488.09	554.81	66.72	g	58.1	Gravel	
#10	2000	462.65	520.08	57.43	g	37.3	Sand	Coarse
#20	850	376.72	406.16	29.44	g	26.6	Sand	Medium
#40	425	364.82	382.66	17.84	g	20.1	Sand	Medium
#60	250	328.76	341.85	13.09	g	15.4	Sand	Fine
#80	180	320.01	321.43	1.42	g	14.9	Sand	Fine
#100	150	328.56	329.34	0.78	g	14.6	Sand	Fine
#200	75	314.92	316.41	1.49	g	14.1	Sand	Fine
				0.00	g	14.1		

Adjusted Hydrometer Sample Mass

Hydrometer Sample Mass (g)	276

Silt/Clay Fraction (Hydrometer Test)

Hydrometer Test Time (min)	Actual	Spec. Gravity	Temp C	Particle Size (Micron)	% Finer	Classification	Sub Class
2	2	1.0110	21.0	34.9	4.46	Silt	
5	5	1.0100	21.0	22.3	3.88	Silt	
15	15	1.0095	21.0	12.9	3.59	Silt	
30	31	1.0090	21.0	9	3.3	Silt	
60	57	1.0080	21.0	6.7	2.72	Silt	
250	235	1.0070	20.5	3.4	2.09	Clay	
1440	1382	1.0060	21.0	1.4	1.55	Clay	

Sediment Grain Size - D422

Client	
Client Sample ID	2017-SED-012
Lab Sample ID	600-146375-B-13

Date Received	4/7/2017
Start Date	04/12/2017 22:12
End Date	04/20/2017 9:27

Dry Weight Determination

Tin Weight	1.03	g
Wet Sample + Tin	16.37	g
Dry Sample + Tin	12.68	g
% Moisture	24.05	%

Non-soil material:	na
Shape (> #10):	subangular
Hardness (> #10):	hard

Date/Time in oven	04/12/2017 22:17
Date/Time out of oven	04/13/2017 18:57

Sample Weights	Tare (g)	Pan+Samp (g)	Samp (g)
Sample Weight (Wet)	44.73	262.65	217.92
Sample Weight (Oven Dried)			165

Sample Split (oven dried)	Tare (g)	Pan+Samp (g)	Samp (g)
Sample >=#10			96.7
Sample <#10			68.3
% Passing #10			31.3

Hydrometer Data

Serial Number	503315
Calib. Date (mm/dd/yyyy)	07/18/2016
Low Temp (C)	17.0
Reading at Low Temp	1.0040
High Temp (C)	23.0
Reading at High Temp	1.0030
Hydrometer Cal Slope	-0.000166667
Hydrometer Cal Intercept	1.006833333
Default Soil Gravity	2.6500

Gravel/Sand Fraction (Sieves)

Sample Fraction	Size (um)	Pan Tare (g)	Pan+Sample (g)	Sample		% Finer	Classification	Sub Class
3 inch	75000			0.00	g	100.0	Gravel	
2 inch	50000			0.00	g	100.0	Gravel	
1.5 inch	37500			0.00	g	100.0	Gravel	
1 inch	25000			0.00	g	100.0	Gravel	
3/4 inch	19000	457.80	464.99	7.19	g	95.6	Gravel	
3/8 inch	9500	447.35	474.26	26.91	g	79.3	Gravel	
#4	4750	488.08	513.62	25.54	g	63.8	Gravel	
#10	2000	462.64	499.67	37.03	g	41.4	Sand	Coarse
#20	850	388.31	409.81	21.50	g	28.4	Sand	Medium
#40	425	366.06	376.08	10.02	g	22.3	Sand	Medium
#60	250	347.94	350.75	2.81	g	20.6	Sand	Fine
#80	180	330.74	331.69	0.95	g	20.0	Sand	Fine
#100	150	330.10	330.73	0.63	g	19.6	Sand	Fine
#200	75	322.66	324.41	1.75	g	18.5	Sand	Fine
				0.00	g	18.5		

Adjusted Hydrometer Sample Mass

Hydrometer Sample Mass (g)	165

Silt/Clay Fraction (Hydrometer Test)

Hydrometer Test Time (min)	Actual	Spec. Gravity	Temp C	Particle Size (Micron)	% Finer	Classification	Sub Class
2	2	1.0190	20.5	32.2	15.2	Silt	
5	5	1.0175	20.5	20.7	13.7	Silt	
15	15	1.0160	20.5	12.2	12.2	Silt	
30	30	1.0150	20.5	8.7	11.3	Silt	
60	59	1.0140	20.5	6.3	10.3	Silt	
250	256	1.0115	20.5	3.1	7.87	Clay	
1440	1440	1.0095	20.5	1.3	5.92	Clay	

Sediment Grain Size - D422

Client	
Client Sample ID	DUP-01
Lab Sample ID	600-146375-B-14

Date Received	4/7/2017
Start Date	04/12/2017 22:18
End Date	04/20/2017 9:41

Dry Weight Determination

Tin Weight	1.03	g
Wet Sample + Tin	45.65	g
Dry Sample + Tin	38.56	g
% Moisture	15.89	%

Non-soil material:	shell
Shape (> #10):	subangular
Hardness (> #10):	hard

Date/Time in oven	04/12/2017 22:20
Date/Time out of oven	04/13/2017 18:58

Sample Weights	Tare (g)	Pan+Samp (g)	Samp (g)
Sample Weight (Wet)	44.91	359.58	314.67
Sample Weight (Oven Dried)			265

Sample Split (oven dried)	Tare (g)	Pan+Samp (g)	Samp (g)
Sample >=#10			172
Sample <#10			93
% Passing #10			29.6

Hydrometer Data

Serial Number	503315
Calib. Date (mm/dd/yyyy)	07/18/2016
Low Temp (C)	17.0
Reading at Low Temp	1.0040
High Temp (C)	23.0
Reading at High Temp	1.0030
Hydrometer Cal Slope	-0.000166667
Hydrometer Cal Intercept	1.006833333
Default Soil Gravity	2.6500

Gravel/Sand Fraction (Sieves)

Sample Fraction	Size (um)	Pan Tare (g)	Pan+Sample (g)	Sample		% Finer	Classification	Sub Class
3 inch	75000			0.00	g	100.0	Gravel	
2 inch	50000			0.00	g	100.0	Gravel	
1.5 inch	37500			0.00	g	100.0	Gravel	
1 inch	25000			0.00	g	100.0	Gravel	
3/4 inch	19000			0.00	g	100.0	Gravel	
3/8 inch	9500	447.35	476.71	29.36	g	88.9	Gravel	
#4	4750	488.08	572.35	84.27	g	57.1	Gravel	
#10	2000	462.64	520.83	58.19	g	35.1	Sand	Coarse
#20	850	388.31	416.76	28.45	g	24.4	Sand	Medium
#40	425	366.06	386.84	20.78	g	16.6	Sand	Medium
#60	250	347.94	354.15	6.21	g	14.3	Sand	Fine
#80	180	330.74	332.40	1.66	g	13.7	Sand	Fine
#100	150	330.10	330.92	0.82	g	13.4	Sand	Fine
#200	75	322.66	324.00	1.34	g	12.9	Sand	Fine
				0.00	g	12.9		

Adjusted Hydrometer Sample Mass

Hydrometer Sample Mass (g)	265

Silt/Clay Fraction (Hydrometer Test)

Hydrometer Test Time (min)	Actual	Spec. Gravity	Temp C	Particle Size (Micron)	% Finer	Classification	Sub Class
2	2	1.0120	20.5	34.7	5.2	Silt	
5	5	1.0110	20.5	22.2	4.6	Silt	
15	15	1.0105	20.5	12.9	4.29	Silt	
30	30	1.0100	20.5	9.2	3.99	Silt	
60	58	1.0090	20.5	6.6	3.38	Silt	
250	256	1.0075	20.5	3.2	2.47	Clay	
1440	1440	1.0065	20.5	1.4	1.87	Clay	

Sediment Grain Size - D422

Client	
Client Sample ID	DUP-02
Lab Sample ID	600-146375-B-15

Date Received	4/7/2017
Start Date	04/12/2017 22:20
End Date	04/20/2017 10:21

Dry Weight Determination

Tin Weight	1.05	g
Wet Sample + Tin	37.38	g
Dry Sample + Tin	30.24	g
% Moisture	19.65	%

Non-soil material:	na
Shape (> #10):	subangular
Hardness (> #10):	hard

Date/Time in oven	04/12/2017 22:22
Date/Time out of oven	04/13/2017 18:58

Sample Weights	Tare (g)	Pan+Samp (g)	Samp (g)
Sample Weight (Wet)	44.56	293.77	249.21
Sample Weight (Oven Dried)			200

Sample Split (oven dried)	Tare (g)	Pan+Samp (g)	Samp (g)
Sample >=#10			118
Sample <#10			82
% Passing #10			32.9

Hydrometer Data

Serial Number	503315
Calib. Date (mm/dd/yyyy)	07/18/2016
Low Temp (C)	17.0
Reading at Low Temp	1.0040
High Temp (C)	23.0
Reading at High Temp	1.0030
Hydrometer Cal Slope	-0.000166667
Hydrometer Cal Intercept	1.006833333
Default Soil Gravity	2.6500

Gravel/Sand Fraction (Sieves)

Sample Fraction	Size (um)	Pan Tare (g)	Pan+Sample (g)	Sample		% Finer	Classification	Sub Class
3 inch	75000			0.00	g	100.0	Gravel	
2 inch	50000			0.00	g	100.0	Gravel	
1.5 inch	37500			0.00	g	100.0	Gravel	
1 inch	25000			0.00	g	100.0	Gravel	
3/4 inch	19000			0.00	g	100.0	Gravel	
3/8 inch	9500	447.35	466.28	18.93	g	90.5	Gravel	
#4	4750	488.08	532.11	44.03	g	68.5	Gravel	
#10	2000	462.64	518.14	55.50	g	40.8	Sand	Coarse
#20	850	388.31	418.80	30.49	g	25.6	Sand	Medium
#40	425	366.06	377.36	11.30	g	20.0	Sand	Medium
#60	250	347.94	350.73	2.79	g	18.6	Sand	Fine
#80	180	330.74	331.57	0.83	g	18.2	Sand	Fine
#100	150	330.10	330.60	0.50	g	18.0	Sand	Fine
#200	75	322.66	323.90	1.24	g	17.4	Sand	Fine
				0.00	g	17.4		

Adjusted Hydrometer Sample Mass

Hydrometer Sample Mass (g)	200

Silt/Clay Fraction (Hydrometer Test)

Hydrometer Test Time (min)	Actual	Spec. Gravity	Temp C	Particle Size (Micron)	% Finer	Classification	Sub Class
2	2	1.0190	20.5	32.2	12.5	Silt	
5	5	1.0180	20.5	20.6	11.7	Silt	
15	15	1.0175	20.5	12	11.3	Silt	
30	29	1.0150	20.5	8.8	9.3	Silt	
60	58	1.0140	20.5	6.3	8.5	Silt	
250	250	1.0115	20.5	3.1	6.49	Clay	
1440	1434	1.0080	20.5	1.3	3.68	Clay	

DATA REPORTING QUALIFIERS

Lab Section	Qualifier	Description

QUALITY CONTROL RESULTS

Client: Golder Associates Inc. Job Number: 600-146375-2

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Geotechnical					
Analysis Batch:200-115890					
600-146375-1	2017-SED-001	T	Solid	D422	
600-146375-2	2017-SED-002	T	Solid	D422	
600-146375-3	2017-SED-003	T	Solid	D422	
600-146375-4	2017-SED-004	T	Solid	D422	
600-146375-5	2017-SED-010	T	Solid	D422	
600-146375-6	2017-SED-011	T	Solid	D422	
600-146375-7	2017-SED-005	T	Solid	D422	
600-146375-9	2017-SED-006	T	Solid	D422	
600-146375-10	2017-SED-007	T	Solid	D422	
600-146375-11	2017-SED-009	T	Solid	D422	
600-146375-12	2017-SED-008	T	Solid	D422	
600-146375-13	2017-SED-012	T	Solid	D422	
600-146375-14	DUP-01	T	Solid	D422	
600-146375-15	DUP-02	T	Solid	D422	

Report Basis
T = Total

TestAmerica Houston
6310 Rothway Street
Houston, TX 77040
Phone (713) 690-4444 Fax (713) 690-5646

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: A. Marlow	Lab PM: Upton, Cathy L	Carrier Tracking No(s):	COC No: 600-52241-15406.2
Client Contact: Ms. Abby Marlow	Phone: 303 664-4302	E-Mail: cathy.upton@testamericainc.com		Page: Page 1 of 2
Company: Golder Associates Inc.				Job #:

Address: 500 Century Plaza Drive Suite 190	Due Date Requested:
City: Houston	TAT Requested (days): Standard
State, Zip: TX, 77073	
Phone:	PO #: Exide1302086
Email: abby_marlow@golder.com	WO #:
Project Name: Exide Recycling Center - Main	Project #: 60004831
Site:	SSOW#:

Analysis Requested — Dallas . Ft Worth

560501

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	D422 - Grain Size (Routine List)	6010B - Metals (As,Cd,Pb)	Moisture	WALKLEY_BLACK - TOC	6020 Total Cd Pb As	Total Number of containers
			Preservation Code:				N	N	N	N		
2017-SED-001	4-5-17	1200	G	Solid			X	X	X	X		2
2017-SED-002		1230		Solid			X	X	X	X		
2017-SED-003		1345		Solid			X	X	X	X		
2017-SED-004		1310		Solid			X	X	X	X		
2017-SED-010		1335		Solid			X	X	X	X		
2017-SED-011		1430		Solid			X	X	X	X		
2017-SED-005		1500		Solid			X	X	X	X		
EB1		1813		~~Solid~~ Water							X	
2017-SED-006	4-5-17	1620		Solid			X	X	X	X		
2017-SED-007		1705		Solid			X	X	X	X		
2017-SED-009	4-6-17	0930		Solid			X	X	X	X		

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Special Instructions/Note:

600-146375 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	3-26-17 1100	Golder	Sherry Rushing	4/7/17 0930	TAH
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

TestAmerica Houston
6310 Rothway Street
Houston, TX 77040
Phone (713) 690-4444 Fax (713) 690-5646

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: A. Marlow	Lab PM: Upton, Cathy L	Carrier Tracking No(s):	COC No: 600-52241-15406.2
Client Contact: Ms. Abby Marlow	Phone: 803-664-4302	E-Mail: cathy.upton@testamericainc.com		Page: Page 2 of 2
Company: Golder Associates Inc.				Job #:
Address: 500 Century Plaza Drive Suite 190	Due Date Requested:			
City: Houston	TAT Requested (days): Standard			
State, Zip: TX, 77073				
Phone:	PO #: Exide1302086			
Email: abby_marlow@golder.com	WO #:			
Project Name: Exide Recycling Center - Main	Project #: 60004831			
Site:	SSOW#:			

Analysis Requested

Dallas . Ft Worth

560501

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	D422 - Grain Size (Routine List)	6010B - Metals (As,Cd,Pb)	Moisture	WALKLEY_BLACK - TOC	Total Number of containers	Special Instructions/Note:
Preservation Code:							N	N	N	N		
2017-SED-008	3-6-17	0850	G	Solid		X	X	X	X	X	2	
2017-SED-008 MS				Solid			X	X	X	X		
2017-SED-008 MSD				Solid			X	X	X	X		
2017-SED-012		1000		Solid			X	X	X	X		
Dup-01		—		Solid			X	X	X	X		
Dup-02		—		Solid			X	X	X	X		
				Solid								
				Solid								
				Solid								
				Solid								
				Solid								

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	3-26-17 1100	Golder	Shirry Justus	4/7/17 0936	TAL
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

TestAmerica Houston

Loc: 600
146375

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sample Receipt Checklist

Date/Time Received: '17 APR 7 9:36

JOB NUMBER: _____ CLIENT: Golder

UNPACKED BY: SJ CARRIER/DRIVER: F/E

Custody Seal Present: ☒ YES ☐ NO Number of Coolers Received: 1

Cooler ID	Temp Blank	Trip Blank	Observed Temp (°C)	Therm ID	Them CF	Corrected Temp (°C)
B/W	Y / N	Y / N	3.1	1625	-.2	2.9
	Y / N	Y / N				
	Y / N	Y / N				
	Y / N	Y / N	SJ			
	Y / N	Y / N				
	Y / N	Y / N				
	Y / N	Y / N				
	Y / N	Y / N				
	Y / N	Y / N				
	Y / N	Y / N				

CF = correction factor

Samples received on ice? ☒ YES ☐ NO

LABORATORY PRESERVATION OF SAMPLES REQUIRED: ☒ NO ☐ YES

Base samples are>pH 12: ☐ YES ☐ NO Acid preserved are<pH 2: ☐ YES ☐ NO

pH paper Lot #_____

VOA headspace acceptable (5-6mm): ☐ YES ☐ NO ☒ NA

	YES	NO
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X	

COMMENTS:

FedEx TRK# 0221 6025 5771 6879 AB LKSA

SJ 4/7/17

Login Sample Receipt Checklist

Client: Golder Associates Inc.

Job Number: 600-146375-2

Login Number: 146375

List Source: TestAmerica Houston

List Number: 1

Creator: Justus, Sherry E

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	2.9
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	Check done at department level as required.

Login Sample Receipt Checklist

Client: Golder Associates Inc.

Job Number: 600-146375-2

Login Number: 146375
List Number: 2
Creator: Johnson, Eleanor E

List Source: TestAmerica Burlington
List Creation: 04/11/17 04:13 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	True	Not present
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	2.6ºC
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	N/A	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	No analysis requiring residual chlorine check assigned.

HISTORICAL CLASS 2 LANDFILL GROUNDWATER MOINITORING WELL DATA

SUMMARY OF HISTORICAL GROUNDWATER MONITORING DATA (2Q14 THROUGH 4Q18)
NORTH CAMU
EXIDE FRISCO RECYCLING CENTER
FRISCO, TEXAS

Monitoring Well				LMW-5																
Sample Date				6/17/2014	9/22/2014	12/17/2014	3/17/2015	6/4/2015	9/10/2015	12/15/2015	3/3/2016	6/2/2016	9/8/2016	12/1/2016	3/1/2017	5/5/2017	8/29/2017	11/28/2017	2/13/2018	5/10/2018	9/25/2018	12/5/2018
Type of Sampling Event				Annual	Quarterly	Quarterly	Annual	Quarterly	Quarterly	Quarterly	Annual	Quarterly	Quarterly	Quarterly	Annual	Quarterly	Quarterly	Quarterly	Annual	Quarterly	Quarterly	Quarterly
Total Metals 6020A and 7470A (mg/L)																						
Analyte	**CAS No.**	**RAL[1] (mg/L)**	**PCL[2] (mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**
Antimony	7440-36-0	0.006	0.006	0.00230 U	NA	NA	0.00230 U	NA	NA	NA	0.000500 U	NA	NA	NA	0.00161 U	NA	NA	NA	0.000400 U	NA	NA	NA
Arsenic	7440-38-2	0.01	0.01	0.00130 U	**0.00179 J**	0.00130 U	0.00130 U	0.00130 U	0.00150 U	0.00150 U	0.00150 U	**0.00183 J**	0.00150 U	0.00150 U	0.00109 U	**0.00179 J**	0.00087 U	**0.000416 J**	**0.000545 J**	**0.000494 J**	**0.000479 J**	**0.000884 J**
Barium	7440-39-3	2	2	**0.0382**	NA	NA	**0.0341**	NA	NA	NA	**0.122**	NA	NA	NA	**0.0638**	NA	NA	NA	**0.0702**	NA	NA	NA
Cadmium	7440-43-9	0.005	0.005	0.0000950 U	0.0000950 U	0.0000950 U	0.0000950 U	0.0000950 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000854 U	0.000854 U	0.000050 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U
Chromium	7440-47-3	0.1	0.1	0.00250 U	NA	NA	0.00250 U	NA	NA	NA	0.00160 U	NA	NA	NA	0.00140 U	NA	NA	NA	0.000400 U	NA	NA	NA
Copper	7440-50-8	1.3	1.3	**0.00153 J**	NA	NA	0.00110 U	NA	NA	NA	**0.00176 J**	NA	NA	NA	0.00200 U	NA	NA	NA	0.00100 U	NA	NA	NA
Lead	7439-92-1	0.015	0.015	**0.00147 J**	**0.00277**	**0.000245 J**	0.000200 U	**0.000425 J**	0.000980 U	0.000980 U	0.000980 U	**0.00122 J**	0.000980 U	0.000980 U	0.000733 U	0.000733 U	**0.00039 J**	0.000600 U	**0.000808 J**	**0.000936 J**	0.000600 U	**0.000749 J**
Mercury	7439-97-6	0.002	0.002	0.0000910 U	NA	NA	0.0000910 U	NA	NA	NA	0.0000800 U	NA	NA	NA	0.000130 U	NA	NA	NA	**0.0000360 J**	NA	NA	NA
Selenium	7782-49-2	0.05	0.05	**0.00262**	**0.00472**	0.00100 U	**0.00294**	**0.00607**	**0.00364**	**0.00266**	**0.00242 J**	**0.00187 J**	**0.00116 J**	**0.00131 J b**	0.00108 U	**0.00800**	**0.0047 J**	**0.00321**	**0.00162 J**	**0.00190 J**	0.00110 U	**0.00189 J**
Silver	7440-22-4	0.12	0.37	0.000250 U	NA	NA	0.000250 U	NA	NA	NA	0.000100 U	NA	NA	NA	0.000941 U	NA	NA	NA	0.000200 U	NA	NA	NA
Zinc	7440-66-6	7.3	22	0.00830 U	NA	NA	0.00830 U	NA	NA	NA	0.00960 U	NA	NA	NA	0.00355 U	NA	NA	NA	**0.00263 J**	NA	NA	NA
Dissolved Metals 6020A and 7470A (mg/L)																						
Analyte	**CAS No.**	**RAL[1] (mg/L)**	**PCL[2] (mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**
Antimony, Dissolved	7440-36-0	0.006	0.006	0.00230 U	NA	NA	0.00230 U	NA	NA	NA	0.000500 U	NA	NA	NA	0.00161 U	NA	NA	NA	0.000400 U	NA	NA	NA
Arsenic, Dissolved	7440-38-2	0.01	0.01	0.00130 U	0.00130 U	0.00130 U	0.00130 U	0.00130 U	0.00150 U	0.00150 U	0.00150 U	0.00150 U	0.00150 U	0.00150 U	**0.00130 J**	**0.00238 J**	0.00087 U	**0.000455 J**	0.000400 U	**0.000444 J**	**0.000560 J**	**0.000888 J**
Barium, Dissolved	7440-39-3	2	2	**0.0365**	NA	NA	**0.0460**	NA	NA	NA	**0.107**	NA	NA	NA	**0.0654**	NA	NA	NA	**0.0643**	NA	NA	NA
Cadmium, Dissolved	7440-43-9	0.005	0.005	0.0000950 U	0.0000950 U	0.0000950	0.0000950 U	0.0000950 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000854 U	0.000854 U	0.000050 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U
Chromium, Dissolved	7440-47-3	0.1	0.1	0.00250 U	NA	NA	**0.00297 J**	NA	NA	NA	0.00160 U	NA	NA	NA	0.00140 U	NA	NA	NA	0.000400 U	NA	NA	NA
Copper, Dissolved	7440-50-8	1.3	1.3	0.00110 U	NA	NA	**0.00281 J**	NA	NA	NA	**0.00192 J**	NA	NA	NA	0.00200 U	NA	NA	NA	0.00100 U	NA	NA	NA
Lead, Dissolved	7439-92-1	0.015	0.015	0.000200 U	0.000200 U	**0.000575 J**	**0.00200**	0.000200 U	0.000980 U	0.000980 U	0.000980 U	0.000980 U	0.000980 U	0.000980 U	0.000733 U	0.000733 U	0.00033 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U
Mercury, Dissolved	7439-97-6	0.002	0.002	0.0000910 U	NA	NA	0.0000910 U	NA	NA	NA	0.0000800 U	NA	NA	NA	0.000130 U	NA	NA	NA	0.0000300 U	NA	NA	NA
Selenium, Dissolved	7782-49-2	0.05	0.05	**0.00249 J**	**0.00441**	**0.00119 J**	**0.00271**	**0.00661**	**0.00341**	**0.00319**	0.00100 U	**0.00193 J**	**0.00107 J**	**0.00128 J**	0.00108 U	**0.00900**	**0.0037 J**	**0.00261**	**0.00180 J**	0.00110 U	0.00110 U	**0.00178 J**
Silver, Dissolved	7440-22-4	0.12	0.37	0.00025 U	NA	NA	0.000250 U	NA	NA	NA	0.000100 U	NA	NA	NA	0.000941 U	NA	NA	NA	0.000200 U	NA	NA	NA
Zinc, Dissolved	7440-66-6	7.3	22	0.00830 U	NA	NA	**0.00995 J**	NA	NA	NA	0.00960 U	NA	NA	NA	0.00355 U	NA	NA	NA	**0.00266 J**	NA	NA	NA

SUMMARY OF HISTORICAL GROUNDWATER MONITORING DATA (2Q14 THROUGH 4Q18)
NORTH CAMU
EXIDE FRISCO RECYCLING CENTER
FRISCO, TEXAS

Monitoring Well				LMW-8																
Sample Date				6/17/2014	9/22/2014	12/17/2014	3/24/2015	6/4/2015	9/9/2015	12/15/2015	3/3/2016	5/31/2016	9/7/2016	12/1/2016	3/1/2017	5/5/2017	8/28/2017	11/28/2017	2/13/2018	5/10/2018	9/25/2018	12/5/2018
Type of Sampling Event				Annual	Quarterly	Quarterly	Annual	Quarterly	Quarterly	Quarterly	Annual	Quarterly	Quarterly	Quarterly	Annual	Quarterly	Quarterly	Quarterly	Annual	Quarterly	Quarterly	Quarterly
Total Metals 6020A and 7470A (mg/L)																						
Analyte	**CAS No.**	**RAL[1] (mg/L)**	**PCL[2] (mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**
Antimony	7440-36-0	0.006	0.006	0.00230 U	NA	NA	0.00230 U	NA	NA	NA	0.000500 U	NA	NA	NA	0.00161 U	NA	NA	NA	0.000400 U	NA	NA	NA
Arsenic	7440-38-2	0.01	0.01	**0.00258**	**0.00197 J**	IV	0.00130 U	0.00130 U	0.00150 U	0.00150 U	0.00150 U	**0.00935**	0.00150 U	**0.00819**	0.00109 U	**0.00135 J**	**0.0016 J**	**0.000418 J**	**0.000513 J**	0.000400 U	0.000400 U	**0.001030 J**
Barium	7440-39-3	2	2	**0.0627**	NA	NA	**0.0603**	NA	NA	NA	**0.0653**	NA	NA	NA	**0.0433**	NA	NA	NA	**0.0565**	NA	NA	NA
Cadmium	7440-43-9	0.005	0.005	0.0000950 U	**0.000120 J**	IV	0.0000950 U	0.0000950 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	**0.000235 J**	0.000854 U	0.000854 U	0.000050 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U
Chromium	7440-47-3	0.1	0.1	**0.00320 J**	NA	NA	0.00250 U	NA	NA	NA	0.00160 U	NA	NA	NA	0.00140 U	NA	NA	NA	0.000400 U	NA	NA	NA
Copper	7440-50-8	1.3	1.3	**0.00188 J**	NA	NA	**0.00139 J**	NA	NA	NA	0.00170 U	NA	NA	NA	0.00200 U	NA	NA	NA	0.00100 U	NA	NA	NA
Lead	7439-92-1	0.015	0.015	**0.000983 J**	**0.00317**	IV	0.000200 U	0.000200 U	0.000980 U	0.000980 U	0.000980 U	0.000980 U	0.000980 U	**0.00619**	0.000733 U	0.000733 U	**0.0016 J**	0.000600 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U
Mercury	7439-97-6	0.002	0.002	0.0000910 U	NA	NA	0.0000910 U	NA	NA	NA	0.0000800 U	NA	NA	NA	0.000130 U	NA	NA	NA	**0.0000330 J**	NA	NA	NA
Selenium	7782-49-2	0.05	0.05	**0.00514**	**0.00740**	IV	**0.00261**	**0.00450**	**0.0141**	**0.00200 J**	**0.00177 J**	**0.00416**	**0.00558**	**0.00273 b**	**0.00396 J**	**0.00522**	**0.026**	**0.0273**	**0.00742**	**0.00345**	**0.00674**	**0.00123 J**
Silver	7440-22-4	0.12	0.37	0.000250 U	NA	NA	0.000250 U	NA	NA	NA	0.000100 U	NA	NA	NA	0.000941 U	NA	NA	NA	0.000200 U	NA	NA	NA
Zinc	7440-66-6	7.3	22	0.00830 U	NA	NA	**0.00878 J**	NA	NA	NA	0.00960 U	NA	NA	NA	0.00355 U	NA	NA	NA	**0.00344 J**	NA	NA	NA
Dissolved Metals 6020A and 7470A (mg/L)																						
Analyte	**CAS No.**	**RAL[1] (mg/L)**	**PCL[2] (mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**
Antimony, Dissolved	7440-36-0	0.006	0.006	0.00230 U	NA	NA	0.00230 U	NA	NA	NA	0.000500 U	NA	NA	NA	0.00161 U	NA	NA	NA	0.000400 U	NA	NA	NA
Arsenic, Dissolved	7440-38-2	0.01	0.01	**0.00138 J**	0.00130 U	0.00130 U	0.00130 U	0.00130 U	**0.00220 J**	0.00150 U	0.00150 U	0.00150 U	0.00150 U	**0.00546**	0.00109 U	**0.00169 J**	0.00087 U	**0.000646 J**	0.000400 U	0.000400 U	0.000400 U	**0.000920 J**
Barium, Dissolved	7440-39-3	2	2	**0.0528**	NA	NA	**0.0647**	NA	NA	NA	**0.0701**	NA	NA	NA	**0.0471**	NA	NA	NA	**0.0620**	NA	NA	NA
Cadmium, Dissolved	7440-43-9	0.005	0.005	0.0000950 U	0.0000950 U	0.0000950 U	0.0000950 U	0.0000950 U	**0.000168 J**	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000854 U	0.000854 U	0.000050 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U
Chromium, Dissolved	7440-47-3	0.1	0.1	0.00250 U	NA	NA	0.00250 U	NA	NA	NA	0.00160 U	NA	NA	NA	0.00140 U	NA	NA	NA	0.000400 U	NA	NA	NA
Copper, Dissolved	7440-50-8	1.3	1.3	0.00110 U	NA	NA	**0.00274 J**	NA	NA	NA	**0.00308 J**	NA	NA	NA	0.00200 U	NA	NA	NA	0.00100 U	NA	NA	NA
Lead, Dissolved	7439-92-1	0.015	0.015	0.000200 U	0.000200 U	**0.000230 J**	**0.000355 J**	0.000200 U	**0.00101 J**	0.000980 U	0.000980 U	0.000980 U	0.000980 U	0.000980 U	0.000733 U	0.000733 U	0.00033 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U
Mercury, Dissolved	7439-97-6	0.002	0.002	0.0000910 U	NA	NA	0.0000910 U	NA	NA	NA	0.0000800 U	NA	NA	NA	0.000130 U	NA	NA	NA	0.000030 U	NA	NA	NA
Selenium, Dissolved	7782-49-2	0.05	0.05	**0.00550**	**0.0108**	**0.0198**	**0.00356**	**0.00446**	**0.0158**	**0.00175 J**	**0.00257**	**0.00205 J**	**0.00522**	0.00100 U	**0.00320 J**	**0.00533**	**0.027 J**	**0.0314**	**0.00892**	**0.00144 J**	**0.00719**	**0.00151 J**
Silver, Dissolved	7440-22-4	0.12	0.37	0.000250 U	NA	NA	0.000250 U	NA	NA	NA	0.000100 U	NA	NA	NA	0.000941 U	NA	NA	NA	0.000200 U	NA	NA	NA
Zinc, Dissolved	7440-66-6	7.3	22	0.00830 U	NA	NA	0.00830 U	NA	NA	NA	0.00960 U	NA	NA	NA	0.00486 U[3]	NA	NA	NA	**0.00426**	NA	NA	NA

SUMMARY OF HISTORICAL GROUNDWATER MONITORING DATA (2Q14 THROUGH 4Q18)
NORTH CAMU
EXIDE FRISCO RECYCLING CENTER
FRISCO, TEXAS

Monitoring Well				LMW-9 / LMW-9R																				
Sample Date				6/17/2014	7/30/2014	9/23/2014	10/28/2014	12/17/2014	3/16/2015	6/4/2015	7/10/2015	9/10/2015	10/15/2015	12/17/2015	3/3/2016	6/8/2016	9/7/2016	12/1/2016	3/1/2017	5/4/2017	8/29/2017	11/28/2017	2/13/2018	5/10/2018	9/25/2018	12/5/2018
Type of Sampling Event				Annual	Resample	Quarterly	Resample	Quarterly	Annual	Quarterly	Resample	Quarterly	Resample	Quarterly	Annual	Quarterly	Quarterly	Quarterly	Annual	Quarterly	Quarterly	Quarterly	Annual	Quarterly	Quarterly	Quarterly
Total Metals 6020A and 7470A (mg/L)																										
Analyte	**CAS No.**	**RAL[1] (mg/L)**	**PCL[2] (mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**
Antimony	7440-36-0	0.006	0.006	0.00230 U	0.00230 U	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.00161 U	NA	NA	NA	0.000400 U	NA	NA	NA
Arsenic	7440-38-2	0.01	0.01	0.00130 U	0.00130 U	0.00130 U	**0.00186 J**	IV	IV	0.00130 U	IV	0.00150 U	IV	IV	NA	0.00150 U	**0.00175 J**	**0.00350**	**0.00366 J**	**0.00363 J**	**0.0017 J**	**0.00207**	**0.00213**	**0.00206**	**0.00164 J**	**0.00217**
Barium	7440-39-3	2	2	**0.00485 J**	**0.00967**	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.0237**	NA	NA	NA	**0.0243**	NA	NA	NA
Cadmium	7440-43-9	0.005	0.005	0.0000950 U	0.0000950 U	0.0000950 U	0.0000950 U	IV	IV	0.0000950 U	IV	0.000150 U	IV	IV	NA	0.000150 U	0.000150 U	0.000150 U	0.000854 U	0.000854 U	**0.000054 J**	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U
Chromium	7440-47-3	0.1	0.1	0.00250 U	0.00250 U	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.00140 U	NA	NA	NA	0.000400 U	NA	NA	NA
Copper	7440-50-8	1.3	1.3	0.00110 U	**0.00164 J**	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.00200 U	NA	NA	NA	0.00100 U	NA	NA	NA
Lead	7439-92-1	0.015	0.015	0.000200 U	**0.000216 J**	**0.000235 J**	0.000200 U	IV	IV	**0.00114 J**	IV	0.000980 U	IV	IV	NA	0.000980 U	0.000980 U	0.000980 U	0.000733 U	0.000733 U	0.00033 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U
Mercury	7439-97-6	0.002	0.002	0.0000910 U	0.0000910 U	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.000130 U	NA	NA	NA	**0.0000300 J**	NA	NA	NA
Selenium	7782-49-2	0.05	0.05	**0.486**	**0.768**	**1.05**	**1.04**	IV	IV	**1.07**	IV	**1.01**	IV	IV	NA	**0.00827**	**0.00288**	**0.0345 b**	**0.00238 J**	**0.00486 J**	**0.0014 J**	**0.00880**	**0.00992**	**0.00265**	**0.00335**	**0.00338**
Silver	7440-22-4	0.12	0.37	0.000250 U	0.000250 U	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.000941 U	NA	NA	NA	0.000200 U	NA	NA	NA
Zinc	7440-66-6	7.3	22	0.00830 U	0.00830 U	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.00762 U[3]	NA	NA	NA	**0.0207**	NA	NA	NA
Dissolved Metals 6020A and 7470A (mg/L)																										
Analyte	**CAS No.**	**RAL[1] (mg/L)**	**PCL[2] (mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**
Antimony, Dissolved	7440-36-0	0.006	0.006	0.00230 U	0.00230 U	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.00161 U	NA	NA	NA	0.000400 U	NA	NA	NA
Arsenic, Dissolved	7440-38-2	0.01	0.01	0.00130 U	**0.00212 J**	0.00130 U	**0.00161 J**	IV	IV	0.00130 U	IV	0.00150 U	0.00150 U	0.00150 U	NA	0.00150 U	**0.00161 J**	**0.00379**	**0.00388 J**	**0.00411 J**	**0.0018 J**	**0.00232**	**0.00210**	**0.00168 J**	**0.00164 J**	**0.00155 J**
Barium, Dissolved	7440-39-3	2	2	**0.00447 J**	**0.00871**	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.0249**	NA	NA	NA	**0.0240**	NA	NA	NA
Cadmium, Dissolved	7440-43-9	0.005	0.005	0.0000950 U	0.0000950 U	0.0000950 U	0.0000950 U	IV	IV	0.0000950 U	IV	**0.000188 J**	**0.000312 J**	0.000150 U	NA	0.000150 U	0.000150 U	**0.000280 J**	0.000854 U	0.000854 U	**0.000050 J**	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U
Chromium, Dissolved	7440-47-3	0.1	0.1	0.00250 U	0.00250 U	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.00140 U	NA	NA	NA	0.000400 U	NA	NA	NA
Copper, Dissolved	7440-50-8	1.3	1.3	0.00110 U	0.00110 U	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.00200 U	NA	NA	NA	0.00100 U	NA	NA	NA
Lead, Dissolved	7439-92-1	0.015	0.015	0.000200 U	0.000200 U	**0.000205 J**	0.000200 U	IV	IV	0.000200 U	IV	**0.00108 J**	**0.00181 J**	**0.00136 J**	NA	0.000980 U	0.000980 U	0.000980 U	0.000733 U	0.000733 U	0.00033 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U
Mercury, Dissolved	7439-97-6	0.002	0.002	0.0000910	0.0000910	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.000130 U	NA	NA	NA	**0.0000310 J**	NA	NA	NA
Selenium, Dissolved	7782-49-2	0.05	0.05	**0.481**	**0.780**	**1.00**	**1.08**	IV	IV	**1.06**	IV	**1.03**	**0.849**	**0.960**	NA	**0.00489**	**0.00332**	**0.0356**	**0.00149 J**	**0.00533**	0.00090 U	**0.00945**	**0.0133**	**0.00228**	**0.00341**	**0.00261**
Silver, Dissolved	7440-22-4	0.12	0.37	0.000250 U	0.000250 U	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.000941 U	NA	NA	NA	0.000200 U	NA	NA	NA
Zinc, Dissolved	7440-66-6	7.3	22	0.00830 U	0.00830 U	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.00819 U[3]	NA	NA	NA	**0.00954**	NA	NA	NA

SUMMARY OF HISTORICAL GROUNDWATER MONITORING DATA (2Q14 THROUGH 4Q18)
NORTH CAMU
EXIDE FRISCO RECYCLING CENTER
FRISCO, TEXAS

Monitoring Well				LMW-17																
Sample Date				6/17/2014	9/23/2014	12/16/2014	3/17/2015	6/4/2015	9/9/2015	12/15/2015	3/3/2016	6/7/2016	9/7/2016	12/1/2016	3/1/2017	5/5/2017	8/29/2017	11/28/2017	2/13/2018	5/10/2018	9/25/2018	12/5/2018
Type of Sampling Event				Annual	Quarterly	Quarterly	Annual	Quarterly	Quarterly	Quarterly	Annual	Quarterly	Quarterly	Quarterly	Annual	Quarterly	Quarterly	Quarterly	Annual	Quarterly	Quarterly	Quarterly
Total Metals 6020A and 7470A (mg/L)																						
Analyte	**CAS No.**	**RAL[1] (mg/L)**	**PCL[2] (mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**
Antimony	7440-36-0	0.006	0.006	0.00230 U	NA	NA	0.00230 U	NA	NA	NA	0.000500 U	NA	NA	NA	0.00161 U	NA	NA	NA	0.000400 U	NA	NA	NA
Arsenic	7440-38-2	0.01	0.01	0.00130 U	0.00130 U	0.00130 U	0.00130 U	0.00130 U	0.00150 U	0.00150 U	0.00150 U	0.00150 U	0.00150 U	0.00150 U	0.00109 U	**0.00168 J**	0.00087 U	0.000400 U	**0.000535 J**	0.000400 U	0.000400 U	**0.000590 J**
Barium	7440-39-3	2	2	**0.0581**	NA	NA	**0.0582**	NA	NA	NA	**0.0862**	NA	NA	NA	**0.0640 J**	NA	NA	NA	**0.0712**	NA	NA	NA
Cadmium	7440-43-9	0.005	0.005	0.0000950 U	0.0000950 U	0.0000950 U	0.0000950 U	0.0000950 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000854 U	0.000854 U	0.000050 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U
Chromium	7440-47-3	0.1	0.1	0.00250 U	NA	NA	0.00250 U	NA	NA	NA	0.00160 U	NA	NA	NA	0.00140 U	NA	NA	NA	0.000400 U	NA	NA	NA
Copper	7440-50-8	1.3	1.3	0.00110 U	NA	NA	**0.00466 J**	NA	NA	NA	0.00170 U	NA	NA	NA	0.00200 U	NA	NA	NA	0.00100 U	NA	NA	NA
Lead	7439-92-1	0.015	0.015	0.000200 U	**0.00415**	**0.000802 J**	**0.000735 J**	**0.00183**	0.000980 U	**0.00200 J**	**0.00104 J**	0.000980 U	0.000980 U	0.000980 U	0.000733 U	0.000733 U	0.00033 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U
Mercury	7439-97-6	0.002	0.002	0.0000910 U	NA	NA	0.0000910 U	NA	NA	NA	0.0000800 U	NA	NA	NA	0.000130 U	NA	NA	NA	**0.0000480 J**	NA	NA	NA
Selenium	7782-49-2	0.05	0.05	**0.00156 J**	**0.00223 J**	**0.00138 J**	**0.00146 J**	**0.00133 J**	**0.00304**	**0.00200 J**	**0.00238 J**	**0.00191 J**	**0.00131 J**	**0.00163 J b**	0.00108 U	**0.00275 J**	**0.0015 J**	**0.00172 J**	0.00110 U	**0.00215**	0.00110 U	0.00110 U
Silver	7440-22-4	0.12	0.37	0.000250 U	NA	NA	0.000250 U	NA	NA	NA	0.000100 U	NA	NA	NA	0.000941 U	NA	NA	NA	0.000200 U	NA	NA	NA
Zinc	7440-66-6	7.3	22	0.00830 U	NA	NA	**0.0105 J**	NA	NA	NA	0.00960 U	NA	NA	NA	0.00355 U	NA	NA	NA	0.00200 U	NA	NA	NA
Dissolved Metals 6020A and 7470A (mg/L)																						
Analyte	**CAS No.**	**RAL[1] (mg/L)**	**PCL[2] (mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**
Antimony, Dissolved	7440-36-0	0.006	0.006	0.00230 U	NA	NA	0.00230 U	NA	NA	NA	0.000500 U	NA	NA	NA	0.00161 U	NA	NA	NA	0.000746 U	NA	NA	NA
Arsenic, Dissolved	7440-38-2	0.01	0.01	0.00130 U	0.00130 U	0.00130 U	0.00130 U	0.00130 U	0.00150 U	0.00150 U	0.00150 U	0.00150 U	0.00150 U	0.00150 U	0.00109 U	**0.00130 J**	0.00087 U	0.000400 U	**0.000471 J**	**0.000417 J**	**0.000443 J**	**0.000484 J**
Barium, Dissolved	7440-39-3	2	2	**0.0606**	NA	NA	**0.0616**	NA	NA	NA	**0.0694**	NA	NA	NA	**0.0652 J**	NA	NA	NA	**0.0731**	NA	NA	NA
Cadmium, Dissolved	7440-43-9	0.005	0.005	0.0000950 U	0.0000950 U	0.0000950 U	0.0000950 U	0.0000950 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000854 U	0.000854 U	0.000050 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U
Chromium, Dissolved	7440-47-3	0.1	0.1	0.00250 U	NA	NA	0.00250 U	NA	NA	NA	0.00160 U	NA	NA	NA	0.00140 U	NA	NA	NA	0.000400 U	NA	NA	NA
Copper, Dissolved	7440-50-8	1.3	1.3	0.00110 U	NA	NA	**0.00223 J**	NA	NA	NA	0.00170 U	NA	NA	NA	0.00200 U	NA	NA	NA	0.00100 U	NA	NA	NA
Lead, Dissolved	7439-92-1	0.015	0.015	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000980 U	0.000980 U	0.000980 U	0.000980 U	0.000980 U	0.000980 U	0.000733 U	0.000733 U	0.00033 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U
Mercury, Dissolved	7439-97-6	0.002	0.002	0.0000910 U	NA	NA	0.0000910 U	NA	NA	NA	0.0000800 U	NA	NA	NA	0.000130 U	NA	NA	NA	0.0000300 U	NA	NA	NA
Selenium, Dissolved	7782-49-2	0.05	0.05	**0.00167 J**	**0.00160 J**	0.00100 U	**0.00174 J**	**0.00167 J**	**0.00255**	**0.00115 J**	**0.00194 J**	**0.00204 J**	0.00100 U	**0.00216 J**	**0.00114 J**	**0.00276 J**	**0.0014 J**	**0.00178 J**	**0.00124 J**	**0.00113 J**	0.00110 U	**0.00171 J**
Silver, Dissolved	7440-22-4	0.12	0.37	0.000250 U	NA	NA	0.000250 U	NA	NA	NA	0.000100 U	NA	NA	NA	0.000941 U	NA	NA	NA	0.000200 U	NA	NA	NA
Zinc, Dissolved	7440-66-6	7.3	22	0.00830 U	NA	NA	0.00830 U	NA	NA	NA	0.00960 U	NA	NA	NA	0.0113 U[3]	NA	NA	NA	**0.00318 J**	NA	NA	NA

SUMMARY OF HISTORICAL GROUNDWATER MONITORING DATA (2Q14 THROUGH 4Q18)
NORTH CAMU
EXIDE FRISCO RECYCLING CENTER
FRISCO, TEXAS

Monitoring Well				LMW-21																
Sample Date				6/17/2014	9/22/2014	12/17/2014	3/17/2015	6/4/2015	9/10/2015	12/15/2015	3/4/2016	6/2/2016	9/8/2016	12/1/2016	3/2/2017	5/5/2017	8/29/2017	11/29/2017	2/13/2018	5/10/2018	9/25/2018	12/5/2018
Type of Sampling Event				Annual	Quarterly	Quarterly	Annual	Quarterly	Quarterly	Quarterly	Annual	Quarterly	Quarterly	Quarterly	Annual	Quarterly	Quarterly	Quarterly	Annual	Quarterly	Quarterly	Quarterly
Total Metals 6020A and 7470A (mg/L)																						
Analyte	**CAS No.**	**RAL[1] (mg/L)**	**PCL[2] (mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**
Antimony	7440-36-0	0.006	0.006	0.00230 U	NA	NA	0.00230 U	NA	NA	NA	0.000500 U	NA	NA	NA	0.00161 U	NA	NA	NA	0.000400 U	NA	NA	NA
Arsenic	7440-38-2	0.01	0.01	**0.00137 J**	**0.00133 J**	0.00130 U	0.00130 U	0.00130 U	0.00150 U	0.00150 U	0.00150 U	**0.00254 J**	0.00150 U	0.00150 U	0.00109 U	0.00179 U[3]	0.00087 U	**0.000435 J**	**0.000608 J**	**0.000509 J**	0.000400 U	**0.000743 J**
Barium	7440-39-3	2	2	**0.0563**	NA	NA	**0.0439**	NA	NA	NA	**0.0414**	NA	NA	NA	**0.0327**	NA	NA	NA	**0.0355**	NA	NA	NA
Cadmium	7440-43-9	0.005	0.005	**0.000148 J**	**0.000208 J**	**0.000145 J**	**0.000135 J**	**0.000100 J**	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000854 U	0.000854 U	**0.000063 J**	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U
Chromium	7440-47-3	0.1	0.1	0.00250 U	NA	NA	0.00250 U	NA	NA	NA	0.00160 U	NA	NA	NA	0.00140 U	NA	NA	NA	0.000400 U	NA	NA	NA
Copper	7440-50-8	1.3	1.3	**0.00180 J**	NA	NA	0.00110 U	NA	NA	NA	0.00170 U	NA	NA	NA	0.00200 U	NA	NA	NA	0.00100 U	NA	NA	NA
Lead	7439-92-1	0.015	0.015	**0.00218**	**0.00185**	**0.00202**	**0.00184**	**0.00132 J**	**0.00133 J**	**0.00194 J**	**0.00194 J**	**0.00246 J**	**0.00241 J**	**0.00119 J**	**0.00142 J**	0.000733 U	**0.00160 J**	**0.000991 J**	**0.00119 J**	**0.00178 J**	**0.00123 J**	**0.00133 J**
Mercury	7439-97-6	0.002	0.002	0.0000910 U	NA	NA	0.0000910 U	NA	NA	NA	0.0000800 U	NA	NA	NA	0.000130 U	NA	NA	NA	**0.0000380 J**	NA	NA	NA
Selenium	7782-49-2	0.05	0.05	**0.00454**	**0.00404**	**0.00262**	**0.00833**	**0.0103**	**0.00685**	**0.0112**	**0.00939**	**0.0100**	**0.00505**	**0.00584 b**	**0.00531**	0.00335 U[3]	**0.0077**	**0.00580**	**0.00621**	**0.00745**	**0.00390**	**0.00860**
Silver	7440-22-4	0.12	0.37	0.000250 U	NA	NA	0.000250 U	NA	NA	NA	0.000100 U	NA	NA	NA	0.000941 U	NA	NA	NA	0.000200 U	NA	NA	NA
Zinc	7440-66-6	7.3	22	0.00830 U	NA	NA	0.00830 U	NA	NA	NA	0.00960 U	NA	NA	NA	0.00355 U	NA	NA	NA	**0.00249 J**	NA	NA	NA
Dissolved Metals 6020A and 7470A (mg/L)																						
Analyte	**CAS No.**	**RAL[1] (mg/L)**	**PCL[2] (mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**
Antimony, Dissolved	7440-36-0	0.006	0.006	0.00230 U	NA	NA	0.00230 U	NA	NA	NA	0.000500 U	NA	NA	NA	0.00161 U	NA	NA	NA	0.000400 U	NA	NA	NA
Arsenic, Dissolved	7440-38-2	0.01	0.01	**0.00132 J**	**0.00135 J**	0.00130 U	0.00130 U	0.00130 U	**0.00150 J**	0.00150 U	0.00150 U	0.00150 U	0.00150 U	0.00150 U	**0.00131 J**	0.00164 U[3]	0.00087 U	**0.000475 J**	**0.000754 J**	**0.000579 J**	0.000400 U	**0.000700 J**
Barium, Dissolved	7440-39-3	2	2	**0.0576**	NA	NA	**0.0458**	NA	NA	NA	**0.0470**	NA	NA	NA	**0.0339**	NA	NA	NA	**0.0366**	NA	NA	NA
Cadmium, Dissolved	7440-43-9	0.005	0.005	**0.000209 J**	**0.000225 J**	**0.000110 J**	**0.000125 J**	0.0000950 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000854 U	0.000854 U	**0.000054 J**	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U
Chromium, Dissolved	7440-47-3	0.1	0.1	0.00250 U	NA	NA	0.00250 U	NA	NA	NA	0.00160 U	NA	NA	NA	0.00140 U	NA	NA	NA	0.000400 U	NA	NA	NA
Copper, Dissolved	7440-50-8	1.3	1.3	0.00110 U	NA	NA	**0.00173 J**	NA	NA	NA	0.00170 U	NA	NA	NA	0.00200 U	NA	NA	NA	0.00100 U	NA	NA	NA
Lead, Dissolved	7439-92-1	0.015	0.015	**0.000629 J**	**0.00105 J**	**0.00112 J**	**0.00134 J**	**0.000775 J**	0.000980 U	**0.00132 J**	**0.00105 J**	0.000980 U	0.000980 U	0.000980 U	0.000733 U	0.000733 U	**0.00063 J**	0.000600 U	0.000600 U	**0.000724 J**	**0.000652 J**	0.000600 U
Mercury, Dissolved	7439-97-6	0.002	0.002	0.0000910 U	NA	NA	0.0000910 U	NA	NA	NA	0.0000800 U	NA	NA	NA	0.000130 U	NA	NA	NA	0.0000300 U	NA	NA	NA
Selenium, Dissolved	7782-49-2	0.05	0.05	**0.00474**	**0.00417**	**0.00303**	**0.00880**	**0.0117**	**0.00744**	**0.0110**	**0.0107**	**0.00864**	**0.00560**	**0.00578**	**0.00531**	0.00246 U[3]	**0.0077**	**0.00588**	**0.00655**	**0.00678**	**0.00439**	**0.00826**
Silver, Dissolved	7440-22-4	0.12	0.37	0.000250 U	NA	NA	0.000250 U	NA	NA	NA	0.000100 U	NA	NA	NA	0.000941 U	NA	NA	NA	0.000200 U	NA	NA	NA
Zinc, Dissolved	7440-66-6	7.3	22	0.00830 U	NA	NA	0.00830 U	NA	NA	NA	0.00960 U	NA	NA	NA	0.00751 U[3]	NA	NA	NA	**0.00351 J**	NA	NA	NA

SUMMARY OF HISTORICAL GROUNDWATER MONITORING DATA (2Q14 THROUGH 4Q18)
NORTH CAMU
EXIDE FRISCO RECYCLING CENTER
FRISCO, TEXAS

Monitoring Well				PMW-19R																	
Sample Date				6/17/2014	9/23/2014	12/16/2014	3/16/2015	6/4/2015	9/9/2015	12/14/2015	3/3/2016	5/31/2016	9/7/2016	12/1/2016	3/1/2017	5/4/2017	8/28/2017	11/29/2017	2/13/2018	5/10/2018	9/24/2018	12/4/2018
Type of Sampling Event				Annual	Quarterly	Quarterly	Annual	Quarterly	Quarterly	Quarterly	Annual	Quarterly	Quarterly	Quarterly	Annual	Quarterly	Quarterly	Quarterly	Annual	Quarterly	Quarterly	Quarterly
Total Metals 6020A and 7470A (mg/L)																						
Analyte	**CAS No.**	**RAL[1] (mg/L)**	**PCL[2] (mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**
Antimony	7440-36-0	0.006	0.006	IV	NA	NA	0.00230 U	NA	NA	NA	0.000500 U	NA	NA	NA	0.00161 U	NA	NA	NA	0.000400 U	NA	NA	NA
Arsenic	7440-38-2	0.01	0.01	IV	IV	IV	**0.00177 J**	**0.00378**	0.00150 U	0.00150 U	**0.00166 J**	**0.00769**	**0.00206 J**	0.00150 U	**0.00127 J**	**0.00238 J**	0.00087 U	0.000400 U	**0.00112 J**	**0.00131 J**	**0.00122 J**	**0.00160 J**
Barium	7440-39-3	2	2	IV	NA	NA	**0.0404**	NA	NA	NA	**0.0509**	NA	NA	NA	**0.0526**	NA	NA	NA	**0.0646**	NA	NA	NA
Cadmium	7440-43-9	0.005	0.005	IV	IV	IV	0.0000950 U	0.0000950 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000854 U	0.000854 U	0.000050 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U
Chromium	7440-47-3	0.1	0.1	IV	NA	NA	**0.00320 J**	NA	NA	NA	0.00160 U	NA	NA	NA	0.00140 U	NA	NA	NA	**0.000837 J**	NA	NA	NA
Copper	7440-50-8	1.3	1.3	IV	NA	NA	**0.00211 J**	NA	NA	NA	**0.00320 J**	NA	NA	NA	**0.00204 J**	NA	NA	NA	**0.00194 J**	NA	NA	NA
Lead	7439-92-1	0.015	0.015	IV	IV	IV	**0.000265 J**	0.000200 U	0.000980 U	0.000980 U	0.000980 U	0.000980 U	0.000980 U	0.000980 U	0.000733 U	0.000733 U	0.00033 U	0.000600 U	**0.00222**	0.000600 U	0.000600 U	0.000600 U
Mercury	7439-97-6	0.002	0.002	IV	NA	NA	0.0000910 U	NA	NA	NA	0.0000800 U	NA	NA	NA	0.000130 U	NA	NA	NA	**0.0000330 J**	NA	NA	NA
Selenium	7782-49-2	0.05	0.05	IV	IV	IV	**0.00227 J**	0.00100 U	0.00100 U	0.00100 U	0.00100 U	**0.00206 J**	0.00100 U	0.00100 U	0.00108 U	**0.00131 J**	0.00090 U	0.00110 U	**0.00240**	**0.00499**	0.00110 U	0.00110 U
Silver	7440-22-4	0.12	0.37	IV	NA	NA	0.000250 U	NA	NA	NA	0.000100 U	NA	NA	NA	0.000941 U	NA	NA	NA	0.000200 U	NA	NA	NA
Zinc	7440-66-6	7.3	22	IV	NA	NA	**0.0104 J**	NA	NA	NA	0.00960 U	NA	NA	NA	0.00355 U	NA	NA	NA	**0.00987**	NA	NA	NA
Dissolved Metals 6020A and 7470A (mg/L)																						
Analyte	**CAS No.**	**RAL[1] (mg/L)**	**PCL[2] (mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**
Antimony, Dissolved	7440-36-0	0.006	0.006	IV	NA	NA	0.00230 U	NA	NA	NA	0.000500 U	NA	NA	NA	0.00161 U	NA	NA	NA	0.000400 U	NA	NA	NA
Arsenic, Dissolved	7440-38-2	0.01	0.01	IV	IV	IV	**0.00178 J**	**0.00414**	0.00150 U	0.00150 U	0.00150 U	**0.00180 J**	**0.00171** J	**0.00245 J**	**0.00212 J**	**0.00207 J**	0.00087 U	**0.000501 J**	**0.000499 J**	**0.000809 J**	**0.00119 J**	**0.00129 J**
Barium, Dissolved	7440-39-3	2	2	IV	NA	NA	**0.0442**	NA	NA	NA	**0.0460**	NA	NA	NA	**0.0573**	NA	NA	NA	**0.0633**	NA	NA	NA
Cadmium, Dissolved	7440-43-9	0.005	0.005	IV	IV	IV	0.0000950 U	0.0000950 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000854 U	0.000854 U	0.000050 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U
Chromium, Dissolved	7440-47-3	0.1	0.1	IV	NA	NA	0.00250 U	NA	NA	NA	0.00160 U	NA	NA	NA	0.00140 U	NA	NA	NA	0.000400 U	NA	NA	NA
Copper, Dissolved	7440-50-8	1.3	1.3	IV	NA	NA	**0.00353 J**	NA	NA	NA	**0.00453 J**	NA	NA	NA	**0.00304 J**	NA	NA	NA	**0.00156 J**	NA	NA	NA
Lead, Dissolved	7439-92-1	0.015	0.015	IV	IV	IV	0.000200 U	0.000200 U	0.000980 U	0.000980 U	0.000980 U	0.000980 U	0.000980 U	0.000980 U	0.000733 U	0.000733 U	0.00033 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U
Mercury, Dissolved	7439-97-6	0.002	0.002	IV	NA	NA	0.0000910 U	NA	NA	NA	0.0000800 U	NA	NA	NA	0.000130 U	NA	NA	NA	0.0000300 U	NA	NA	NA
Selenium, Dissolved	7782-49-2	0.05	0.05	IV	IV	IV	**0.00253**	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00108 U	**0.00162 J**	0.00090 U	0.00110 U	**0.00113 J**	**0.00278**	0.00110 U	0.00110 U
Silver, Dissolved	7440-22-4	0.12	0.37	IV	NA	NA	0.000250 U	NA	NA	NA	0.000100 U	NA	NA	NA	0.000941 U	NA	NA	NA	0.000200 U	NA	NA	NA
Zinc, Dissolved	7440-66-6	7.3	22	IV	NA	NA	**0.0107 J**	NA	NA	NA	0.00960 U	NA	NA	NA	0.00558 U[3]	NA	NA	NA	**0.00378 J**	NA	NA	NA

SUMMARY OF HISTORICAL GROUNDWATER MONITORING DATA (2Q14 THROUGH 4Q18)
NORTH CAMU
EXIDE FRISCO RECYCLING CENTER
FRISCO, TEXAS

Monitoring Well				PMW-20R																
Sample Date				6/17/2014	9/22/2014	12/17/2014	3/17/2015	6/4/2015	9/10/2015	12/15/2015	3/4/2016	6/3/2016	9/8/2016	12/1/2016	3/2/2017	5/5/2017	8/29/2017	11/29/2017	2/14/2018	5/10/2018	9/25/2018	12/5/2018
Type of Sampling Event				Annual	Quarterly	Quarterly	Annual	Quarterly	Quarterly	Quarterly	Annual	Quarterly	Quarterly	Quarterly	Annual	Quarterly	Quarterly	Quarterly	Annual	Quarterly	Quarterly	Quarterly
Total Metals 6020A and 7470A (mg/L)																						
Analyte	**CAS No.**	**RAL[1] (mg/L)**	**PCL[2] (mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**
Antimony	7440-36-0	0.006	0.006	0.00230 U	NA	NA	0.00230 U	NA	NA	NA	0.000500 U	NA	NA	NA	0.00161 U	NA	NA	NA	0.000400 U	NA	NA	NA
Arsenic	7440-38-2	0.01	0.01	0.00130 U	0.00130 U	0.00130 U	0.00130 U	0.00130 U	0.00150 U	0.00150 U	0.00150 U	**0.00154 J**	0.00150 U	0.00150 U	0.00109 U	0.00171 U[3]	0.00087 U	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000400 U
Barium	7440-39-3	2	2	**0.0645**	NA	NA	**0.0610**	NA	NA	NA	**0.0628**	NA	NA	NA	**0.0498**	NA	NA	NA	**0.0530**	NA	NA	NA
Cadmium	7440-43-9	0.005	0.005	0.0000950 U	**0.000137 J**	**0.000130 J**	0.0000950 U	0.0000950 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000854 U	0.000854 U	0.000050 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U
Chromium	7440-47-3	0.1	0.1	0.00250 U	NA	NA	0.00250 U	NA	NA	NA	0.00160 U	NA	NA	NA	0.00140 U	NA	NA	NA	0.000400 U	NA	NA	NA
Copper	7440-50-8	1.3	1.3	**0.00187 J**	NA	NA	0.00110 U	NA	NA	NA	0.00170 U	NA	NA	NA	0.00200 U	NA	NA	NA	0.00100 U	NA	NA	NA
Lead	7439-92-1	0.015	0.015	**0.00198**	**0.00101 J**	**0.00196**	**0.00134 J**	**0.00179**	**0.00143 J**	**0.00327**	**0.00107 J**	**0.00112 J**	0.000980 U	0.000980 U	**0.00106 J**	**0.00100 J**	**0.0011 J**	**0.000829 J**	0.000600 U	**0.00140 J**	**0.0000661 J**	**0.000631 J**
Mercury	7439-97-6	0.002	0.002	0.0000910 U	NA	NA	0.0000910 U	NA	NA	NA	0.0000800 U	NA	NA	NA	0.000130 U	NA	NA	NA	**0.0000350 J**	NA	NA	NA
Selenium	7782-49-2	0.05	0.05	0.00100 U	**0.00136 J**	**0.00296**	**0.00362**	**0.00524**	**0.00299**	**0.00334**	**0.00225 J**	**0.00269**	**0.00126 J**	**0.00137 J b**	0.00108 U	0.00316 U[3]	0.00090 U	0.00110 U	**0.00212**	0.00110 U	**0.00183 J**	**0.00235**
Silver	7440-22-4	0.12	0.37	0.000250 U	NA	NA	0.000250 U	NA	NA	NA	0.000100 U	NA	NA	NA	0.000941 U	NA	NA	NA	0.000200 U	NA	NA	NA
Zinc	7440-66-6	7.3	22	0.00830 U	NA	NA	0.00830 U	NA	NA	NA	0.00960 U	NA	NA	NA	0.00355 U	NA	NA	NA	0.00200 U	NA	NA	NA
Dissolved Metals 6020A and 7470A (mg/L)																						
Analyte	**CAS No.**	**RAL[1] (mg/L)**	**PCL[2] (mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**
Antimony, Dissolved	7440-36-0	0.006	0.006	0.00230 U	NA	NA	0.00230 U	NA	NA	NA	0.000500 U	NA	NA	NA	0.00161 U	NA	NA	NA	0.000400 U	NA	NA	NA
Arsenic, Dissolved	7440-38-2	0.01	0.01	0.00130 U	0.00130 U	0.00130 U	0.00130 U	0.00130 U	0.00150 U	0.00150 U	0.00150 U	0.00150 U	0.00150 U	0.00150 U	0.00109 U	0.00126 U[3]	0.00087 U	0.000400 U	**0.000453 J**	0.000400 U	0.000400 U	0.000400 U
Barium, Dissolved	7440-39-3	2	2	**0.0677**	NA	NA	**0.0625**	NA	NA	NA	**0.0587**	NA	NA	NA	**0.0510**	NA	NA	NA	**0.0543**	NA	NA	NA
Cadmium, Dissolved	7440-43-9	0.005	0.005	0.0000950 U	**0.000177 J**	**0.0000950 J**	0.0000950 U	0.0000950 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000854 U	0.000854 U	0.000050 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U
Chromium, Dissolved	7440-47-3	0.1	0.1	0.00250 U	NA	NA	0.00250 U	NA	NA	NA	0.00160 U	NA	NA	NA	0.00140 U	NA	NA	NA	0.000400 U	NA	NA	NA
Copper, Dissolved	7440-50-8	1.3	1.3	**0.00139 J**	NA	NA	**0.00116 J**	NA	NA	NA	**0.00186 J**	NA	NA	NA	0.00200 U	NA	NA	NA	0.00100 U	NA	NA	NA
Lead, Dissolved	7439-92-1	0.015	0.015	0.000200 U	**0.000724 J**	**0.000695 J**	**0.000500 J**	**0.000410 J**	0.000980 U	0.000980 U	0.000980 U	0.000980 U	0.000980 U	0.000980 U	0.000733	0.000733 U	**0.00044 J**	0.000600 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U
Mercury, Dissolved	7439-97-6	0.002	0.002	0.0000910 U	NA	NA	0.0000910 U	NA	NA	NA	0.0000800 U	NA	NA	NA	0.000130 U	NA	NA	NA	0.0000300 U	NA	NA	NA
Selenium, Dissolved	7782-49-2	0.05	0.05	0.00100 U	**0.00175 J**	**0.00230 J**	**0.00303**	**0.00641**	**0.00327**	**0.00435**	**0.00174 J**	**0.00284**	**0.00127 J**	**0.00181 J**	0.00108 U	0.00243 U[3]	**0.0012 J**	**0.00247**	0.00110 U	0.00110 U	**0.00180 J**	**0.00253**
Silver, Dissolved	7440-22-4	0.12	0.37	0.000250 U	NA	NA	0.000250 U	NA	NA	NA	0.000100 U	NA	NA	NA	0.000941 U	NA	NA	NA	0.000200 U	NA	NA	NA
Zinc, Dissolved	7440-66-6	7.3	22	0.00830 U	NA	NA	0.00830 U	NA	NA	NA	0.00960 U	NA	NA	NA	0.00586 U[3]	NA	NA	NA	**0.00343 J**	NA	NA	NA

SUMMARY OF HISTORICAL GROUNDWATER MONITORING DATA (2Q14 THROUGH 4Q18)

NORTH CAMU

EXIDE FRISCO RECYCLING CENTER

FRISCO, TEXAS

Monitoring Well				LMW-22																				
Sample Date				6/17/2014	7/30/2014	9/22/2014	12/17/2014	3/17/2015	6/4/2015	9/9/2015	10/30/2015	12/15/2015	3/3/2016	6/1/2016	9/7/2016	10/13/2016	12/1/2016	3/1/2017	5/5/2017	8/29/2017	9/18/2017	11/29/2017	2/13/2018	5/10/2018	9/25/2018	12/5/2018
Type of Sampling Event				Annual	Resample	Quarterly	Quarterly	Annual	Quarterly	Quarterly	Resample	Quarterly	Annual	Quarterly	Quarterly	Resample	Quarterly	Annual	Quarterly	Quarterly	Resample	Quarterly	Annual	Quarterly	Quarterly	Quarterly
Total Metals 6020A and 7470A (mg/L)																										
Analyte	**CAS No.**	**RAL[1] (mg/L)**	**PCL[2] (mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**
Antimony	7440-36-0	0.006	0.006	0.00230 U	0.00230 U	NA	NA	IV	NA	NA	NA	NA	0.000500 U	NA	NA	NA	NA	0.00161 U	NA	NA	NA	NA	0.000400 U	NA	NA	NA
Arsenic	7440-38-2	0.01	0.01	**0.0121**	**0.00245 J**	**0.00278**	**0.00296**	IV	**0.00197 J**	**0.0177**	**0.0126**	**0.00153 J**	**0.00329**	**0.00598**	**0.0141**	**0.0193**	**0.0105**	**0.00206 J**	**0.00561**	**0.012**	**0.0140**	**0.00911**	**0.00719**	**0.00328**	**0.00772**	**0.0051**
Barium	7440-39-3	2	2	**0.0979**	**0.0973**	NA	NA	IV	NA	NA	NA	NA	**0.0851**	NA	NA	NA	NA	**0.0427**	NA	NA	NA	NA	**0.0579**	NA	NA	NA
Cadmium	7440-43-9	0.005	0.005	0.0000950 U	0.0000950 U	0.0000950 U	0.0000950 U	IV	0.0000950 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000854 U	0.000854 U	0.000050 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U
Chromium	7440-47-3	0.1	0.1	0.00250 U	0.00250 U	NA	NA	IV	NA	NA	NA	NA	0.00160 U	NA	NA	NA	NA	0.00140 U	NA	NA	NA	NA	0.000400 U	NA	NA	NA
Copper	7440-50-8	1.3	1.3	0.00110 U	**0.00141 J**	NA	NA	IV	NA	NA	NA	NA	0.00170 U	NA	NA	NA	NA	0.00200 U	NA	NA	NA	NA	0.00100 U	NA	NA	NA
Lead	7439-92-1	0.015	0.015	0.000200 U	**0.00173**	**0.00123 J**	**0.00113 J**	IV	**0.000375 J**	**0.00127 J**	0.000980 U	0.000980 U	0.000980 U	0.000980 U	0.000980 U	0.000980 U	0.000980 U	0.000733 U	0.000733 U	0.00033 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U
Mercury	7439-97-6	0.002	0.002	0.0000910 U	0.0000910 U	NA	NA	IV	NA	NA	NA	NA	0.0000800 U	NA	NA	NA	NA	0.000130 U	NA	NA	NA	NA	**0.0000880 J**	NA	NA	NA
Selenium	7782-49-2	0.05	0.05	0.00100 U	**0.00170 J**	**0.00297**	**0.00408**	IV	**0.00161 J**	0.00100 U	0.00100 U	0.00100 U	0.00100 U	**0.00143 J**	0.00100 U	0.00100 U	0.00100 U	0.00108 U	0.00108 U	0.00090 U	0.00110 U	0.00110 U	0.00110 U	0.00110 U	0.00110 U	0.00110 U
Silver	7440-22-4	0.12	0.37	0.000250 U	0.000250 U	NA	NA	IV	NA	NA	NA	NA	0.000100 U	NA	NA	NA	NA	0.000941 U	NA	NA	NA	NA	0.000200 U	NA	NA	NA
Zinc	7440-66-6	7.3	22	0.00830 U	0.00830 U	NA	NA	IV	NA	NA	NA	NA	0.00960 U	NA	NA	NA	NA	0.00470 U[3]	NA	NA	NA	NA	0.00200 U	NA	NA	NA
Dissolved Metals 6020A and 7470A (mg/L)																										
Analyte	**CAS No.**	**RAL[1] (mg/L)**	**PCL[2] (mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**
Antimony, Dissolved	7440-36-0	0.006	0.006	0.00230 U	0.00230 U	NA	NA	IV	NA	NA	NA	NA	0.000500 U	NA	NA	NA	NA	0.00161 U	NA	NA	NA	NA	0.000602 U	NA	NA	NA
Arsenic, Dissolved	7440-38-2	0.01	0.01	**0.0131**	**0.00309**	**0.00258**	**0.00217 J**	IV	**0.00178 J**	**0.0203**	**0.0128**	0.00150 U	**0.00310**	**0.00222 J**	**0.0125**	**0.0192**	**0.0112**	**0.00205 J**	0.00536 U[3]	**0.012**	**0.0135**	**0.00917**	**0.00438**	**0.00268**	**0.00817**	**0.00461**
Barium, Dissolved	7440-39-3	2	2	**0.0968**	**0.0867**	NA	NA	IV	NA	NA	NA	NA	**0.0852**	NA	NA	NA	NA	**0.0408**	NA	NA	NA	NA	**0.0587**	NA	NA	NA
Cadmium, Dissolved	7440-43-9	0.005	0.005	0.0000950 U	0.0000950 U	0.0000950 U	0.0000950 U	IV	0.0000950 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000854 U	0.000854 U	0.000050 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U
Chromium, Dissolved	7440-47-3	0.1	0.1	0.00250 U	0.00250 U	NA	NA	IV	NA	NA	NA	NA	0.00160 U	NA	NA	NA	NA	0.00140 U	NA	NA	NA	NA	0.000400 U	NA	NA	NA
Copper, Dissolved	7440-50-8	1.3	1.3	0.00110 U	0.00110 U	NA	NA	IV	NA	NA	NA	NA	**0.00258 J**	NA	NA	NA	NA	0.00200 U	NA	NA	NA	NA	0.00100 U	NA	NA	NA
Lead, Dissolved	7439-92-1	0.015	0.015	0.000200 U	0.000200 U	**0.000213 J**	**0.000295 J**	IV	0.000200 U	0.000980 U	0.000980 U	0.000980 U	0.000980 U	0.000980 U	0.000980 U	0.000980 U	0.000980 U	0.000733 U	0.000733 U	0.00033 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U
Mercury, Dissolved	7439-97-6	0.002	0.002	0.0000910 U	0.0000910 U	NA	NA	IV	NA	NA	NA	NA	0.0000800 U	NA	NA	NA	NA	0.000130 U	NA	NA	NA	NA	0.0000300 U	NA	NA	NA
Selenium, Dissolved	7782-49-2	0.05	0.05	0.00100 U	**0.00192 J**	**0.00260**	**0.00406**	IV	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00108 U	0.00224 U[3]	0.00090 U	0.00110 U	**0.00162 J**	0.00110 U	0.00110 U	0.00110 U	0.00110 U
Silver, Dissolved	7440-22-4	0.12	0.37	0.000250 U	0.000250 U	NA	NA	IV	NA	NA	NA	NA	0.000100 U	NA	NA	NA	NA	0.000941 U	NA	NA	NA	NA	0.000200 U	NA	NA	NA
Zinc, Dissolved	7440-66-6	7.3	22	0.00830 U	0.00830 U	NA	NA	IV	NA	NA	NA	NA	0.00960 U	NA	NA	NA	NA	0.00355 U	NA	NA	NA	NA	**0.0328**	NA	NA	NA

SUMMARY OF HISTORICAL GROUNDWATER MONITORING DATA (2Q14 THROUGH 4Q18)
NORTH CAMU
EXIDE FRISCO RECYCLING CENTER
FRISCO, TEXAS

Monitoring Well				MW-45																
Sample Date				6/17/2014	9/22/2014	12/16/2014	3/16/2015	6/4/2015	9/9/2015	12/14/2015	3/3/2016	5/31/2016	9/8/2016	12/1/2016	3/1/2017	5/4/2017	8/28/2017	11/28/2017	2/12/2018	5/10/2018	9/24/2018	12/5/2018
Type of Sampling Event				Annual	Quarterly	Quarterly	Annual	Quarterly	Quarterly	Quarterly	Annual	Quarterly	Quarterly	Quarterly	Annual	Quarterly	Quarterly	Quarterly	Annual	Quarterly	Quarterly	Quarterly
Total Metals 6020A and 7470A (mg/L)																						
Analyte	**CAS No.**	**RAL[1] (mg/L)**	**PCL[2] (mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**
Antimony	7440-36-0	0.006	0.006	0.00230 U	NA	NA	0.00230 U	NA	NA	NA	0.000500 U	NA	NA	NA	0.00161 U	NA	NA	NA	0.000400 U	NA	NA	NA
Arsenic	7440-38-2	0.01	0.01	0.00130 U	0.00130 U	0.00130 U	0.00130 U	**0.00191 J**	0.00150 U	0.00150 U	0.00150 U	**0.00595**	0.00150 U	0.00150 U	0.00109 U	**0.00136 J**	0.00087 U	0.000400 U	**0.000677 J**	**0.000428 J**	0.000400 U	**0.000452 J**
Barium	7440-39-3	2	2	**0.0915**	NA	NA	**0.0778**	NA	NA	NA	**0.0972**	NA	NA	NA	**0.0499**	NA	NA	NA	**0.0863**	NA	NA	NA
Cadmium	7440-43-9	0.005	0.005	0.0000950 U	0.0000950 U	0.0000950 U	0.0000950 U	0.0000950 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000854 U	0.000854 U	0.000050 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U
Chromium	7440-47-3	0.1	0.1	0.00250 U	NA	NA	0.00250 U	NA	NA	NA	0.00160 U	NA	NA	NA	0.00140 U	NA	NA	NA	0.000400 U	NA	NA	NA
Copper	7440-50-8	1.3	1.3	0.00110 U	NA	NA	0.00110 U	NA	NA	NA	0.00170 U	NA	NA	NA	0.00200 U	NA	NA	NA	0.00100 U	NA	NA	NA
Lead	7439-92-1	0.015	0.015	**0.000421 J**	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000980 U	0.000980 U	0.000980 U	0.000980 U	0.000980 U	0.000980 U	0.000733 U	**0.00112 J**	0.00033 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U
Mercury	7439-97-6	0.002	0.002	0.0000910 U	NA	NA	0.0000910 U	NA	NA	NA	0.0000800 U	NA	NA	NA	0.000130 U	NA	NA	NA	0.0000300 U	NA	NA	NA
Selenium	7782-49-2	0.05	0.05	**0.00145 J**	**0.00152 J**	**0.00183 J**	**0.00210 J**	**0.0172**	**0.00460**	**0.00851**	**0.00984**	**0.00241 J**	**0.00450**	**0.00379 b**	**0.00155 J**	**0.00216 J**	**0.00094 J**	**0.00123 J**	**0.00159 J**	0.00110 U	0.00110 U	**0.00238**
Silver	7440-22-4	0.12	0.37	0.000250 U	NA	NA	0.000250 U	NA	NA	NA	0.000100 U	NA	NA	NA	0.000941 U	NA	NA	NA	0.000200 U	NA	NA	NA
Zinc	7440-66-6	7.3	22	0.00830 U	NA	NA	0.00830 U	NA	NA	NA	0.00960 U	NA	NA	NA	0.00355 U	NA	NA	NA	0.00200 U	NA	NA	NA
Dissolved Metals 6020A and 7470A (mg/L)																						
Analyte	**CAS No.**	**RAL[1] (mg/L)**	**PCL[2] (mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**
Antimony, Dissolved	7440-36-0	0.006	0.006	0.00230 U	NA	NA	0.00230 U	NA	NA	NA	0.000500 U	NA	NA	NA	0.00161 U	NA	NA	NA	0.000423 U	NA	NA	NA
Arsenic, Dissolved	7440-38-2	0.01	0.01	0.00130 U	0.00130 U	0.00130 U	0.00130 U	**0.00137 J**	0.00150 U	0.00150 U	0.00150 U	0.00150 U	0.00150 U	0.00150 U	0.00109 U	0.00109 U	0.00087 U	**0.000462 J**	**0.000572 J**	**0.000414 J**	0.000400 U	0.000400 U
Barium, Dissolved	7440-39-3	2	2	**0.0924**	NA	NA	**0.0831**	NA	NA	NA	**0.0805**	NA	NA	NA	**0.0502**	NA	NA	NA	**0.0833**	NA	NA	NA
Cadmium, Dissolved	7440-43-9	0.005	0.005	0.0000950 U	0.0000950 U	0.0000950 U	0.0000950 U	0.0000950 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000150 U	0.000854 U	0.000854 U	0.000050 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U
Chromium, Dissolved	7440-47-3	0.1	0.1	0.00250 U	NA	NA	0.00250 U	NA	NA	NA	0.00160 U	NA	NA	NA	0.00140 U	NA	NA	NA	0.000400 U	NA	NA	NA
Copper, Dissolved	7440-50-8	1.3	1.3	0.00110 U	NA	NA	0.00110 U	NA	NA	NA	**0.00323 J**	NA	NA	NA	0.00200 U	NA	NA	NA	0.00100 U	NA	NA	NA
Lead, Dissolved	7439-92-1	0.015	0.015	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000980 U	0.000980 U	0.000980 U	0.000980 U	0.000980 U	0.000980 U	0.000733 U	0.000733 U	0.00033 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U
Mercury, Dissolved	7439-97-6	0.002	0.002	0.0000910 U	NA	NA	0.0000910 U	NA	NA	NA	0.0000800 U	NA	NA	NA	0.000130 U	NA	NA	NA	0.0000300 U	NA	NA	NA
Selenium, Dissolved	7782-49-2	0.05	0.05	**0.00155 J**	**0.00197 J**	**0.00151 J**	**0.00259**	**0.0187**	**0.00476**	**0.00987**	**0.00763**	**0.00255**	**0.00437**	**0.00209 J**	**0.00116 J**	**0.00262 J**	**0.0017 J**	**0.00200 J**	**0.00198 J**	**0.00112 J**	0.00110 U	**0.00290**
Silver, Dissolved	7440-22-4	0.12	0.37	0.000250 U	NA	NA	0.000250 U	NA	NA	NA	0.000100 U	NA	NA	NA	0.000941 U	NA	NA	NA	0.000200 U	NA	NA	NA
Zinc, Dissolved	7440-66-6	7.3	22	0.00830 U	NA	NA	0.00830 U	NA	NA	NA	0.00960 U	NA	NA	NA	0.00355 U	NA	NA	NA	**0.00241 J**	NA	NA	NA

SUMMARY OF HISTORICAL GROUNDWATER MONITORING DATA (2Q14 THROUGH 4Q18)
NORTH CAMU
EXIDE FRISCO RECYCLING CENTER
FRISCO, TEXAS

Monitoring Well				MW-41							MW-47						
Sample Date				7/11/2017	8/29/2017	11/29/2017	2/14/2018	5/10/2018	9/25/2018	12/5/2018	5/5/2017	8/29/2017	11/29/2017	2/14/2018	5/10/2018	9/25/2018	12/5/2018
Type of Sampling Event				Quarterly	Quarterly	Quarterly	Annual	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Annual	Quarterly	Quarterly	Quarterly
Total Metals 6020A and 7470A (mg/L)																	
Analyte	**CAS No.**	**RAL[1] (mg/L)**	**PCL[2] (mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**
Antimony	7440-36-0	0.006	0.006	NA	NA	NA	0.000400 U	NA	NA	NA	NA	NA	NA	0.000400 U	NA	NA	NA
Arsenic	7440-38-2	0.01	0.01	**0.00167 J**	**0.0018 J**	**0.000707 J**	**0.00114 J**	**0.000858 J**	**0.000879 J**	**0.00120 J**	**0.00195 J**	0.00087 U	0.000400 U	**0.000513 J**	0.000400 U	**0.00107 J**	**0.001520 J**
Barium	7440-39-3	2	2	NA	NA	NA	**0.0687**	NA	NA	NA	NA	NA	NA	**0.0475**	NA	NA	NA
Cadmium	7440-43-9	0.005	0.005	0.000854 U	0.000050 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000854 U	0.000050 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U
Chromium	7440-47-3	0.1	0.1	NA	NA	NA	0.000400 U	NA	NA	NA	NA	NA	NA	0.000400 U	NA	NA	NA
Copper	7440-50-8	1.3	1.3	NA	NA	NA	0.00100 U	NA	NA	NA	NA	NA	NA	0.00100 U	NA	NA	NA
Lead	7439-92-1	0.015	0.015	0.000733 U	0.00033 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U	**0.000610 J**	0.000733 U	0.00033 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U
Mercury	7439-97-6	0.002	0.002	NA	NA	NA	**0.0000310 J**	NA	NA	NA	NA	NA	NA	**0.0000330 J**	NA	NA	NA
Selenium	7782-49-2	0.05	0.05	0.00326 U[3]	0.00090 U	0.00110 U	0.00110 U	0.00110 U	0.00110 U	0.00110 U	**0.00159 J**	0.00090 U	0.00110 U	0.00110 U	0.00110 U	0.00110 U	0.00110 U
Silver	7440-22-4	0.12	0.37	NA	NA	NA	0.000200 U	NA	NA	NA	NA	NA	NA	0.000200 U	NA	NA	NA
Zinc	7440-66-6	7.3	22	NA	NA	NA	**0.00269 J**	NA	NA	NA	NA	NA	NA	0.00200 U	NA	NA	NA
Dissolved Metals 6020A and 7470A (mg/L)																	
Analyte	**CAS No.**	**RAL[1] (mg/L)**	**PCL[2] (mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**	**(mg/L)**
Antimony, Dissolved	7440-36-0	0.006	0.006	NA	NA	NA	0.000400 U	NA	NA	NA	NA	NA	NA	0.000400 U	NA	NA	NA
Arsenic, Dissolved	7440-38-2	0.01	0.01	**0.00230 J**	**0.0017 J**	**0.000640 J**	**0.000914 J**	**0.000667 J**	**0.000883 J**	**0.000724 J**	**0.00151 J**	0.00087 U	**0.000408 J**	**0.000470 J**	0.000400 U	**0.00105 J**	**0.00135 J**
Barium, Dissolved	7440-39-3	2	2	NA	NA	NA	**0.0696**	NA	NA	NA	NA	NA	NA	**0.0503**	NA	NA	NA
Cadmium, Dissolved	7440-43-9	0.005	0.005	0.000854 U	0.000050 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000854 U	0.000050 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U
Chromium, Dissolved	7440-47-3	0.1	0.1	NA	NA	NA	0.000400 U	NA	NA	NA	NA	NA	NA	0.000400 U	NA	NA	NA
Copper, Dissolved	7440-50-8	1.3	1.3	NA	NA	NA	0.00100 U	NA	NA	NA	NA	NA	NA	0.00100 U	NA	NA	NA
Lead, Dissolved	7439-92-1	0.015	0.015	0.000733 U	0.00033 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U	0.000733 U	0.00033 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U
Mercury, Dissolved	7439-97-6	0.002	0.002	NA	NA	NA	**0.0000330 J**	NA	NA	NA	NA	NA	NA	**0.0000320 J**	NA	NA	NA
Selenium, Dissolved	7782-49-2	0.05	0.05	0.00371 U[3]	0.00090 U	0.00110 U	0.00110 U	0.00110 U	0.00110 U	0.00110 U	**0.00200 J**	0.00090 U	0.00110 U	0.00110 U	0.00110 U	0.00110 U	0.00110 U
Silver, Dissolved	7440-22-4	0.12	0.37	NA	NA	NA	0.000200 U	NA	NA	NA	NA	NA	NA	0.000200 U	NA	NA	NA
Zinc, Dissolved	7440-66-6	7.3	22	NA	NA	NA	**0.00320 J**	NA	NA	NA	NA	NA	NA	**0.00401**	NA	NA	NA

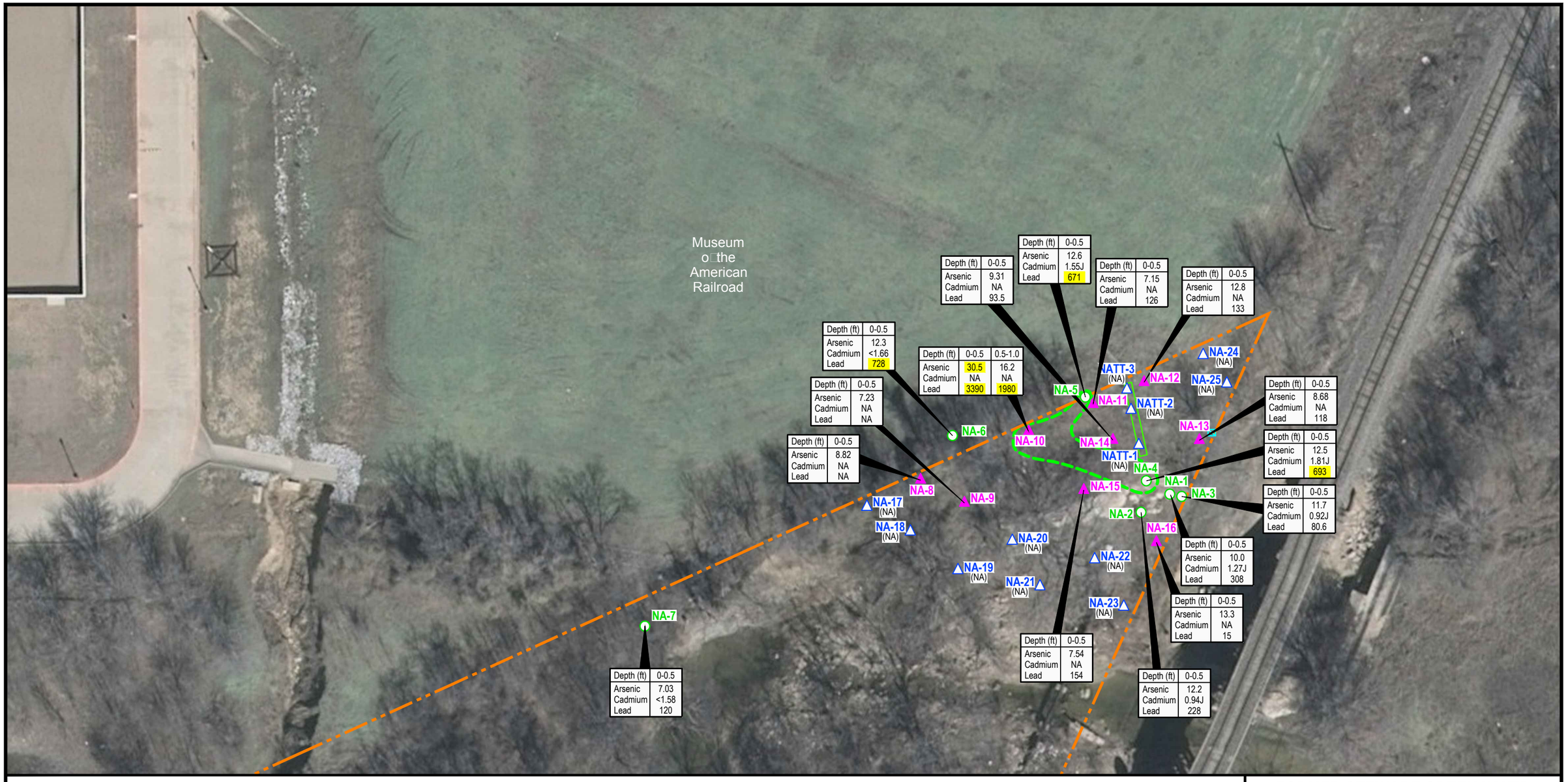
NORTH CAMU
EXIDE FRISCO RECYCLING CENTER
FRISCO, TEXAS

Notes
Results in bold italics denote detections.
USEPA - United States Environmental Protection Agency.
RAL - Residential Assessment Level.
PCL - Protective Concentration Level.
SDL - Sample Detection Limit.
RBEL - Risk Based Exposure Limit.
TRRP - Texas Risk Reduction Program.
N/A - Not Applicable.
NS - Not Sampled.
mg/L - Milligrams per liter.
CAMU - Corrective Action Management Unit.
[1] - The Groundwater Residential Assessment Level (GW RAL) is the TRRP Tier 1 Residential $^{GW}GW_{Ing}$ PCL applicable for Class 2 groundwater ingestion.
[2] - The Groundwater Critical Protective Concentration Level (PCL) is the TRRP Tier 1 Commercial/Industrial $^{GW}GW_{Ing}$ PCL applicable for Class 2 groundwater ingestion.
[3] - The sample detection was qualified non-detect based on the detection in the associated method blank.

Flags and Qualifiers
U - Analyte was not detected at or above the Method Detection Limit (SDL).
J - Result is an estimated value.
JP - Result is an estimated value; the lower of the two values is reported when the % difference between the results of two GC.
b - The compound was found in the blank and sample.

Prepared by: KK 12/14/2016
Updated by: SR 06/15/2018, AGA 03/19/2019
Checked by: BEF 07/20/2018, EPW 05/15/2019
Reviewed by: AMF 05/16/2019

FORMER STEWART CREEK WASTEWATER TREATMENT PLANT



EXPLANATION

- Approx. Property Boundary
- Surface Water Marker
- Test Trench
- Affected Property Area PCLE Zone Non-site
- Approx. Property Boundary Soil Sample Location
- Original Chip Sample Location
- Supplemental Soil Sample Location Initial Phase analysis
- Supplemental Soil Sample Location Analysis as necessary
- Response Action Containment Area Sample

Notes:
1. Property boundary from Winkelmann & Associates, Inc. Survey, dated 9/23/11.
2. All concentrations are in mg/Kg.
3. Highlighted lead concentrations exceed the Protective Concentration Level PCL of 400 mg/kg. Highlighted arsenic concentrations exceed the critical PCL of 2 mg/Kg.
4. NA - Not analyzed
5. Post-Remediation verification samples data are presented in the RACR, submitted separately from this report.

N

Approx. Scale in Feet

0 20 40

Source of photo:
North Central Texas Council of Government (NCTCOG) flown 2007 by Bohannan Huston.

FORMER STEWART CREEK WWTP
FRISCO, TEXAS

Figure A.1

PRE-REMEDIATION COC CONCENTRATION MAP NORTH AREA SOILS

PROJECT: 17	BY: AJD	REVISIONS
DATE: SEPT., 2012	CHECKED: EFP	

PASTOR, BEHLING & WHEELER, LLC
CONSULTING ENGINEERS AND SCIENTISTS

NORTH AREA SURFACE SOIL DATA SUMMARY: METALS

Affected Property Assessment Report

Former Stewart Creek WWTP
Frisco, TX

Constiuent: **RAL/cPCL:**	Sample Interval (ft bgs)	Sample Date	Arsenic 24 mg/kg	Cadmium 52 mg/kg	Lead 250 mg/kg	Selenium 230 mg/kg
NA-1	0-0.5	08/11/2011	10	1.27 J	**308**	1.69
NA-2	0-0.5	08/11/2011	12.2	0.94 J	228	<1.66
NA-3	0-0.5	08/11/2011	11.7	0.92 J	80.6	<1.73
NA-4	0-0.5	08/11/2011	12.5	1.81 J	**693**	<1.81
NA-5	0-0.5	08/11/2011	12.6	1.55 J	**671**	<1.77
NA-6	0-0.5	08/11/2011	12.3	<1.66	**728**	<3.58
NA-7	0-0.5	08/11/2011	7.03	<1.58	120	<3.41
NA-10 (0.5-1.0)	0.5-1	10/06/2011	16.2	---	**1980**	---
NA-10 (0-0.5)	0.5-1	10/06/2011	**30.5**	---	**3390**	---
NA-11 (0.5-1.0)	0.5-1	10/06/2011	7.15	---	126	---
NA-12 (0-0.5)	0-0.5	10/06/2011	12.8	---	133	---
NA-13 (0-0.5)	0-0.5	10/06/2011	8.68	---	118	---
NA-14 (0-0.5)	0-0.5	10/06/2011	9.31	---	93.5	---
NA-15 (0-0.5)	0-0.5	10/06/2011	7.64	---	184	---
NA-16 (0-0.5)	0-0.5	10/06/2011	13.3	---	15	---
NA-8 (0-0.5)	0-0.5	10/06/2011	8.82	---	180	---
NA-9 (0-0.5)	0-0.5	10/06/2011	7.23	---	62.9	---

Notes:

1. Concentrations exceeding the Residential Assessment Level (RAL) or the Site-specific cleanup value (lead only: 250mg/kg) are bolded.
2. Synthetic precipitation leaching procedure results for arsenic include 0.00029 mg/L for MW-6 (1-2) and 0.0032 mg/L for MW-8 (1-2).

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Texas: T104704232-11-2

Report of Sample Analysis

Pastor, Behling and Wheeler LLC.
2201 Double Creek Dr., Suite 4004
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ATTN: Eric Pastor

Project: Stewart Creek WWTP Soil Inv.
Project #: 1624-North Area
Print Date/Time: 08/15/11 15:38

Attached is our analytical report for the samples received for your project. Below is a list of your individual sample descriptions with our corresponding laboratory number. We also have enclosed a copy of the Chain of Custody that was received with your samples and a form documenting the condition of your samples upon arrival. Please note any unused portion of the samples may be discarded upon expiration of the EPA holding time for the analysis performed or after 30 days from the above report date, unless you have requested otherwise.

ERMI Environmental Laboratories certifies that all results contained in this report were produced in accordance with the requirements of the National Environmental Laboratory Accreditation Program (NELAP) unless otherwise noted. The results presented apply to the samples analyzed in accordance with the chain-of-custody document(s) furnished with the samples. This report is intended for the sole use of the customer for whom the work was performed and must be reproduced, without modification, in its entirety.

Sample Identification

Laboratory ID #	Client Sample ID	Matrix	Sampled Date/Time	Received Date/Time
1108308-01	NA-1	Solid	08/11/11 13:00	08/11/11 15:40
1108308-02	NA-2	Solid	08/11/11 13:07	08/11/11 15:40
1108308-03	NA-3	Solid	08/11/11 13:15	08/11/11 15:40
1108308-04	NA-4	Solid	08/11/11 13:25	08/11/11 15:40
1108308-05	NA-5	Solid	08/11/11 13:43	08/11/11 15:40
1108308-06	NA-6	Solid	08/11/11 13:55	08/11/11 15:40
1108308-07	NA-7	Solid	08/11/11 14:08	08/11/11 15:40

Thank you for the opportunity to serve your environmental chemistry analysis needs. If you have any questions or concerns regarding this report please contact our Customer Service Department at the phone number below.

Respectfully submitted,

Kendall K. Brown
President

Local: (972) 727-1123 **Long Distance: (800) 228-ERMI** **FAX: (972) 727-1175**

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Project: Stewart Creek WWTP Soil Inv.
Project #: 1624-North Area
Print Date/Time: 08/15/11 15:38

Laboratory ID #: 1108308-01
Sample Type: Grab
Matrix: Solid
Sample Collected By: Eric Pastor — Customer
Sample Description: NA-1
Sample Date/Time: 08/11/11 1300

Analyte(s)	Result	SDL	MQL	Units	F*	Inst	Batch	Analysis Date/Time	Anlst	Flag
Conventional Chemistry Parameters, SM 2540G										
% Solids	**97**	0.040	0.2	%	1.00	W2	1H12026	08/12/11 1542	MDG	
Metals (Total), EPA 3050B										
Acid Digestion of Sludges/Solids	**Completed**	N/A	N/A	-	51.02	DB1	1H11028	08/11/11 1515	SPS	
Metals (Total), EPA 6010B										**R-01**
Arsenic	**10.0**	0.66	0.25	mg/kg dry	10.20	M4	1H11028	08/12/11 1540	SPS	
Cadmium	**1.27**	0.78	0.221	mg/kg dry	10.20	M4	1H11028	08/12/11 1540	SPS	J
Lead	**308**	1.48	0.42	mg/kg dry	10.20	M4	1H11028	08/12/11 1540	SPS	
Selenium	**ND**	1.69	0.4	mg/kg dry	10.20	M4	1H11028	08/12/11 1540	SPS	

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Report of Sample Analysis

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Project: Stewart Creek WWTP Soil Inv.
Project #: 1624-North Area
Print Date/Time: 08/15/11 15:38

Laboratory ID #: 1108308-02
Sample Type: Grab
Matrix: Solid
Sample Collected By: Eric Pastor — Customer
Sample Description: NA-2
Sample Date/Time: 08/11/11 1307

Analyte(s)	Result	SDL	MQL	Units	F*	Inst	Batch	Analysis Date/Time	Anlst	Flag
Conventional Chemistry Parameters, SM 2540G										
% Solids	**96**	0.040	0.2	%	1.00	W2	1H12026	08/12/11 1542	MDG	
Metals (Total), EPA 3050B										
Acid Digestion of Sludges/Solids	**Completed**	N/A	N/A	-	50.00	DB1	1H11028	08/11/11 1515	SPS	
Metals (Total), EPA 6010B										**R-01**
Arsenic	**12.2**	0.65	0.25	mg/kg dry	10.00	M4	1H11028	08/12/11 1547	SPS	
Cadmium	**0.94**	0.77	0.221	mg/kg dry	10.00	M4	1H11028	08/12/11 1547	SPS	J
Lead	**228**	1.46	0.42	mg/kg dry	10.00	M4	1H11028	08/12/11 1547	SPS	
Selenium	**ND**	1.66	0.4	mg/kg dry	10.00	M4	1H11028	08/12/11 1547	SPS	

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Project: Stewart Creek WWTP Soil Inv.
Project #: 1624-North Area
Print Date/Time: 08/15/11 15:38

Laboratory ID #: 1108308-03
Sample Type: Grab
Matrix: Solid
Sample Collected By: Eric Pastor — Customer
Sample Description: NA-3
Sample Date/Time: 08/11/11 1315

Analyte(s)	Result	SDL	MQL	Units	F*	Inst	Batch	Analysis Date/Time	Anlst	Flag
Conventional Chemistry Parameters, SM 2540G										
% Solids	**94**	0.040	0.2	%	1.00	W2	1H12026	08/12/11 1542	MDG	
Metals (Total), EPA 3050B										
Acid Digestion of Sludges/Solids	**Completed**	N/A	N/A	-	51.02	DB1	1H11028	08/11/11 1515	SPS	
Metals (Total), EPA 6010B										**R-01**
Arsenic	**11.7**	0.68	0.25	mg/kg dry	10.20	M4	1H11028	08/12/11 1554	SPS	
Cadmium	**0.92**	0.80	0.221	mg/kg dry	10.20	M4	1H11028	08/12/11 1554	SPS	J
Lead	**80.6**	1.52	0.42	mg/kg dry	10.20	M4	1H11028	08/12/11 1554	SPS	
Selenium	**ND**	1.73	0.4	mg/kg dry	10.20	M4	1H11028	08/12/11 1554	SPS	

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Print Date/Time: 08/15/11 15:38

Laboratory ID #: 1108308-04
Sample Type: Grab
Matrix: Solid
Sample Collected By: Eric Pastor — Customer
Sample Description: NA-4
Sample Date/Time: 08/11/11 1325

Analyte(s)	Result	SDL	MQL	Units	F*	Inst	Batch	Analysis Date/Time	Anlst	Flag
Conventional Chemistry Parameters, SM 2540G										
% Solids	**90**	0.040	0.2	%	1.00	W2	1H12026	08/12/11 1542	MDG	
Metals (Total), EPA 3050B										
Acid Digestion of Sludges/Solids	**Completed**	N/A	N/A	-	51.02	DB1	1H11028	08/11/11 1515	SPS	
Metals (Total), EPA 6010B										**R-01**
Arsenic	**12.5**	0.71	0.25	mg/kg dry	10.20	M4	1H11028	08/12/11 1602	SPS	
Cadmium	**1.81**	0.84	0.221	mg/kg dry	10.20	M4	1H11028	08/12/11 1602	SPS	J
Lead	**693**	1.58	0.42	mg/kg dry	10.20	M4	1H11028	08/12/11 1602	SPS	
Selenium	**ND**	1.81	0.4	mg/kg dry	10.20	M4	1H11028	08/12/11 1602	SPS	

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Report of Sample Analysis

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Project: Stewart Creek WWTP Soil Inv.
Project #: 1624-North Area
Print Date/Time: 08/15/11 15:38

Laboratory ID #: 1108308-05
Sample Type: Grab
Matrix: Solid
Sample Collected By: Eric Pastor — Customer
Sample Description: NA-5
Sample Date/Time: 08/11/11 1343

Analyte(s)	Result	SDL	MQL	Units	F*	Inst	Batch	Analysis Date/Time	Anlst	Flag
Conventional Chemistry Parameters, SM 2540G										
% Solids	**87**	0.040	0.2	%	1.00	W2	1H12026	08/12/11 1542	MDG	
Metals (Total), EPA 3050B										
Acid Digestion of Sludges/Solids	**Completed**	N/A	N/A	-	48.08	DB1	1H11028	08/11/11 1515	SPS	
Metals (Total), EPA 6010B										**R-01**
Arsenic	**12.6**	0.70	0.25	mg/kg dry	9.62	M4	1H11028	08/12/11 1610	SPS	
Cadmium	**1.55**	0.82	0.221	mg/kg dry	9.62	M4	1H11028	08/12/11 1610	SPS	J
Lead	**671**	1.55	0.42	mg/kg dry	9.62	M4	1H11028	08/12/11 1610	SPS	
Selenium	**ND**	1.77	0.4	mg/kg dry	9.62	M4	1H11028	08/12/11 1610	SPS	

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Project #: 1624-North Area
Print Date/Time: 08/15/11 15:38

Laboratory ID #: 1108308-06
Sample Type: Grab
Matrix: Solid
Sample Collected By: Eric Pastor — Customer
Sample Description: NA-6
Sample Date/Time: 08/11/11 1355

Analyte(s)	Result	SDL	MQL	Units	F*	Inst	Batch	Analysis Date/Time	Anlst	Flag
Conventional Chemistry Parameters, SM 2540G										
% Solids	**94**	0.040	0.2	%	1.00	W2	1H12026	08/12/11 1542	MDG	
Metals (Total), EPA 3050B										
Acid Digestion of Sludges/Solids	**Completed**	N/A	N/A	-	52.63	DB1	1H11028	08/11/11 1515	SPS	
Metals (Total), EPA 6010B										**R-01**
Arsenic	**12.3**	1.41	0.25	mg/kg dry	21.05	M4	1H11028	08/12/11 1637	SPS	
Cadmium	**ND**	1.66	0.221	mg/kg dry	21.05	M4	1H11028	08/12/11 1637	SPS	
Lead	**728**	3.13	0.42	mg/kg dry	21.05	M4	1H11028	08/12/11 1637	SPS	
Selenium	**ND**	3.58	0.4	mg/kg dry	21.05	M4	1H11028	08/12/11 1637	SPS	

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Report of Sample Analysis

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Project: Stewart Creek WWTP Soil Inv.
Project #: 1624-North Area
Print Date/Time: 08/15/11 15:38

Laboratory ID #: 1108308-07
Sample Type: Grab
Matrix: Solid
Sample Collected By: Eric Pastor — Customer
Sample Description: NA-7
Sample Date/Time: 08/11/11 1408

Analyte(s)	Result	SDL	MQL	Units	F*	Inst	Batch	Analysis Date/Time	Anlst	Flag
Conventional Chemistry Parameters, SM 2540G										
% Solids	**90**	0.040	0.2	%	1.00	W2	1H12026	08/12/11 1542	MDG	
Metals (Total), EPA 3050B										
Acid Digestion of Sludges/Solids	**Completed**	N/A	N/A	-	48.08	DB1	1H11028	08/11/11 1515	SPS	
Metals (Total), EPA 6010B										**R-01**
Arsenic	**7.03**	1.34	0.25	mg/kg dry	19.23	M4	1H11028	08/12/11 1645	SPS	
Cadmium	**ND**	1.58	0.221	mg/kg dry	19.23	M4	1H11028	08/12/11 1645	SPS	
Lead	**120**	2.98	0.42	mg/kg dry	19.23	M4	1H11028	08/12/11 1645	SPS	
Selenium	**ND**	3.41	0.4	mg/kg dry	19.23	M4	1H11028	08/12/11 1645	SPS	

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Project: Stewart Creek WWTP Soil Inv.
Project #: 1624-North Area
Print Date/Time: 08/15/11 15:38

Conventional Chemistry Parameters - Quality Control

Analyte(s)	Result	*SDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Blank (1H12026-BLK1)										
Prepared & Analyzed: 08/12/11 15:42										
% Solids	**ND**	0.040	%							
Duplicate (1H12026-DUP1)										
Prepared & Analyzed: 08/12/11 15:42					**Source: 1108308-01**					
% Solids	**97**	0.040	%		97			0	4	

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Project: Stewart Creek WWTP Soil Inv.
Project #: 1624-North Area
Print Date/Time: 08/15/11 15:38

Metals (Total) - Quality Control

Analyte(s)	Result	*SDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Blank (1H11028-BLK1) Prepared & Analyzed: 08/11/11 15:15										
Acid Digestion of Sludges/Solids	**Completed**	N/A	-							
Arsenic	**ND**	0.06	mg/kg wet							
Cadmium	**ND**	0.07	mg/kg wet							
Lead	**ND**	0.14	mg/kg wet							
Selenium	**0.26**	0.16	mg/kg wet							J
Laboratory Control Sample (1H11028-BS1) Prepared & Analyzed: 08/11/11 15:15										
Acid Digestion of Sludges/Solids	**Completed**	N/A	-				0-0			
Arsenic	**24.5**	0.06	mg/kg wet	25.0		98	85-113			
Cadmium	**24.6**	0.07	mg/kg wet	25.0		98	85-115			
Lead	**24.1**	0.14	mg/kg wet	25.0		96	85-114			
Selenium	**47.1**	0.16	mg/kg wet	50.0		94	85-110			
Laboratory Control Sample Duplicate (1H11028-BSD1) Prepared & Analyzed: 08/11/11 15:15										
Acid Digestion of Sludges/Solids	**Completed**	N/A	-				0-0		0	
Arsenic	**24.0**	0.06	mg/kg wet	25.0		96	85-113	2	5	
Cadmium	**24.1**	0.07	mg/kg wet	25.0		96	85-115	2	5	
Lead	**24.0**	0.14	mg/kg wet	25.0		96	85-114	0.7	5	
Selenium	**45.9**	0.16	mg/kg wet	50.0		92	85-110	2	6	
Matrix Spike (1H11028-MS1) Prepared & Analyzed: 08/11/11 15:15					**Source: 1108233-01**					
Acid Digestion of Sludges/Solids	**Completed**	N/A	-		ND		0-0			
Arsenic	**1010**	20.3	mg/kg dry	806	ND	126	75-125			Q-02, R-01
Cadmium	**963**	23.9	mg/kg dry	806	3.62	119	75-125			R-01
Lead	**1080**	45.2	mg/kg dry	806	67.8	125	75-125			R-01
Selenium	**2050**	51.6	mg/kg dry	1610	17.9	126	75-125			Q-02, R-01

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Report of Sample Analysis

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Project: Stewart Creek WWTP Soil Inv.
Project #: 1624-North Area
Print Date/Time: 08/15/11 15:38

Metals (Total) - Quality Control

Analyte(s)	Result	*SDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Matrix Spike Duplicate (1H11028-MSD1) Prepared & Analyzed: 08/11/11 15:15					**Source: 1108233-01**					
Acid Digestion of Sludges/Solids	**Completed**	N/A	-		ND		0-0		0	
Arsenic	**976**	20.1	mg/kg dry	798	ND	122	75-125	4	20	R-01
Cadmium	**942**	23.6	mg/kg dry	798	3.62	118	75-125	2	15	R-01
Lead	**1060**	44.7	mg/kg dry	798	67.8	124	75-125	2	20	R-01
Selenium	**1980**	51.1	mg/kg dry	1600	17.9	123	75-125	4	19	R-01

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Project: Stewart Creek WWTP Soil Inv.
Project #: 1624-North Area
Print Date/Time: 08/15/11 15:38

Notes and Definitions

The results presented in this report were generated using those methods given in 40 CFR Part 136 for Water and Wastewater samples and in SW-846 for RCRA/Solid Waste samples.

J	This value is above the method detection limit but below the reporting limit.
Q-02	The recovery of this analyte in the MS was outside the acceptable range due to interference, large dilutions required for analysis or a combination of these factors. The recovery of this analyte in the LCS(s) was within the acceptable range.
R-01	The higher reporting limit is due to dilutions required for analysis as a result of a high concentration of target and/or non-target parameters in this sample.
ND	Analyte NOT DETECTED at or above the reporting limit
dry	Sample results reported on a dry weight basis
LCS/LCSD	Laboratory Control Sample/Laboratory Control Sample Duplicate
MS/MSD	Matrix Spike/Matrix Spike Duplicate
RPD	Relative Percent Difference
mg/kg	milligrams per kilogram
mg/l	milligrams per liter
ug/kg	micrograms per kilogram
ug/l	micrograms per liter
exc	Not covered under scope of NELAP accreditation.
F*	Calculated factor rounded to 3 significant figures. Concentration factor when <1.00 and dilution factor when >1.00.
Inst	Instrument Identification
Anlst	Analyst Initials
SDL	Sample Detection Limit
MQL	Method Quantitation Limit
naa	This analysis/parameter is not accreditable under the current NELAP program

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Project: Stewart Creek WWTP Soil Inv.
Project #: 1721-North Area
Print Date/Time: 10/14/11 16:58

Attached is our analytical report for the samples received for your project. Below is a list of your individual sample descriptions with our corresponding laboratory number. We also have enclosed a copy of the Chain of Custody that was received with your samples and a form documenting the condition of your samples upon arrival. Please note any unused portion of the samples may be discarded upon expiration of the EPA holding time for the analysis performed or after 30 days from the above report date, unless you have requested otherwise.

ERMI Environmental Laboratories certifies that all results contained in this report were produced in accordance with the requirements of the National Environmental Laboratory Accreditation Program (NELAP) unless otherwise noted. The results presented apply to the samples analyzed in accordance with the chain-of-custody document(s) furnished with the samples. This report is intended for the sole use of the customer for whom the work was performed and must be reproduced, without modification, in its entirety.

Sample Identification

Laboratory ID #	Client Sample ID	Matrix	Sampled Date/Time	Received Date/Time
1110261-01	NA-12 (0-0.5)	Solid	10/06/11 08:51	10/07/11 11:48
1110261-02	NA-13 (0-0.5)	Solid	10/06/11 11:25	10/07/11 11:48
1110261-03	NA-11 (0.5-1.0)	Solid	10/06/11 10:45	10/07/11 11:48
1110261-04	NA-14 (0-0.5)	Solid	10/06/11 11:50	10/07/11 11:48
1110261-05	NA-15 (0-0.5)	Solid	10/06/11 12:04	10/07/11 11:48
1110261-06	NA-10 (0-0.5)	Solid	10/06/11 12:12	10/07/11 11:48
1110261-07	NA-8 (0-0.5)	Solid	10/06/11 12:40	10/07/11 11:48
1110261-08	NA-16 (0-0.5)	Solid	10/06/11 14:41	10/07/11 11:48
1110261-09	NA-9 (0-0.5)	Solid	10/06/11 14:05	10/07/11 11:48

Thank you for the opportunity to serve your environmental chemistry analysis needs. If you have any questions or concerns regarding this report please contact our Customer Service Department at the phone number below.

Respectfully submitted,

Kendall K. Brown
President

Local: (972) 727-1123 **Long Distance: (800) 228-ERMI** **FAX: (972) 727-1175**

Environmental Laboratories
Bethany Tech Center • Suite 190
400 W. Bethany Rd. • Allen, Texas 75013

State Certifications
Arkansas: 88-0647
Oklahoma: 8727
Louisiana: 02007
Kansas: E-10388
Texas: T104704232-11-2

Report of Sample Analysis

Pastor, Behling and Wheeler LLC.
2201 Double Creek Dr., Suite 4004
Round Rock, TX 78664
ATTN: Eric Pastor

Project: Stewart Creek WWTP Soil Inv.
Project #: 1721-North Area
Print Date/Time: 10/14/11 16:58

Laboratory ID #: 1110261-01
Sample Description: NA-12 (0-0.5)
Sample Type: Grab
Matrix: Solid
Sample Date/Time: 10/06/11 0851
Sample Collected By: Chris Moore
Customer

Analyte(s)	Result	SDL	MQL	Units	F*	Inst	Batch	Analysis Date/Time	Anlst	Flag
Conventional Chemistry Parameters, SM 2540G										
% Solids	**90**	0.040	0.2	%	1.00	W2	1J11009	10/11/11 1018	MDG	
Metals (Total), EPA 3050B										
Acid Digestion of Sludges/Solids	**Completed**	N/A	N/A	-	51.02	DB2	1J12026	10/12/11 1133	SPS	
Metals (Total), EPA 6010B										
Arsenic	**12.8**	1.43	0.25	mg/kg dry	20.41	M4	1J12026	10/13/11 1505	SPS	R-01

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Report of Sample Analysis

Pastor, Behling and Wheeler LLC.
2201 Double Creek Dr., Suite 4004
Round Rock, TX 78664
ATTN: Eric Pastor

Project: Stewart Creek WWTP Soil Inv.
Project #: 1721-North Area
Print Date/Time: 10/14/11 16:58

Laboratory ID #: 1110261-02
Sample Type: Grab
Matrix: Solid
Sample Collected By: Chris Moore — Customer
Sample Description: NA-13 (0-0.5)
Sample Date/Time: 10/06/11 1125

Analyte(s)	Result	SDL	MQL	Units	F*	Inst	Batch	Analysis Date/Time	Anlst	Flag
Conventional Chemistry Parameters, SM 2540G										
% Solids	**85**	0.040	0.2	%	1.00	W2	1J11009	10/11/11 1018	MDG	
Metals (Total), EPA 3050B										
Acid Digestion of Sludges/Solids	**Completed**	N/A	N/A	-	49.02	DB2	1J12026	10/12/11 1133	SPS	
Metals (Total), EPA 6010B										
Arsenic	**8.68**	0.73	0.25	mg/kg dry	9.80	M4	1J12026	10/13/11 1745	SPS	R-01

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Report of Sample Analysis

Pastor, Behling and Wheeler LLC.
2201 Double Creek Dr., Suite 4004
Round Rock, TX 78664
ATTN: Eric Pastor

Project: Stewart Creek WWTP Soil Inv.
Project #: 1721-North Area
Print Date/Time: 10/14/11 16:58

Laboratory ID #: 1110261-03
Sample Type: Grab
Matrix: Solid
Sample Collected By: Chris Moore — Customer
Sample Description: NA-11 (0.5-1.0)
Sample Date/Time: 10/06/11 1045

Analyte(s)	Result	SDL	MQL	Units	F*	Inst	Batch	Analysis Date/Time	Anlst	Flag
Conventional Chemistry Parameters, SM 2540G										
% Solids	**84**	0.040	0.2	%	1.00	W2	1J11009	10/11/11 1018	MDG	
Metals (Total), EPA 3050B										
Acid Digestion of Sludges/Solids	**Completed**	N/A	N/A	-	49.50	DB2	1J12026	10/12/11 1133	SPS	
Metals (Total), EPA 6010B										
Arsenic	**7.15**	0.74	0.25	mg/kg dry	9.90	M4	1J12026	10/13/11 1751	SPS	R-01

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Report of Sample Analysis

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2201 Double Creek Dr., Suite 4004
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Project: Stewart Creek WWTP Soil Inv.
Project #: 1721-North Area
Print Date/Time: 10/14/11 16:58

Laboratory ID #: 1110261-04
Sample Type: Grab
Matrix: Solid
Sample Collected By: Chris Moore — Customer
Sample Description: NA-14 (0-0.5)
Sample Date/Time: 10/06/11 1150

Analyte(s)	Result	SDL	MQL	Units	F*	Inst	Batch	Analysis Date/Time	Anlst	Flag
Conventional Chemistry Parameters, SM 2540G										
% Solids	**92**	0.040	0.2	%	1.00	W2	1J11009	10/11/11 1018	MDG	
Metals (Total), EPA 3050B										
Acid Digestion of Sludges/Solids	**Completed**	N/A	N/A	-	49.50	DB2	1J12026	10/12/11 1133	SPS	
Metals (Total), EPA 6010B										
Arsenic	**9.31**	1.36	0.25	mg/kg dry	19.80	M4	1J12026	10/13/11 1555	SPS	R-01

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Report of Sample Analysis

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Project: Stewart Creek WWTP Soil Inv.
Project #: 1721-North Area
Print Date/Time: 10/14/11 16:58

Laboratory ID #: 1110261-05
Sample Type: Grab
Matrix: Solid
Sample Collected By: Chris Moore — Customer
Sample Description: NA-15 (0-0.5)
Sample Date/Time: 10/06/11 1204

Analyte(s)	Result	SDL	MQL	Units	F*	Inst	Batch	Analysis Date/Time	Anlst	Flag
Conventional Chemistry Parameters, SM 2540G										
% Solids	**85**	0.040	0.2	%	1.00	W2	1J11009	10/11/11 1018	MDG	
Metals (Total), EPA 3050B										
Acid Digestion of Sludges/Solids	**Completed**	N/A	N/A	-	51.55	DB2	1J12026	10/12/11 1133	SPS	
Metals (Total), EPA 6010B										
Arsenic	**7.64**	0.76	0.25	mg/kg dry	10.31	M4	1J12026	10/13/11 1758	SPS	R-01

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Project #: 1721-North Area
Print Date/Time: 10/14/11 16:58

Laboratory ID #: 1110261-06
Sample Type: Grab
Matrix: Solid
Sample Collected By: Chris Moore — Customer
Sample Description: NA-10 (0-0.5)
Sample Date/Time: 10/06/11 1212

Analyte(s)	Result	SDL	MQL	Units	F*	Inst	Batch	Analysis Date/Time	Anlst	Flag
Conventional Chemistry Parameters, SM 2540G										
% Solids	**85**	0.040	0.2	%	1.00	W2	1J11009	10/11/11 1018	MDG	
Metals (Total), EPA 3050B										
Acid Digestion of Sludges/Solids	**Completed**	N/A	N/A	-	48.08	DB2	1J12026	10/12/11 1133	SPS	
Metals (Total), EPA 6010B										
Arsenic	**30.5**	1.42	0.25	mg/kg dry	19.23	M4	1J12026	10/13/11 1607	SPS	R-01

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Report of Sample Analysis

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Project: Stewart Creek WWTP Soil Inv.
Project #: 1721-North Area
Print Date/Time: 10/14/11 16:58

Laboratory ID #: 1110261-07
Sample Type: Grab
Matrix: Solid
Sample Collected By: Chris Moore — Customer
Sample Description: NA-8 (0-0.5)
Sample Date/Time: 10/06/11 1240

Analyte(s)	Result	SDL	MQL	Units	F*	Inst	Batch	Analysis Date/Time	Anlst	Flag
Conventional Chemistry Parameters, SM 2540G										
% Solids	**83**	0.040	0.2	%	1.00	W2	1J11009	10/11/11 1018	MDG	
Metals (Total), EPA 3050B										
Acid Digestion of Sludges/Solids	**Completed**	N/A	N/A	-	50.00	DB2	1J12026	10/12/11 1133	SPS	
Metals (Total), EPA 6010B										
Arsenic	**8.82**	0.76	0.25	mg/kg dry	10.00	M4	1J12026	10/13/11 1805	SPS	R-01

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ATTN: Eric Pastor

Project: Stewart Creek WWTP Soil Inv.
Project #: 1721-North Area
Print Date/Time: 10/14/11 16:58

Laboratory ID #: 1110261-08
Sample Type: Grab
Matrix: Solid
Sample Collected By: Chris Moore — Customer
Sample Description: NA-16 (0-0.5)
Sample Date/Time: 10/06/11 1441

Analyte(s)	Result	SDL	MQL	Units	F*	Inst	Batch	Analysis Date/Time	Anlst	Flag
Conventional Chemistry Parameters, SM 2540G										
% Solids	**93**	0.040	0.2	%	1.00	W2	1J11009	10/11/11 1018	MDG	
Metals (Total), EPA 3050B										
Acid Digestion of Sludges/Solids	**Completed**	N/A	N/A	-	52.63	DB2	1J12026	10/12/11 1133	SPS	
Metals (Total), EPA 6010B										
Arsenic	**13.3**	1.43	0.25	mg/kg dry	21.05	M4	1J12026	10/13/11 1621	SPS	R-01

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Project: Stewart Creek WWTP Soil Inv.
Project #: 1721-North Area
Print Date/Time: 10/14/11 16:58

Laboratory ID #: 1110261-09
Sample Type: Grab
Matrix: Solid
Sample Collected By: Chris Moore — Customer
Sample Description: NA-9 (0-0.5)
Sample Date/Time: 10/06/11 1405

Analyte(s)	Result	SDL	MQL	Units	F*	Inst	Batch	Analysis Date/Time	Anlst	Flag
Conventional Chemistry Parameters, SM 2540G										
% Solids	**88**	0.040	0.2	%	1.00	W2	1J11009	10/11/11 1018	MDG	
Metals (Total), EPA 3050B										
Acid Digestion of Sludges/Solids	**Completed**	N/A	N/A	-	51.02	DB2	1J12026	10/12/11 1133	SPS	
Metals (Total), EPA 6010B										
Arsenic	**7.23**	0.73	0.25	mg/kg dry	10.20	M4	1J12026	10/13/11 1812	SPS	R-01

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Report of Sample Analysis

Pastor, Behling and Wheeler LLC.
2201 Double Creek Dr., Suite 4004
Round Rock, TX 78664
ATTN: Eric Pastor

Project: Stewart Creek WWTP Soil Inv.
Project #: 1721-North Area
Print Date/Time: 10/14/11 16:58

Conventional Chemistry Parameters - Quality Control

Analyte(s)	Result	*SDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Blank (1J11009-BLK1)										
Prepared & Analyzed: 10/11/11 10:18										
% Solids	**ND**	0.040	%							
Duplicate (1J11009-DUP1)										
Prepared & Analyzed: 10/11/11 10:18					**Source: 1110176-01**					
% Solids	**89**	0.040	%		89			0.3	7	
Duplicate (1J11009-DUP2)										
Prepared & Analyzed: 10/11/11 10:18					**Source: 1110261-08**					
% Solids	**94**	0.040	%		93			0.9	7	

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Report of Sample Analysis

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Project: Stewart Creek WWTP Soil Inv.
Project #: 1721-North Area
Print Date/Time: 10/14/11 16:58

Metals (Total) - Quality Control

Analyte(s)	Result	*SDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Blank (1J12026-BLK1) Prepared & Analyzed: 10/12/11 11:33										
Acid Digestion of Sludges/Solids	**Completed**	N/A	-							
Arsenic	**ND**	0.06	mg/kg wet							
Laboratory Control Sample (1J12026-BS1) Prepared & Analyzed: 10/12/11 11:33										
Acid Digestion of Sludges/Solids	**Completed**	N/A	-				0-0			
Arsenic	**24.9**	0.06	mg/kg wet	24.8		100	85-113			
Laboratory Control Sample Duplicate (1J12026-BSD1) Prepared & Analyzed: 10/12/11 11:33										
Acid Digestion of Sludges/Solids	**Completed**	N/A	-				0-0		0	
Arsenic	**25.6**	0.06	mg/kg wet	24.8		103	85-113	3	5	
Matrix Spike (1J12026-MS1) Prepared & Analyzed: 10/12/11 11:33					**Source: 1110203-01**					
Acid Digestion of Sludges/Solids	**Completed**	N/A	-		ND		0-0			
Arsenic	**26.5**	0.60	mg/kg wet	23.8	0.50	109	75-125			R-01
Matrix Spike (1J12026-MS2) Prepared & Analyzed: 10/12/11 11:33					**Source: 1110261-01**					
Acid Digestion of Sludges/Solids	**Completed**	N/A	-		ND		0-0			
Arsenic	**43.6**	1.37	mg/kg dry	27.2	12.8	113	75-125			R-01
Matrix Spike Duplicate (1J12026-MSD1) Prepared & Analyzed: 10/12/11 11:33					**Source: 1110203-01**					
Acid Digestion of Sludges/Solids	**Completed**	N/A	-		ND		0-0		0	
Arsenic	**25.4**	0.60	mg/kg wet	23.8	0.50	105	75-125	4	20	R-01

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Report of Sample Analysis

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ATTN: Eric Pastor

Project: Stewart Creek WWTP Soil Inv.
Project #: 1721-North Area
Print Date/Time: 10/14/11 16:58

Metals (Total) - Quality Control

Analyte(s)	Result	*SDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Matrix Spike Duplicate (1J12026-MSD2)					**Source: 1110261-01**					
Prepared & Analyzed: 10/12/11 11:33										
Acid Digestion of Sludges/Solids	**Completed**	N/A	-		ND		0-0		0	
Arsenic	**39.0**	1.33	mg/kg dry	26.4	12.8	99	75-125	11	20	R-01

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ATTN: Eric Pastor

Project: Stewart Creek WWTP Soil Inv.
Project #: 1721-North Area
Print Date/Time: 10/14/11 16:58

Notes and Definitions

The results presented in this report were generated using those methods given in 40 CFR Part 136 for Water and Wastewater samples and in SW-846 for RCRA/Solid Waste samples.

R-01	The higher reporting limit is due to dilutions required for analysis as a result of a high concentration of target and/or non-target parameters in this sample.
ND	Analyte NOT DETECTED at or above the reporting limit
dry	Sample results reported on a dry weight basis
LCS/LCSD	Laboratory Control Sample/Laboratory Control Sample Duplicate
MS/MSD	Matrix Spike/Matrix Spike Duplicate
RPD	Relative Percent Difference
mg/kg	milligrams per kilogram
mg/l	milligrams per liter
ug/kg	micrograms per kilogram
ug/l	micrograms per liter
exc	Not covered under scope of NELAP accreditation.
F*	Calculated factor rounded to 3 significant figures. Concentration factor when <1.00 and dilution factor when >1.00.
Inst	Instrument Identification
Anlst	Analyst Initials
SDL	Sample Detection Limit
MQL	Method Quantitation Limit
naa	This analysis/parameter is not accreditable under the current NELAP program

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Report of Sample Analysis

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2201 Double Creek Dr., Suite 4004
Round Rock, TX 78664
ATTN: Eric Pastor

Project: Stewart Creek WWTP Soil Inv.
Project #: 1721-North Area
Print Date/Time: 10/18/11 16:44

Attached is our analytical report for the samples received for your project. Below is a list of your individual sample descriptions with our corresponding laboratory number. We also have enclosed a copy of the Chain of Custody that was received with your samples and a form documenting the condition of your samples upon arrival. Please note any unused portion of the samples may be discarded upon expiration of the EPA holding time for the analysis performed or after 30 days from the above report date, unless you have requested otherwise.

ERMI Environmental Laboratories certifies that all results contained in this report were produced in accordance with the requirements of the National Environmental Laboratory Accreditation Program (NELAP) unless otherwise noted. The results presented apply to the samples analyzed in accordance with the chain-of-custody document(s) furnished with the samples. This report is intended for the sole use of the customer for whom the work was performed and must be reproduced, without modification, in its entirety.

Sample Identification

Laboratory ID #	Client Sample ID	Matrix	Sampled Date/Time	Received Date/Time
1110463-01	NA-12 (0-0.5)	Solid	10/06/11 08:51	10/17/11 08:48
1110463-02	NA-13 (0-0.5)	Solid	10/06/11 11:25	10/17/11 08:48
1110463-03	NA-11 (0.5-1.0)	Solid	10/06/11 10:45	10/17/11 08:48
1110463-04	NA-14 (0-0.5)	Solid	10/06/11 11:50	10/17/11 08:48
1110463-05	NA-15 (0-0.5)	Solid	10/06/11 12:04	10/17/11 08:48
1110463-06	NA-10 (0-0.5)	Solid	10/06/11 12:12	10/17/11 08:48
1110463-07	NA-8 (0-0.5)	Solid	10/06/11 12:40	10/17/11 08:48
1110463-08	NA-16 (0-0.5)	Solid	10/06/11 14:41	10/17/11 08:48
1110463-09	NA-9 (0-0.5)	Solid	10/06/11 14:05	10/17/11 08:48

Thank you for the opportunity to serve your environmental chemistry analysis needs. If you have any questions or concerns regarding this report please contact our Customer Service Department at the phone number below.

Respectfully submitted,

Kendall K. Brown
President

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Project #: 1721-North Area
Print Date/Time: 10/18/11 16:44

Laboratory ID #: 1110463-01
Sample Type: Grab
Matrix: Solid
Sample Collected By: Chris Moore — Customer
Sample Description: NA-12 (0-0.5)
Sample Date/Time: 10/06/11 0851

Analyte(s)	Result	SDL	MQL	Units	F*	Inst	Batch	Analysis Date/Time	Anlst	Flag
Conventional Chemistry Parameters, SM 2540G										
% Solids	**90**	0.040	0.2	%	1.00	W2	1J11009	10/11/11 1018	MDG	
Metals (Total), EPA 3050B										
Acid Digestion of Sludges/Solids	**Completed**	N/A	N/A	-	51.02	DB2	1J12026	10/12/11 1133	SPS	
Metals (Total), EPA 6010B										
Lead	**133**	9.51	0.42	mg/kg dry	20.41	M4	1J12026	10/13/11 1505	SPS	R-01

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Report of Sample Analysis

Pastor, Behling and Wheeler LLC.
2201 Double Creek Dr., Suite 4004
Round Rock, TX 78664
ATTN: Eric Pastor

Project: Stewart Creek WWTP Soil Inv.
Project #: 1721-North Area
Print Date/Time: 10/18/11 16:44

Laboratory ID #: 1110463-02
Sample Type: Grab
Matrix: Solid
Sample Collected By: Chris Moore — Customer
Sample Description: NA-13 (0-0.5)
Sample Date/Time: 10/06/11 1125

Analyte(s)	Result	SDL	MQL	Units	F*	Inst	Batch	Analysis Date/Time	Anlst	Flag
Conventional Chemistry Parameters, SM 2540G										
% Solids	**85**	0.040	0.2	%	1.00	W2	1J11009	10/11/11 1018	MDG	
Metals (Total), EPA 3050B										
Acid Digestion of Sludges/Solids	**Completed**	N/A	N/A	-	49.02	DB2	1J12026	10/12/11 1133	SPS	
Metals (Total), EPA 6010B										
Lead	**118**	4.86	0.42	mg/kg dry	9.80	M4	1J12026	10/13/11 1745	SPS	R-01

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Report of Sample Analysis

Pastor, Behling and Wheeler LLC.
2201 Double Creek Dr., Suite 4004
Round Rock, TX 78664
ATTN: Eric Pastor

Project: Stewart Creek WWTP Soil Inv.
Project #: 1721-North Area
Print Date/Time: 10/18/11 16:44

Laboratory ID #: 1110463-03
Sample Type: Grab
Matrix: Solid
Sample Collected By: Chris Moore — Customer
Sample Description: NA-11 (0.5-1.0)
Sample Date/Time: 10/06/11 1045

Analyte(s)	Result	SDL	MQL	Units	F*	Inst	Batch	Analysis Date/Time	Anlst	Flag
Conventional Chemistry Parameters, SM 2540G										
% Solids	**84**	0.040	0.2	%	1.00	W2	1J11009	10/11/11 1018	MDG	
Metals (Total), EPA 3050B										
Acid Digestion of Sludges/Solids	**Completed**	N/A	N/A	-	49.50	DB2	1J12026	10/12/11 1133	SPS	
Metals (Total), EPA 6010B										
Lead	**126**	4.92	0.42	mg/kg dry	9.90	M4	1J12026	10/13/11 1751	SPS	R-01

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Report of Sample Analysis

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Round Rock, TX 78664
ATTN: Eric Pastor

Project: Stewart Creek WWTP Soil Inv.
Project #: 1721-North Area
Print Date/Time: 10/18/11 16:44

Laboratory ID #: 1110463-04
Sample Type: Grab
Matrix: Solid
Sample Collected By: Chris Moore — Customer
Sample Description: NA-14 (0-0.5)
Sample Date/Time: 10/06/11 1150

Analyte(s)	Result	SDL	MQL	Units	F*	Inst	Batch	Analysis Date/Time	Anlst	Flag
Conventional Chemistry Parameters, SM 2540G										
% Solids	**92**	0.040	0.2	%	1.00	W2	1J11009	10/11/11 1018	MDG	
Metals (Total), EPA 3050B										
Acid Digestion of Sludges/Solids	**Completed**	N/A	N/A	-	49.50	DB2	1J12026	10/12/11 1133	SPS	
Metals (Total), EPA 6010B										
Lead	**93.5**	9.09	0.42	mg/kg dry	19.80	M4	1J12026	10/13/11 1555	SPS	R-01

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Report of Sample Analysis

Pastor, Behling and Wheeler LLC.
2201 Double Creek Dr., Suite 4004
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ATTN: Eric Pastor

Project: Stewart Creek WWTP Soil Inv.
Project #: 1721-North Area
Print Date/Time: 10/18/11 16:44

Laboratory ID #: 1110463-05
Sample Type: Grab
Matrix: Solid
Sample Collected By: Chris Moore — Customer
Sample Description: NA-15 (0-0.5)
Sample Date/Time: 10/06/11 1204

Analyte(s)	Result	SDL	MQL	Units	F*	Inst	Batch	Analysis Date/Time	Anlst	Flag
Conventional Chemistry Parameters, SM 2540G										
% Solids	**85**	0.040	0.2	%	1.00	W2	1J11009	10/11/11 1018	MDG	
Metals (Total), EPA 3050B										
Acid Digestion of Sludges/Solids	**Completed**	N/A	N/A	-	51.55	DB2	1J12026	10/12/11 1133	SPS	
Metals (Total), EPA 6010B										
Lead	**154**	5.09	0.42	mg/kg dry	10.31	M4	1J12026	10/13/11 1758	SPS	R-01

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Report of Sample Analysis

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Project: Stewart Creek WWTP Soil Inv.
Project #: 1721-North Area
Print Date/Time: 10/18/11 16:44

Laboratory ID #: 1110463-06
Sample Type: Grab
Matrix: Solid
Sample Collected By: Chris Moore — Customer
Sample Description: NA-10 (0-0.5)
Sample Date/Time: 10/06/11 1212

Analyte(s)	Result	SDL	MQL	Units	F*	Inst	Batch	Analysis Date/Time	Anlst	Flag
Conventional Chemistry Parameters, SM 2540G										
% Solids	**85**	0.040	0.2	%	1.00	W2	1J11009	10/11/11 1018	MDG	
Metals (Total), EPA 3050B										
Acid Digestion of Sludges/Solids	**Completed**	N/A	N/A	-	48.08	DB2	1J12026	10/12/11 1133	SPS	
Metals (Total), EPA 6010B										
Lead	**3390**	9.49	0.42	mg/kg dry	19.23	M4	1J12026	10/13/11 1607	SPS	R-01

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Report of Sample Analysis

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Project: Stewart Creek WWTP Soil Inv.
Project #: 1721-North Area
Print Date/Time: 10/18/11 16:44

Laboratory ID #: 1110463-07
Sample Type: Grab
Matrix: Solid
Sample Collected By: Chris Moore — Customer
Sample Description: NA-8 (0-0.5)
Sample Date/Time: 10/06/11 1240

Analyte(s)	Result	SDL	MQL	Units	F*	Inst	Batch	Analysis Date/Time	Anlst	Flag
Conventional Chemistry Parameters, SM 2540G										
% Solids	**83**	0.040	0.2	%	1.00	W2	1J11009	10/11/11 1018	MDG	
Metals (Total), EPA 3050B										
Acid Digestion of Sludges/Solids	**Completed**	N/A	N/A	-	50.00	DB2	1J12026	10/12/11 1133	SPS	
Metals (Total), EPA 6010B										
Lead	**180**	5.07	0.42	mg/kg dry	10.00	M4	1J12026	10/13/11 1805	SPS	R-01

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Project: Stewart Creek WWTP Soil Inv.
Project #: 1721-North Area
Print Date/Time: 10/18/11 16:44

Laboratory ID #: 1110463-08
Sample Type: Grab
Matrix: Solid
Sample Collected By: Chris Moore — Customer
Sample Description: NA-16 (0-0.5)
Sample Date/Time: 10/06/11 1441

Analyte(s)	Result	SDL	MQL	Units	F*	Inst	Batch	Analysis Date/Time	Anlst	Flag
Conventional Chemistry Parameters, SM 2540G										
% Solids	**93**	0.040	0.2	%	1.00	W2	1J11009	10/11/11 1018	MDG	
Metals (Total), EPA 3050B										
Acid Digestion of Sludges/Solids	**Completed**	N/A	N/A	-	52.63	DB2	1J12026	10/12/11 1133	SPS	
Metals (Total), EPA 6010B										
Lead	**15.0**	9.53	0.42	mg/kg dry	21.05	M4	1J12026	10/13/11 1621	SPS	R-01

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Report of Sample Analysis

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Project: Stewart Creek WWTP Soil Inv.
Project #: 1721-North Area
Print Date/Time: 10/18/11 16:44

Laboratory ID #: 1110463-09
Sample Type: Grab
Matrix: Solid
Sample Collected By: Chris Moore — Customer
Sample Description: NA-9 (0-0.5)
Sample Date/Time: 10/06/11 1405

Analyte(s)	Result	SDL	MQL	Units	F*	Inst	Batch	Analysis Date/Time	Anlst	Flag
Conventional Chemistry Parameters, SM 2540G										
% Solids	**88**	0.040	0.2	%	1.00	W2	1J11009	10/11/11 1018	MDG	
Metals (Total), EPA 3050B										
Acid Digestion of Sludges/Solids	**Completed**	N/A	N/A	-	51.02	DB2	1J12026	10/12/11 1133	SPS	
Metals (Total), EPA 6010B										
Lead	**62.9**	4.86	0.42	mg/kg dry	10.20	M4	1J12026	10/13/11 1812	SPS	R-01

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Project: Stewart Creek WWTP Soil Inv.
Project #: 1721-North Area
Print Date/Time: 10/18/11 16:44

Conventional Chemistry Parameters - Quality Control

Analyte(s)	Result	*SDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Blank (1J11009-BLK1)										
Prepared & Analyzed: 10/11/11 10:18										
% Solids	**ND**	0.040	%							
Duplicate (1J11009-DUP1)										
Prepared & Analyzed: 10/11/11 10:18					**Source: 1110176-01**					
% Solids	**89**	0.040	%		89			0.3	7	
Duplicate (1J11009-DUP2)										
Prepared & Analyzed: 10/11/11 10:18					**Source: 1110261-08**					
% Solids	**94**	0.040	%		93			0.9	7	

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Report of Sample Analysis

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2201 Double Creek Dr., Suite 4004
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ATTN: Eric Pastor

Project: Stewart Creek WWTP Soil Inv.
Project #: 1721-North Area
Print Date/Time: 10/18/11 16:44

Metals (Total) - Quality Control

Analyte(s)	Result	*SDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Blank (1J12026-BLK1)										
Prepared & Analyzed: 10/12/11 11:33										
Acid Digestion of Sludges/Solids	**Completed**	N/A	-							
Lead	**ND**	N/A	mg/kg wet							
Laboratory Control Sample (1J12026-BS1)										
Prepared & Analyzed: 10/12/11 11:33										
Acid Digestion of Sludges/Solids	**Completed**	N/A	-				0-0			
Lead	**24.6**	N/A	mg/kg wet	24.8		99	85-114			
Laboratory Control Sample Duplicate (1J12026-BSD1)										
Prepared & Analyzed: 10/12/11 11:33										
Acid Digestion of Sludges/Solids	**Completed**	N/A	-				0-0		0	
Lead	**25.3**	N/A	mg/kg wet	24.8		102	85-114	3	5	
Matrix Spike (1J12026-MS1)					**Source: 1110203-01**					
Prepared & Analyzed: 10/12/11 11:33										
Acid Digestion of Sludges/Solids	**Completed**	N/A	-		ND		0-0			
Lead	**28.1**	N/A	mg/kg wet	23.8	2.80	106	75-125			R-01
Matrix Spike (1J12026-MS2)					**Source: 1110261-01**					
Prepared & Analyzed: 10/12/11 11:33										
Acid Digestion of Sludges/Solids	**Completed**	N/A	-		ND		0-0			
Lead	**98.4**	N/A	mg/kg dry	27.2	133	-127	75-125			Q-02, R-01
Matrix Spike Duplicate (1J12026-MSD1)					**Source: 1110203-01**					
Prepared & Analyzed: 10/12/11 11:33										
Acid Digestion of Sludges/Solids	**Completed**	N/A	-		ND		0-0		0	
Lead	**27.2**	N/A	mg/kg wet	23.8	2.80	103	75-125	3	20	R-01

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Project: Stewart Creek WWTP Soil Inv.
Project #: 1721-North Area
Print Date/Time: 10/18/11 16:44

Metals (Total) - Quality Control

Analyte(s)	Result	*SDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Matrix Spike Duplicate (1J12026-MSD2)					**Source: 1110261-01**					
Prepared & Analyzed: 10/12/11 11:33										
Acid Digestion of Sludges/Solids	**Completed**	N/A	-		ND		0-0		0	
Lead	**113**	N/A	mg/kg dry	26.4	133	-75	75-125	14	20	Q-02, R-01

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Report of Sample Analysis

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Project: Stewart Creek WWTP Soil Inv.
Project #: 1721-North Area
Print Date/Time: 10/18/11 16:44

Notes and Definitions

The results presented in this report were generated using those methods given in 40 CFR Part 136 for Water and Wastewater samples and in SW-846 for RCRA/Solid Waste samples.

Q-02	The recovery of this analyte in the MS was outside the acceptable range due to interference, large dilutions required for analysis or a combination of these factors. The recovery of this analyte in the LCS(s) was within the acceptable range.
R-01	The higher reporting limit is due to dilutions required for analysis as a result of a high concentration of target and/or non-target parameters in this sample.
ND	Analyte NOT DETECTED at or above the reporting limit
dry	Sample results reported on a dry weight basis
LCS/LCSD	Laboratory Control Sample/Laboratory Control Sample Duplicate
MS/MSD	Matrix Spike/Matrix Spike Duplicate
RPD	Relative Percent Difference
mg/kg	milligrams per kilogram
mg/l	milligrams per liter
ug/kg	micrograms per kilogram
ug/l	micrograms per liter
exc	Not covered under scope of NELAP accreditation.
F*	Calculated factor rounded to 3 significant figures. Concentration factor when <1.00 and dilution factor when >1.00.
Inst	Instrument Identification
Anlst	Analyst Initials
SDL	Sample Detection Limit
MQL	Method Quantitation Limit
naa	This analysis/parameter is not accreditable under the current NELAP program

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Report of Sample Analysis

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2201 Double Creek Dr., Suite 4004
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ATTN: Eric Pastor

Project: Stewart Creek WWTP Soil Inv.
Project #: 1721-North Area
Print Date/Time: 10/26/11 16:51

Attached is our analytical report for the samples received for your project. Below is a list of your individual sample descriptions with our corresponding laboratory number. We also have enclosed a copy of the Chain of Custody that was received with your samples and a form documenting the condition of your samples upon arrival. Please note any unused portion of the samples may be discarded upon expiration of the EPA holding time for the analysis performed or after 30 days from the above report date, unless you have requested otherwise.

ERMI Environmental Laboratories certifies that all results contained in this report were produced in accordance with the requirements of the National Environmental Laboratory Accreditation Program (NELAP) unless otherwise noted. The results presented apply to the samples analyzed in accordance with the chain-of-custody document(s) furnished with the samples. This report is intended for the sole use of the customer for whom the work was performed and must be reproduced, without modification, in its entirety.

Sample Identification

Laboratory ID #	Client Sample ID	Matrix	Sampled Date/Time	Received Date/Time
1110606-01	NA-10 (0.5-1.0)	Solid	10/06/11 12:16	10/19/11 17:23

Thank you for the opportunity to serve your environmental chemistry analysis needs. If you have any questions or concerns regarding this report please contact our Customer Service Department at the phone number below.

Respectfully submitted,

Kendall K. Brown
President

Local: (972) 727-1123 **Long Distance: (800) 228-ERMI** **FAX: (972) 727-1175**

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ATTN: Eric Pastor

Project: Stewart Creek WWTP Soil Inv.
Project #: 1721-North Area
Print Date/Time: 10/26/11 16:51

Laboratory ID #: 1110606-01
Sample Type: Grab
Sample Description: NA-10 (0.5-1.0)
Matrix: Solid
Sample Date/Time: 10/06/11 1216
Sample Collected By: Chris Moore
Customer

Analyte(s)	Result	SDL	MQL	Units	F*	Inst	Batch	Analysis Date/Time	Anlst	Flag
Conventional Chemistry Parameters, SM 2540G										
% Solids	**85**	0.040	0.2	%	1.00	W3	1J21009	10/21/11 1545	KTF	S-14
Metals (Total), EPA 3050B										
Acid Digestion of Sludges/Solids	**Completed**	N/A	N/A	-	47.62	DB2	1J24043	10/24/11 1500	SPS	
Metals (Total), EPA 6010B										
Arsenic	**16.2**	0.35	0.25	mg/kg dry	4.76	M4	1J24043	10/24/11 2019	SPS	R-01
Lead	**1980**	2.36	0.42	mg/kg dry	4.76	M4	1J24043	10/24/11 2019	SPS	R-01

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Project: Stewart Creek WWTP Soil Inv.
Project #: 1721-North Area
Print Date/Time: 10/26/11 16:51

Conventional Chemistry Parameters - Quality Control

Analyte(s)	Result	*SDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Blank (1J21009-BLK1)										
Prepared & Analyzed: 10/21/11 15:45										
% Solids	**ND**	0.040	%							
Duplicate (1J21009-DUP1)										
Prepared & Analyzed: 10/21/11 15:45					**Source: 1110556-01**					
% Solids	**87**	0.040	%		87			0.8	7	

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Project: Stewart Creek WWTP Soil Inv.
Project #: 1721-North Area
Print Date/Time: 10/26/11 16:51

Metals (Total) - Quality Control

Analyte(s)	Result	*SDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Blank (1J24043-BLK1) Prepared & Analyzed: 10/24/11 15:00										
Acid Digestion of Sludges/Solids	**Completed**	N/A	-							
Arsenic	**ND**	0.06	mg/kg wet							
Lead	**ND**	N/A	mg/kg wet							
Laboratory Control Sample (1J24043-BS1) Prepared & Analyzed: 10/24/11 15:00										
Acid Digestion of Sludges/Solids	**Completed**	N/A	-				0-0			
Arsenic	**24.2**	0.06	mg/kg wet	24.8		98	85-113			
Lead	**26.0**	N/A	mg/kg wet	24.8		105	85-114			
Laboratory Control Sample Duplicate (1J24043-BSD1) Prepared & Analyzed: 10/24/11 15:00										
Acid Digestion of Sludges/Solids	**Completed**	N/A	-				0-0		0	
Arsenic	**23.8**	0.06	mg/kg wet	24.5		97	85-113	1	5	
Lead	**25.6**	N/A	mg/kg wet	24.5		104	85-114	2	5	
Matrix Spike (1J24043-MS1) Prepared & Analyzed: 10/24/11 15:00					**Source: 1110650-01**					
Acid Digestion of Sludges/Solids	**Completed**	N/A	-		ND		0-0			
Arsenic	**45.9**	0.81	mg/kg dry	32.0	5.41	126	75-125			Q-02, R-01
Lead	**123**	N/A	mg/kg dry	32.0	25.0	306	75-125			Q-02, R-01
Matrix Spike Duplicate (1J24043-MSD1) Prepared & Analyzed: 10/24/11 15:00					**Source: 1110650-01**					
Acid Digestion of Sludges/Solids	**Completed**	N/A	-		ND		0-0		0	
Arsenic	**46.9**	0.79	mg/kg dry	31.3	5.41	133	75-125	2	20	Q-02, R-01
Lead	**101**	N/A	mg/kg dry	31.3	25.0	241	75-125	20	20	Q-02, R-01

Local: (972) 727-1123 **Long Distance: (800) 228-ERMI** **FAX: (972) 727-1175**

Environmental Laboratories
Bethany Tech Center • Suite 190
400 W. Bethany Rd. • Allen, Texas 75013

State Certifications
Arkansas: 88-0647
Oklahoma: 8727
Louisiana: 02007
Kansas: E-10388
Texas: T104704232-11-2

Report of Sample Analysis

Pastor, Behling and Wheeler LLC.
2201 Double Creek Dr., Suite 4004
Round Rock, TX 78664
ATTN: Eric Pastor

Project: Stewart Creek WWTP Soil Inv.
Project #: 1721-North Area
Print Date/Time: 10/26/11 16:51

Notes and Definitions

The results presented in this report were generated using those methods given in 40 CFR Part 136 for Water and Wastewater samples and in SW-846 for RCRA/Solid Waste samples.

Q-02	The recovery of this analyte in the MS was outside the acceptable range due to interference, large dilutions required for analysis or a combination of these factors. The recovery of this analyte in the LCS(s) was within the acceptable range.
R-01	The higher reporting limit is due to dilutions required for analysis as a result of a high concentration of target and/or non-target parameters in this sample.
S-14	This analysis was performed outside the recommended holding time. This analysis is used only for dry weight calculation and is representative of the total solids present in the sample at the time the dry weight corrected analyses were performed.
ND	Analyte NOT DETECTED at or above the reporting limit
dry	Sample results reported on a dry weight basis
LCS/LCSD	Laboratory Control Sample/Laboratory Control Sample Duplicate
MS/MSD	Matrix Spike/Matrix Spike Duplicate
RPD	Relative Percent Difference
mg/kg	milligrams per kilogram
mg/l	milligrams per liter
ug/kg	micrograms per kilogram
ug/l	micrograms per liter
exc	Not covered under scope of NELAP accreditation.
F*	Calculated factor rounded to 3 significant figures. Concentration factor when <1.00 and dilution factor when >1.00.
Inst	Instrument Identification
Anlst	Analyst Initials
SDL	Sample Detection Limit
MQL	Method Quantitation Limit
naa	This analysis/parameter is not accreditable under the current NELAP program

Local: (972) 727-1123 **Long Distance: (800) 228-ERMI** **FAX: (972) 727-1175**

OFF-SITE STOCKPILED RAILROAD MUSEUM SOIL ANALYTICAL RESULTS

Gulf Coast ACCUTEST LABORATORIES

09/21/15

Technical Report for

APEX TITAN, Inc.

7020114C033/ Soil Stockpile

Accutest Job Number: TC73471

Sampling Date: 09/15/15

Report to:

APEX TITAN, Inc.
2351 W. Northwest Hwy Suite 3321
Dallas, TX 75220
LEvans@apexcos.com; JMinter@apexcos.com

ATTN: Lori Evans

Total number of pages in report: **20**

NELAP ACCREDITED TNI LABORATORY

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Richard Rodriguez
Laboratory Director

Client Service contact: Sylvia Garza 713-271-4700

Certifications: TX (T104704220-15-21) AR (14-016-0) AZ (AZ0769) FL (E87628) KS (E-10366) LA (85695/04004) NJ (TX010) OK (2014-172) VA (7654)

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Accutest Laboratories is the sole authority for authorizing edits or modifications to this document. Unauthorized modification of this report is strictly prohibited.

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Accutest Laboratories

Sample Summary

APEX TITAN, Inc.

Job No: TC73471

7020114C033/ Soil Stockpile

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
TC73471-1	09/15/15	12:15		09/16/15	SO	Soil	SP-01
TC73471-2	09/15/15	12:25		09/16/15	SO	Soil	SP-02
TC73471-3	09/15/15	12:35		09/16/15	SO	Soil	SP-03
TC73471-4	09/15/15	12:50		09/16/15	SO	Soil	SP-04
TC73471-5	09/15/15	12:55		09/16/15	SO	Soil	SP-05

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

Summary of Hits

Job Number: TC73471
Account: APEX TITAN, Inc.
Project: 7020114C033/ Soil Stockpile
Collected: 09/15/15

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
TC73471-1	**SP-01**					
Arsenic		7.0	0.30		mg/kg	SW846 6010B
Cadmium		0.44	0.24		mg/kg	SW846 6010B
Lead [a]		17.0	0.90		mg/kg	SW846 6010B
TC73471-2	**SP-02**					
Arsenic		8.4	0.32		mg/kg	SW846 6010B
Cadmium		0.48	0.25		mg/kg	SW846 6010B
Lead		26.7	0.19		mg/kg	SW846 6010B
TC73471-3	**SP-03**					
Arsenic		8.6	0.31		mg/kg	SW846 6010B
Cadmium		0.55	0.25		mg/kg	SW846 6010B
Lead		42.6	0.19		mg/kg	SW846 6010B
TC73471-4	**SP-04**					
Arsenic		10.0	0.29		mg/kg	SW846 6010B
Cadmium		0.37	0.23		mg/kg	SW846 6010B
Lead [a]		23.0	0.87		mg/kg	SW846 6010B
TC73471-5	**SP-05**					
Arsenic		7.7	0.29		mg/kg	SW846 6010B
Cadmium		0.41	0.23		mg/kg	SW846 6010B
Lead [a]		25.6	0.88		mg/kg	SW846 6010B

(a) Elevated reporting limit due to dilution required for high interfering element.

Sample Results

Report of Analysis

Accutest Laboratories

Report of Analysis

Client Sample ID:	SP-01		
Lab Sample ID:	TC73471-1	**Date Sampled:**	09/15/15
Matrix:	SO - Soil	**Date Received:**	09/16/15
		Percent Solids:	83.4
Project:	7020114C033/ Soil Stockpile		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	7.0	0.30	mg/kg	1	09/17/15	09/18/15	NS	SW846 6010B [1]	SW846 3050B [2]
Cadmium	0.44	0.24	mg/kg	1	09/17/15	09/18/15	NS	SW846 6010B [1]	SW846 3050B [2]
Lead [a]	17.0	0.90	mg/kg	5	09/17/15	09/18/15	NS	SW846 6010B [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA11408
(2) Prep QC Batch: MP26649

(a) Elevated reporting limit due to dilution required for high interfering element.

RL = Reporting Limit

Accutest Laboratories

Report of Analysis

Client Sample ID:	SP-02		
Lab Sample ID:	TC73471-2	**Date Sampled:**	09/15/15
Matrix:	SO - Soil	**Date Received:**	09/16/15
		Percent Solids:	82.0
Project:	7020114C033/ Soil Stockpile		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	8.4	0.32	mg/kg	1	09/17/15	09/18/15	NS	SW846 6010B [1]	SW846 3050B [2]
Cadmium	0.48	0.25	mg/kg	1	09/17/15	09/18/15	NS	SW846 6010B [1]	SW846 3050B [2]
Lead	26.7	0.19	mg/kg	1	09/17/15	09/18/15	NS	SW846 6010B [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA11408
(2) Prep QC Batch: MP26649

RL = Reporting Limit

Accutest Laboratories

Report of Analysis

Client Sample ID:	SP-03		
Lab Sample ID:	TC73471-3	**Date Sampled:**	09/15/15
Matrix:	SO - Soil	**Date Received:**	09/16/15
		Percent Solids:	82.5
Project:	7020114C033/ Soil Stockpile		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	8.6	0.31	mg/kg	1	09/17/15	09/18/15	NS	SW846 6010B [1]	SW846 3050B [2]
Cadmium	0.55	0.25	mg/kg	1	09/17/15	09/18/15	NS	SW846 6010B [1]	SW846 3050B [2]
Lead	42.6	0.19	mg/kg	1	09/17/15	09/18/15	NS	SW846 6010B [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA11408
(2) Prep QC Batch: MP26649

RL = Reporting Limit

Accutest Laboratories

Report of Analysis

Client Sample ID:	SP-04		
Lab Sample ID:	TC73471-4	**Date Sampled:**	09/15/15
Matrix:	SO - Soil	**Date Received:**	09/16/15
		Percent Solids:	86.5
Project:	7020114C033/ Soil Stockpile		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	10.0	0.29	mg/kg	1	09/17/15	09/18/15	NS	SW846 6010B [1]	SW846 3050B [2]
Cadmium	0.37	0.23	mg/kg	1	09/17/15	09/18/15	NS	SW846 6010B [1]	SW846 3050B [2]
Lead [a]	23.0	0.87	mg/kg	5	09/17/15	09/18/15	NS	SW846 6010B [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA11408
(2) Prep QC Batch: MP26649

(a) Elevated reporting limit due to dilution required for high interfering element.

RL = Reporting Limit

Accutest Laboratories

Report of Analysis

Client Sample ID:	SP-05		
Lab Sample ID:	TC73471-5	**Date Sampled:**	09/15/15
Matrix:	SO - Soil	**Date Received:**	09/16/15
		Percent Solids:	85.5
Project:	7020114C033/ Soil Stockpile		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	7.7	0.29	mg/kg	1	09/17/15	09/18/15	NS	SW846 6010B [1]	SW846 3050B [2]
Cadmium	0.41	0.23	mg/kg	1	09/17/15	09/18/15	NS	SW846 6010B [1]	SW846 3050B [2]
Lead [a]	25.6	0.88	mg/kg	5	09/17/15	09/18/15	NS	SW846 6010B [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA11408
(2) Prep QC Batch: MP26649

(a) Elevated reporting limit due to dilution required for high interfering element.

RL = Reporting Limit

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

T273471 CHAIN OF CUSTODY RECORD

APEX

Office Location Dallas

Laboratory: Accutest
Address: Houston, TX
Contact:
Phone:
PO/SO #:

Project Manager L. Evans

ANALYSIS REQUESTED: As, Cd, Pb 6010 SW846 #6010

Lab use only
Due Date:
Temp. of coolers when received (C°): 1 4.7 | 2 | 3 | 4 | 5
Page 1 of 1

Sampler's Name: Jason Mileer
Sampler's Signature: [signature]

Proj. No. 7020114C033
Project Name: Soil Stockpile
No/Type of Containers

	Matrix	Date	Time	Comp	Grab	Identifying Marks of Sample(s)	Start Depth	End Depth	VOA	A/G 1 Lt.	250 ml	Glass Jar	P/O	As, Cd, Pb	Lab Sample ID (Lab Use Only)
1	S	9-15-15	1215		X	SP-01	—						1	X	
2	|	|	1225		X	SP-02	—						1	X	
3	|	|	1235		X	SP-03	—						1	X	
4	|	|	1250		X	SP-04	—						1	X	
5	S	9-15-15	1255		X	SP-05	—						1	X	

NFE 9-15-15

TAGGED BY: [signature]

VERIFIED BY: [signature]

Turn around time ☒ Normal ☐ 25% Rush ☐ 50% Rush ☐ 100% Rush

Relinquished by (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
[signature]	9-15-15	1915	FedEx	9-15-15	1915
[signature]			[signature]	9-16-15	1010

NOTES: FedEx 643273706340

Matrix: WW - Wastewater, W - Water, S - Soil, SD - Solid, L - Liquid, A - Air Bag, C - Charcoal tube, SL - sludge, O - Oil
Container: VOA - 40 ml vial, A/G - Amber / Or Glass 1 Liter, 250 ml - Glass wide mouth, P/O - Plastic or other

Apex TITAN, Inc. • 2351 W. Northwest Hwy., Suite 3321 • Dallas, Texas 75220 • Office: 214-350-5469 • Fax 214-350-2914

4.1 4

TC73471: Chain of Custody
Page 1 of 3

Accutest Laboratories Sample Receipt Summary

Accutest Job Number: TC73471 **Client:** APEX **Project:** L EVANS

Date / Time Received: 9/16/2015 **Delivery Method:** **Airbill #'s:** 643273706340

No. Coolers: 1 **Therm ID:** IR-5; **Temp Adjustment Factor:** 0;

Cooler Temps (Initial/Adjusted): #1: (4.7/4.7);

Cooler Security	Y	or	N		Y	or	N
1. Custody Seals Present:	☑		☐	3. COC Present:	☑		☐
2. Custody Seals Intact:	☑		☐	4. Smpl Dates/Time OK	☑		☐

Cooler Temperature	Y	or	N
1. Temp criteria achieved:	☑		☐
2. Cooler temp verification:			
3. Cooler media:	Ice (Bag)		

Quality Control Preservation	Y	or	N	N/A	WTB	STB
1. Trip Blank present / cooler:	☐		☐	☑	☐	☐
2. Trip Blank listed on COC:	☐		☐	☑		
3. Samples preserved properly:	☑		☐			
4. VOCs headspace free:	☐		☐	☑		

Sample Integrity - Documentation	Y	or	N
1. Sample labels present on bottles:	☑		☐
2. Container labeling complete:	☑		☐
3. Sample container label / COC agree:	☑		☐

Sample Integrity - Condition	Y	or	N
1. Sample recvd within HT:	☑		☐
2. All containers accounted for:	☑		☐
3. Condition of sample:	Intact		

Sample Integrity - Instructions	Y	or	N	N/A
1. Analysis requested is clear:	☑		☐	
2. Bottles received for unspecified tests	☐		☑	
3. Sufficient volume recvd for analysis:	☑		☐	
4. Compositing instructions clear:	☐		☐	☑
5. Filtering instructions clear:	☐		☐	☑

Comments

Accutest Laboratories
V:713.271.4700

10165 Harwin Drive
F: 713.271.4770

Houston, TX 77036
www/accutest.com

TC73471: Chain of Custody
Page 2 of 3

ACCUTEST LABORATORIES

Sample Receipt Log

Job #: TC73471 **Date / Time Received:** 9/16/2015 10:10:00 AM **Initials:** BG

Client: APEX

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	pH	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TC73471-1	4oz	1	2-103	N/P	Note #2 - Preservative check not applicable.	IR-5	4.7	0	4.7
1	TC73471-2	4oz	1	2-103	N/P	Note #2 - Preservative check not applicable.	IR-5	4.7	0	4.7
1	TC73471-3	4oz	1	2-103	N/P	Note #2 - Preservative check not applicable.	IR-5	4.7	0	4.7
1	TC73471-4	4oz	1	2-103	N/P	Note #2 - Preservative check not applicable.	IR-5	4.7	0	4.7
1	TC73471-5	4oz	1	2-103	N/P	Note #2 - Preservative check not applicable.	IR-5	4.7	0	4.7

TC73471: Chain of Custody
Page 3 of 3

Gulf Coast ACCUTEST LABORATORIES

Metals Analysis

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: TC73471
Account: APEXTTXD - APEX TITAN, Inc.
Project: 7020114C033/ Soil Stockpile

QC Batch ID: MP26649 Methods: SW846 6010B
Matrix Type: SOLID Units: mg/kg

Prep Date: 09/17/15

Metal	RL	IDL	MDL	MB raw	final
Aluminum	10	.3	1.6		
Antimony	0.25	.024	.063		
Arsenic	0.25	.035	.1	0.0045	<0.25
Barium	10	.0057	1.3		
Beryllium	0.20	.0003	.028		
Boron	5.0	.01	.6		
Cadmium	0.20	.0038	.029	-0.00050	<0.20
Calcium	250	.11	34		
Chromium	0.50	.0062	.068		
Cobalt	2.5	.0042	.4		
Copper	1.0	.021	.12		
Iron	5.0	.082	.85		
Lead	0.15	.022	.053	0.019	<0.15
Lithium	15	.053	2		
Magnesium	250	.8	31		
Manganese	0.75	.00095	.094		
Molybdenum	0.50	.0025	.078		
Nickel	2.0	.0047	.2		
Potassium	250	.8	34		
Selenium	0.25	.037	.086		
Silver	0.50	.0074	.06		
Sodium	250	.46	33		
Sulfur	2.5	.064	.62		
Strontium	0.50	.0021	.077		
Thallium	0.50	.014	.12		
Tin	2.5	.011	.12		
Titanium	1.0	.0089	.13		
Vanadium	2.5	.006	.31		
Zinc	1.0	.0017	.41		

Associated samples MP26649: TC73471-1, TC73471-2, TC73471-3, TC73471-4, TC73471-5

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: TC73471
Account: APEXTTXD - APEX TITAN, Inc.
Project: 7020114C033/ Soil Stockpile

QC Batch ID: MP26649
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date: 09/17/15

Metal	TC73471-1 Original	MS	Spikelot MPTW11	% Rec	QC Limits
Arsenic	7.0	25.6	24	77.5	75-125
Cadmium	0.44	19.0	24	77.3	75-125
Lead	17.0	43.0	24	108.3	75-125

Associated samples MP26649: TC73471-1, TC73471-2, TC73471-3, TC73471-4, TC73471-5

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: TC73471
Account: APEXTTXD - APEX TITAN, Inc.
Project: 7020114C033/ Soil Stockpile

QC Batch ID: MP26649 Methods: SW846 6010B
Matrix Type: SOLID Units: mg/kg

Prep Date: 09/17/15

Metal	TC73471-1 Original	MSD	Spikelot MPTW11	% Rec	MSD RPD	QC Limit
Arsenic	7.0	26.1	24	79.6	1.9	20
Cadmium	0.44	19.6	24	79.8	3.1	20
Lead	17.0	42.0	24	104.1	2.4	20

Associated samples MP26649: TC73471-1, TC73471-2, TC73471-3, TC73471-4, TC73471-5

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: TC73471
Account: APEXTTXD - APEX TITAN, Inc.
Project: 7020114C033/ Soil Stockpile

QC Batch ID: MP26649
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date: 09/17/15

Metal	LCS Result	Spikelot MPLCD068	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	98.6	113	87.3	78-122
Barium				
Beryllium				
Boron				
Cadmium	59.4	67.5	88.0	82-118
Calcium				
Chromium				
Cobalt				
Copper				
Iron				
Lead	85.3	90.1	94.7	82-119
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Potassium				
Selenium				
Silver				
Sodium				
Sulfur				
Strontium				
Thallium				
Tin				
Titanium				
Vanadium				
Zinc				

Associated samples MP26649: TC73471-1, TC73471-2, TC73471-3, TC73471-4, TC73471-5

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: TC73471
Account: APEXTTXD - APEX TITAN, Inc.
Project: 7020114C033/ Soil Stockpile

QC Batch ID: MP26649
Matrix Type: SOLID

Methods: SW846 6010B
Units: ug/l

Prep Date: 09/17/15

Metal	TC73471-1 Original	SDL 1:5	%DIF	QC Limits
Arsenic	116	155	33.3*(a)	0-10
Cadmium	7.28	8.58	17.9*(a)	0-10
Lead	284	278	1.9	0-10

Associated samples MP26649: TC73471-1, TC73471-2, TC73471-3, TC73471-4, TC73471-5

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested
(a) Serial dilution indicates possible matrix interference.

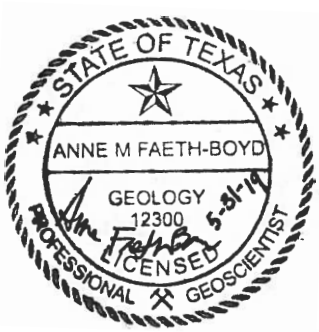
APPENDIX 3.1

DEEP GROUNDWATER PRELIMINARY DESIGN INVESTIGATION REPORT

REPORT

DEEP GROUNDWATER PRELIMINARY DESIGN INVESTIGATION REPORT

Exide Frisco Recycling Facility
7471 Old 5th Street, Frisco, Texas 75034-5047
TCEQ SWR No. 30516
TCEQ Hazardous Waste Permit No. HW-50206
TCEQ Agreed Order Docket No. 2011-1712-IHW-E
EPA ID No. TXD006451090
Customer No. CN600129779
Regulated Entity No. RN100218643



GOLDER ASSOCIATES INC.
Geoscience Firm Registration
Certificate Number 50369

Submitted to:

Mr. Brad Weaver
Director, Remediation
Exide Technologies
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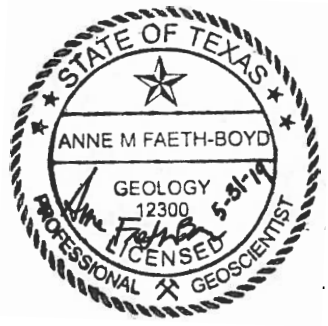

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1.0 INTRODUCTION AND BACKGROUND

1.1 Introduction

Golder Associates Inc. (Golder) has prepared this Deep Groundwater Preliminary Design Investigation (DGW PDI) Report for the Exide Technologies, Inc. (Exide) Former Operating Plant (FOP) located at 7471 Old 5th Street in Frisco, Texas (Figure 1). The DGW PDI Report has been prepared following work completed between May and August 2018 (as outlined in the DGW PDI Work Plan dated March 1, 2018 and updated on April 10, 2018) in response to the Texas Commission on Environmental Quality (TCEQ) Technical Notice of Deficiency (NOD) dated December 7, 2017 and in support of next steps for Exide's FRC Resource Conservation and Recovery Act (RCRA) Permit Renewal Application with a Major Amendment and Compliance Plan (referred to throughout as the "Permit Renewal Application"). This Report includes the rationale and methodology used while performing investigation activities of deeper groundwater at the Site.

1.2 Background

As part of overall Site remedial activities, a Corrective Action Management Unit (CAMU), hereafter referred to as the Remediation Consolidation Area (RCA), will be designed, engineered, constructed, and operated within the FOP area of the Frisco Recycling Center. The proposed RCA will be located in an area of existing contamination and will be used as a consolidation area for soil and sediment excavated from other areas of the FRC, Stewart Creek, and the off-Site City of Frisco Railroad Museum. In addition to the RCA, one closed pre-RCRA landfill (the North Disposal Area [NDA]) and one closed Class 2 Landfill (the Slag Landfill) are located adjacent to the north of the proposed RCA. The locations of the NDA, the Slag Landfill, and the proposed RCA are shown on Figure 2.

To address the potential for contaminant migration from the FOP to groundwater and the potential for discharge of contaminated groundwater to Stewart Creek, TCEQ requested that additional investigation activities be performed and that a groundwater protection element be added to the FOP design to address the potential for future migration of contaminants in groundwater to Stewart Creek.

2.0 OVERVIEW OF PDI

The objective of the DGW PDI was to gather enough hydrogeological and chemical data necessary to evaluate alternative remedial technologies, and to develop a basic design and implementation plan for a groundwater protection element at the FOP. In general, the DGW PDI consisted of the following activities:

- Review of relevant existing Site documents including borehole logs, monitoring well construction and sampling information, and hydraulic conductivity testing.
- Field investigation along the downgradient side of the proposed groundwater remedy location, including the following:

- Eleven (11) boreholes were advanced to bedrock and continuously logged to identify transmissive units throughout the length of the borehole. Attention was directed to identify the presence of transmissive units that had the potential to discharge groundwater to Stewart Creek. Two additional shallow borings were advanced adjacent to deeper borehole locations where a separate shallow transmissive unit was identified during the DGW PDI activities.
- All thirteen (13) boreholes (eleven deep and two shallow) were converted into monitoring wells based on lithology observed during drilling. Screened sections were positioned to monitor the water elevation and water quality of the transmissive units.
- After installation, the monitoring wells were developed by surging and pumping in the screened level using a stainless-steel bailer and a submersible pump. Development continued until water quality parameters were generally stabilized and groundwater was relatively free of sediment.
- A water elevation survey was conducted using each new monitoring well and specific existing monitoring wells near the proposed groundwater protection element location. Weekly water elevation surveys were conducted one (1) week prior to drilling activities and four (4) weeks following drilling activities to evaluate groundwater elevations in shallow and/or deeper transmissive units and to establish potentiometric surface elevations near the proposed groundwater protection element. Additionally, the surface water elevation of Stewart Creek was measured (using Global Positioning System [GPS] technology) at five locations of Stewart Creek adjacent to the FOP and newly installed or existing monitoring wells to evaluate groundwater gradient and discharge potential towards Stewart Creek.
- A groundwater quality sampling event was conducted using each new monitoring well and existing monitoring wells MW-10, MW-16, MW-16S, MW-17, MW-18, MW-24, MW-26, MW-27, MW-29, MW-30, MW-31, MW-44, and MW-46 following the second week of the water elevation survey. Each monitoring well was purged and sampled using low-flow sampling methodology. Field parameters (dissolved oxygen [DO], Oxidation-Reduction Potential [ORP], pH, temperature and specific conductivity) were measured using a flow-through cell. Following stabilization of field parameters, groundwater was collected for laboratory analysis for wet chemistry and Site-specific metals. Monitoring wells near the former diesel aboveground storage tank (AST) (DGW-MW-2, DGW-MW-3, DGW-MW-4, DGW-MW-10, DGW-MW-10S and MW-29) were also analyzed for total petroleum hydrocarbons (TPH).
- Hydraulic conductivity testing using a slug testing method was performed following the well installation and development. Slug testing was performed in each of the new monitoring wells that had a deep transmissive unit present (except for DGW-MW-11 which did not have sufficient water present at the time

of testing). Slug-in tests were conducted and analyzed using falling- or rising-head methodology to estimate the saturated hydraulic conductivity of the lower transmissive unit, if present. Slug testing was also performed at existing monitoring wells MW-26, MW-27, MW-29, and MW-44.

- Evaluation of new and existing data to update the Site conceptual model including the preparation of potentiometric surface maps, fence diagrams and plume maps
- Evaluation of updated conceptual model and available data to determine appropriate groundwater remedial actions at the FOP

This DGW PDI report presents a summary of the data obtained during the PDI and discusses the updated conceptual model for the FOP. A detailed evaluation of the suitability of a permeable reactive barrier for the Site based on Site data and existing publicly available literature is included as Appendix 3.2 to the Response Action Plan (RAP, which is included as Appendix M to the Permit Renewal Application). A Groundwater Remedy Evaluation, reviewing alternatives for a groundwater protection element at the FOP using the new and existing data at the Site, is included as Appendix 3.3 to the RAP. Information from additional field investigations performed in 2019 is summarized in Appendix 3.5 to the RAP. A Column Study to support the evaluation and design of the composition of the proposed PRB is included as Appendix 3.6 to the RAP and a detailed design report for the funnel and gate permeable reactive barrier that is proposed for the FOP is included as Appendix 3.7 to the RAP.

3.0 FIELD PROCEDURES

3.1 Health and Safety

This work was performed under a Site-Specific Health and Safety Plan (HASP), in accordance with OSHA regulation 29 CFR 1910.120. Each subcontractor was responsible for its own health and safety program. This work was conducted using Level D Protection. All Golder and subcontracted personnel working on this Site who might be potentially exposed to hazardous materials had successfully completed 40-hour HAZWOPER training.

All field personnel working on-Site completed pre-mobilization medical monitoring required by the Occupational Safety and Health Administration (OSHA) lead standard. All personnel working on-Site provided documentation that they are medically cleared to use respirators, and had a fit test completed; unless Golder (or other subcontractors) provided rationale for not wearing respirators during on-Site work. All contaminated clothing and personal protective equipment were disposed of or cleaned as appropriate before leaving the Site. Contaminated investigation derived waste (IDW) was placed in client-provided containers on-Site, sampled, and profiled for off-Site disposal.

3.2 Site Access

Prior to mobilization to the field, Golder coordinated with Site personnel regarding access and utilities. All DGW PDI field activities were located within the Exide Site boundaries and approval for each location was obtained from Exide prior to initiating any field activities. The drilling subcontractor submitted the state-required public utility locate and Golder also contracted a private utility locate company to clear boring locations using ground penetrating radar (GPR), and visually surveyed the area prior to initiating drilling activities. Golder also requested and completed an on-Site meeting with all public utility locators one day prior to initiating drilling activities.

3.3 Drilling Activities

Prior to initiation of drilling activities, a water elevation survey of existing monitoring wells in the vicinity of the FOP was performed on May 9, 2018. Updated potentiometric surface maps from the May 9, 2018 water elevation survey are provided as Figures 4A and 4B.

Drilling activities were completed by WEST Drilling, a Texas–licensed drilling subcontractor directly subcontracted to Golder. Figure 2 shows the locations of the monitoring wells. Shallow boreholes were placed adjacent to the deep boreholes if a separate shallow transmissive unit was identified during drilling of the deeper borehole.

Eleven (11) vertical soil borings were advanced to bedrock or refusal using a hollow stem auger drill rig and direct push sampling technology (DGW-MW-1 through DGW-MW-11). All soil borings were sampled continuously using a three-inch continuous sampling system to identify transmissive units. Based on lithology encountered during drilling of the deeper boreholes, separate shallow transmissive units were identified at two locations and wells were advanced adjacent to DGW-MW-10 (DGW-MW-10S) and DGW-MW-11 (DGW-MW-11S). All borehole material was logged for lithology and classified based on the Unified Soil Classification System (USCS) by a Golder engineer. The dampness of each soil core was also noted during the logging process. Pertinent data concerning the drilling activities was recorded in the field boring logs. No slag or battery case fragments were encountered in the soil cores during the DGW PDI. Field borings logs are provided as Attachment A.

3.4 Monitoring Well Installation

Based on lithology of each borehole, eleven (11) deep boreholes and two (2) shallow boreholes were converted into monitoring wells using a hollow stem auger rig (DGW-MW-1 through DGW-MW-11 and DGW-MW-10S and

DGW-MW-11S). The monitoring wells were constructed of two-inch diameter polyvinyl chloride (PVC) with a 0.010-inch slotted screen at each location. The screened intervals of the deeper monitoring well screens were determined based on lithology. Deep monitoring wells were set across the lowermost transmissive unit encountered. The screened intervals of the shallow monitoring wells (DGW-MW-10S and DGW-MW-11S) were determined based on lithology and presence of a separate shallow transmissive unit.

Monitoring wells were constructed in general accordance with Texas Water Development Board (TWDB) and the Texas Commission on Environmental Quality (TCEQ) requirements other than as noted below. These requirements include Texas Administrative Code Chapter 30 (30 TAC) §330.421 (effective March 2006) and reporting requirements set forth for licensed water well installers by the TWDB. In some instances, insufficient space was available in the column for placement of both two feet of bentonite above the sand interval and two feet of concrete above the bentonite interval due to the length of the screened interval (as was the case for monitoring wells DGW-MW-3 and DGW-MW-5). As reported by WEST Drilling and as noted in the monitoring well construction information (included in the Geology Report [provided as Attachment G to the Part B of the RCRA Permit Renewal Application]), monitoring wells DGW-MW-8, DGW-MW-10, and DGW-MW-11 were constructed with only one foot of concrete. The drilling subcontractor submitted the necessary drilling and, as applicable, plugging reports to the TWDB and TDLR, as required, which are provided as Attachment F. These reports were submitted in 2018 and resubmitted with corrections in 2019. The final revised well reports were not received at the time of report production.

Monitoring wells were surveyed by Brittain & Crawford LLC (B&C), a Texas-licensed land surveyor, on May 22, 2018 to determine groundwater elevations relative to mean sea level. Surface water elevations along Stewart Creek were also collected at specified locations by B&C on May 22, 2018. Survey data is provided as Attachment G. Water level elevations were used to calculate groundwater flow direction and gradient in relation to Stewart Creek and the proposed RCA location. Potentiometric surface maps including surface water measurements for May 22, 2018 are provided as Figures 4C and 4D.

3.5 Well Development

Following installation, each of the new monitoring wells was developed with a submersible pump and/or stainless-steel bailer. The monitoring wells were developed (surged and pumped/bailed) until the well was relatively free of sediment. Once well development had ceased, purging continued until field parameters were generally stable and turbidity was below 100 nephelometric turbidity units (NTUs) or until the well went dry (DGW-MW-3). At locations where minimal groundwater was present, development consisted of bailing the wells dry four times (DGW-MW-10S, DGW-MW-11 and DGW-MW-11S). Well development forms are provided as Attachment B.

3.6 Groundwater Elevation Survey

Following installation of the monitoring wells, a groundwater elevation survey was conducted weekly for four weeks. Wells measured included all new monitoring wells (DGW-MW-1 through DGW-MW-11, DGW-MW-10S, and DGW-MW-11S) along with existing monitoring wells near Stewart Creek and the RCA. Existing monitoring wells that were included in the water elevation survey included: MW-18, MW-39, MW-40, B9N, MW-22, MW-21, B7N, MW-23, MW-10, MW-44, MW-27, MW-36, MW-35, MW-29, MW-34, MW-33, MW-12, MW-26, MW-46, MW-32, MW-14, MW-31, MW-30, MW-13, B5N, MW-17, MW-24, MW-38, MW-16, and MW-16S. Depth-to-water measurements were measured from the casing datum to the nearest one-hundredth of a foot using an electronic water level meter with a graduated tape. Total well depths were also measured on May 9, 2018 and May 22, 2018. Water level elevations from both existing and newly installed monitoring wells were used to establish

groundwater potentiometric maps for both shallow and deeper groundwater units. Potentiometric Surface Maps for all five weeks of the elevation survey are presented in Figures 4A through 4J.

3.7 Groundwater Sampling Procedures

Sampling procedures were conducted in general accordance with the Revised Class 2 Landfill Groundwater Monitoring Plan, prepared by Pastor, Behling & Wheeler and dated July 31, 2013 (which TCEQ approved in a letter dated April 4, 2014) and in accordance with the applicable standard operating procedures (SOPs). A copy of the Revised Class 2 Landfill Groundwater Monitoring Plan for the North CAMU and the associated TCEQ approval letter is provided as Attachment K to the Part B RCRA Permit Renewal Application. The sampling procedures are further described in the sections below.

3.7.1 Groundwater Level Measurements

As described in further detail in Section 3.6, groundwater elevations were collected and recorded one week prior to drilling activities and weekly for a total of four weeks following drilling and well development activities. Groundwater level measurements are presented in Table 1.

3.7.2 Well Inspection

Prior to drilling activities, each existing monitoring well was inspected for signs of damage to the well protective casing and well pad, where applicable. MW-43 surface completion was damaged, and the well was compromised; therefore, no water level elevations from MW-43 were collected during the water elevation survey. This well will be decommissioned during decommissioning of the DGW PDI wells. The lock on each well was checked to make sure it was present and operable. The well numbering on each well was also checked for legibility. Locks were added and replaced, and monitoring wells were relabeled, where applicable.

3.7.3 Prevention of Cross-Contamination

Special care was exercised to prevent contamination of the groundwater and extracted samples during the sampling activities. Improperly cleaned equipment is the primary means of cross-contamination. To prevent such contamination, all non-dedicated sampling equipment was thoroughly cleaned before and between uses at different sampling locations as described in Section 3.10. In addition to using properly cleaned equipment, a new pair of disposable latex/nitrile (or similar) gloves was worn during sampling at each well.

3.7.4 Well Purging and Sampling

Following the second week of water elevation measurements, the new monitoring wells (DGW-MW-1 through DGW-MW-11, DGW-MW-10S, and DGW-MW-11S) and existing monitoring wells MW-10, MW-16, MW-16S, MW-17, MW-18, MW-24, MW-26, MW-27, MW-29, MW-30, MW-31, MW-44, and MW-46 were purged and sampled using low-flow methodology. Prior to sampling, each well was purged using a peristaltic pump. The objective was to remove water at a rate that minimizes drawdown to the formation, to the extent practicable. The pump intake was set within the center of the screened interval for each monitoring well such that the water pumped was drawn directly from the formation with little disturbance to the sampling zone and to avoid mixing of casing water.

Wells were purged at a rate of 0.5 L/min or less, depending on recharge rate of the well. Field parameters were collected during purging and used to determine when the well has been adequately stabilized (purged). Stabilization was considered complete when field parameters (specific conductivity, DO, ORP, pH, and temperature) readings are within approximately 10%. Consistent with standard operating procedures for low readings of DO +/- 0.2 mg/L was considered stable and for low readings of ORP, +/- 10 mV was considered

stable. Turbidity was also collected and recorded during purging. The well continued to be purged until readings were below 10 NTU or three consecutive readings were within approximately 10%. Field groundwater parameter readings are presented in Table 3. Where turbidity exceeded 10 NTUs (DGW-MW-11S, MW-17, and MW-46), the total metals sample was filtered through a disposable 10-micron filter prior to collection. Dissolved metals samples were field filtered using a 0.45-micron filter. If the well went dry during purging, sampling was performed the following day provided that the well has sufficiently recharged (at least 70%) to allow adequate sample collection (DGW-MW-11S and MW-44).

Samples were collected using the same pump used for purging. The sample bottle was filled directly from the dedicated tubing. Samples were placed in laboratory-supplied sample bottles and shipped for overnight delivery by FedEx or by courier to ALS in Houston, Texas. Groundwater sample collection forms are provided as Attachment C.

3.7.5 Container and Labels

The analytical testing laboratory provided containers and appropriate container lids. The containers were filled, and container lids were tightly closed. The following information was legibly and indelibly written on the label:

- Project identification
- Sample identification
- Location
- Name or initials of collector
- Date and time of collection
- Analysis requested
- Sample preservative, if applicable
- Filtered or unfiltered

3.7.6 Chain-of-Custody Control

After samples were collected, chain-of-custody procedures were followed to establish a written record of sample movement between the sampling site and the testing laboratory.

3.7.7 Sample Shipment

Samples awaiting shipment to the laboratory were stored in a cooler with ice such that the samples maintained a temperature of at most 4 degrees Celsius. Once a set of samples was ready for shipment, the samples were re-packed with ice such that no water would leak from either the bags of ice or the package (i.e., a cooler) during shipment. Completed chain-of-custody forms were inserted into a plastic sleeve and placed inside the sample shipment container. The cooler was labeled with the sample collector's name, address, and telephone number; the laboratory's name, address, and telephone number; and the date of shipment. The cooler was sealed with a chain-of-custody seal and signed and dated by the sampler before shipment.

3.7.8 Hydraulic Conductivity Testing

Following installation of the new monitoring wells, hydraulic conductivity estimates were obtained using the “slug test” methodology. A slug test is a field test used to estimate the hydraulic conductivity of formation materials

adjacent to the screen section. The basic approach is to “instantaneously” change the water elevation in the well by raising or lowering the initial or static elevation and observing the return of the water level to static over time.

Prior to conducting the slug tests, static water level was measured in each well. A pressure transducer was then lowered down the well to a sufficient depth to allow insertion of a slug into the water column above the transducer. Once the transducer readings stabilized, a PVC slug approximately 1 inch in diameter and 2.8 feet long was quickly, but carefully lowered into the well to displace the water column. When possible in wells with a larger water column, two slugs of identical size were lowered to increase displacement and allow for a more defined curve for interpretation. Once the water column lowered to static conditions and stabilized as indicated on the transducer, the slug(s) were removed quickly and carefully. The transducer experienced a drop in water level elevation and was continuously monitored until water levels returned to static conditions and stabilized. The slugs were decontaminated between each location as described in Section 3.10.

Following completion of field activities, the data was analyzed using a combination of the Hvorslev Slug Test Solution and Golder proprietary software. Slug testing was performed at newly installed monitoring wells DGW-MW-1 through DGW-MW-10. Slug testing was not performed in newly installed monitoring wells DGW-MW-10S, DGW-MW-11, or DGW-MW-11S due to the low volume of water within the well. Slug testing was also performed at existing monitoring wells MW-26, MW-27, MW-29, and MW-44.

3.8 Laboratory Analytical Program

Following collection, samples were shipped to ALS’s Houston, Texas laboratory. Samples were analyzed for total and dissolved metals (lead, cadmium, arsenic, selenium, and antimony) and for wet chemistry analyses including total organic carbon (TOC), dissolved organic carbon (DOC), alkalinity, chloride, nitrate/nitrite, and sulfate. Additional total and dissolved metals were also added to assist with remedial element design (calcium, magnesium, iron).

In addition, selected monitoring wells were analyzed for total petroleum hydrocarbons (TPH) near the former diesel AST (DGW-MW-2, DGW-MW-3, DGW-MW-4, DGW-MW-10, DGW-MW-10S, and MW-29).

Specific methods for analyses are listed below:

- Total and Dissolved Metals – EPA Method SW-846 6020
- TOC and DOC – Standard Method 5310B
- Alkalinity – Standard Method 2320B
- Chloride, Nitrate/Nitrite and Sulfate – EPA Method 300
- Total Petroleum Hydrocarbons (TPH) by TX 1005; and
- TPH by TX 1006 (DGW-MW-3 only).

Monitoring well MW-10 was resampled for total and dissolved lead on August 1, 2018 to further evaluate the May 2018 PCL exceedance for total lead (described below in Section 5.2).

Analytical data from both the May 2018 sampling event and the August 1, 2018 resampling event of MW-10 is provided in Table 2.

3.9 Investigation-Derived Waste

All liquid investigation derived waste (IDW), including drilling water and decontamination water was containerized on-Site in 55-gallon steel drums at the Site pending disposition. All soil IDW was stockpiled in one less than 50 cubic yard stockpile on top of plastic sheeting and analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), TPH (TX 1005), and toxicity characteristic leaching procedure (TCLP) Resource Conservation and Recovery Act (RCRA) metals. The stockpile was covered with plastic sheeting pending disposition. Stockpile results are presented in Table 4.

Following disposition, water IDW was removed from the Site and disposed of in a facility authorized to receive the material on July 29, 2018. Soil IDW was characterized as Class 2 material and was transported to and disposed of in the on-Site North CAMU.

3.10 Decontamination

Decontamination was conducted in general conformance with ASTM Standard D 5088-15. The drill rig was decontaminated prior to arrival on-Site with attention to the working end and downhole equipment (i.e., rods, etc.). Non-dedicated downhole drilling and sampling equipment was decontaminated prior to use at each location. Decontamination consisted of washing the equipment in a potable water and Alconox™ solution, followed by a potable water rinse, and then a distilled water rinse. Decontamination of this equipment, including rods, was performed at a decontamination area or adjacent to the drill rig. Wastewater generated by the decontamination process was containerized as IDW for proper disposal.

3.11 Quality Assurance/Quality Control

The investigation activities were conducted in general accordance with industry standard practices. Field procedures, including groundwater sampling, collection of quality assurance and quality control (QA/QC) samples, and installation of monitoring wells were also conducted in accordance with industry standard practices. All pertinent sampling information and other associated field activities were recorded in a field logbook or on field forms. Samples were handled under appropriate chain-of-custody documentation and procedures.

To confirm the accuracy and reproducibility of the laboratory analytical results, the analytical laboratory implemented a program, including laboratory replicate samples, method blanks and control standards. The laboratory QA/QC data generated during the sample analysis is included in the laboratory analytical reports provided to Golder. Laboratory analytical reports are provided as Attachment D.

Field QA/QC protocols included one field duplicate sample collected for every 20 or less field samples collected. No equipment blanks were warranted as all sampling equipment was either new or dedicated (i.e. no submersible pump was needed for sampling).

Once the analytical data was received from the laboratory, the laboratory report was reviewed for any narratives or comments indicating qualified data. No data required additional evaluation with the laboratory. Next, the data was reviewed for results in expected ranges. No anomalous results were noted for additional review. The laboratory quality control report was also reviewed to note any qualified data or other indications of anomalous runs. The data was deemed validated as appropriate. Data Usability Summaries (DUS) were prepared in accordance with Texas Risk Reduction Program (TRRP) 13 guidance. DUS's are provided as Attachment E.

4.0 GEOLOGY AND HYDROGEOLOGY RESULTS

4.1 Site Geology

Soils encountered as part of the DGW PDI were generally like borings advanced and recorded at the Site during previous investigations. The geology encountered at the Site generally consists of approximately 10 to 30 feet of moist to wet, clay-rich, colluvial soils (Quaternary undivided surficial deposits) overlying the Eagle Ford Shale Formation. Colluvium is a general term used to define soil material and rock debris that accumulates at the base of slopes due to erosional forces such as slides, slumps, sheet-floods, or debris flows. It is typically characterized by heterogeneous and poorly sorted material. The colluvial soils at the Site typically consist of clay or silty clay with minor occurrences of gravelly clay (gravel suspended in a clay matrix), sand, and clayey gravel lenses. Detailed regional and Site-specific geology is presented in Part B, Attachment G as part of the Permit Renewal.

Fence diagrams were created to depict the geology and hydrogeology of the FOP. A fence diagram location map is provided as Figure 3A. Fence Diagram J-J' is presented as Figure 3B and details lithology along the south side of the FOP and runs along the north side of Stewart Creek. Fence Diagram K-K' is presented as Figure 3C and details the lithology along the northern portion of the proposed RCA running along the edge of the North Disposal Area and the Slag Landfill.

For simplicity, the data from new and existing boring logs was used to group the varying colluvial soils into two primary types of units above bedrock, a unit consisting of clay and silty clay, and a unit consisting of all soils containing more coarse-grained components including gravelly/sandy clay, gravelly/sandy silty clay, silt, sandy silt, and silty sand. When grouped in this manner, the presence of potentially more transmissive units near the ground surface as well as deeper above bedrock is apparent. It is noted however that portions of the transmissive units will be more or less transmissive than others due to the varying contents of more coarse-grained material within the unit.

4.2 Hydraulic Gradient

Based on groundwater levels recorded during the five weeks of the elevation survey, the groundwater flow direction at the RCA flows primarily south and west towards Stewart Creek. Based on the June 12, 2018 data, groundwater flows to the south at a gradient of 0.029 feet per foot (ft/ft) (as measured from MW-30 towards MW-26) and to the west at a gradient of 0.026 ft/ft (as measured from MW-30 towards DGW-MW-5).

4.3 Hydraulic Conductivity

A summary of the hydraulic conductivity results is presented in Table 5. Hydraulic conductivities at the Site ranged from 2E-02 to 2E-06 centimeters per second (cm/s) with the highest hydraulic conductivities measured in wells with the most coarse-grained soils and the lowest hydraulic conductivities measured in wells with the least amount of coarse-grained material. The wells were grouped into two groups based on a detailed review of boring logs (more detail is presented in boring logs than in fence diagrams as the fence diagrams were simplified as discussed above). New wells that were installed targeting the deeper transmissive unit and had higher hydraulic conductivities had a hydraulic conductivity geometric mean of 2E-03 cm/s (DGW-MW-1 through DGW-MW-10).

5.0 LABORATORY ANALYTICAL RESULTS AND SCREENING CRITERIA

5.1 Groundwater Comparison Criteria

To evaluate groundwater analytical data, detected Site chemicals of concern (COCs) were compared to screening criteria from the TCEQ Texas Risk Reduction Program (TRRP) Guidance. Screening levels used to determine the Critical Protective Concentration Limits (PCLs) included comparison of:

- $^{GW}GW_{Ing}$ PCL (based on drinking water ingestion)
- $^{Air}GW_{Inh\text{-}V}$ PCL (based on indoor air inhalation, as applicable for TPH only)
- ^{SW}GW PCL (with a dilution factor of 0.15, based on chronic aquatic life criteria for wells along Stewart Creek)
- ^{SW}GW PCL (with a dilution factor of 0.15, based on recreation contact recreation criteria for wells along Stewart Creek)

The critical PCL for each COC is listed in Table 2.

TOC, DOC, alkalinity, calcium, iron, magnesium, chloride, nitrate/nitrite, and sulfate were collected as remediation design parameters only and not screened against TRRP PCLs as they are not designated as COCs for the Site.

5.2 Groundwater COC Analytical Detections

Total and dissolved antimony, arsenic, cadmium, lead, and selenium were compared to their respective Critical PCLs. TPH was collected at select monitoring wells near the former diesel AST (DGW-MW-2, DGW-MW-3, DGW-MW-4, DGW-MW-10, DGW-MW-10S and MW-29) and compared to the respective Critical PCL (0.98 milligrams per Liter [mg/L]). Groundwater data is presented below for each metal followed by an evaluation of exceedances of the Critical PCL for each well. For wells installed and sampled during the DGW PDI, all data is subject to resampling and data evaluation which resampling was conducted in August, is in the data evaluation process and will be provided under separate cover.

5.2.1 Overview of COC Concentrations

5.2.2 Lead

Total lead concentrations detected during the DGW PDI ranged from not detected (less than 0.000600 mg/L) to 0.0390 mg/L and dissolved lead concentrations ranged from not detected (less than 0.000600 mg/L) to 0.0411mg/L. The critical PCL for lead is 0.015 mg/L (for both total and dissolved). Lead exceeded the critical PCL in five of 26 wells, three in the deeper unit in the vicinity of the RCA, one in the shallow unit in the vicinity of the RCA, and MW-10 to the east (cross gradient/upgradient) of the proposed RCA (which was not confirmed upon resampling). Exceedances ranged between 0.0225 and 0.0411 mg/L. None of the lead PCL exceedances were in the wells immediately along Stewart Creek (outside of the flood wall).

5.2.3 Cadmium

Total cadmium concentrations detected during the DGW PDI ranged from not detected (less than 0.000200 mg/L) to 0.0254 mg/L and dissolved cadmium concentrations ranged from not detected (less than 0.000200 mg/L) to 0.0259 mg/l. The PCLs for cadmium are 0.005 mg/L (total) and 0.0017 mg/L (dissolved). There were PCL exceedances in three of 26 wells, one in the shallow unit and two in the deeper unit near the proposed RCA.

None of the cadmium PCL exceedances were in the wells immediately along Stewart Creek (outside of the flood wall).

5.2.4 Arsenic

Total arsenic concentrations detected during the DGW PDI ranged from not detected (less than 0.000200 mg/L) to 0.100 mg/L and dissolved arsenic concentrations ranged from not detected (less than 0.000200 mg/L) to 0.103 mg/L. The critical PCL (for both total and dissolved) arsenic is 0.010 mg/L. There were PCL exceedances in eight of 26 wells (all in the deeper unit) near the proposed RCA. Arsenic was detected outside of the flood wall adjacent to Stewart Creek in only one location (close to but slightly above the 0.010 mg/L PCL [detections were 0.0112 mg/L for total and 0.0102 mg/L for dissolved] in MW-27, as discussed further in Section 5.2.8).

5.2.5 Antimony

Total antimony concentrations detected during the DGW PDI ranged from less than 0.00400 mg/L (not detected) to 0.0240 mg/L and dissolved antimony concentrations ranged from less than 0.00400 mg/L (not detected) to 0.0245 mg/L. Antimony detections exceeded the critical PCL (0.006 mg/L for both total and dissolved) in two wells (one in the shallow unit and one in the deeper unit) near the proposed RCA. None of the antimony PCL exceedances were in the wells immediately along Stewart Creek (outside of the flood wall).

5.2.6 Selenium

Total selenium concentrations detected during the DGW PDI ranged from less than 0.00110 mg/L (not detected) to 0.0325 mg/L and dissolved selenium concentrations detected during the PDI ranged from less than 0.00110 mg/L (not detected) to 0.0269 mg/L. There were no exceedances of the critical PCL (0.05 mg/L for both total and dissolved).

5.2.7 TPH

TPH was detected above the critical PCL for TX 1005 method at one of six locations (DGW-MW-3). The sample was further analyzed per TRRP guidance using the TX 1006 method. Results of the TX 1006 analysis were all below the method quantitation limit (MQL). Downgradient well MW-27 has historically been sampled for TPH and there have been no exceedances.

5.2.8 Location-Specific Discussion

The following monitoring wells had detections of Site COCs above their respective PCLs:

- DGW-MW-2: Total arsenic (0.0132 mg/L) and dissolved arsenic (0.0127 mg/L) were detected above their critical PCLs of 0.01 mg/L.
- DGW-MW-3: Total arsenic (0.100 mg/L) and dissolved arsenic (0.103 mg/L) were detected above their critical PCLs of 0.010 mg/L. In addition, TPH was detected above the critical PCL for TX 1005 method. The sample was further analyzed per TRRP guidance using the TX 1006 method. Results of the TX 1006 analysis were all below the method quantitation limit (MQL).
- DGW-MW-6: Total arsenic (0.0134 mg/L) and dissolved arsenic (0.0136 mg/L) were detected above their critical PCLs of 0.010 mg/L.
- DGW-MW-7: Total arsenic (0.0218 mg/L) and dissolved arsenic (0.0209 mg/L) were detected above their critical PCLs of 0.010 mg/L.

- DGW-MW-10: Total arsenic (0.0113 mg/L) and dissolved arsenic (0.0112 mg/L) were detected above their critical PCLs of 0.010 mg/L.
- DGW-MW-11: Total cadmium (0.0254 mg/L) and dissolved cadmium (0.0259 mg/L) were detected above their respective critical PCLs of 0.005 mg/L (total) and 0.0017 mg/L (dissolved) . Total lead (0.0362 mg/L) and dissolved lead (0.0338 mg/L) were detected above their critical PCLs of 0.015 mg/L.
- DGW-MW-11S: Total antimony (0.0240 mg/L) and dissolved antimony (0.0245 mg/L) were detected above their critical PCLs of 0.006 mg/L. Dissolved cadmium (0.00382 mg/L) was detected above the critical PCL of 0.0017 mg/L. Total lead (0.0285 mg/L) and dissolved lead (0.0411 mg/L) were detected above their critical PCLs of 0.015 mg/L.
- MW-10: Total lead (0.0390 mg/L) was detected above the critical PCL of 0.015 mg/L during the May 2018 DGW PDI investigation. This was the first detection of lead at MW-10 over the critical PCL since March 2005. Prior to the May 2018 DGW PDI, MW-10 was last sampled as part of the Affected Property Report Assessment (APAR) investigations in March 2013 and no COCs were detected above their respective critical PCLs. MW-10 was resampled on August 1, 2018 to confirm the critical PCL exceedance from the May 2018 DGW PDI. Results from the August 2018 resampling event were below the critical PCL for total and dissolved lead.
- MW-27: Total arsenic (0.0112 mg/L) and dissolved arsenic (0.0102 mg/L) were detected above the critical PCL for arsenic (0.010 mg/L) during the DGW PDI. This was the first time arsenic was sampled at MW-27. Prior to the DGW PDI, MW-27 was last sampled for total and dissolved lead and cadmium during the APAR investigation in February 2014. Additional analyses including polycyclic aromatic hydrocarbons and TPH (TX 1005) were collected in April 2013 (and there were no exceedances).
- MW-30: Total antimony (0.00868 mg/L) and dissolved antimony (0.00885 mg/L) were detected above the critical PCL for antimony (0.006 mg/L) during the DGW PDI. Total arsenic (0.0657 mg/L) and dissolved arsenic (0.0166 mg/L) were detected above the critical PCL for arsenic (0.01 mg/L) during the DGW PDI. Total lead (0.0225 mg/L) was detected above the critical PCL for lead (0.015 mg/L) during the DGW PDI. These detections were the first exceedances of lead detected at MW-30. Previously, MW-30 was only analyzed for total and dissolved cadmium and lead. MW-30 is located within the North Disposal Area and north of the proposed RCA and was last sampled as part of the APAR investigation in April 2013.
- MW-31: Total arsenic (0.0106 mg/L) and dissolved arsenic (0.0101 mg/L) were detected above the critical PCL for arsenic (0.01 mg/L) during the DGW PDI. Previously, MW-31 was only analyzed for total and dissolved cadmium and lead and no COCs were detected above their respective critical PCLs. MW-31 is located beneath the former Battery Storage Building and within the proposed RCA. MW-31 was last sampled as part of the APAR investigation in May 2013.
- MW-46: Total lead (0.0354 mg/L) was detected above the critical PCL for lead (0.015 mg/L) during the DGW PDI. Dissolved cadmium (0.00219 mg/L) was detected above the critical PCL for dissolved cadmium (0.0017 mg/L) during the DGW PDI. During the APAR investigation, MW-46 had an exceedance of the critical PCLs for dissolved cadmium (0.00190 mg/L) and dissolved lead (0.0259

mg/L) in January 2014. The well was subsequently resampled in February and March 2014and neither dissolved cadmium nor dissolved lead were detected over their respective critical PCLs.

Newly installed monitoring wells DGW-MW-1, DGW-MW-4, DGW-MW-5, DGW-MW-8, DGW-MW-9, and DGW-MW-10S had no detections of COCs above their respective critical PCLs.

The sampling during the DGW PDI of existing monitoring wells MW-16, MW-16S, MW-17, MW-18, MW-24, MW-26, MW-29, and MW-44 had no detections of COCs above their respective PCLs.

A summary of COC detections in groundwater is presented in Table 2. Laboratory analytical reports containing the groundwater analytical data are included in Attachment D. A protective concentration level exceedance (PCLE) plume map was developed and is presented as Figure 5.

5.3 Remediation Design Parameter Evaluation

As described above, monitoring wells were also sampled for total and dissolved calcium, iron, and magnesium, alkalinity, chloride, sulfate, nitrate/nitrite, total organic carbon, and dissolved organic carbon. Results for these parameters are described below:

- Total calcium concentrations ranges from 93.9 to 830 mg/L. Dissolved calcium concentrations ranged from 98.2 to 546 mg/L.
- Total iron concentrations ranged from 0.0631 mg/L to 73.5 mg/L. Dissolved iron concentrations ranged from 0.012 mg/L to 69.3 mg/L.
- Total magnesium concentrations ranged from 6.3 mg/L to 302 mg/L and dissolved magnesium concentrations ranged from 6.3 mg/L to 323 mg/L.
- Total alkalinity ranged from 170 mg/L to 803 mg/L.
- Chloride concentrations ranged from 32.4 mg/L to 1,780 mg/L.
- Sulfate concentrations ranged from 127 mg/L to 5,010 mg/L.
- Nitrate was detected in five wells and concentrations ranged from less than 0.0300 mg/L (not detected) to 7.62 mg/L.
- Total organic carbon ranged from 1.26 mg/L to 19.9 mg/L.
- Dissolved organic carbon ranged from 1.67 to 18.5 mg/L.

A discussion of remediation design parameters in relationship to the remedial alternatives analysis is included under separate cover (Appendix 3.3 of the RAP). Additional groundwater results and discussion from 2018 and early 2019 are presented as part of the Permeable Reactive Barrier Wall Column Study Report included under separate cover (Appendix 3.6 of the RAP).

6.0 UPDATED SITE CONCEPTUAL MODEL AND REVIEW OF MONITORING WELL NETWORK

Results of the field investigation and review of previous Site data were used to evaluate the hydrogeologic setting and groundwater quality of the proposed RCA location. A summary of the updated Site conceptual model is presented below:

- A vertically and horizontally discontinuous shallow water-bearing transmissive unit is present in the central portion of the proposed RCA inside of the flood wall. The water in this unit has historically had detections of cadmium and lead above the PCLs (e.g. MW-32, MW-33 and MW-34), which were also documented in DGW-MW-11S during the DGW PDI. This shallow unit was not observed at DGW-MW-8, DGW-MW-5, DGW-MW-4, DGW-MW-3, and DGW-MW-2 where no shallow coarse-grained materials were observed; and was not present in other locations where shallower coarse-grained materials were observed but were not water-bearing [DGW-MW-6, DGW-MW-7, DGW-MW-1, and DGW-MW-9]). This shallow (and often previously referred to as perched) groundwater moves horizontally toward Stewart Creek and is captured by the existing French Drain and flood wall system.
- A deeper water-bearing transmissive unit has been documented on both the inside and outside of the flood wall (MW-16S, MW-17, DGW-MW-5, MW-46, MW-26, DGW-MW-11, DGW-MW-10, MW-29, DGW-MW-4, MW-27, DGW-MW-3, and DGW-MW-2). This unit is generally present above bedrock, or above a smaller discontinuous unit of more fine-grained soils (clay) and is hydraulically connected to Stewart Creek (as the shale base of this unit is also the base of Stewart Creek in some areas). Groundwater moving through this unit flows to the south or west toward Stewart Creek at a rate of 0.057 to 0.072 meters per day as calculated below using the Darcy velocity equation for calculation of groundwater flux (also shown below).

$$\upsilon = k * i$$

Where:

- υ = Darcy velocity (meters per day)
- i = gradient (ft/ft)
- k = hydraulic conductivity (cm/s)

Gradient Location	Monitoring Well Locations	Elevation (ft above mean sea level)	Elevation Difference (ft)	Distance Between Wells (ft)	Groundwater Gradient (ft/ft)	Hydraulic Conductivity Geometric Mean (cm/s)	(υ) Darcy Velocity (m/day)	(υ_{avg}) Average Darcy Velocity (m/day)
South	MW-30	633.84	7.50	260.45	0.029	0.0023	0.057	0.065
	MW-26	626.34						
West	MW-30	633.84	13.74	378.89	0.036		0.072	
	DGW-MW-5	620.10						

- There are monitoring wells positioned in downgradient locations to assess contaminant migration. The exception to this is downgradient of DGW-MW-10 and DGW-MW-11 where PCL exceedances for antimony, arsenic, cadmium, lead and selenium were observed and the closest downgradient well (MW-26) which does not have PCL exceedances but may not be positioned in a location to

adequately assess migration from DGW-MW-11. An additional shallow monitoring well is proposed downgradient from DGW-MW-11 as described in the RAP. Arsenic exceeded the PCL at both DGW-MW-2 and DGW-MW-3 but the exceedances at DGW-MW-3 were an order of magnitude higher and MW-27 is positioned downgradient of DGW-MW-3. Well installation immediately downgradient from MW-46 is not possible based on access but MW-26 is downgradient from the related plume. Surface water monitoring data for Stewart Creek have not indicated exceedances above applicable PCLs (see 2014 APAR included as Attachment H to the Permit Renewal Application).

- The shallower unit is separated from the deeper transmissive unit in most places, although it is recognized that there may be areas of the FOP where granular fill and debris, utilities, or the former stream channel of Stewart Creek or the North Tributary provide a pathway between the shallower and deeper units. The presence of these pathways between the shallower and deeper units may be the contributing factor to the PCL exceedances of lead, cadmium and antimony in the wells screened in the deeper transmissive unit in the central portion of the proposed RCA (MW-46, DGW-MW-11 and MW-30). It is noted that lead and cadmium concentrations in MW-46 and MW-30 have historically fluctuated and are not consistently above the PCL. DGW-MW-11 is a new well and will be resampled to confirm the detections identified to date. It is also noted that there are no PCL exceedances in the wells installed closest to where the former path of Stewart Creek intersects the current path of Stewart Creek (where it would be assumed that water moving through the former Stewart Creek stream channel would be closest to discharging to surface water (see current and historic results for MW-24 and DGW-MW-9).
- In the areas to the east and the west of the proposed RCA and outside of the flood wall, there were no exceedances identified in deeper downgradient wells (MW-16S, MW-17, DGW-MW-5, MW-44, DGW-MW-1, and DGW-MW-9) and there has been no indication of the presence of shallow water moving between the proposed RCA location and Stewart Creek (no water-bearing unit was identified during recent investigation activities at DGW-MW-5, DGW-MW-1, and DGW-MW-9).

7.0 CONCLUSIONS

At the request of TCEQ and based on the data presented in this report, a groundwater protection element has been added to the RAP for the FOP to address the existing identified groundwater PCL exceedances as well as the potential for future migration of water through the FOP towards Stewart Creek. Based on existing data and data obtained during the DGW PDI, the groundwater protection element will be designed to address the following:

- Groundwater migration to both the south and west sides of the proposed RCA location (considering the groundwater gradient and flux presented herein)
- Groundwater COCs with critical PCL exceedances including lead, cadmium, arsenic and antimony (and as a conservative measure selenium) detected at the ranges of concentrations presented herein (subject to confirmation by resampling)
- Groundwater that is present in a shallow transmissive unit within the FOP area and groundwater that is present in deeper transmissive units across the Site (extending from the ground surface to bedrock)

A detailed evaluation of the suitability of a permeable reactive barrier for the Site based on Site data and existing publicly available literature is included as Appendix 3.2 to the RAP. A Groundwater Remedy Evaluation, reviewing alternatives for a groundwater protection element at the FOP using the new and existing data at the Site, is included as Appendix 3.3 to the RAP. Information from additional field investigations performed in 2019 is summarized in Appendix 3.5 to the RAP. A Column Study to support the evaluation and design of the composition of the proposed PRB is included as Appendix 3.6 to the RAP and a detailed design report for the funnel and gate permeable reactive barrier that is proposed for the FOP is included as Appendix 3.7 to the RAP.

8.0 REFERENCES

The following references were used in the preparation of this DGW PDI Report:

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Texas Commission on Environmental Quality (TCEQ), RE: Response Deep Groundwater Preliminary Design Investigation (DGW PDI) Work Plan, dated March 1, 2018, Exide Frisco Recycling Facility, 7471 5th St. Frisco, TX 75034-5047, TCEQ SWR No. 30516, CN600129779, RN100218643, TCEQ Hazardous Waste Permit No. HW-50206, TCEQ Agreed Order Docket No, 2011-1712-IHW-E, EPA ID No. TX006451090, April 10, 2018.

9.0 CLOSING

Golder appreciates the opportunity to assist Exide with this project. Please contact the undersigned if you have any questions or would like any additional information about this Report.

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TABLES

Groundwater Elevation Survey Data
Appendix 3.1
Deep Groundwater Pre-Design Investigation Report

Well ID	TOC Elevation	Screen Interval	Measurement Date	Depth to Groundwater (ft btoc)	Groundwater Elevation (ft amsl)
B7N	645.60	14-24	05/09/18	12.71	632.89
			05/22/18	13.04	632.56
			05/27/18	13.21	632.39
			06/05/18	13.59	632.01
			06/12/18	13.67	631.93
B9N	640.69	7-17	05/09/18	9.30	631.39
			05/22/18	9.22	631.47
			05/27/18	9.61	631.08
			06/05/18	9.44	631.25
			06/12/18	9.43	631.26
MW-16	628.88	67.5-77.5	04/25/18	9.03	619.85
			05/09/18	9.21	619.67
			05/22/18	9.14	619.74
			05/27/18	9.14	619.74
			06/05/18	11.78	617.10
			06/12/18	11.82	617.06
MW-16S	628.00	7-17	04/25/18	9.02	618.98
			05/09/18	9.03	618.97
			05/22/18	9.15	618.85
			05/27/18	9.28	618.72
			06/05/18	9.38	618.62
			06/12/18	9.44	618.56
MW-17	629.00	7-17	04/25/18	8.48	620.52
			05/09/18	8.56	620.44
			05/22/18	8.55	620.45
			05/27/18	8.65	620.35
			06/05/18	8.61	620.39
			06/12/18	8.59	620.41
MW-18	633.00	5.5-15.5	05/09/18	4.21	628.79
			05/22/18	4.04	628.96
			05/27/18	4.66	628.34
			06/05/18	4.58	628.42
			06/12/18	4.25	628.75
MW-22	636.89	3-13	05/09/18	3.64	633.25
			05/22/18	5.66	631.23
			05/27/18	6.46	630.43
			06/05/18	7.02	629.87
			06/12/18	5.41	631.48
MW-23	644.15	4.5-19.5	05/09/18	6.26	637.89
			05/22/18	6.50	637.65
			05/27/18	6.48	637.67
			06/05/18	8.88	635.27
			06/12/18	6.93	637.22

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Well ID	TOC Elevation	Screen Interval	Measurement Date	Depth to Groundwater (ft btoc)	Groundwater Elevation (ft amsl)
MW-26	631.93	5-15	04/25/18	5.65	626.28
			05/09/18	5.65	626.28
			05/22/18	5.61	626.32
			05/27/18	5.51	626.42
			06/05/18	8.05	623.88
			06/12/18	5.59	626.34
MW-27	633.42	5-15	04/24/18	5.67	627.75
			05/09/18	5.74	627.68
			05/22/18	5.84	627.58
			05/27/18	5.96	627.46
			06/05/18	5.98	627.44
			06/12/18	6.02	627.40
MW-29	633.51	4.5-14.5	04/24/18	6.07	627.44
			05/09/18	5.95	627.56
			05/22/18	6.08	627.43
			05/27/18	5.97	627.54
			06/05/18	7.09	626.42
			06/12/18	5.94	627.57
MW-39	639.70	10-20	05/09/18	10.27	629.43
			05/22/18	11.07	628.63
			05/27/18	11.58	628.12
			06/05/18	12.32	627.38
			06/12/18	12.36	627.34
MW-40	635.51	5-15	05/09/18	5.90	629.61
			05/22/18	6.61	628.90
			05/27/18	6.77	628.74
			06/05/18	7.06	628.45
			06/12/18	7.16	628.35
MW-43	645.45	10-20	05/09/18	WELL DAMAGED	WELL DAMAGED
MW-44	637.50	5-15	04/24/18	9.76	627.74
			05/09/18	9.71	627.79
			05/22/18	10.18	627.32
			05/27/18	10.38	627.12
			06/05/18	10.55	626.95
			06/12/18	10.67	626.83
B5N	631.43	6.5-16.5	04/25/18	10.21	621.22
			05/09/18	10.21	621.22
			05/22/18	10.32	621.11
			05/27/18	10.41	621.02
			06/05/18	10.39	621.04
			06/12/18	10.36	621.07

Groundwater Elevation Survey Data
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Well ID	TOC Elevation	Screen Interval	Measurement Date	Depth to Groundwater (ft btoc)	Groundwater Elevation (ft amsl)
MW-10	644.82	7-17	05/09/18	6.60	638.22
			05/22/18	6.79	638.03
			05/27/18	6.72	638.10
			06/05/18	7.11	637.71
			06/12/18	7.23	637.59
			08/01/18	8.15	636.67
MW-12	635.16	8-18.5	05/09/18	8.35	626.81
			05/22/18	8.14	627.02
			05/27/18	8.74	626.42
			06/05/18	8.37	626.79
			06/12/18	8.42	626.74
MW-13	637.08	12-22	05/09/18	15.96	621.12
			05/22/18	16.25	620.83
			05/27/18	16.32	620.76
			06/05/18	16.45	620.63
			06/11/18	16.40	620.68
MW-14	631.01	7-17	05/09/18	6.07	624.94
			05/22/18	5.97	625.04
			05/27/18	5.99	625.02
			06/05/18	6.02	624.99
			06/12/18	6.06	624.95
MW-21	635.99	3-13	05/09/18	2.91	633.08
			05/22/18	3.65	632.34
			05/27/18	4.10	631.89
			06/05/18	4.35	631.64
			06/12/18	3.87	632.12
MW-24	642.96	14-29	05/09/18	21.91	621.05
			05/22/18	22.17	620.79
			05/27/18	22.33	620.63
			06/05/18	22.41	620.55
			06/12/18	22.33	620.63
MW-30	645.15	12-32	05/22/18	11.15	634.00
			05/27/18	11.22	633.93
			06/05/18	11.41	633.74
			06/12/18	11.31	633.84
MW-31	636.71	8-23	04/24/18	10.35	626.36
			05/09/18	10.19	626.52
			05/22/18	10.42	626.29
			05/27/18	10.40	626.31
			06/05/18	10.52	626.19
			06/12/18	10.31	626.40

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Deep Groundwater Pre-Design Investigation Report

Well ID	TOC Elevation	Screen Interval	Measurement Date	Depth to Groundwater (ft btoc)	Groundwater Elevation (ft amsl)
MW-32	630.96	2.5-5	04/24/18	3.24	627.72
			05/09/18	3.30	627.66
			05/22/18	3.17	627.79
			05/27/18	3.18	627.78
			06/05/18	3.11	627.85
			06/12/18	3.06	627.90
MW-33	632.59	2.5-5	04/24/18	0.85	631.74
			05/09/18	0.80	631.79
			05/22/18	0.85	631.74
			05/27/18	0.81	631.78
			06/05/18	R	R
			06/12/18	0.91	631.68
MW-34	632.83	2.5-5	04/24/18	3.58	629.25
			05/09/18	3.57	629.26
			05/22/18	3.51	629.32
			05/27/18	3.47	629.36
			06/05/18	3.46	629.37
			06/12/18	3.39	629.44
MW-35	632.55	2.5-5	04/24/18	3.88	628.67
			05/09/18	3.92	628.63
			05/22/18	3.81	628.74
			05/27/18	3.76	628.79
			06/05/18	3.81	628.74
			06/12/18	3.81	628.74
MW-36	633.63	2.5-5	05/09/18	3.25	630.38
			05/22/18	3.12	630.51
			05/27/18	3.11	630.52
			06/05/18	3.05	630.58
			06/12/18	3.09	630.54
MW-38	623.14	5-15	05/10/18	6.65	616.49
			05/22/18	6.91	616.23
			05/27/18	7.25	615.89
			06/05/18	7.47	615.67
			06/12/18	7.75	615.39
MW-46	630.98	10-20	04/24/18	3.95	627.03
			05/08/18	4.24	626.74
			05/22/18	4.41	626.57
			05/27/18	4.51	626.47
			06/05/18	4.59	626.39
			06/12/18	4.53	626.45

Groundwater Elevation Survey Data
Appendix 3.1
Deep Groundwater Pre-Design Investigation Report

Well ID	TOC Elevation	Screen Interval	Measurement Date	Depth to Groundwater (ft btoc)	Groundwater Elevation (ft amsl)
DGW-MW-1	638.97	10.2-29.7	05/22/18	10.91	628.06
			05/27/18	11.09	627.88
			06/05/18	11.24	627.73
			06/12/18	11.30	627.67
DGW-MW-2	634.05	10.2-19.7	05/22/18	6.30	627.75
			05/27/18	6.41	627.64
			06/05/18	6.49	627.56
			06/12/18	6.51	627.54
DGW-MW-3	633.00	5.2-19.7	05/22/18	5.30	627.70
			05/27/18	5.39	627.61
			06/05/18	5.47	627.53
			06/12/18	5.54	627.46
DGW-MW-4	632.12	10.2-19.7	05/22/18	3.61	628.51
			05/27/18	3.70	628.42
			06/05/18	3.81	628.31
			06/12/18	3.76	628.36
DGW-MW-5	630.12	5.2-19.7	05/22/18	9.95	620.17
			05/27/18	10.03	620.09
			06/05/18	10.01	620.11
			06/12/18	10.02	620.10
DGW-MW-6	642.98	15.2-29.7	05/22/18	12.92	630.06
			05/27/18	13.01	629.97
			06/05/18	13.21	629.77
			06/12/18	13.01	629.97
DGW-MW-7	643.01	15.2-29.7	05/22/18	13.20	629.81
			05/27/18	13.26	629.75
			06/05/18	13.48	629.53
			06/12/18	13.26	629.75
DGW-MW-8	644.13	15.2-29.7	05/22/18	24.24	619.89
			05/27/18	24.34	619.79
			06/05/18	24.49	619.64
			06/12/18	24.48	619.65
DGW-MW-9	644.81	10.2-24.7	05/22/18	16.85	627.96
			05/27/18	17.02	627.79
			06/05/18	17.14	627.67
			06/12/18	17.18	627.63
DGW-MW-10	631.55	15.2-19.7	05/22/18	2.64	628.91
			05/27/18	2.58	628.97
			06/05/18	2.74	628.81
			06/12/18	2.67	628.88

Groundwater Elevation Survey Data
Appendix 3.1
Deep Groundwater Pre-Design Investigation Report

Well ID	TOC Elevation	Screen Interval	Measurement Date	Depth to Groundwater (ft btoc)	Groundwater Elevation (ft amsl)
DGW-MW-10S	631.66	2.7-7.2	05/22/18	7.08	624.58
			05/27/18	5.60	626.06
			06/05/18	6.35	625.31
			06/12/18	5.15	626.51
DGW-MW-11	631.28	10.2-17.2	05/22/18	16.86	614.42
			05/27/18	10.00	621.28
			06/05/18	7.80	623.48
			06/12/18	6.83	624.45
DGW-MW-11S	631.54	2.2-6.7	05/22/18	5.47	626.07
			05/27/18	4.71	626.83
			06/05/18	6.70	624.84
			06/12/18	1.86	629.68

Stewart Creek Elevations

Survey Point	Measurement Date	Northing (feet)	Easting (feet)	Elevation (ft amsl)
Edge of Water; South of Former Admin Building	05/22/18	7101573.05	2480800.60	627.93
Edge of Water; South of DGW-MW-4	05/22/18	7101659.03	2480115.77	627.18
Edge of Water; Southwest of DGW-MW-11	05/22/18	7101830.84	2479865.52	625.82
Edge of Water; West DGW-MW-5	05/22/18	7102097.27	2479550.23	620.15
Edge of Water; Southwest of DGW-MW-8	05/22/18	7102149.59	2479452.46	618.21

Notes:
1. TOC - top of casing
2. ft btoc - feet below top of casing.
3. ft amsl - feet above mean sea level.
4. NM - not measured.
5. R - Depth to groundwater was disqualified as a field error

Prepared by: EPW 06/13/2018
Updated by: BCW 08/06/2018
Checked by: JS 06/13/2018, EPW 08/06/2018
Reviewed by: AMF 08/14/2018

Table 2
Groundwater Analytical Data Summary
Appendix 3.1
Deep Groundwater Pre-Design Investigation Report

Sample ID		$^{GW}GW_{Ing}$ PCL[1]	$^{Air}GW_{Inh-V}$ PCL[1]	^{SW}SW PCL (based on Tier 1 Contact Recreation Water PCL)	^{SW}SW PCL (based on chronic aquatic life criteria)	Dilution Factor for Perennial Streams	^{SW}GW PCL (with dilution factor of 0.15, based on chronic aquatic life criteria)[2,4]	^{SW}GW PCL (with dilution factor of 0.15, based on contact recreation)[4]	Critical PCL[2]	MQL[5]	DGW-MW-1[4]	DGW-MW-2[4]	DGW-MW-3[4]	DGW-MW-4[4]	DGW-MW-5[4]	DGW-MW-6
Date Sampled											05/31/18	05/31/18	05/31/18	05/30/18	05/30/18	05/30/18
Screen Interval											10.2-29.7	10.2-19.7	5.2-19.7	10.2-19.7	5.2-19.7	15.2-29.7
Total Metals by EPA Method SW-846 6020																
Antimony	mg/L	0.006	--	0.199	2.2	0.15	14.7	1.33	0.006	0.00200	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000400 U	**0.00117 J**
Arsenic	mg/L	0.01	--	0.0285	--	0.15	--	0.19	0.01	0.00200	**0.00533**	**0.0132**	**0.100**	**0.00564**	**0.00366**	**0.0134**
Cadmium	mg/L	0.005	--	0.149	--	0.15	--	0.99	0.005	0.00200	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	**0.000699 J**
Lead	mg/L	0.015	--	0.015	--	0.15	--	0.10	0.015	0.00200	0.000600 U	0.000600 U	**0.000802 J**	0.000600 U	0.000600 U	**0.00106 J**
Selenium	mg/L	0.05	--	4.13	0.005	0.15	0.0333	27.5	0.0333	0.00200	**0.00398**	**0.00375**	**0.00302**	**0.00174 J**	**0.00272**	**0.00242**
Dissolved Metals by EPA Method SW-846 6020																
Antimony	mg/L	0.006	--	0.199	--	0.15	--	1.33	0.006	0.00200	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000400 U	**0.00122 J**
Arsenic	mg/L	0.01	--	0.0285	0.15	0.15	1.00	0.19	0.01	0.00200	**0.00497**	**0.0127**	**0.103**	**0.00546**	**0.00340**	**0.0136**
Cadmium	mg/L	0.005	--	0.149	0.000256	0.15	0.0017	0.99	0.0017	0.00200	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U
Lead	mg/L	0.015	--	0.015	0.00268	0.15	0.0179	0.10	0.015	0.00200	0.000600 U	0.000600 U	0.000600 U	**0.000615 J**	0.000600 U	0.000600 U
Selenium	mg/L	0.05	--	4.13	--	0.15	--	27.5	0.050	0.00200	**0.00321**	**0.00296**	**0.00335**	**0.00318**	**0.00331**	**0.00246**
Total Petroleum Hydrocarbons (TPH) by TX 1005																
>nC12 to nC28	mg/L	0.98	970	37.4	--	0.15	--	249	0.98	0.47	NS	0.20 U	**3.10**	0.20 U	NS	NS
>nC28 to nC35	mg/L	0.98	970	28.1	--	0.15	--	187	0.98	0.47	NS	0.20 U	0.20 U	0.20 U	NS	NS
nC6 to nC12	mg/L	0.98	230	56.2	--	0.15	--	375	0.98	0.47	NS	0.20 U	0.20 U	0.20 U	NS	NS
Total Petroleum Hydrocarbon	mg/L	--	--	--	--	--	--	--	--	0.47	NS	0.20 U	**3.10**	0.20 U	NS	NS
Total Petroleum Hydrocarbons (TPH) by TX 1006																
Not Detected																
Remediation Design Parameters																
Total Metals by EPA Method SW-846 6020																
Calcium	mg/L	--	--	--	--	--	--	--	See note 7	0.500	**294**	**277**	**93.9**	**229**	**197**	**250 J**
Iron	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**1.92**	**5.41**	**7.04**	**4.03**	**7.14**	**28.3**
Magnesium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**21.9**	**36.8**	**11.5**	**31.7**	**22.0**	**39.4**
Dissolved Metals by EPA Method SW-846 6020																
Calcium	mg/L	--	--	--	--	--	--	--	See note 7	0.500	**276**	**125**	**98.2**	**198**	**174**	**466 J**
Iron	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**1.62**	**5.38**	**7.05**	**3.86**	**7.07**	**29.1**
Magnesium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**21.7**	**35.6**	**11.6**	**30.5**	**22.1**	**43.0**
Alkalinity by SM 2320B																
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	**616**	**656**	**548**	**566**	**573**	**520**
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U
Alkalinity, Total (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	**616**	**656**	**548**	**566**	**573**	**520**
Anions by E300.0																
Chloride	mg/L	--	--	--	--	--	--	--	See note 7	0.500	**99.4**	**103**	**46.6**	**87.8**	**172**	**120**
Sulfate	mg/L	--	--	--	--	--	--	--	See note 7	5.00	**825**	**812**	**127**	**810**	**1,000**	**1,330**
Nitrate/Nitrite (as N)	mg/L	--	--	--	--	--	--	--	See note 7	0.200	0.0300 U	0.0300 U	0.0320 U	0.0300 U	0.0300 U	0.0300 U
Total/Dissolved Organic Carbon by SM5310B																
Total Organic Carbon (TOC)	mg/L	--	--	--	--	--	--	--	See note 7	1.00	**3.24**	**6.24**	**19.9**	**6.20**	**6.68**	**7.24**
Dissolved Organic Carbon (DOC)	mg/L	--	--	--	--	--	--	--	See note 7	1.00	**3.32**	**6.38**	**17.8**	**5.74**	**6.21**	**6.82**

Table 2
Groundwater Analytical Data Summary
Appendix 3.1
Deep Groundwater Pre-Design Investigation Report

Sample ID		$^{GW}GW_{Ing}$ PCL[1]	$^{Air}GW_{Inh-V}$ PCL[1]	^{SW}SW PCL (based on Tier 1 Contact Recreation Water PCL)	^{SW}SW PCL (based on chronic aquatic life criteria)	Dilution Factor for Perennial Streams	^{SW}GW PCL (with dilution factor of 0.15, based on chronic aquatic life criteria)[2,4]	^{SW}GW PCL (with dilution factor of 0.15, based on contact recreation)[4]	Critical PCL[2]	MQL[5]	DGW-MW-7	DGW-MW-8	DGW-MW-9[4]	DGW-MW-10[4]	DGW-MW-10S[4]	DGW-MW-11[4]	DGW-MW-11S[4]
Date Sampled											05/30/18	05/30/18	05/31/18	05/30/18	05/31/18	05/30/18	5/30/2018-5/31/2018
Screen Interval											15.2-29.7	15.2-29.7	10.2-24.7	15.2-19.7	2.7-7.2	10.2-17.2	2.2-6.7
Total Metals by EPA Method SW-846 6020																	
Antimony	mg/L	0.006	--	0.199	2.2	0.15	14.7	1.33	0.006	0.00200	**0.00160 J**	**0.000919 J**	0.000400 U	**0.000459 J**	**0.00433**	**0.00467 J**	**0.0240**
Arsenic	mg/L	0.01	--	0.0285	--	0.15	--	0.19	0.01	0.00200	**0.0218**	**0.00271**	**0.00270**	**0.0113**	**0.00852**	0.000200 U	**0.00338**
Cadmium	mg/L	0.005	--	0.149	--	0.15	--	0.99	0.005	0.00200	**0.000250 J**	0.000200 U	0.000200 U	0.000200 U	**0.000930 J**	**0.0254**	**0.00346**
Lead	mg/L	0.015	--	0.015	--	0.15	--	0.10	0.015	0.00200	0.000600 U	0.000600 U	**0.000738 J**	**0.000855 J**	**0.00772**	**0.0362**	**0.0285 J**
Selenium	mg/L	0.05	--	4.13	0.005	0.15	0.0333	27.5	0.0333	0.00200	**0.00585**	**0.00723**	**0.00350**	**0.00814**	**0.00676**	0.00550 U	**0.00911**
Dissolved Metals by EPA Method SW-846 6020																	
Antimony	mg/L	0.006	--	0.199	--	0.15	--	1.33	0.006	0.00200	**0.00157 J**	**0.000895 J**	0.000400 U	0.000400 U	**0.00402**	**0.00448 J**	**0.0245**
Arsenic	mg/L	0.01	--	0.0285	0.15	0.15	1.00	0.19	0.01	0.00200	**0.0209**	**0.00232**	**0.00245**	**0.0112**	**0.00522**	0.000200 U	**0.00376**
Cadmium	mg/L	0.005	--	0.149	0.000256	0.15	0.0017	0.99	0.0017	0.00200	0.000200 U	0.000200 U	0.000200 U	0.000200 U	**0.000655 J**	**0.0259**	**0.00382**
Lead	mg/L	0.015	--	0.015	0.00268	0.15	0.0179	0.10	0.015	0.00200	0.000600 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U	**0.0338**	**0.0411 J**
Selenium	mg/L	0.05	--	4.13	--	0.15	--	27.5	0.050	0.00200	**0.00584**	**0.00736**	**0.00323**	**0.00848**	**0.00715**	0.00550 U	**0.0110**
Total Petroleum Hydrocarbons (TPH) by TX 1005																	
>nC12 to nC28	mg/L	0.98	970	37.4	--	0.15	--	249	0.98	0.47	NS	NS	NS	0.19 U	0.20 U	NS	NS
>nC28 to nC35	mg/L	0.98	970	28.1	--	0.15	--	187	0.98	0.47	NS	NS	NS	0.19 U	0.20 U	NS	NS
nC6 to nC12	mg/L	0.98	230	56.2	--	0.15	--	375	0.98	0.47	NS	NS	NS	0.19 U	0.20 U	NS	NS
Total Petroleum Hydrocarbon	mg/L	--	--	--	--	--	--	--	--	0.47	NS	NS	NS	0.19 U	0.20 U	NS	NS
Total Petroleum Hydrocarbons (TPH) by TX 1006																	
Not Detected																	
Remediation Design Parameters																	
Total Metals by EPA Method SW-846 6020																	
Calcium	mg/L	--	--	--	--	--	--	--	See note 7	0.500	**333**	**440**	**556**	**308**	**264**	**544**	**368**
Iron	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**21.8**	**0.704**	**17.6**	**9.53**	**2.69**	**13.6**	**0.0631 J**
Magnesium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**24.6**	**108**	**217**	**54.0**	**29.8**	**302**	**105**
Dissolved Metals by EPA Method SW-846 6020																	
Calcium	mg/L	--	--	--	--	--	--	--	See note 7	0.500	**367**	**231**	**546**	**291**	**184**	**510**	**306**
Iron	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**21.4**	**0.332**	**17.6**	**9.22**	**0.0424 J**	**14.0**	**0.473 J**
Magnesium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**26.7**	**112**	**216**	**56.6**	**31.1**	**323**	**115**
Alkalinity by SM 2320B																	
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	**531**	**693**	**744**	**803**	**529**	**318**	**265**
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U
Alkalinity, Total (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	**531**	**693**	**744**	**803**	**529**	**318**	**265**
Anions by E300.0																	
Chloride	mg/L	--	--	--	--	--	--	--	See note 7	0.500	**167**	**421**	**89.9**	**279**	**140**	**215**	**209**
Sulfate	mg/L	--	--	--	--	--	--	--	See note 7	5.00	**1,940**	**1,680**	**2,910**	**1,770**	**4,740**	**5,010**	**4,750**
Nitrate/Nitrite (as N)	mg/L	--	--	--	--	--	--	--	See note 7	0.200	0.0300 U	0.0300 U	0.0300 U	0.0300 U	0.164 U	**1.33 J**	**7.62**
Total/Dissolved Organic Carbon by SM5310B																	
Total Organic Carbon (TOC)	mg/L	--	--	--	--	--	--	--	See note 7	1.00	**7.66**	**7.75**	**5.63**	**10.0**	**18.0**	**4.94**	**11.7**
Dissolved Organic Carbon (DOC)	mg/L	--	--	--	--	--	--	--	See note 7	1.00	**7.07 J**	**7.61 J**	**5.39**	**9.56**	**18.5**	**5.07**	**12.2**

Sample ID		$^{GW}GW_{Ing}$ PCL[1]	$^{Air}GW_{Inh-V}$ PCL[1]	^{SW}SW PCL (based on Tier 1 Contact Recreation Water PCL)	^{SW}SW PCL (based on chronic aquatic life criteria)	Dilution Factor for Perennial Streams	^{SW}GW PCL (with dilution factor of 0.15, based on chronic aquatic life criteria)[2,4]	^{SW}GW PCL (with dilution factor of 0.15, based on contact recreation)[4]	Critical PCL[2]	MQL[5]	MW-10		MW-16[4]	MW-16S[4]	MW-17[4]	MW-18[5]	MW-24	MW-26[4]
Date Sampled											05/31/18	08/01/18	05/31/18	05/31/18	06/04/18	06/04/18	05/30/18	06/04/18
Screen Interval											7-17		67.5-77.5	7-17	7-17	5.5-15.5	14-29	5-15
Total Metals by EPA Method SW-846 6020																		
Antimony	mg/L	0.006	--	0.199	2.2	0.15	14.7	1.33	0.006	0.00200	**0.00283**	NS	0.00110 U	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000400 U
Arsenic	mg/L	0.01	--	0.0285	--	0.15	--	0.19	0.01	0.00200	**0.000977 J**	NS	**0.00265**	**0.00392**	0.000400 U	**0.00139 J**	**0.00361**	**0.000995 J**
Cadmium	mg/L	0.005	--	0.149	--	0.15	--	0.99	0.005	0.00200	**0.00138 J**	NS	0.000200 U	**0.000733 J**	0.000200 U	0.000200 U	0.000200 U	0.000200 U
Lead	mg/L	0.015	--	0.015	--	0.15	--	0.10	0.015	0.00200	**0.0390**	**0.0115**	**0.00107 J**	0.000600 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U
Selenium	mg/L	0.05	--	4.13	0.005	0.15	0.0333	27.5	0.0333	0.00200	**0.00328**	NS	**0.0325**	**0.0179**	**0.00693 J**	0.00110 U	**0.00687**	**0.00170 J**
Dissolved Metals by EPA Method SW-846 6020																		
Antimony	mg/L	0.006	--	0.199	--	0.15	--	1.33	0.006	0.00200	**0.00230**	NS	**0.000763 J**	0.000400 U	0.00129 U	0.000400 U	0.000400 U	0.00295 U
Arsenic	mg/L	0.01	--	0.0285	0.15	0.15	1.00	0.19	0.01	0.00200	0.000400 U	NS	**0.00246**	**0.000889 J**	0.000400 U	**0.000562 J**	**0.00113 J**	0.000400 U
Cadmium	mg/L	0.005	--	0.149	0.000256	0.15	0.0017	0.99	0.0017	0.00200	**0.000881 J**	NS	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U
Lead	mg/L	0.015	--	0.015	0.00268	0.15	0.0179	0.10	0.015	0.00200	**0.000654 J**	**0.00143 J**	0.000600 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U
Selenium	mg/L	0.05	--	4.13	--	0.15	--	27.5	0.050	0.00200	**0.00252**	NS	**0.0279**	**0.0209**	**0.0237 J**	0.00110 U	**0.00571**	**0.00704 J**
Total Petroleum Hydrocarbons (TPH) by TX 1005																		
>nC12 to nC28	mg/L	0.98	970	37.4	--	0.15	--	249	0.98	0.47	NS	NS	NS	NS	NS	NS	NS	NS
>nC28 to nC35	mg/L	0.98	970	28.1	--	0.15	--	187	0.98	0.47	NS	NS	NS	NS	NS	NS	NS	NS
nC6 to nC12	mg/L	0.98	230	56.2	--	0.15	--	375	0.98	0.47	NS	NS	NS	NS	NS	NS	NS	NS
Total Petroleum Hydrocarbon	mg/L	--	--	--	--	--	--	--	--	0.47	NS	NS	NS	NS	NS	NS	NS	NS
Total Petroleum Hydrocarbons (TPH) by TX 1006																		
Not Detected																		
Remediation Design Parameters																		
Total Metals by EPA Method SW-846 6020																		
Calcium	mg/L	--	--	--	--	--	--	--	See note 7	0.500	**146**	NS	**366**	**830**	**375**	**144**	**305 J**	**433**
Iron	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**1.11**	NS	**0.07410 J**	**2.39**	**1.83**	**0.418**	**2.42**	**3.69**
Magnesium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**12.1**	NS	**28.7**	**80.1**	**32.9**	**6.30**	**32.3**	**211**
Dissolved Metals by EPA Method SW-846 6020																		
Calcium	mg/L	--	--	--	--	--	--	--	See note 7	0.500	**142**	NS	**341**	**466**	**251**	**127**	**507 J**	**505**
Iron	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**0.0188 J**	NS	0.0120 U	**0.722**	**1.78**	0.0120 U	**1.39**	**4.52**
Magnesium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**11.5**	NS	**28.7**	**82.9**	**34.9**	**6.30**	**32.9**	**249 JL**
Alkalinity by SM 2320B																		
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	**315**	NS	**358**	**654**	**445**	**289**	**515**	**652**
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	5.00 U	NS	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	5.00 U	NS	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U
Alkalinity, Total (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	**315**	NS	**358**	**654**	**445**	**289**	**515**	**652**
Anions by E300.0																		
Chloride	mg/L	--	--	--	--	--	--	--	See note 7	0.500	**32.4**	NS	**1,070**	**1,780**	**382**	**76.8**	**285**	**219**
Sulfate	mg/L	--	--	--	--	--	--	--	See note 7	5.00	**810**	NS	**611**	**1,050**	**2,070**	**180**	**1,910**	**3,740**
Nitrate/Nitrite (as N)	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**3.28**	NS	**1.51**	0.0300 U	0.0300 U	0.0350 U	0.0300 U	0.0300 U
Total/Dissolved Organic Carbon by SM5310B																		
Total Organic Carbon (TOC)	mg/L	--	--	--	--	--	--	--	See note 7	1.00	**2.16**	NS	**8.36**	**6.36**	**4.54**	**1.26**	**4.34**	**3.43**
Dissolved Organic Carbon (DOC)	mg/L	--	--	--	--	--	--	--	See note 7	1.00	**2.34**	NS	**8.12**	**6.17**	**4.89**	**1.67**	**4.85 J**	**3.66**

Table 2
Groundwater Analytical Data Summary
Appendix 3.1
Deep Groundwater Pre-Design Investigation Report

Sample ID		$^{GW}GW_{Ing}$ PCL[1]	$^{Air}GW_{Inh-V}$ PCL[1]	^{SW}SW PCL (based on Tier 1 Contact Recreation Water PCL)	^{SW}SW PCL (based on chronic aquatic life criteria)	Dilution Factor for Perennial Streams	^{SW}GW PCL (with dilution factor of 0.15, based on chronic aquatic life criteria)[2,4]	^{SW}GW PCL (with dilution factor of 0.15, based on contact recreation)[4]	Critical PCL[2]	MQL[5]	MW-27[4]	MW-29[4]	MW-30	MW-31	MW-44[4]	MW-46[4]
Date Sampled											05/31/18	05/31/18	05/31/18	06/01/18	06/01/18	06/01/18
Screen Interval											5-15	4.5-14.5	12-32	8-23	5-15	10-20
Total Metals by EPA Method SW-846 6020																
Antimony	mg/L	0.006	--	0.199	2.2	0.15	14.7	1.33	0.006	0.00200	0.000400 U	0.000400 U	**0.00868**	0.000400 U	0.000400 U	**0.00263**
Arsenic	mg/L	0.01	--	0.0285	--	0.15	--	0.19	0.01	0.00200	**0.0112**	**0.00191 J**	**0.0657**	**0.0106**	**0.00326**	**0.00461**
Cadmium	mg/L	0.005	--	0.149	--	0.15	--	0.99	0.005	0.00200	**0.000578 J**	0.000200 U	0.000200 U	0.000200 U	0.000200 U	**0.00204**
Lead	mg/L	0.015	--	0.015	--	0.15	--	0.10	0.015	0.00200	**0.00726**	0.000600 U	**0.0225**	0.000600 U	**0.000842 J**	**0.0354**
Selenium	mg/L	0.05	--	4.13	0.005	0.15	0.0333	27.5	0.0333	0.00200	**0.00299**	**0.0190**	**0.00328**	**0.00595**	**0.00627**	**0.00754**
Dissolved Metals by EPA Method SW-846 6020																
Antimony	mg/L	0.006	--	0.199	--	0.15	--	1.33	0.006	0.00200	0.000400 U	0.000400 U	**0.00885**	0.000400 U	0.000400 U	**0.000569 J**
Arsenic	mg/L	0.01	--	0.0285	0.15	0.15	1.00	0.19	0.01	0.00200	**0.0102**	**0.00152 J**	**0.0166**	**0.0101**	**0.00108 J**	**0.00187 J**
Cadmium	mg/L	0.005	--	0.149	0.000256	0.15	0.0017	0.99	0.0017	0.00200	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	**0.00219**
Lead	mg/L	0.015	--	0.015	0.00268	0.15	0.0179	0.10	0.015	0.00200	0.000600 U	0.000600 U	**0.0132**	**0.000633 J**	0.000600 U	**0.00183 J**
Selenium	mg/L	0.05	--	4.13	--	0.15	--	27.5	0.050	0.00200	**0.00300**	**0.0197**	**0.00163 J**	**0.00550**	**0.00661**	**0.00793**
Total Petroleum Hydrocarbons (TPH) by TX 1005																
>nC12 to nC28	mg/L	0.98	970	37.4	--	0.15	--	249	0.98	0.47	NS	0.20 U	NS	NS	NS	NS
>nC28 to nC35	mg/L	0.98	970	28.1	--	0.15	--	187	0.98	0.47	NS	0.20 U	NS	NS	NS	NS
nC6 to nC12	mg/L	0.98	230	56.2	--	0.15	--	375	0.98	0.47	NS	0.20 U	NS	NS	NS	NS
Total Petroleum Hydrocarbon	mg/L	--	--	--	--	--	--	--	--	0.47	NS	0.20 U	NS	NS	NS	NS
Total Petroleum Hydrocarbons (TPH) by TX 1006																
Not Detected																
Remediation Design Parameters																
Total Metals by EPA Method SW-846 6020																
Calcium	mg/L	--	--	--	--	--	--	--	See note 7	0.500	**288**	**546**	**378**	**391**	**492**	**338**
Iron	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**26.3**	**8.01**	**23.1**	**7.05**	**11.1**	**73.5**
Magnesium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**24.1**	**232**	**29.2**	**31.9**	**65.3**	**175**
Dissolved Metals by EPA Method SW-846 6020																
Calcium	mg/L	--	--	--	--	--	--	--	See note 7	0.500	**290**	**393**	**194 J**	**301**	**367**	**208**
Iron	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**25.5**	**7.74**	**6.35**	**6.73**	**8.27**	**69.3**
Magnesium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**23.6**	**207**	**32.5**	**32.3**	**64.7**	**109**
Alkalinity by SM 2320B																
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	**269**	**658**	**547**	**761**	**567**	**170**
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U
Alkalinity, Total (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	**269**	**658**	**547**	**761**	**567**	**170**
Anions by E300.0																
Chloride	mg/L	--	--	--	--	--	--	--	See note 7	0.500	**85.7**	**1,160**	**114**	**130**	**301**	**360**
Sulfate	mg/L	--	--	--	--	--	--	--	See note 7	5.00	**896**	**4,420**	**950**	**1,650**	**1,680**	**2,700**
Nitrate/Nitrite (as N)	mg/L	--	--	--	--	--	--	--	See note 7	0.200	0.0300 U	0.0300 U	0.0300 U	0.0300 U	0.0300 U	**0.150 J**
Total/Dissolved Organic Carbon by SM5310B																
Total Organic Carbon (TOC)	mg/L	--	--	--	--	--	--	--	See note 7	1.00	**6.96**	**11.5**	**8.28**	**10.4**	**6.14**	**4.46**
Dissolved Organic Carbon (DOC)	mg/L	--	--	--	--	--	--	--	See note 7	1.00	**6.76**	**10.9**	**6.40**	**9.83**	**6.28**	**4.15**

Groundwater Analytical Data Summary
Appendix 3.1
Deep Groundwater Pre-Design Investigation Tech Memo

Notes:
Detected analytes are bolded.
Green highlight indicates analyte exceeds Critical PCL.
NS - Not Sampled.
J - Analyte concentration estimated.
U - Analyte not detected above method quantitation limit (MQL).
L - Bias likely low.
-- Indicates PCL not available.
(1) Samples for dissolved analysis field filtered with a 0.45 micron filter.
(2) ^{SW}GW PCL set to ^{SW}SW RBEL based on chronic aquatic life criteria for monitoring wells along Stewart Creek assuming ecological criteria (perennial streams) assuming use of a 0.15 dilution factor. Per TRRP-24, specific aquatic life criteria for arsenic, cadmium and lead apply to dissolved rather than total concentrations since the dissolved phase represents the bioavailable form. Also per TRRP-24, the SWGW PCL applies to monitoring wells where there is a potential to discharge to surface water. Arsenic, cadmium, and lead RBELs based on hardness value of 106 mg/L for Segment 0823.
(3) Critical PCLs are minimum of the TRRP commercial-industrial Tier 1 $^{GW}GW_{Ing}$ and $^{Air}GW_{Inh\text{-}V}$ PCLs, or applicable ^{SW}GW PCLs.
(4) For purposes of this assessment, all groundwater wells were considered a potential point of discharge where the ^{SW}GW PCL for may apply (assuming a dilution factor of 0.15)
(5) MQL values shown are based on 2018 data. No MQL values exceeded applicable PCLs.
(6) Direct Human Contact Recreation Water Tier 1 PCL (last updated March 2006) used to evaluate exposure to constituents of concern (COCs) through the accidental ingestion of surface water and dermal contact. When no value was listed (lead), the dri
(7) These constituents were included for design considerations only and are not COCs at the Site.
(8) SWGW PCL (SW RBEL based on chronic aquatic life criteria, no dilution factor) added for reference purposes.

Prepared by: BCW 06/05/2018
Updated by: EPW 07/16/2018, BCW 08/06/18
Checked by: EPW 06/13/2018, BEF 07/16/2018
Reviewed by: AMF/THR 08/14/2018

Table 3

Groundwater Field Paramter Summary
Appendix 3.1
Deep Groundwater Pre-Design Investigation Report

Monitoring Well	Sample Date	Temperature °C	ORP mV	Specific Conductivity mS/cm	pH -	Turbidity NTU	Dissolved Oxygen mg/L	Total Drawdown (feet)
DGW-MW-1	5/31/2018	21.25	2.3	2.507	6.48	9.16	0.09	0.16
DGW-MW-2	5/31/2018	23.61	-11.7	2.486	6.43	9.77	0.58	0.00
DGW-MW-3	5/31/2018	22.45	-73.9	1.178	6.72	8.64	0.60	1.30
DGW-MW-4	5/30/2018	22.96	-32.2	2.459	6.48	6.17	0.78	0.03
DGW-MW-5	5/30/2018	20.72	-27.1	3.237	6.59	9.40	0.18	0.02
DGW-MW-6	5/30/2018	23.73	-55.7	3.421	6.44	9.30	0.28	0.79
DGW-MW-7	5/30/2018	22.70	-11.6	4.752	6.83	8.10	0.25	0.07
DGW-MW-8	5/30/2018	30.32	9.2	4.765	6.43	9.60	3.10	0.20
DGW-MW-9	5/31/2018	22.94	-3.0	5.301	6.13	8.69	0.06	0.09
DGW-MW-10	5/30/2018	22.80	-29.3	4.755	6.25	3.89	0.63	0.36
DGW-MW-10S	5/31/2018	25.12	13.6	7.223	6.95	25.3	1.81	2.64
DGW-MW-11	5/30/2018	21.09	47.6	8.736	5.95	7.57	4.43	4.38
DGW-MW-11S	5/30/2018-5/31/2018	25.13	184.5	8.438	7.16	16.5	3.03	1.43
MW-10	5/31/2018	22.74	55.2	1.352	6.53	8.68	0.20	0.63
	8/1/2018	23.72	59.8	1.812	6.50	3.81	0.26	1.51
MW-16	5/31/2018	20.57	200.9	4.509	6.52	2.89	1.08	2.24
MW-16S	5/31/2018	20.35	114.8	7.639	5.98	6.11	0.10	0.30
MW-17	6/4/2018	20.34	55.0	4.720	6.36	15.8	0.17	0.19
MW-18	6/4/2018	19.23	213.4	1.008	6.44	3.16	0.26	0.61
MW-24	5/30/2018	21.58	17.6	4.549	6.45	9.20	0.10	0.19
MW-26	6/4/2018	20.70	63.8	6.785	6.32	9.81	0.27	4.15
MW-27	5/31/2018	22.91	-45.4	2.008	6.33	8.59	0.10	4.18
MW-29	5/31/2018	21.71	60.3	9.431	5.94	7.03	0.49	5.86
MW-30	5/31/2018	22.89	-79.0	2.601	6.53	9.17	0.05	0.02
MW-31	6/1/2018	23.12	-20.4	4.325	6.47	9.42	0.09	0.54
MW-44	6/1/2018	22.59	17.2	3.710	6.25	10.8	0.15	7.69
MW-46	6/1/2018	23.08	42.5	4.724	5.40	65.2	0.28	3.01

Notes:
1. mV - millivolts
2. mS/cm - milliSiemens/centimeter
3. NTU - Nephelometric Turbidity Unit
4. mg/L - milligrams/liter

Prepared by: BCW 08/06/2018
Checked by: EPW 08/06/2018
Reviewed by: AMF/THR 08/14/2018

Table 4
Investigation Stockpile Soil Results
Appendix 3.1
Deep Groundwater Pre-Design Investigation Report

Analyte	Texas Class 2 Non-Hazardous Screening Values	Sample ID / Date Sampled	DGW-PDI SP-01 5/21/2018	
Volatile Organic Compounds (VOCs) by EPA 8260B				
1,1-Dichloroethene	0.6	mg/L	<0.010	U
1,2-Dichloroethane	0.5*	mg/L	<0.010	U
1,4-Dichlorobenzene	7.5*	mg/L	<0.012	U
2-Butanone (methyl ethyl ketone)	200.0*	mg/L	<0.020	U
Benzene	0.5*	mg/L	<0.012	U
Carbon tetrachloride	0.5*	mg/L	<0.012	U
Chlorobenzene	70.0	mg/L	<0.0080	U
Chloroform	6.0*	mg/L	<0.012	U
Tetrachloroethene	0.7*	mg/L	<0.012	U
Trichloroethene	0.5*	mg/L	<0.010	U
Vinyl chloride	0.2*	mg/L	<0.0080	U
Semi-Volatile Organic Compounds (SVOCs) by EPA 8270				
2,4,5-Trichlorophenol	400.0*	mg/L	<0.00091	U
2,4,6-Trichlorophenol	2.0*	mg/L	<0.0014	U
2,4-Dinitrotoluene	0.13*	mg/L	<0.0010	U
Cresols, Total	200.0*	mg/L	<0.0020	U
Hexachlorobenzene	0.13*	mg/L	<0.0011	U
Hexachlorobutadiene	0.4	mg/L	<0.0011	U
Hexachloroethane	3.0*	mg/L	<0.0010	U
Nitrobenzene	2.0*	mg/L	<0.00081	U
Pentachlorophenol	100.0*	mg/L	<0.0016	U
Pyridine	0.4	mg/L	<0.0020	U
Total Petroleum Hydrocarbons by TX1005				
>nC12 to nC28	NL	mg/Kg	<9.6	U
>nC28 to nC35	NL	mg/Kg	<9.6	U
nC6 to nC12	NL	mg/Kg	<7.2	U
Total Petroleum Hydrocarbon	NL	mg/Kg	<7.2	U
Metals by EPA 6020/7470				
Antimony	1.0	mg/L	**0.0324**	**J**
Arsenic	1.8	mg/L	<0.00400	U
Barium	100.0*	mg/L	**0.360**	
Beryllium	0.08	mg/L	<0.00200	U
Cadmium	0.5	mg/L	**0.108**	
Chromium	5.0*	mg/L	<0.00400	U
Lead	1.5	mg/L	**1.02**	
Mercury	0.2*	mg/L	<0.0000300	U
Nickel	70.0	mg/L	**0.0380**	**J**
Selenium	1.0*	mg/L	<0.0110	U
Silver	5.0*	mg/L	<0.00200	U
Vanadium	NL	mg/L	<0.00600	U

NOTES

Detected analytes are bolded.

J - Analyte detected below quantitation limit.

U - Analyzed but not detected above the MDL/SDL.

mg/L - Milligrams per liter.

mg/Kg - Milligrams per kilogram.

EPA - Environmental Protection Agency.

TCLP - Toxicity Characteristic Leaching Procedure.

NL - Not listed.

* - No value listed for Class 2; value shown is Class 1 regulatory levels.

Data subject to change based on data validation.

Prepared by: EPW 05/30/2018

Checked by: TJG 05/30/2018

Reviewed by: AMF 06/01/2018

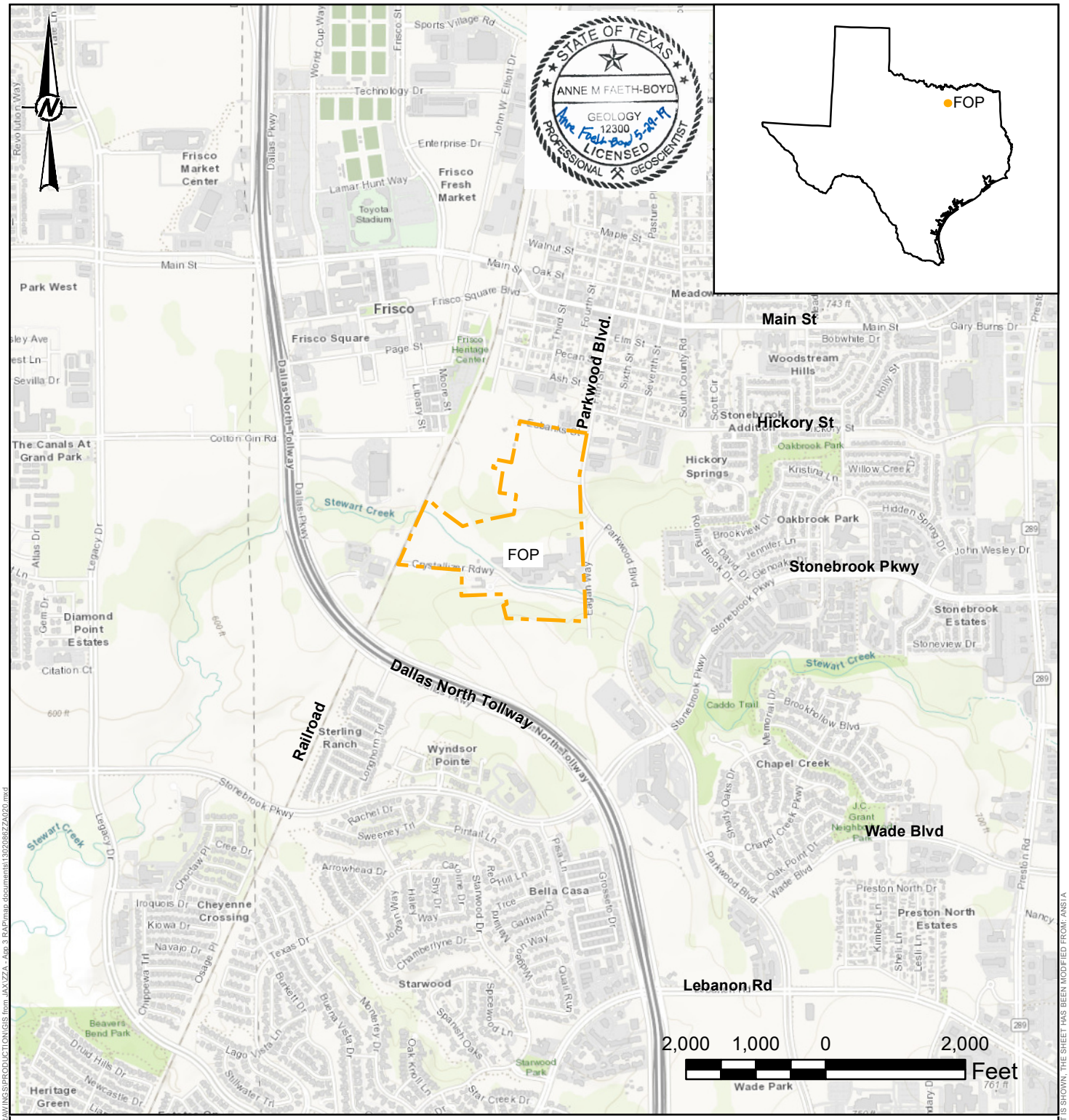
Hydraulic Conductivity Testing Results Summary
Appendix 3.1
Deep Groundwater Pre-Design Investigation Report

Well ID	Saturated Interval (ft BGS)	Ground Surface Elevation (ft AMSL)	Top of Saturated Interval Elevation (ft AMSL)	Bottom of Interval Elevation (ft AMSL)	Transmissivity (T) (m^2/sec)	Hydraulic Conductivity (k) (cm/sec)
DGW-MW-1	10.2-29.7	635.52	625.32	605.82	7.5E-05	1.3E-03
DGW-MW-2	10.2-19.7	634.45	624.25	614.75	2.7E-04	9.4E-03
DGW-MW-3	5.98-19.7	633.68	627.70	613.98	9.0E-06	2.0E-04
DGW-MW-4	10.2-19.7	632.50	622.30	612.80	2.0E-04	6.9E-03
DGW-MW-5	6.82-19.7	626.99	620.17	607.29	7.2E-04	1.8E-02
DGW-MW-6	15.2-29.7	640.42	625.22	610.72	1.0E-05	2.3E-04
DGW-MW-7	15.2-29.7	639.95	624.75	610.25	3.6E-04	8.2E-03
DGW-MW-8	20.37-29.7	640.26	619.89	610.56	2.2E-05	7.0E-04
DGW-MW-9	14.26-24.7	642.22	627.96	617.52	2.0E-04	6.1E-03
DGW-MW-10	15.2-19.7	631.97	616.77	612.27	2.4E-05	1.8E-03
MW-26	5.0-15.0	628.34	623.34	613.34	6.4E-08	2.1E-06
MW-27	5.0-15.0	629.89	624.89	614.89	9.4E-08	3.1E-06
MW-29	4.5-14.5	629.39	624.89	614.89	1.8E-07	5.9E-06
MW-44	7.01-15.0	634.33	627.32	619.33	5.5E-07	2.3E-05

Notes:
DGW PDI - Deep Groundwater Pre-Design Investigation
Saturated intervals taken from water elevation survey conducted on May 22, 2018.
ft - feet
AMSL - Above mean sea level
BGS - Below ground surface

Prepared by: JS
Checked by: EPW/JCW
Reviewed by: THR/AMF

FIGURES



LEGEND

Former Operating Plant Property Boundary

REFERENCE

1.BASE MAP - SOURCES: ESRI, HERE, DELORME, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), SWISSTOPO, MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER

CLIENT
EXIDE TECHNOLOGIES

PROJECT
DEEP GROUNDWATER PRE-DESIGN INVESTIGATION

TITLE
FORMER OPERATING PLANT LOCATION MAP

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-28
PREPARED	EPW
DESIGN	CDS
REVIEW	EPW
APPROVED	AMF

PROJECT No.	CONTROL	Rev.	FIGURE
13-02086-06	1302086ZZA020.mxd	0	1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI A

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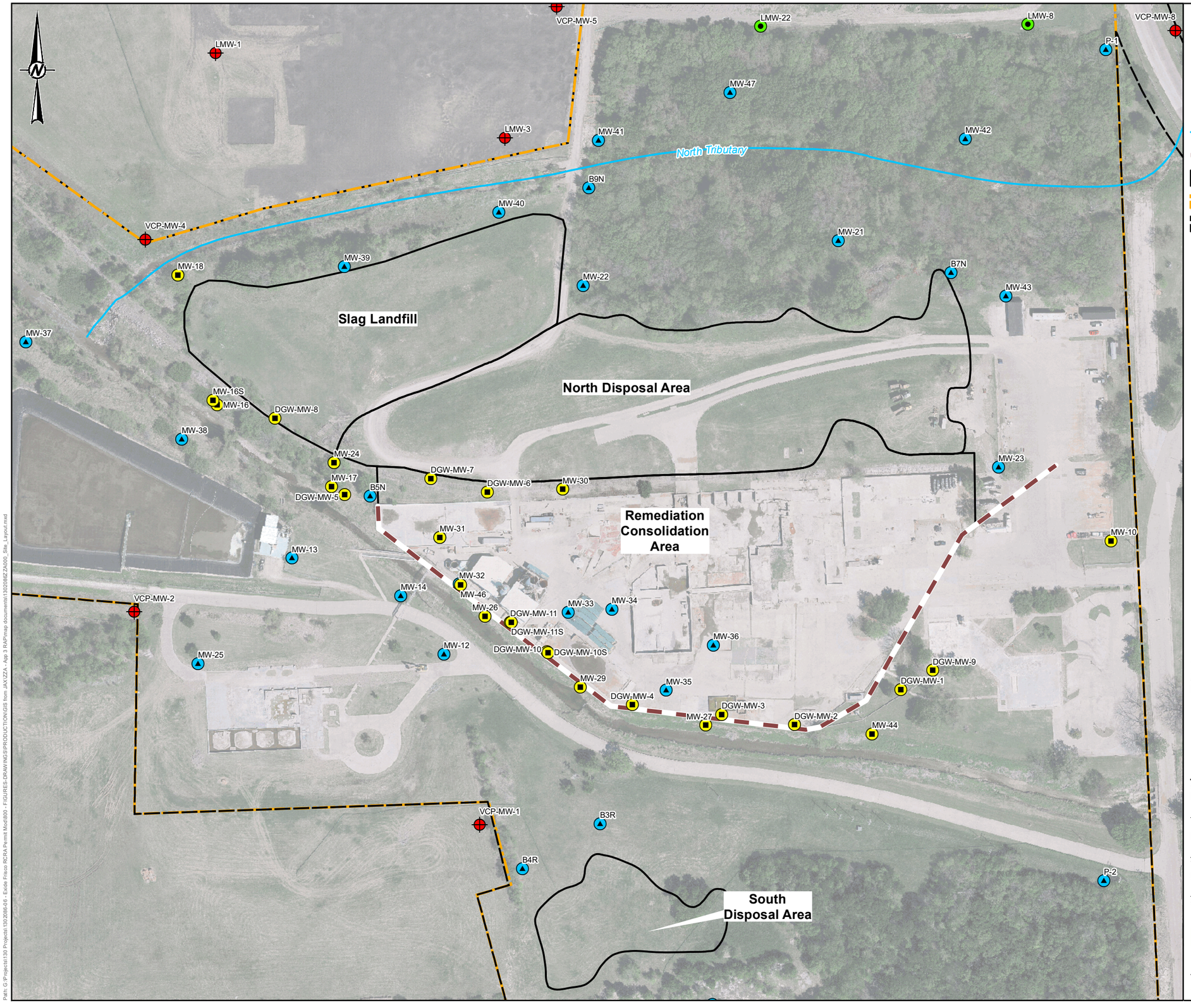

LEGEND

- North CAMU Monitoring Wells
- DGW-PDI Monitoring Wells
- Additional FOP Monitoring Wells
- Other Off-Site Monitoring Wells
- Surface Water Centerline
- Proposed Flood Wall
- Disposal Area
- Former Operating Plant Property Boundary
- Former Undeveloped Buffer Property

STATE OF TEXAS
ANNE M FAETH-BOYD
GEOLOGY
12300
LICENSED
PROFESSIONAL GEOSCIENTIST
5-28-19

REFERENCE

1. SITE FEATURES - GOLDER, 2014
2. AERIAL IMAGERY - PROVIDED BY DALLAS AERIAL SURVEY, DATED APRIL, 2017.

CLIENT
EXIDE TECHNOLOGIES

PROJECT
DEEP GROUNDWATER PRE-DESIGN INVESTIGATION

TITLE
SITE LAYOUT MAP

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-28
PREPARED	SJRS
DESIGN	EPW
REVIEW	EPW
APPROVED	AMF/THR

PROJECT No.	CONTROL	Rev.	FIGURE
13-02086-06	1302086ZZA000	0	**2**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI B

1 in

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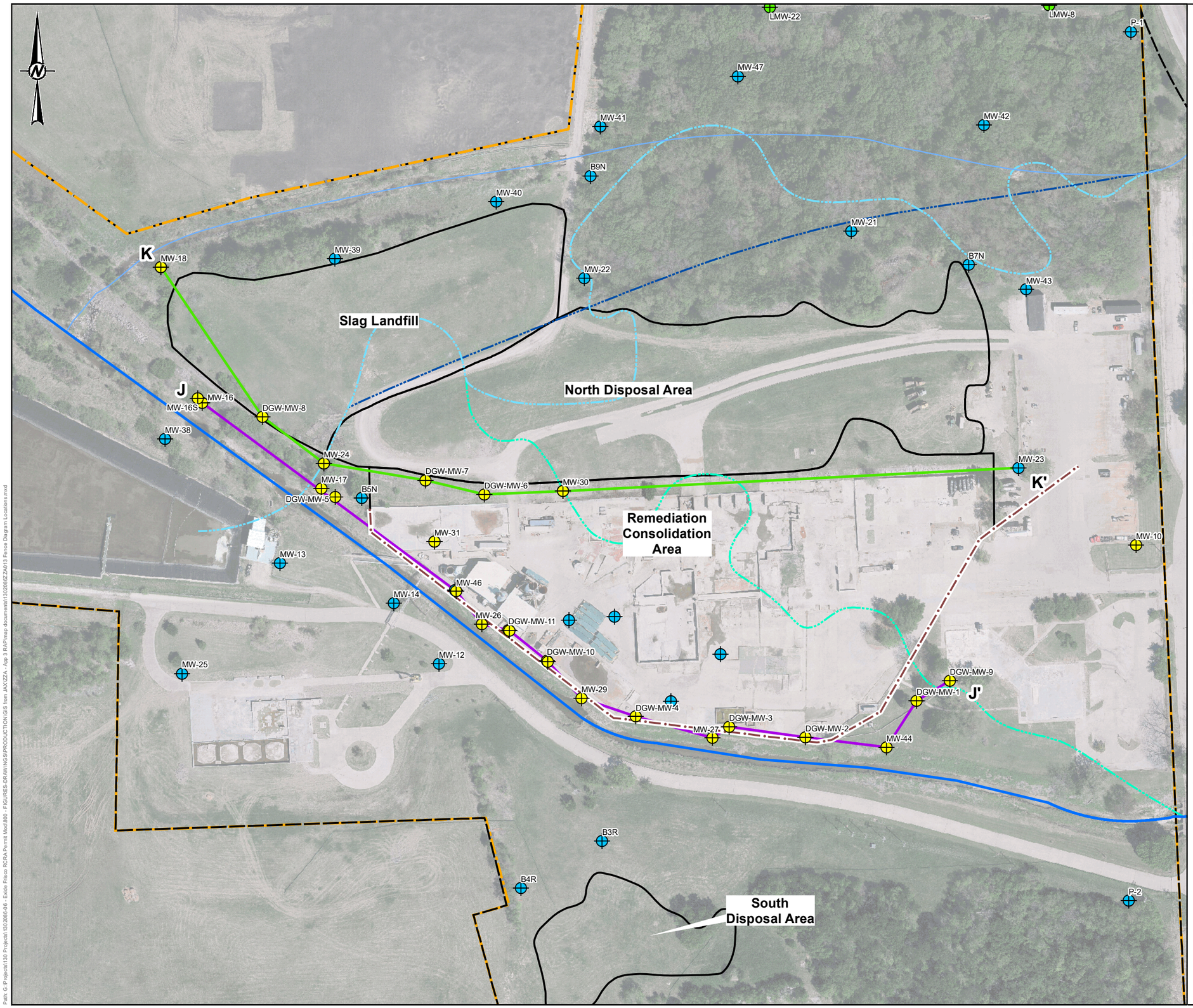
Path: G:\Projects\130 Projects\13020864-06 - Exide Frisco RCRA Permit Mod\800 - FIGURES-DRAWINGS\PRODUCTION\GIS from JAX-ZZA - App 3 RAP\map documents\1302086ZZA000_Site_Layout.mxd



LEGEND

- North CAMU Monitoring Wells
- DGW-PDI Monitoring Wells
- Additional FOP Monitoring Wells
- J-J'
- K-K'
- Former Path of North Tributary (1951 Aerial Photo)
- Former Path of North Tributary (1972 Aerial Photo)
- Former Path of Stewart Creek (1951 Aerial Photo)
- Remediation Consolidation Area
- Disposal Area
- Former Operating Plant Property Boundary
- Former Undeveloped Buffer Property
- Proposed Flood Wall

STATE OF TEXAS
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GEOLOGY
12300
LICENSED
PROFESSIONAL GEOSCIENTIST

160 80 0 160
Feet

REFERENCE

1. SITE FEATURES - GOLDER, 2014
2. DGW-PDI MONITORING WELL LOCATIONS & CREEK ELEVATIONS - BRITTAIN & CRAWFORD, 05/22/2018
3. AERIAL IMAGERY - PROVIDED BY DALLAS AERIAL SURVEY, DATED APRIL, 2017.

CLIENT
EXIDE TECHNOLOGIES

PROJECT
DEEP GROUNDWATER PRE-DESIGN INVESTIGATION

TITLE
FENCE DIAGRAM LOCATION MAP

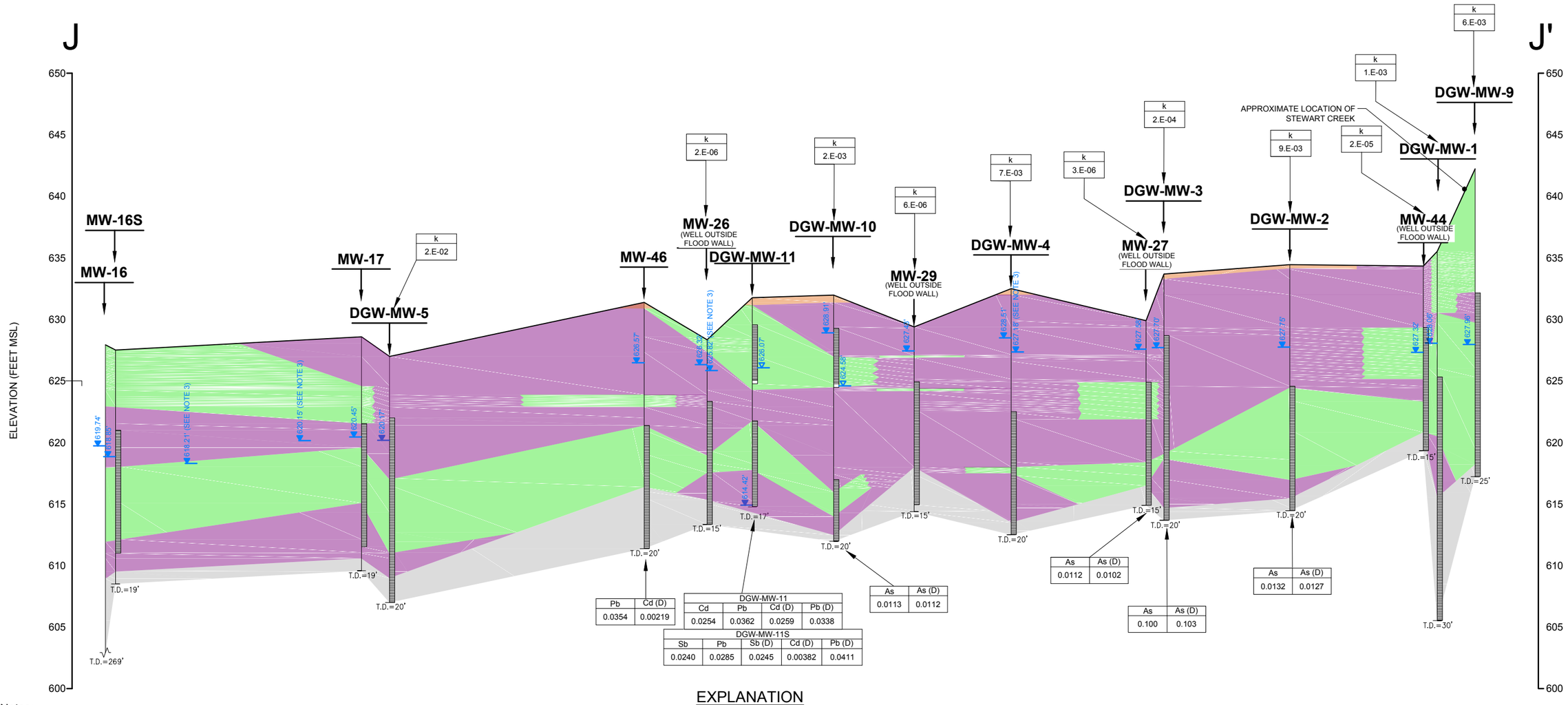
CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-28
PREPARED	SJRS
DESIGN	EPW
REVIEW	EPW
APPROVED	AMF/THR

PROJECT No. 13-02086-06 | CONTROL 1302086ZZA013 | Rev. 0 | FIGURE **3A**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI B

Path: G:\Projects\1302086-06 - Exide Frisco RCRA Permit Mod\800 - FIGURES-DRAWINGS\PRODUCTION\GIS from JAX\ZZA - App 3 RAPmap documents\1302086ZZA013 Fence Diagram Locations.mxd



Notes:

1. Ground surface topography is estimated. Monitoring well ground surface elevations were surveyed by a licensed surveyor.
2. See Figure VI.A-8 for cross section and fence diagram locations.
3. Surface water elevations in Stewart Creek were surveyed by a licensed surveyor on 05/22/2018 and are shown for reference purposes only.
4. MSL - Above mean sea level.
5. As - Arsenic, Cd - Cadmium, Pb - Lead, (D) Dissolved sample.
6. Analytical results presented are exceedances of the Critical Protective Concentration Level (PCL) for the analyte in milligrams per liter (mg/L).
7. Critical PCL for analytes are as follows: 0.012 mg/L for As and As (D), 0.005 mg/L for Cd, 0.0017 mg/L for Cd (D), and 0.015 for Pb and Pb (D).
7. k - Specific conductivity in centimeters per second (cm/sec).

GENERALIZED LITHOLOGIC ABBREVIATIONS

- CONCRETE
- (CH) CLAY and (CL) SILTY CLAY
- (CH) Gravelly/Sandy CLAY, (CL) Gravelly/Sandy SILTY CLAY, (ML) SILT, (ML) Sandy SILT, and (SM) SILTY SAND
- EAGLE FORD SHALE

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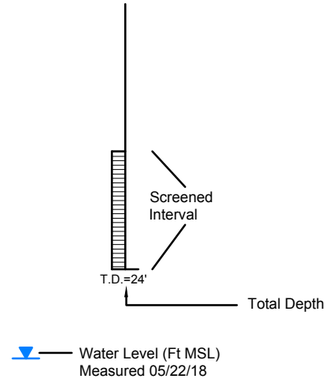
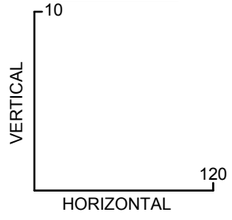
ANNE M FAETH-BOYD
GEOLOGY
12300
LICENSED
PROFESSIONAL GEOSCIENTIST

EXPLANATION

MONITORING WELL CONSTRUCTION



SCALE IN FEET



12x Vertical Exaggeration

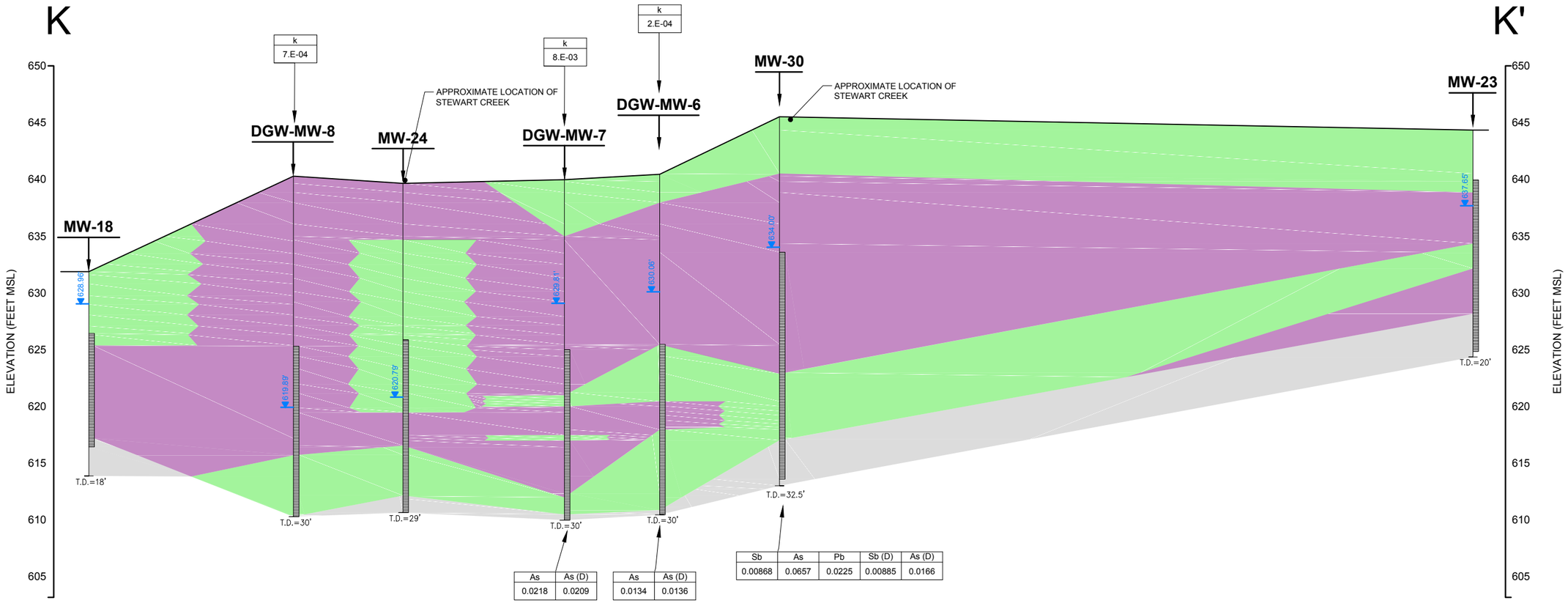
EXIDE FRISCO RECYCLING CENTER RCRA PERMIT RENEWAL APPLICATION
DEEP GROUNDWATER PRE-DESIGN INVESTIGATION

Figure 3B

VI.A-18 GEOLOGIC FENCE DIAGRAM J-J' (10 OF 11)

PROJECT: 13-02086-06	BY: JS	REVISIONS
DATE: JUNE, 2018	CHECKED: PJJ/EPW	

GOLDER ASSOCIATES INC.



EXPLANATION

Notes:

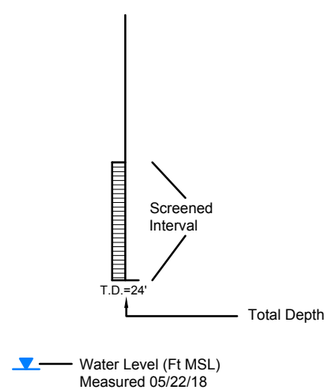
1. Ground surface topography is estimated. Monitoring well ground surface elevations were surveyed by a licensed surveyor.
2. See Figure VI.A-8 for cross section and fence diagram locations.
3. MSL - Above mean sea level.
4. Sb - Antimony, As - Arsenic, Cd - Cadmium, Pb - Lead, (D) Dissolved sample.
5. Analytical results presented are exceedances of the Critical Protective Concentration Level (PCL) for the analyte in milligrams per liter (mg/L).
6. Critical PCL for analytes are as follows: 0.012 mg/L for As and As (D), 0.005 mg/L for Cd, 0.0017 mg/L for Cd (D), 0.015 for Pb and Pb (D), and 0.006 mg/L for Sb and Sb (D).
7. k - Specific conductivity in centimeters per second (cm/sec).

GENERALIZED LITHOLOGIC ABBREVIATIONS

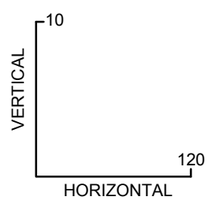
- (CH) CLAY and (CL) SILTY CLAY
- (CH) Gravelly/Sandy CLAY, (CL) Gravelly/Sandy SILTY CLAY, (ML) SILT, (ML) Sandy SILT, and (SM) SILTY SAND
- EAGLE FORD SHALE

STATE OF TEXAS
ANNE M FAETH-BOYD
GEOLOGY
12300
LICENSED
PROFESSIONAL GEOSCIENTIST

MONITORING WELL CONSTRUCTION



SCALE IN FEET



12x Vertical Exaggeration

EXIDE FRISCO RECYCLING CENTER RCRA PERMIT RENEWAL APPLICATION DEEP GROUNDWATER PRE-DESIGN INVESTIGATION

Figure 3C

VI.A-19 GEOLOGIC FENCE DIAGRAM K-K' (11 OF 11)

PROJECT: 13-02086-06	BY: JS	REVISIONS
DATE: JUNE, 2018	CHECKED: PJJ/EPW	

GOLDER ASSOCIATES INC.

LMW-1 NM
VCP-MW-5
LMW-22 633.69
LMW-8 635.44
P-1 637.19
VCP-MW-8
MW-47 632.53
LMW-3 NM
MW-41 631.73
MW-42 633.38
B9N 631.39
MW-40 629.61
VCP-MW-4
MW-21 633.08
MW-39 629.43
B7N 632.89
MW-18 628.79
MW-22 633.25
MW-43 NM*
Slag Landfill
MW-37 NM
North Disposal Area
MW-16S 618.97
DGW-MW-8 NM
MW-16 619.67
MW-38 616.49
MW-24 621.05
MW-23 637.89
DGW-MW-7 NM
DGW-MW-6 NM
MW-30 NM
MW-17 620.44
B5N 621.22
DGW-MW-5 NM
Remediation Consolidation Area
MW-31 626.52
MW-10 638.22
MW-13 621.12
MW-32 627.66
MW-14 624.94
MW-46 626.74
VCP-MW-2
MW-33 631.79
MW-34 629.26
DGW-MW-11S NM
MW-26 626.28
MW-36 630.38
MW-25 NM
MW-12 626.81
DGW-MW-11 NM
DGW-MW-10S NM
DGW-MW-10 NM
DGW-MW-9 NM
MW-29 627.56
MW-35 628.63
DGW-MW-1 NM
DGW-MW-4 NM
DGW-MW-3 NM
MW-27 627.68
DGW-MW-2 NM
MW-44 627.79
VCP-MW-1
B3R NM
B4R NM
P-2 NM
South Disposal Area

629 628 627 626 625 624 623 622 621 620 619 618 617 618 619 620 621 622 623 624 625 626 627 630 631 632 633 634 635 636 637 638

LEGEND

- North CAMU Monitoring Wells
- DGW-PDI Monitoring Wells
- Additional FOP Monitoring Wells
- Other Off-Site Monitoring Wells
- Potentiometric Surface – Deep (May 9, 2018)
- Surface Water Centerline
- Disposal Area
- Former Operating Plant Property Boundary
- Former Undeveloped Buffer Property
- Proposed Flood Wall

STATE OF TEXAS
ANNE M FAETH-BOYD
GEOLOGY
12300
LICENSED
PROFESSIONAL GEOSCIENTIST
5-28-19

150 75 0 150
Feet

REFERENCE

1. SITE FEATURES - GOLDER, 2014
2. DGW MONITORING WELLS WERE NOT INSTALLED AT THE TIME OF ELEVATION SURVEY.
3. AERIAL IMAGERY - PROVIDED BY DALLAS AERIAL SURVEY, DATED APRIL, 2017.
4. NM - WELL NOT MEASURED.
5. NM* - SURFACE COMPLETION DAMAGED, WELL NOT ACCESSIBLE.
6. MW-32, MW-33, MW-34, MW-35, AND MW-36 INCLUDED ON SHALLOW POTENTIOMETRIC SURFACE MAP AND NOT USED FOR CONTOURING ON THIS FIGURE.

CLIENT
EXIDE TECHNOLOGIES

PROJECT
DEEP GROUNDWATER PRE-DESIGN INVESTIGATION

TITLE
POTENTIOMETRIC SURFACE MAP – DEEP GROUNDWATER (MAY 9, 2018)

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-28
PREPARED	SJRS
DESIGN	EPW
REVIEW	EPW
APPROVED	AMF/THR

PROJECT No. 13-02086-06
CONTROL 1302086ZZA002
Rev. 0
FIGURE **4A**

Path: G:\Projects\1302086-06 - Exide Frisco RCRA Permit Mod\800 - FIGURES-DRAWINGS\PRODUCTION\GIS from JAX\ZZA - App 3 RAP\map documents\1302086ZZA002 wl 2018\05\09 deep.mxd

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI B
0 1in

LEGEND

- DGW-PDI Monitoring Wells
- Additional FOP Monitoring Wells
- Potentiometric Surface – Shallow (May 9, 2018)
- Surface Water Centerline
- Disposal Area
- Proposed Flood Wall

STATE OF TEXAS
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GEOLOGY
12300
LICENSED
PROFESSIONAL GEOSCIENTIST
5-28-19

50 25 0 50
Feet

REFERENCE

1. SITE FEATURES - GOLDER, 2014
2. DGW MONITORING WELLS WERE NOT INSTALLED AT THE TIME OF THIS ELEVATION SURVEY.
3. AERIAL IMAGERY - PROVIDED BY DALLAS AERIAL SURVEY, DATED APRIL, 2017.
4. NM - WELL NOT MEASURED.
5. MW-26, MW-27, MW-29, MW-30, MW-31, AND MW-46 INCLUDED ON DEEP POTENTIOMETRIC SURFACE MAP AND NOT USED FOR CONTOURING ON THIS FIGURE.

CLIENT
EXIDE TECHNOLOGIES

PROJECT
DEEP GROUNDWATER PRE-DESIGN INVESTIGATION

TITLE
POTENTIOMETRIC SURFACE MAP – SHALLOW GROUNDWATER (MAY 9, 2018)

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-28
PREPARED	SJRS
DESIGN	EPW
REVIEW	EPW
APPROVED	AMF/THR

PROJECT No.	CONTROL	Rev.	FIGURE
13-02086-06	1302086ZZA003	0	**4B**

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LMW-1 NM
VCP-MW-5
LMW-22 NM
LMW-8 NM
P-1 NM
VCP-MW-8
MW-47 NM
LMW-3 NM
MW-41 NM
MW-42 NM
North Tributary
B9N 631.47
MW-40 628.90
629
630
631
632
VCP-MW-4
MW-21 632.34
MW-39 628.63
MW-18 628.96
B7N 632.56
MW-22 631.23
MW-43 NM*
628
627
626
625
624
623
622
621
620
619
618
617
633
634
635
636
637
Slag Landfill
MW-37 NM
MW-16S 618.85
MW-16 619.74
DGW-MW-8 619.89
MW-38 616.23
SW-5 618.21
MW-24 620.79
North Disposal Area
DGW-MW-7 629.81
DGW-MW-6 630.06
MW-30 634.00
MW-23 637.65
SW-4 620.15
MW-17 620.45
DGW-MW-5 620.17
B5N 621.11
Remediation Consolidation Area
638
MW-10 638.03
MW-13 620.83
MW-31 626.29
MW-32 627.79
MW-46 626.57
DGW-MW-11 614.42
MW-33 631.74
VCP-MW-2
MW-14 625.04
MW-26 626.32
DGW-MW-11S 626.07
MW-34 629.32
MW-25 NM
SW-3 625.82
DGW-MW-10 628.91
MW-36 630.51
MW-12 627.02
DGW-MW-10S 624.58
MW-35 628.74
DGW-MW-1 628.06
DGW-MW-9 627.96
MW-29 627.43
DGW-MW-4 628.51
DGW-MW-3 627.70
DGW-MW-2 627.75
MW-44 627.32
SW-2 627.18
MW-27 627.58
Stewart Creek
SW-1 627.93
VCP-MW-1
B3R NM
B4R NM
P-2 NM
South Disposal Area

LEGEND

- North CAMU Monitoring Wells
- DGW-PDI Monitoring Wells
- Additional FOP Monitoring Wells
- Other Off-Site Monitoring Wells
- Surface Water Survey Elevation
- Potentiometric Surface – Deep (May 22, 2018)
- Surface Water Centerline
- Disposal Area
- Former Operating Plant Property Boundary
- Former Undeveloped Buffer Property
- Proposed Flood Wall

STATE OF TEXAS
ANNE M FAETH-BOYD
GEOLOGY
12300
LICENSED
PROFESSIONAL GEOSCIENTIST

150 75 0 150
Feet

REFERENCE

1. SITE FEATURES - GOLDER, 2014
2. DGW-PDI MONITORING WELL LOCATIONS & CREEK ELEVATIONS - BRITTAIN & CRAWFORD, 05/22/2018
3. AERIAL IMAGERY - PROVIDED BY DALLAS AERIAL SURVEY, DATED APRIL, 2017.
4. NM - WELL NOT MEASURED.
5. NM* - SURFACE COMPLETION DAMAGED, WELL NOT ACCESSIBLE.
6. MW-32, MW-33, MW-34, MW-35, AND MW-36 INCLUDED ON SHALLOW POTENTIOMETRIC SURFACE MAP AND NOT USED

CLIENT
EXIDE TECHNOLOGIES

PROJECT
DEEP GROUNDWATER PRE-DESIGN INVESTIGATION

TITLE
POTENTIOMETRIC SURFACE MAP – DEEP GROUNDWATER (MAY 22, 2018)

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-29
PREPARED	SJRS
DESIGN	EPW
REVIEW	EPW
APPROVED	AMF/THR

PROJECT No. 13-02086-06
CONTROL 1302086ZZA004
Rev. 0
FIGURE **4C**

Path: G:\Projects\130 Projects\13020861-06 - Exide Frisco RCRA Permit Mod\800 - FIGURES-DRAWINGS\PRODUCTION\GIS from .aAX\ZZA - App 3 RAP\mxd documents\1302086ZZA004 wl 2018\05\22 deep.mxd

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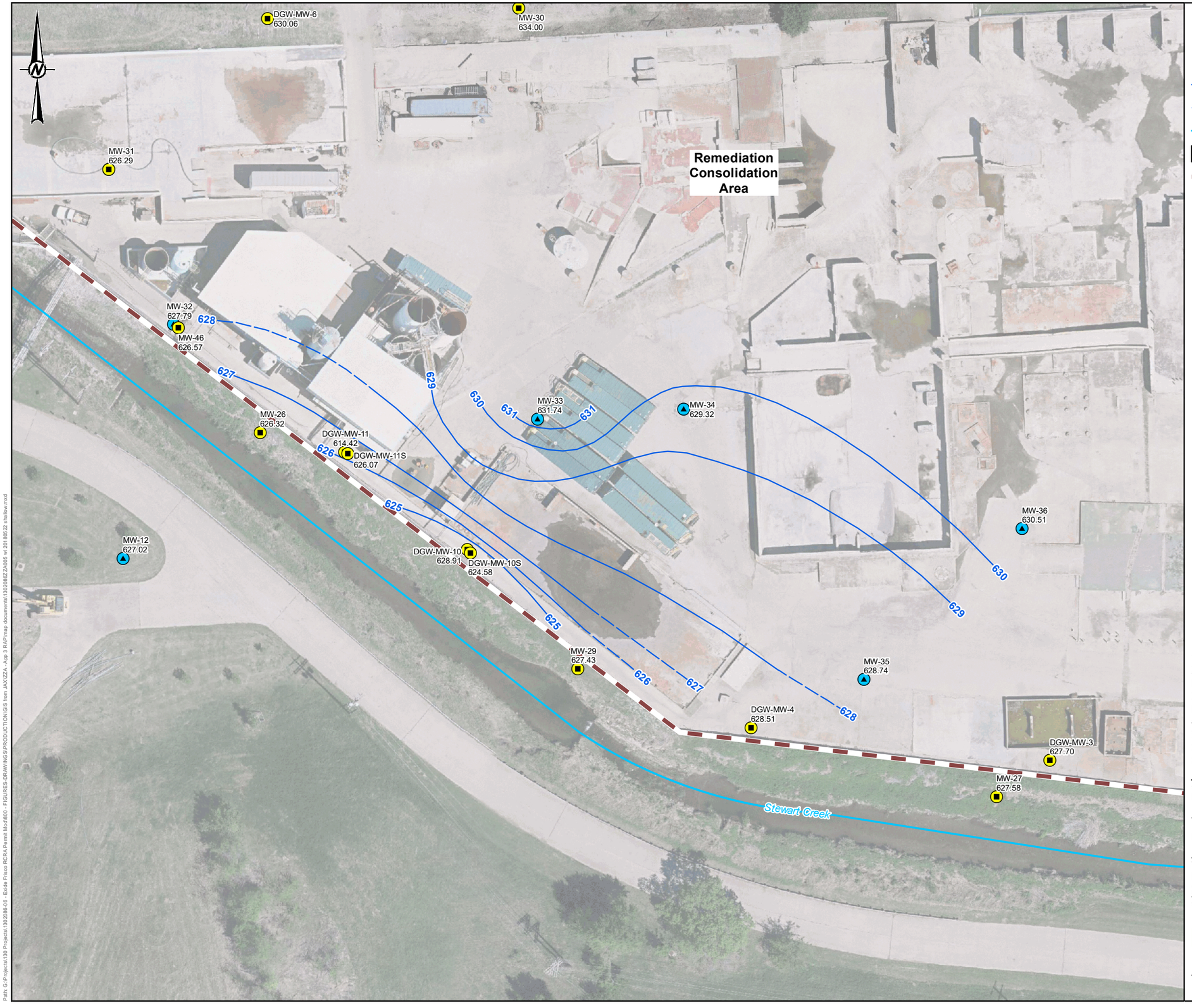

LEGEND

- DGW-PDI Monitoring Wells
- Additional FOP Monitoring Wells
- Potentiometric Surface – Shallow (May 22, 2018)
- Inferred Potentiometric Surface
- Surface Water Centerline
- Disposal Area
- Proposed Flood Wall

STATE OF TEXAS
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GEOLOGY
12300
LICENSED
PROFESSIONAL GEOSCIENTIST

50 25 0 50
Feet

REFERENCE

1. SITE FEATURES - GOLDER, 2014
2. DGW-PDI MONITORING WELL LOCATIONS & CREEK ELEVATIONS - BRITTAIN & CRAWFORD, 5/22/2018
3. AERIAL IMAGERY - PROVIDED BY DALLAS AERIAL SURVEY, DATED APRIL, 2017.
4. NM - WELL NOT MEASURED.
5. MW-26, MW-27, MW-29, MW-30, MW-31, AND MW-46 INCLUDED ON DEEP POTENTIMETRIC SURFACE MAP AND NOT USED FOR CONTOURING ON THIS FIGURE.

CLIENT
EXIDE TECHNOLOGIES

PROJECT
DEEP GROUNDWATER PRE-DESIGN INVESTIGATION

TITLE
POTENTIOMETRIC SURFACE MAP – SHALLOW GROUNDWATER (MAY 22, 2018)

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-28
PREPARED	SJRS
DESIGN	EPW
REVIEW	EPW
APPROVED	AMF/THR

PROJECT No.	CONTROL	Rev.	FIGURE
13-02086-06	1302086ZZA005	0	**4D**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI B

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Path: G:\Projects\130 Projects\1302086-08 - Exide Frisco RCRA Permit Mod\800 - FIGURES-DRAWINGS\PRODUCTION\GIS from JAX\ZZA - Age 3 RAP\map documents\1302086ZZA005_wl 20180522 shallow.mxd

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VCP-MW-5
LMW-22 NM
LMW-8 NM
P-1 NM
VCP-MW-8
MW-47 NM
LMW-3 NM
MW-41 NM
MW-42 NM
North Tributary
B9N 631.08
MW-40 628.74
VCP-MW-4
MW-39 628.12
MW-21 631.89
MW-18 628.34
MW-22 630.43
B7N 632.39
MW-43 NM*
Slag Landfill
MW-37 NM
North Disposal Area
MW-16S 618.72
MW-16 619.74
DGW-MW-8 619.79
MW-38 615.89
MW-24 620.63
DGW-MW-7 629.75
MW-23 637.67
MW-17 620.35
B5N 621.02
DGW-MW-6 629.97
DGW-MW-5 620.09
MW-30 633.93
Remediation Consolidation Area
MW-10 638.10
MW-31 626.31
MW-13 620.76
MW-14 625.02
MW-46 626.47
MW-32 627.78
MW-34 629.36
VCP-MW-2
DGW-MW-11S 626.83
MW-26 626.42
DGW-MW-11 621.28
MW-33 631.78
MW-25 NM
MW-12 626.42
DGW-MW-10S 626.06
DGW-MW-10 628.97
MW-36 630.52
DGW-MW-9 627.79
MW-35 628.79
MW-29 627.54
DGW-MW-1 627.88
DGW-MW-4 628.42
DGW-MW-2 627.64
MW-27 627.46
DGW-MW-3 627.61
MW-44 627.12
Stewart Creek
VCP-MW-1
B3R NM
B4R NM
P-2 NM
South Disposal Area

LEGEND

- North CAMU Monitoring Wells
- DGW-PDI Monitoring Wells
- Additional FOP Monitoring Wells
- Other Off-Site Monitoring Wells
- Potentiometric Surface – Deep (May 27, 2018)
- Surface Water Centerline
- Disposal Area
- Former Operating Plant Property Boundary
- Former Undeveloped Buffer Property
- Proposed Flood Wall

STATE OF TEXAS
ANNE M FAETH-BOYD
GEOLOGY
12300
LICENSED
PROFESSIONAL GEOSCIENTIST

150 75 0 150
Feet

REFERENCE

1. SITE FEATURES - GOLDER, 2014
2. DGW-PDI MONITORING WELL LOCATIONS ELEVATIONS - BRITTAIN & CRAWFORD, 05/22/2018
3. AERIAL IMAGERY - PROVIDED BY DALLAS AERIAL SURVEY, DATED APRIL, 2017.
4. NM - WELL NOT MEASURED.
5. NM* - SURFACE COMPLETION DAMAGED, WELL NOT ACCESSIBLE.
6. MW-32, MW-33, MW-34, MW-35, MW-36, DGW-MW-10S, AND DGW-MW-11S INCLUDED ON SHALLOW POTENTIOMETRIC SURFACE MAP AND NOT USED FOR CONTOURING ON THIS FIGURE.

CLIENT
EXIDE TECHNOLOGIES

PROJECT
DEEP GROUNDWATER PRE-DESIGN INVESTIGATION

TITLE
POTENTIOMETRIC SURFACE MAP – DEEP GROUNDWATER (MAY 27, 2018)

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-28
PREPARED	SJRS
DESIGN	EPW
REVIEW	EPW
APPROVED	AMF/THR

PROJECT No.	CONTROL	Rev.	FIGURE
13-02086-06	1302086ZZA006	0	4E

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI B

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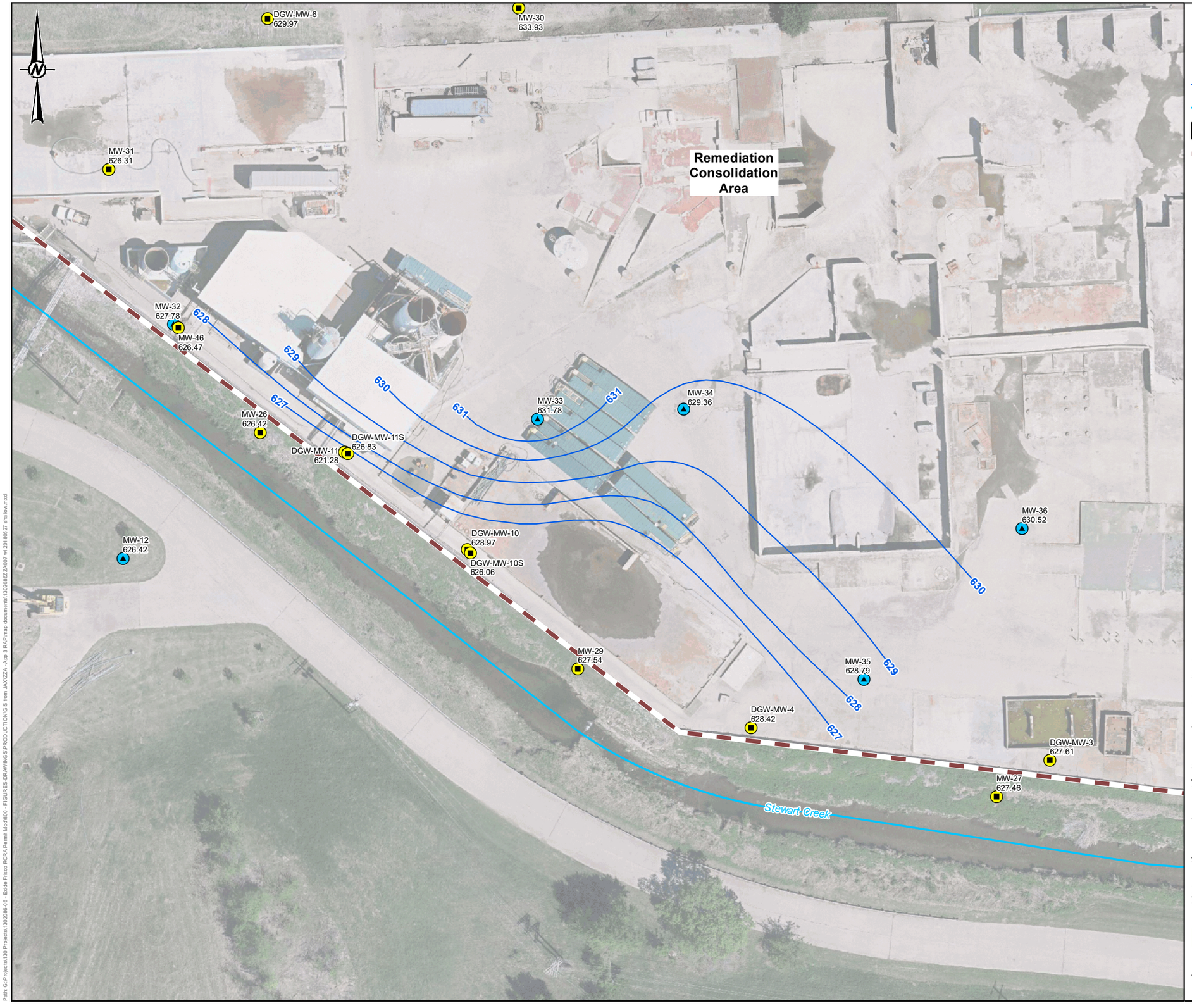

LEGEND

- DGW-PDI Monitoring Wells
- Additional FOP Monitoring Wells
- Potentiometric Surface – Shallow (May 27, 2018)
- Surface Water Centerline
- Disposal Area
- Proposed Flood Wall

STATE OF TEXAS
ANNE M FAETH-BOYD
GEOLOGY
12300
LICENSED
PROFESSIONAL GEOSCIENTIST

50 25 0 50
Feet

REFERENCE

1. SITE FEATURES - GOLDER, 2014
2. DGW-PDI MONITORING WELL LOCATIONS ELEVATIONS - BRITTAIN & CRAWFORD, 05/22/2018
3. AERIAL IMAGERY - PROVIDED BY DALLAS AERIAL SURVEY, DATED APRIL, 2017.
4. MW-26, MW-27, MW-29, MW-30, MW-31, MW-46, DGW-MW-3, DGW-MW-4, DGW-MW-6, DGW-MW-10, AND DGW-MW-11 INCLUDED ON THE DEEP POTENTIOMETRIC SURFACE MAP AND NOT USED FOR CONTOURING ON THIS FIGURE.

CLIENT
EXIDE TECHNOLOGIES

PROJECT
DEEP GROUNDWATER PRE-DESIGN INVESTIGATION

TITLE
POTENTIOMETRIC SURFACE MAP – SHALLOW GROUNDWATER (MAY 27, 2018)

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-28
PREPARED	SJRS
DESIGN	EPW
REVIEW	EPW
APPROVED	AMF/THR

PROJECT No.	CONTROL	Rev.	FIGURE
13-02086-06	1302086ZZA007	0	**4F**

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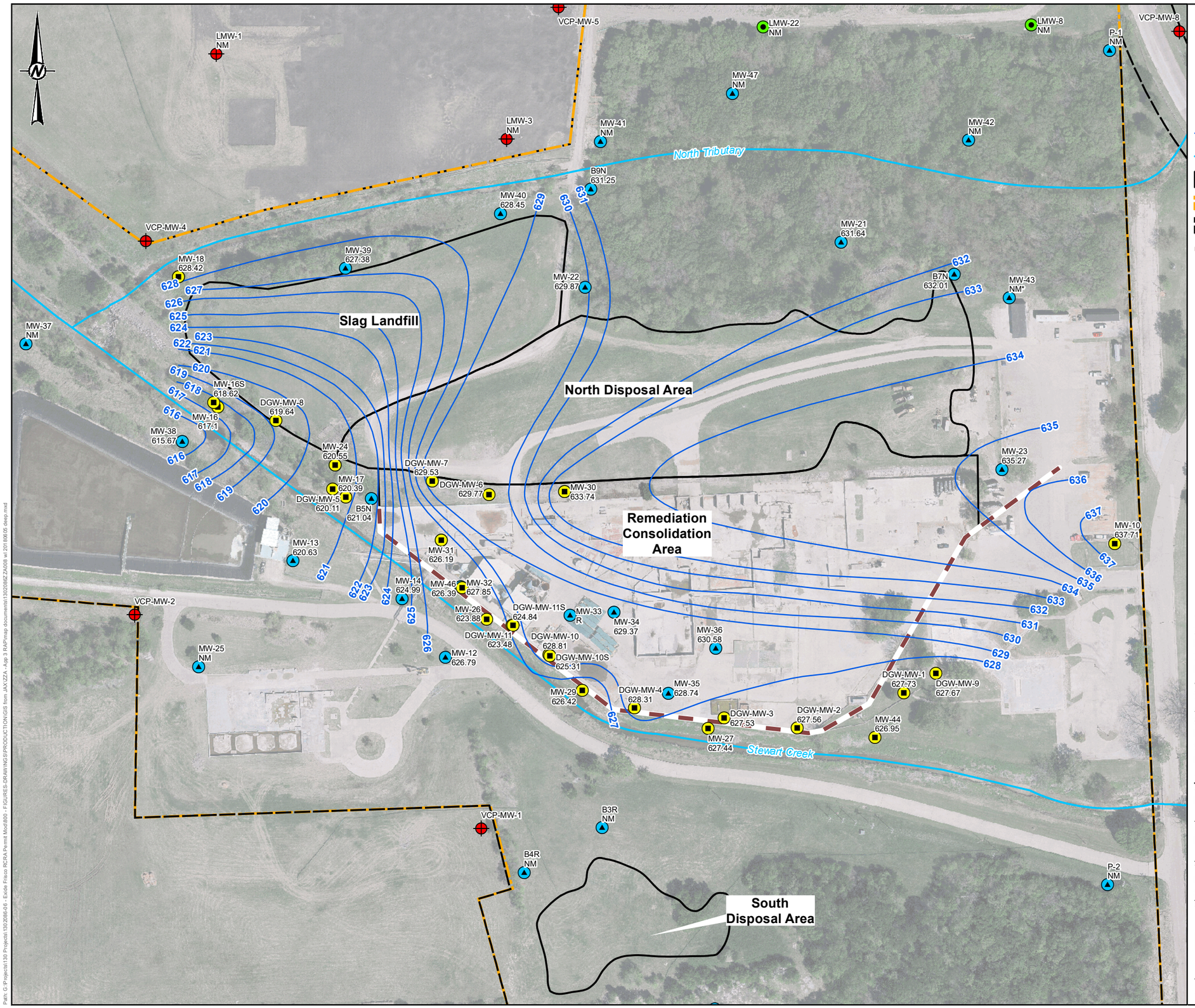

LEGEND

- North CAMU Monitoring Wells
- DGW-PDI Monitoring Wells
- Additional FOP Monitoring Wells
- Other Off-Site Monitoring Wells
- Potentiometric Surface – Deep (June 4, 2018)
- Surface Water Centerline
- Disposal Area
- Former Operating Plant Property Boundary
- Former Undeveloped Buffer Property
- Proposed Flood Wall

150 75 0 150
Feet

REFERENCE

1. SITE FEATURES - GOLDER, 2014
2. DGW-PDI MONITORING WELL LOCATIONS ELEVATIONS - BRITTAIN & CRAWFORD, 05/22/2018
3. AERIAL IMAGERY - PROVIDED BY DALLAS AERIAL SURVEY, DATED APRIL, 2017.
4. NM - WELL NOT MEASURED.
5. NM* - SURFACE COMPLETION DAMAGED, WELL NOT ACCESSIBLE.
6. MW-32, MW-33, MW-34, MW-35, MW-36, DGW-MW-10S, AND DGW-MW-11S INCLUDED ON SHALLOW POTENTIOMETRIC SURFACE MAP AND NOT USED FOR CONTOURING ON THIS FIGURE.
7. DGW-MW-11 NOT USED IN CONTOURING.

STATE OF TEXAS
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PROFESSIONAL GEOSCIENTIST

CLIENT
EXIDE TECHNOLOGIES

PROJECT
DEEP GROUNDWATER PRE-DESIGN INVESTIGATION

TITLE
POTENTIOMETRIC SURFACE MAP – DEEP GROUNDWATER (JUNE 5, 2018)

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-28
PREPARED	SJRS
DESIGN	EPW
REVIEW	EPW
APPROVED	AMF/THR

PROJECT No.	CONTROL	Rev.	FIGURE
13-02086-06	1302086ZZA008	0	4G

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LEGEND

- DGW-PDI Monitoring Wells
- Additional FOP Monitoring Wells
- Potentiometric Surface – Shallow (June 5, 2018)
- Inferred Potentiometric Surface – Shallow (June 5, 2018)
- Surface Water Centerline
- Disposal Area
- Proposed Flood Wall

STATE OF TEXAS
ANNE M FAETH-BOYD
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PROFESSIONAL GEOSCIENTIST
5-28-19

50 25 0 50
Feet

REFERENCE

1. SITE FEATURES - GOLDER, 2014
2. DGW-PDI MONITORING WELL LOCATIONS ELEVATIONS - BRITTAIN & CRAWFORD, 05/22/2018
3. AERIAL IMAGERY - PROVIDED BY DALLAS AERIAL SURVEY, DATED APRIL, 2017.
4. R - WATER LEVEL ELEVATION REJECTED DUE TO FIELD ERROR.
5. MW-26, MW-27, MW-29, MW-30, MW-31, MW-46, DGW-MW-3, DGW-MW-4, DGW-MW-6, DGW-MW-10, AND DGW-MW-11 INCLUDED ON THE DEEP POTENTIOMETRIC SURFACE MAP AND NOT USED FOR THE CONTOURING ON THIS FIGURE.

CLIENT
EXIDE TECHNOLOGIES

PROJECT
DEEP GROUNDWATER PRE-DESIGN INVESTIGATION

TITLE
POTENTIOMETRIC SURFACE MAP – SHALLOW GROUNDWATER (JUNE 5, 2018)

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-28
PREPARED	SJRS
DESIGN	EPW
REVIEW	EPW
APPROVED	AMF/THR

PROJECT No.	CONTROL	Rev.	FIGURE
13-02086-06	1302086ZZA009	0	**4H**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI B

1in

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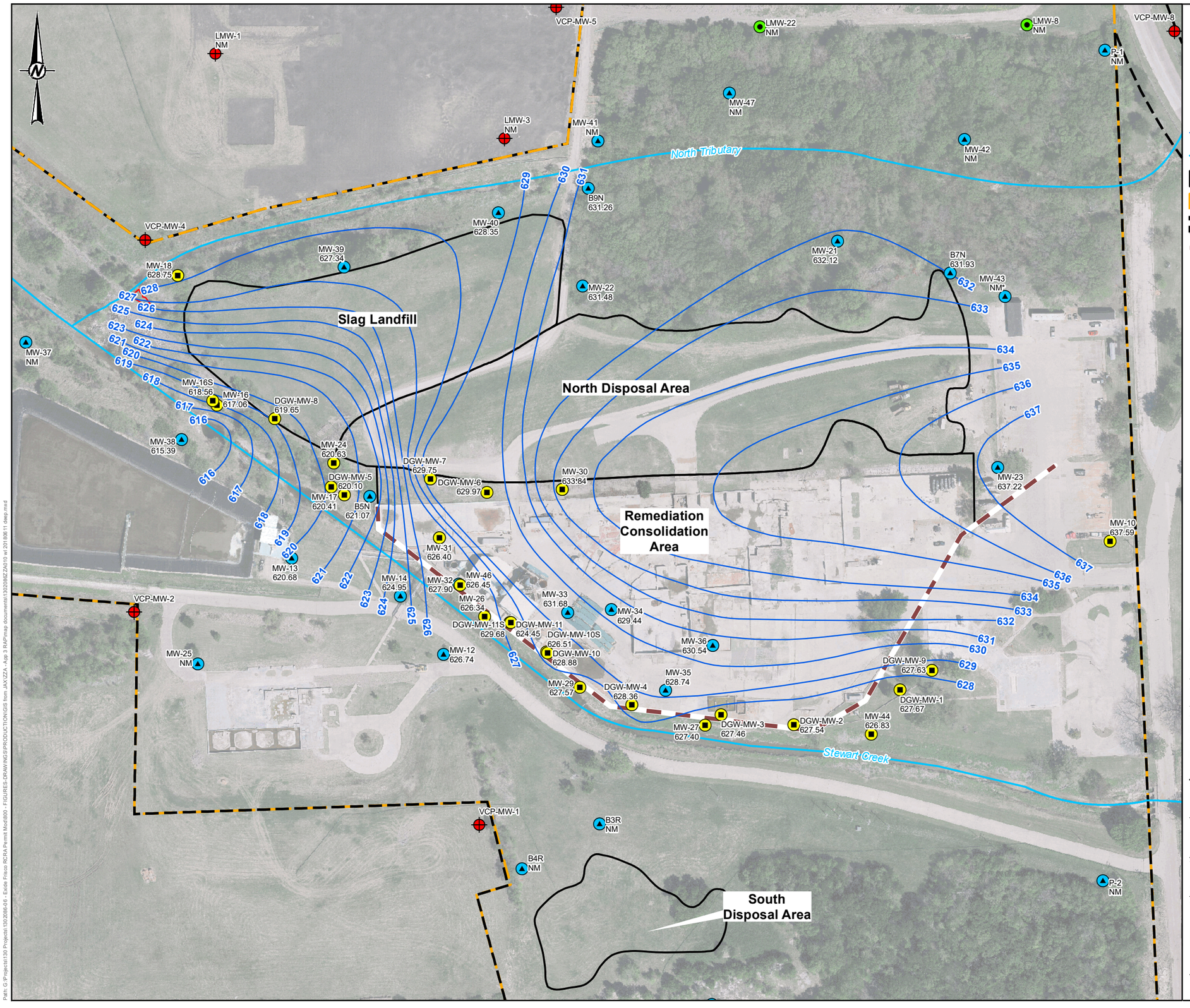

LEGEND

- North CAMU Monitoring Wells
- DGW-PDI Monitoring Wells
- Additional FOP Monitoring Wells
- Other Off-Site Monitoring Wells
- Potentiometric Surface – Deep (June 12, 2018)
- Surface Water Centerline
- Disposal Area
- Former Operating Plant Property Boundary
- Former Undeveloped Buffer Property
- Proposed Flood Wall

150 75 0 150
Feet

REFERENCE

1. SITE FEATURES - GOLDER, 2014
2. DGW-PDI MONITORING WELL LOCATIONS & CREEK ELEVATIONS - BRITTAIN & CRAWFORD, 05/22/2018
3. AERIAL IMAGERY - PROVIDED BY DALLAS AERIAL SURVEY, DATED APRIL, 2017.
4. NM - WELL NOT MEASURED.
5. NM* - SURFACE COMPLETION DAMAGED, WELL NOT ACCESSIBLE.
6. MW-32, MW-33, MW-34, MW-35, MW-36, DGW-MW-10S, AND DGW-MW-11S INCLUDED ON SHALLOW POTENTIOMETRIC SURFACE MAP AND NOT USED FOR CONTOURING ON THIS FIGURE.
7. DGW-MW-11 NOT USED IN CONTOURING.

STATE OF TEXAS
ANNE M FAETH-BOYD
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LICENSED
PROFESSIONAL GEOSCIENTIST
5-28-19

CLIENT
EXIDE TECHNOLOGIES

PROJECT
DEEP GROUNDWATER PRE-DESIGN INVESTIGATION

TITLE
POTENTIOMETRIC SURFACE MAP – DEEP GROUNDWATER (JUNE 12, 2018)

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-28
PREPARED	SJRS
DESIGN	EPW
REVIEW	EPW
APPROVED	AMF/THR

PROJECT No. 13-02086-06 | CONTROL 1302086ZZA010 | Rev. 0 | FIGURE **4I**

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DGW-MW-6
629.97

MW-30
633.84

MW-31
626.40

Remediation Consolidation Area

MW-32
627.90

MW-46
626.45

628

629

630

631

631

MW-33
631.68

MW-34
629.44

MW-26
626.34

DGW-MW-11
624.45

DGW-MW-11S
629.68

628

MW-36
630.54

627

627

MW-12
626.74

DGW-MW-10
628.88

DGW-MW-10S
626.51

630

MW-29
627.57

MW-35
628.74

629

DGW-MW-4
628.36

DGW-MW-3
627.46

MW-27
627.40

Stewart Creek

LEGEND

- DGW-PDI Monitoring Wells
- Additional FOP Monitoring Wells
- Potentiometric Surface – Shallow (June 12, 2018)
- Surface Water Centerline
- Disposal Area
- Proposed Flood Wall

STATE OF TEXAS
ANNE M FAETH-BOYD
GEOLOGY
12300
LICENSED
PROFESSIONAL GEOSCIENTIST

50 25 0 50
Feet

REFERENCE

1. SITE FEATURES - GOLDER, 2014
2. DGW-PDI MONITORING WELL LOCATIONS & CREEK ELEVATIONS - BRITTAIN & CRAWFORD, 06/12/2018
3. AERIAL IMAGERY - PROVIDED BY DALLAS AERIAL SURVEY, DATED APRIL, 2017.
4. MW-26, MW-27, MW-29, MW-30, MW-31, MW-46, DGW-MW-3, DGW-MW-4, DGW-MW-6, DGW-MW-10, AND DGW-MW-11 INCLUDED ON THE DEEP POTENTIOMETRIC SURFACE MAP AND NOT USED FOR CONTOURING ON THIS FIGURE.

CLIENT
EXIDE TECHNOLOGIES

PROJECT
DEEP GROUNDWATER PRE-DESIGN INVESTIGATION

TITLE
POTENTIOMETRIC SURFACE MAP – SHALLOW GROUNDWATER (JUNE 12, 2018)

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-28
PREPARED	SJRS
DESIGN	EPW
REVIEW	EPW
APPROVED	AMF/THR

PROJECT No.	CONTROL	Rev.	FIGURE
13-02086-06	1302086ZZA011	0	**4J**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI B

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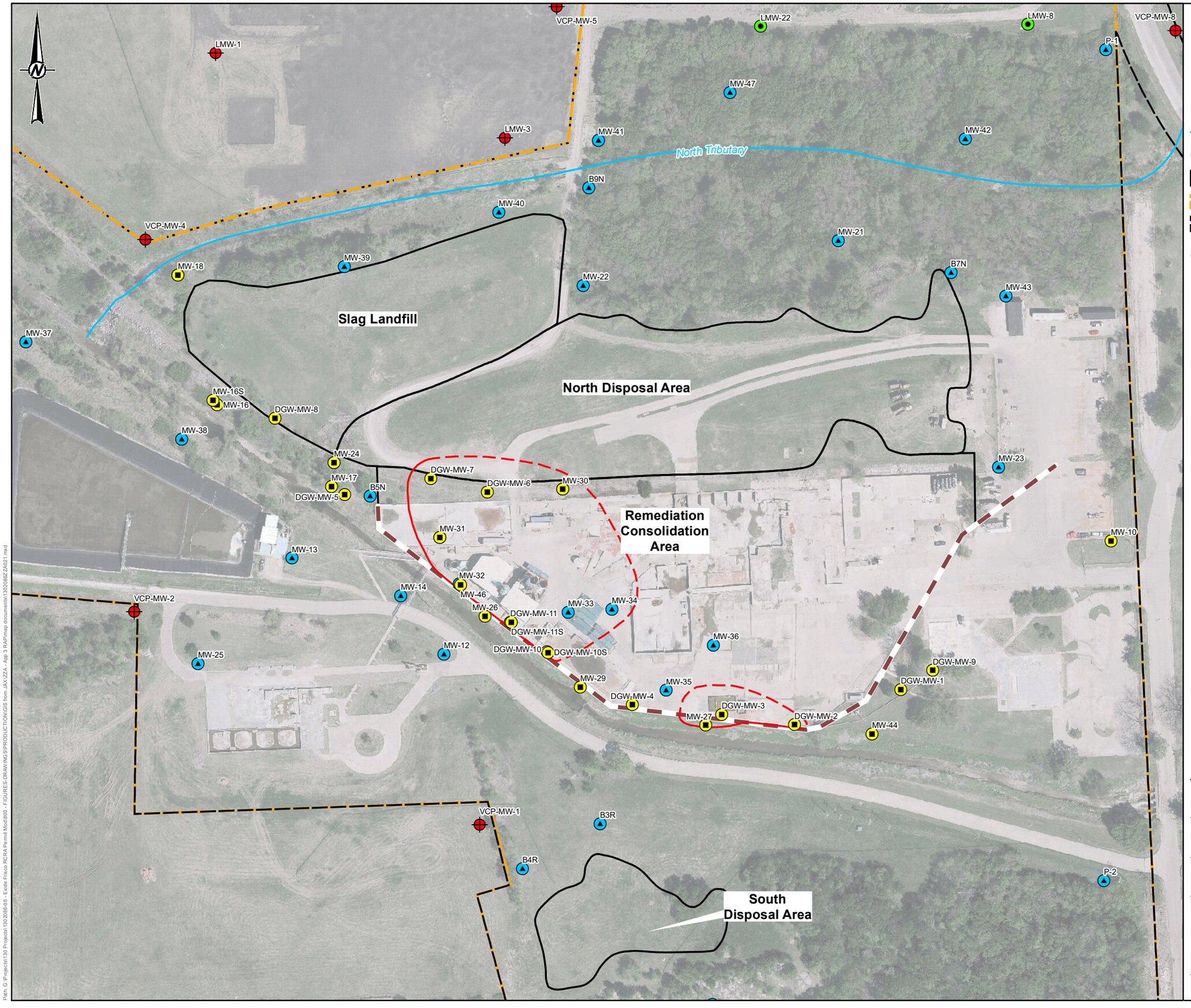

LEGEND

- North CAMU Monitoring Wells
- DGW-PDI Monitoring Wells
- Additional FOP Monitoring Wells
- Other Off-Site Monitoring Wells
- Surface Water Centerline
- Proposed Flood Wall
- Disposal Area
- Former Operating Plant Property Boundary
- Former Undeveloped Buffer Property
- Groundwater Protective Concentration Level Exceedance (PCLE) Zone

STATE OF TEXAS
ANNE M FAETH-BOYD
GEOLOGY
12300
LICENSED
PROFESSIONAL GEOSCIENTIST

150 75 0 150
Feet

REFERENCE

1. SITE FEATURES - GOLDER, 2014
2. AERIAL IMAGERY - AND AERIAL IMAGERY PROVIDED BY DALLAS AERIAL SURVEY DATED APRIL, 2017

CLIENT
EXIDE TECHNOLOGIES

PROJECT
DEEP GROUNDWATER PRE-DESIGN INVESTIGATION

TITLE
FOP GROUNDWATER PCLE ZONE MAP (GROUNDWATER PLUME MAP)

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-28
PREPARED	SJRS
DESIGN	EPW
REVIEW	EPW
APPROVED	AMF/THR

PROJECT No.	CONTROL	Rev.	FIGURE
13-02086-06	1302086ZZA000	0	5

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI B

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ATTACHMENT A

FIELD BORING LOGS

LOG OF DGW-MW-1

DRILLING METHOD: Direct Push/HSA
NORTHING: 7,101,738 FT
DATE/TIME: 5/15/2018, 0950 - 1020
DRILLER: West Drilling, Gus Alejandre
EASTING: 2,480,600 FT
TOTAL DEPTH: 30 FT BGS
RIG: CME-75
SURFACE ELEVATION: 635.52 FT AMSL

DEPTH (Feet)	RUN No.	PID (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
	1		4.5/5.0		ML		(0.0-5.0) (ML) SILT, non-plastic fines, trace fine sand; moderate yellowish brown (10YR 5/4); non-cohesive, dry, loose. (1.0) No fine sand, soil color changes to dark yellowish brown (10YR 4/2).
5	2		1.5/5.0		ML		(5.0-10.0) (ML) sandy SILT, non-plastic fines, fine sand, trace fine sub-angular gravel; dark yellowish brown (10YR 4/2); non-cohesive, dry, loose.
10	3		5.0/5.0		CL		(10.0-15.0) (CL) gravelly SILTY CLAY, low plastic fines, fine to coarse well graded sub-angular gravel; brownish gray (5YR 4/1); cohesive, W<PL, firm.
15	4		2.0/5.0		CL CH		(15.0-15.5) (CL) SILTY CLAY, medium plastic fines, trace fine sub-angular gravel; brownish gray (5YR 4/1); cohesive, W~PL, soft. (15.5-20.0) (CH) CLAY, high plastic fines; brownish gray (5YR 4/1) with moderate yellowish brown (10YR 5/4) mottling, iron staining; cohesive, W<PL, stiff.
20	5		3.5/5.0				(19.5) Soil color changes to dark gray (N3). (20.0-30.0) SHALE; dark gray (N3); dry, very stiff.
25	6		5.0/5.0				(25.0) Shale becomes medium light gray (N4).
30							END OF BORING AT 30 FEET BELOW GROUND SURFACE.
35							

PROJECT No: 130-2086-06
COMPILED BY: BCW
PROJECT: Exide Frisco
CHECKED BY: PJJ
LOCATION: Near Flood Wall and Admin Building
REVIEWED BY: THR/AMF

LOG OF DGW-MW-2

DRILLING METHOD: Direct Push/HSA
NORTHING: 7,101,676 FT
DATE/TIME: 5/15/2018, 1140 - 1220
DRILLER: West Drilling, Gus Alejandre
EASTING: 2,480,415 FT
TOTAL DEPTH: 20 FT BGS
RIG: CME-75
SURFACE ELEVATION: 634.45 FT AMSL

DEPTH (Feet)	RUN No.	PID (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
							(0.0-0.3) CONCRETE.
							*approximately 3" of subgrade gravel fill.
	1		3.8/5.0		CL		(0.3-5.0) (CL) SILTY CLAY, low plastic fines, trace fine sub-rounded gravel; brownish black (5YR 2/1); cohesive, W<PL, stiff.
5							
	2		1.1/5.0		CL		(5.0-10.0) (CL) SILTY CLAY, low plastic fines; brownish black (5YR 2/1); cohesive, W<PL, stiff.
							*Driller reports poor recovery due to clays
10							
					CH		(10.0-12.5) (CH) sandy CLAY, high plastic fines, fine sand; brownish gray (5YR 4/1); cohesive, W~PL, stiff.
	3		2.3/5.0				
					CH		(12.5-15.0) (CH) gravelly CLAY, high plastic fines, fine sub-rounded to sub-angular gravel, some fine sand; pale yellowish brown (10YR 6/2); cohesive, W~PL, very stiff.
15							
					CL		(15.0-17.5) (CL) gravelly SILTY CLAY, low plastic fines, fine to medium well graded sub-rounded gravel; pale yellowish brown (10YR 6/2); cohesive, W>PL, very stiff.
	4		5.0/5.0				
					CL		(17.5-19.0) (CL) SILTY CLAY, low plastic fines, trace fine sand; dark gray (N3) with moderate yellowish brown (10YR 5/4) mottling, iron staining; cohesive W<PL, very stiff.
							(19.0-20.0) SHALE; dark gray (N3), dry, stiff.
20							END OF BORING AT 20 FEET BELOW GROUND SURFACE.
25							
30							
35							

PROJECT No: 130-2086-06
COMPILED BY: BCW
PROJECT: Exide Frisco
CHECKED BY: PJJ
LOCATION: South of Former Lead Oxide Tank
REVIEWED BY: THR/AMF

LOG OF DGW-MW-3

DRILLING METHOD: Direct Push/HSA
NORTHING: 7,101,694 FT
DATE/TIME: 5/15/2018, 1540 - 1620
DRILLER: West Drilling, Gus Alejandre
EASTING: 2,480,288 FT
TOTAL DEPTH: 20 FT BGS
RIG: CME-75
SURFACE ELEVATION: 633.68 FT AMSL

DEPTH (Feet)	RUN No.	PID (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
							(0.0-0.4) CONCRETE.
							*approximately 3" of subgrade gravel fill.
	1		4.0/5.0		CH		(0.4-7.5) (CH) CLAY, high plastic fines; brownish black (5YR 2/1), hydrocarbon staining and mild odor; cohesive, W<PL, very stiff.
5							
	2		2.5/5.0		CL		(7.5-10.0) (CL) SILTY CLAY, low plastic fines, some fine sand; brownish gray (5YR 4/1); cohesive, W>PL, soft.
10	3		5.0/5.0		CH		(10.0-14.6) (CH) CLAY, high plastic fines, trace fine sand; brownish gray (5YR 4/1); cohesive, W~PL, very stiff.
					CH		(14.6-15.0) (CH) gravelly CLAY, high plastic fines, fine to medium well graded sub-rounded to rounded gravel; brownish gray (5YR 4/1); cohesive, W~PL, very stiff.
15	4		5.0/5.0		CH		(15.0-19.0) (CH) CLAY, high plastic fines, trace fine sand; brownish gray (5YR 4/1) with pale yellowish brown (10YR 6/2) mottling, iron staining; cohesive, W<PL, very stiff.
							(19.0-20.0) SHALE; dark gray (N3); dry, stiff.
20							END OF BORING AT 20 FEET BELOW GROUND SURFACE.
25							
30							
35							

PROJECT No: 130-2086-06
COMPILED BY: BCW
PROJECT: Exide Frisco
CHECKED BY: PJJ
LOCATION: South of Former Diesel Tank
REVIEWED BY: THR/AMF

LOG OF DGW-MW-4

DRILLING METHOD: Direct Push/HSA
NORTHING: 7,101,711 FT
DATE/TIME: 5/15/2018, 1350 - 1440
DRILLER: West Drilling, Gus Alejandre
EASTING: 2,480,132 FT
TOTAL DEPTH: 20 FT BGS
RIG: CME-75
SURFACE ELEVATION: 632.50 FT AMSL

DEPTH (Feet)	RUN No.	PID (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
							(0.0-0.5) CONCRETE.
	1		3.6/5.0		CH		*approximately 3" of subgrade gravel fill. (0.5-5.0) (CH) CLAY, high plastic fines; brownish gray (5YR 2/1), heavy hydrocarbon odor and staining; cohesive, W<PL, stiff. (2.5) 1 inch seam of fine to coarse well graded sub-rounded gravel.
5	2		1.7/5.0		CH		(5.0-14.5) (CH) CLAY, high plastic fines; brownish gray (5YR 4/1); cohesive, W~PL, firm.
10	3		2.8/5.0				
15	4		5.0/5.0		CH CH		(14.5-15.0) (CH) gravelly CLAY, high plastic fines, fine to medium sub-angular gravel; brownish gray (5YR 4/1); cohesive, W~PL, very stiff. (15.0-19.0) (CH) CLAY, high plastic fines, trace fine sand; dark gray (N3) with moderate yellowish brown (10YR 5/4) & brownish gray (5YR 4/1) mottling, iron staining; cohesive, W~PL, very stiff to hard.
20							(19.0-20.0) SHALE; dark gray (N3); dry, very stiff. END OF BORING AT 20 FEET BELOW GROUND SURFACE.
25							
30							
35							

PROJECT No: 130-2086-06
COMPILED BY: BCW
PROJECT: Exide Frisco
CHECKED BY: PJJ
LOCATION: Flood Wall Apex; Near Former French Drain
REVIEWED BY: THR/AMF

LOG OF DGW-MW-5

DRILLING METHOD: Direct Push/HSA
NORTHING: 7,102,077 FT
DATE/TIME: 5/16/2018, 0910 - 0945
DRILLER: West Drilling, Gus Alejandre
EASTING: 2,479,632 FT
TOTAL DEPTH: 20 FT BGS
RIG: CME-75
SURFACE ELEVATION: 626.99 FT AMSL

DEPTH (Feet)	RUN No.	PID (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
	1		3.8/5.0		CH		(0.0-5.0) (CH) CLAY, high plastic fines, trace fine sand; dusky yellowish brown (10YR 2/2); cohesive, W<PL, stiff.
5	2		2.2/5.0		CL		(5.0-10.0) (CL) SILTY CLAY, low plastic fines, some fine to medium sub-angular gravel; dark yellowish brown (10YR 4/2); cohesive, W>PL, firm.
10	3		2.6/5.0		CH		(10.0-16.0) (CH) gravelly sandy CLAY, high plastic fines, fine to coarse well-graded sub-angular to sub-rounded gravel, fine sand; pale yellowish brown (10YR 6/2); cohesive, W>PL, very stiff.
15	4		5.0/5.0				(15.0) Soil color changes to brownish gray (5YR 4/1).
					CH		(16.0-18.0) (CH) CLAY, high plastic fines, trace fine sand; medium gray (N5), cohesive, W~PL, very stiff.
20					SHALE		(18.0-20.0) SHALE; dark gray (N3), moist, very stiff.
							END OF BORING AT 20 FEET BELOW GROUND SURFACE.
25							
30							
35							

PROJECT No: 130-2086-06
COMPILED BY: BCW
PROJECT: Exide Frisco
CHECKED BY: PJJ
LOCATION: West of Former Battery Storage Building
REVIEWED BY: THR/AMF

LOG OF DGW-MW-6

DRILLING METHOD: Direct Push/HSA
NORTHING: 7,102,081 FT
DATE/TIME: 5/16/2018, 1040 - 1130
DRILLER: West Drilling, Gus Alejandre
EASTING: 2,479,880 FT
TOTAL DEPTH: 30 FT BGS
RIG: CME-75
SURFACE ELEVATION: 640.42 FT AMSL

DEPTH (Feet)	RUN No.	PID (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
	1		2.2/5.0		ML		(0.0-2.5) gravelly sandy SILT, non-plastic fines, fine to coarse well graded sub-rounded to sub-angular gravel, fine sand; dark yellowish brown (10YR 4/2); non-cohesive, dry, loose.
					CH		(2.5-5.0) (CH) CLAY, high plastic fines, trace fine sand; dark yellowish brown (10YR 4/2); cohesive, W<PL, stiff.
5	2		5.0/5.0		CH		(5.0-10.0) (CH) CLAY, high plastic fines, trace sub-rounded gravel; dusky yellowish brown (10YR 2/2); cohesive, W<PL, very stiff.
10	3		5.0/5.0		CH		(10.0-12.5) (CH) CLAY, high plastic fines, trace fine sub-rounded gravels, trace fine sand; dusky yellowish brown (10YR 2/2); cohesive, W<PL, very stiff.
					CL		(12.5-15.0) (CL) SILTY CLAY, low plastic fines, trace fine sand; pale yellowish brown (10YR 2/2); cohesive, W<PL, stiff.
15	4		2.5/5.0		CL		(15.0-20.0) (CL) sandy SILTY CLAY, low plastic fines, fine sand; brownish gray (5YR 4/1); cohesive, W~PL, firm.
20	5		5.0/5.0		CH		(20.0-22.5) (CH) CLAY, high plastic fines, some fine to coarse well graded sub-rounded to sub-angular gravels, some fine sand; brownish gray (5YR 4/1); cohesive, W~PL, very stiff.
25	6		5.0/5.0		CH		(22.5-29.6) (CH) gravelly CLAY, high plastic fines, fine to medium well graded sub-rounded to rounded gravels, some fine sand; pale yellowish brown (10YR 6/2) with moderate yellowish brown (10YR 5/4) mottling, iron staining; cohesive, W~PL, very stiff.
30							(29.6-30.0) SHALE; dark gray (N3), dry, very stiff. END OF BORING AT 30 FEET BELOW GROUND SURFACE.
35							

PROJECT No: 130-2086-06
COMPILED BY: BCW
PROJECT: Exide Frisco
CHECKED BY: PJJ
LOCATION: South of North Disposal Area
REVIEWED BY: THR/AMF

LOG OF DGW-MW-7

DRILLING METHOD: Direct Push/HSA
NORTHING: 7,102,104 FT
DATE/TIME: 5/16/2018, 1300 - 1400
DRILLER: West Drilling, Gus Alejandre
EASTING: 2,479,782 FT
TOTAL DEPTH: 30 FT BGS
RIG: CME-75
SURFACE ELEVATION: 639.95 FT AMSL

DEPTH (Feet)	RUN No.	PID (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
	1		1.3/5.0		CL		(0.0-5.0) (CL) gravelly SILTY CLAY, low plastic fines, fine to coarse sub-rounded to sub-angular gravel, trace fine sand; dusky yellowish brown (10YR 2/2); cohesive, W<PL, stiff.
5	2		5.0/5.0				(5.0-19.0) (CL) SILTY CLAY, low plastic fines, trace fine sand, trace fine sub-rounded to rounded gravel; dusky yellowish brown (10YR 2/2); cohesive, W<PL, very stiff.
10	3		5.0/5.0		CL		
15	4		4.5/5.0				(15.0) No gravel
					CH		(19.0-20.0) (CH) sandy CLAY, high plastic fines, fine sand; brownish gray (5YR 4/1); cohesive, W~PL, firm.
20	5		5.0/5.0		CH		(20.0-22.5) (CH) CLAY, high plastic fines, trace fine sub-rounded to rounded gravel, trace fine sand; brownish gray (5YR 4/1); cohesive, W~PL, very stiff.
					CH		(22.5-23.0) (CH) gravelly CLAY, high plastic fines, fine to coarse well graded sub-rounded to sub-angular gravel, trace fine sand; brownish gray (5YR 4/1); cohesive, W~PL, very stiff.
25	6		5.0/5.0		CH		(23.0-28.0) (CH) CLAY, high plastic fines, trace fine rounded gravel, trace fine sand; brownish gray (5YR 4/1); cohesive, W~PL, very stiff.
					CH		(28.0-29.5) (CH&GW) CLAY and GRAVEL, high plastic fines, fine to coarse well graded sub-rounded to sub-angular gravel, trace fine sand; pale yellowish brown (10YR 6/2); cohesive, W>PL, very stiff.
30							(29.5-30.0) SHALE; dark gray (N3), moist, very stiff. END OF BORING AT 30 FEET BELOW GROUND SURFACE.
35							

PROJECT No: 130-2086-06
COMPILED BY: BCW
PROJECT: Exide Frisco
CHECKED BY: PJJ
LOCATION: South of North Disposal Area
REVIEWED BY: THR/AMF

LOG OF DGW-MW-8

DRILLING METHOD: Direct Push/HSA
NORTHING: 7,102,210 FT
DATE/TIME: 5/17/2018, 0920 - 1045
DRILLER: West Drilling, Robert Williams
EASTING: 2,479,511 FT
TOTAL DEPTH: 30 FT BGS
RIG: Geoprobe 7822DT
SURFACE ELEVATION: 640.26 FT AMSL

DEPTH (Feet)	RUN No.	PID (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
	1		3.0/5.0		CL		(0.0-1.0) (CL) SILTY CLAY, low plastic fines, some fine sand, trace medium sub-angular gravels; dusky yellowish brown (10YR 2/2) with dark yellowish brown (10YR 4/2) and moderate yellowish brown (10YR 5/4) mottling; cohesive, W<PL, firm.
					CL		(1.0-5.0) (CL) SILTY CLAY, low plastic fines, trace fine sand; dusky yellowish brown (10YR 2/2); cohesive, W<PL, firm.
5	2		1.0/5.0		CL		(5.0-10.0) (CL) SILTY CLAY, low plastic fines, trace fine sand; dusky yellowish brown (10YR 2/2); cohesive, W<PL, soft.
10	3		5.0/5.0		CL		(10.0-20.0) (CL) SILTY CLAY, low plastic fines, trace fine sand; dusky yellowish brown (10YR 2/2) with some medium gray (N5) mottling; cohesive, W<PL, firm.
15	4		5.0/5.0				(19.0) Some fine sand; brownish gray (5YR 4/1); soft.
20	5		5.0/5.0		CH		(20.0-24.6) (CH) CLAY, high plastic fines, trace fine sand; olive gray (5Y 4/1) to brownish gray (5YR 4/1); cohesive, W<PL, stiff.
25	6		5.0/5.0		CH		(24.6-25.0) (CH) gravelly CLAY, high plastic fines, fine to medium well graded sub-rounded gravel; olive gray (5Y 4/1) to brownish gray (5YR 4/1); cohesive, W<PL, very stiff.
					CH		(25.0-30.0) (CH) gravelly CLAY, high plastic fines, fine to coarse well graded sub-rounded gravels, some very fine sand; olive gray (5Y 4/1), iron staining; cohesive, W~PL, very stiff. *Shale present in endcap.
30							END OF BORING AT 30 FEET BELOW GROUND SURFACE.
35							

PROJECT No: 130-2086-06
COMPILED BY: BCW
PROJECT: Exide Frisco
CHECKED BY: PJJ
LOCATION: South of Slag Landfill; Along RR
REVIEWED BY: THR/AMF

LOG OF DGW-MW-9

DRILLING METHOD: Direct Push/HSA
NORTHING: 7,101,771 FT
DATE/TIME: 5/16/2018, 1535 - 1605
DRILLER: West Drilling, Gus Alejandro
EASTING: 2,480,655 FT
TOTAL DEPTH: 25 FT BGS
RIG: CME-75
SURFACE ELEVATION: 642.22 FT AMSL

DEPTH (Feet)	RUN No.	PID (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
0	1		3.0/5.0		SC		(0.0-9.0) (SC) CLAYEY SAND, fine sand, low to medium plastic fines; moderate brown (5YR 3/4); non-cohesive, dry, compact.
5	2		3.0/5.0		SC		(5.0) Increasing fines content
10	3		5.0/5.0		CH		(9.0-10.0) (CH) sandy CLAY, high plastic fines, fine sand; dark yellowish brown (10YR 4/2); cohesive, W<PL, stiff.
					CH		(10.0-12.5) (CH) CLAY, high plastic fines, trace fine sand; dusky yellowish brown (10YR 2/2); cohesive, W<PL, stiff.
					CH		(12.5-15.0) (CH) sandy CLAY, high plastic fines, fine sand; brownish gray (5YR 4/1); cohesive, W<PL, soft.
15	4		5.0/5.0		CH		(15.0-16.0) (CH) sandy CLAY, high plastic fines, fine sand; brownish gray (5YR 4/1); cohesive, W<PL, stiff.
					CH		(16.0-20.0) (CH) gravelly CLAY, high plastic fines, fine to coarse well graded sub-rounded to sub-angular gravel, some fine sand; brownish gray (5YR 4/1), iron staining; cohesive, W~PL, stiff.
20	5		5.0/5.0		CH		(20.0-22.0) (CH) sandy CLAY, high plastic fines, fine sand, some fine sub-rounded to rounded gravel; brownish gray (5YR 4/1); cohesive, W~PL, soft.
					CH		(22.0-24.0) (CH) sandy gravelly CLAY, high plastic fines, fine sand, fine to coarse well graded gravel; pale yellowish brown (10YR 6/2); cohesive, W~PL, very stiff.
25							(24.0-25.0) SHALE; dark gray (N3); moist, very stiff.
							END OF BORING AT 25 FEET BELOW GROUND SURFACE.
30							
35							

PROJECT No: 130-2086-06
COMPILED BY: BCW
PROJECT: Exide Frisco
CHECKED BY: PJJ
LOCATION: Near Admin Building
REVIEWED BY: THR/AMF

LOG OF DGW-MW-10

DRILLING METHOD: Direct Push/HSA
NORTHING: 7,101,804 FT
DATE/TIME: 5/18/2018, 0900 - 1000
DRILLER: West Drilling, Robert Williams
EASTING: 2,479,984 FT
TOTAL DEPTH: 20 FT BGS
RIG: Geoprobe 7822DT
SURFACE ELEVATION: 631.97 FT AMSL

DEPTH (Feet)	RUN No.	PID (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
							(0.0-0.6) CONCRETE.
	1		1.0/5.0		CL		*approximately 3" of subgrade gravel fill. (0.6-5.0) (CL) SILTY CLAY, low plastic fines, some medium sub-angular gravels, trace fine sand; brownish black (5YR 2/1); cohesive, W<PL, soft.
5	2		2.6/5.0		CL		(5.0-7.5) (CL) gravelly SILTY CLAY, low plastic fines, medium to coarse sub-angular to angular gravels, trace fine sand; brownish gray (5YR 4/1); cohesive, W>PL, very stiff.
					CH		(7.5-13.0) (CH) CLAY, high plastic fines, trace fine sand; brownish gray (5YR 4/1) cohesive, W~PL, stiff.
10	3		3.8/5.0		CH		(10.0) Soil water content becomes greater than plastic limit.
					CH		(13.0-14.5) (CH) CLAY, high plastic fines, some fine sand; brownish gray (5YR 4/1); cohesive, W~PL, very stiff.
15	4		1.0/1.0		CH		(14.5-15.0) (CH) CLAY, high plastic fines, some fine to coarse sub-rounded to sub-angular well graded gravel, some fine sand; brownish gray (5YR 4/1); cohesive, W~PL, very stiff.
	5		4.0/4.0		SM		(15.0-16.0) (CH) CLAY, high plastic fines, some fine sand, trace fine to medium sub-angular to angular gravels; brownish gray (5YR 4/1); cohesive, W>PL, firm.
					CH		(16.0-18.0) (SM) SILTY SAND, fine sand, non-plastic fines; brownish gray (5YR 4/1); non-cohesive, wet, dense. *Driller encounters hard drilling section at 16.5 ft BGS
20							(18.0-19.5) (CH) CLAY, high plastic fines, trace fine sand; medium gray (N5); cohesive, W~PL, very stiff. (19.5-20.0) SHALE; dark gray (N3); moist, very stiff. END OF BORING AT 20 FEET BELOW GROUND SURFACE.
25							
30							
35							

PROJECT No: 130-2086-06
COMPILED BY: BCW
PROJECT: Exide Frisco
CHECKED BY: PJJ
LOCATION: South of Slag Treatment Building
REVIEWED BY: THR/AMF

LOG OF DGW-MW-10S

DRILLING METHOD: Direct Push/HSA
NORTHING: 7,101,802 FT
DATE/TIME: 5/18/2018, 1150 - 1233
DRILLER: West Drilling, Robert Williams
EASTING: 2,479,986 FT
TOTAL DEPTH: 10 FT BGS
RIG: Geoprobe 7822DT
SURFACE ELEVATION: 631.90 FT AMSL

DEPTH (Feet)	RUN No.	PID (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
							(0.0-0.6) CONCRETE.
					ML		*approximately 3" of subgrade gravel fill.
	1		1.6/5.0				(0.6-2.5) (ML) sandy gravelly SILT, non-plastic fines, fine sand, fine to medium well graded sub-angular gravel; brownish gray (5YR 4/1) fines with grayish black (N2) sand; non-cohesive, wet, compact.
					CH		(2.5-5.0) (CH) CLAY, high plastic fines, some fine sand; brownish black (5YR 2/1); cohesive, W~PL, firm.
5					SM		(5.0-5.5) (SM) SILTY SAND, fine sand, non-plastic fines, trace fine to medium sub-angular gravels; brownish black (5YR 2/1); non-cohesive, wet, compact.
					CH		
	2		5.0/5.0		CH		(5.5-6.0) (CH) CLAY, high plastic fines, some fine sand; brownish black (5YR 2/1); cohesive, W~PL, firm.
							(6.0-10.0) (CH) CLAY, high plastic fines, trace fine sand; brownish gray (5YR 4/1); cohesive, W~PL, very stiff.
10							END OF BORING AT 10 FEET BELOW GROUND SURFACE.
15							
20							
25							
30							
35							

PROJECT No: 130-2086-06
COMPILED BY: BCW
PROJECT: Exide Frisco
CHECKED BY: PJJ
LOCATION: South of Slag Treatment Building
REVIEWED BY: THR/AMF

LOG OF DGW-MW-11

DRILLING METHOD: Direct Push/HSA
NORTHING: 7,101,855 FT
DATE/TIME: 5/18/2018, 1400 - 1607
DRILLER: West Drilling, Robert Williams
EASTING: 2,479,920 FT
TOTAL DEPTH: 17 FT BGS
RIG: Geoprobe 7822DT
SURFACE ELEVATION: 631.76 FT AMSL

DEPTH (Feet)	RUN No.	PID (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
							(0.0-0.6) CONCRETE.
	1		1.0/5.0		SM		*approximately 3" of subgrade gravel fill. (0.6-5.0) (SM) SILTY SAND, fine sand, non-plastic fines; mix of moderate yellowish brown (10YR 5/4) and dusky yellowish brown (10YR 2/2); non-cohesive, wet, loose.
5	2		2.9/5.0		CH		(5.0-7.5) (CH) sandy CLAY, high plastic fines, fine sand, trace medium sub-angular gravels; dusky yellowish brown (10YR 2/2); cohesive, W>PL, soft.
					CH		(7.5-10.0) (CH) CLAY, high plastic fines, trace fine sand; brownish black (5YR 2/1); cohesive, W~PL, stiff.
10	3		4.5/5.0		CH		(10.0-14.0) (CH) gravelly CLAY, high plastic fines, fine to coarse well graded sub-angular gravel, trace fine sand; dark yellowish brown (10YR 4/2); cohesive, W>PL, stiff.
					CH		(14.0-15.0) (CH) CLAY, high plastic fines, trace fine sand, trace medium sub-angular gravels; brownish gray (5YR 4/1); cohesive, W~PL, very stiff.
15	2		5.0/1.0		CL		(15.0-16.0) (CL) SILTY CLAY, medium plastic fines, trace fine sand, trace medium sub-angular gravels; brownish gray (5YR 4/1); cohesive, W>PL, soft.
					CL		(16.0-17.0) (CL) SILTY CLAY, medium plastic fines, some fine sand, trace fine sub-angular gravels; pale yellowish brown (10YR 6/2); cohesive, W>PL, very stiff.
							REFUSAL AT 17 FEET BELOW GROUND SURFACE.
20							
25							
30							
35							

PROJECT No: 130-2086-06
COMPILED BY: BCW
PROJECT: Exide Frisco
CHECKED BY: PJJ
LOCATION: South of WWTP
REVIEWED BY: THR/AMF

LOG OF DGW-MW-11S

DRILLING METHOD: Direct Push/HSA
NORTHING: 7,101,854 FT
DATE/TIME: 5/18/2018, 1630 - 1710
DRILLER: West Drilling, Robert Williams
EASTING: 2,479,922 FT
TOTAL DEPTH: 10 FT BGS
RIG: Geoprobe 7822DT
SURFACE ELEVATION: 631.78 FT AMSL

DEPTH (Feet)	RUN No.	PID (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
							(0.0-0.6) CONCRETE.
					ML		*approximately 3" of subgrade gravel fill.
	1		2.1/5.0		SM		(0.6-1.5) (ML) SILT, non-plastic fines, some fine to medium sub-rounded gravels, some fine sand; medium gray (N5) with white (N9) gravel; non-cohesive, dry, loose.
					CH		(1.5-2.5) (SM) SILTY SAND, fine sand, non-plastic fines, trace fine sub-angular gravel; moderate yellowish brown (10YR 5/4) with black (N1) gravel; non-cohesive, moist, compact.
5					ML		(2.5-5.0) (CH) CLAY, high plastic fines, trace fine sand; brownish black (5YR 2/1); cohesive, W~PL, firm.
	2		5.0/5.0		CH		(5.0-6.0) (ML) sandy SILT, non-plastic fines, fine sand, some fine to medium sub-angular gravel; dark gray (N3); non-cohesive, wet, compact.
					CH		(6.0-9.0) (CH) CLAY, high plastic fines, trace fine sand; gradation from brownish black (5YR 2/1) to pale yellowish brown (10YR 6/2); cohesive, W<PL, stiff.
10							(9.0-10.0) (CH) gravelly CLAY, high plastic fines, fine to coarse well graded sub-rounded to sub-angular gravels; pale yellowish brown (10YR 6/2); cohesive, W<PL, very stiff.
							END OF BORING AT 10 FEET BELOW GROUND SURFACE.
15							
20							
25							
30							
35							

PROJECT No: 130-2086-06
COMPILED BY: BCW
PROJECT: Exide Frisco
CHECKED BY: PJJ
LOCATION: South of WWTP
REVIEWED BY: THR/AMF

ATTACHMENT B

WELL DEVELOPMENT LOGS

GOLDER

WELL DEVELOPMENT/PURGING FORM

Project Ref: Exide - Deep GW PDI **Project No.: 130-2086-06**

Location DGW-MW-1

Monitored By: B. Works Date 5/19/18 Time 1450

Well Piezometer Data

(circle one)

Depth of Well (from top of PVC or ground)	33.02	feet
Depth of Water (from top of PVC or ground)	10.97	feet
Radius of Casing	1	inches
	0.08	feet
Casing Volume	~~22.05~~ 2	cubic feet
	3.59	gallons

1455-1515
S.S. bailing
~5 gal removed

Development / Purging Discharge Data

Purging Method S.S. bailer / monsoon

Start Purging Date 5/19/18 Time 1525

Stop Purging Date 5/19/18 Time 1625

Final @
WL: 12.12 FT BTOC
TD: 33.10 FT BTOC

Monitoring

Date	Time	Volume Discharge (gals)	Temp (°C)	pH	Spec.Cond. (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Redox Potential (+/- mV)	WL (ft BTOC)	Appearance of Water and Comments
5/19/18	1515	5	20.77	6.69	2.442	>1000	5.56	11.8	11.17	Milky brown
	1535	15	19.91	6.40	2.228	>1000	1.16	9.7	13.41	" "
	1550	25	19.78	6.42	2.193	>1000	0.75	4.2	13.47	" "
	1600	35	19.60	6.39	2.155	>1000	0.69	3.6	13.56	" " * stop surging
	1608	40	19.57	6.38	2.149	458	0.54	4.6	13.80	Cloudy
	1613	45	19.57	6.38	2.150	298	0.54	5.7	13.90	"
	1620	50	19.53	6.38	2.148	184	0.50	6.4	13.94	"
↓	1625	55	19.54	6.38	2.140	72.5	0.48	6.8	13.96	
			DEVELOPMENT COMPLETE							

GOLDER

WELL DEVELOPMENT/PURGING FORM

Project Ref: Exide - Deep GW PDI | **Project No.: 130-2086-06**

Location DGW-MW-2

Monitored By: 05/19/18 Date 05/19/18 Time 1508

Well Piezometer Data

(circle one)

TD @ 1700 on 05/19/18 = 19.66 Ft BTOC

Depth of Well (from top of PVC or ground)	19.65	feet
Depth of Water (from top of PVC or ground)	6.28	feet
Radius of Casing	1	inches
	0.08	feet
Casing Volume	13.37	cubic feet
	2.18	gallons

Development / Purging Discharge Data

Purging Method: SS Bailer; SS Monsoon

Start Purging Date 05/19/18 Time 1508

Stop Purging Date 05/19/18 Time 1652

Monitoring

Date	Time	Volume Discharge (gals)	Temp (°C)	pH	Spec.Cond. (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Redox Potential (+/- mV)	WL (ft BTOC)	Appearance of Water and Comments
05/19/18	1522	5.0	22.59	6.71	2.365	>1000	2.08	-7.0	6.51	milky gray/brown
	1549	15.0	22.22	6.53	2.513	>1000	0.17	-25.2	6.45	"
	1603	25.0	22.15	6.52	2.512	>1000	0.11	-31.3	6.46	"
	1614	35.0	22.10	6.51	2.519	>1000	0.07	-34.8	6.46	very cloudy brown, Stop surging
	1620	40.0	22.07	6.52	2.496	524	0.11	-38.2	6.49	cloudy
	1624	45.0	22.05	6.52	2.500	314	0.07	-39.8	6.49	slightly cloudy
	1629	50.0	22.06	6.52	2.504	208	0.07	-41.2	6.48	"
	1633	55.0	22.07	6.52	2.507	264	0.06	-42.3	6.48	mostly clear
	1638	60.0	22.08	6.52	2.506	225	0.08	-43.2	6.48	"
	1642	65.0	22.07	6.52	2.510	163	0.07	-43.9	6.48	"
	1647	70.0	22.07	6.52	2.512	132	0.06	-41.6	6.48	"
	1652	75.0	22.07	6.52	2.519	99.3	0.05	-45.4	6.48	clear
			- DEVELOPMENT COMPLETE -							

Bailer pump

GOLDER

WELL DEVELOPMENT/PURGING FORM

Project Ref: Exide - Deep GW PDI | **Project No.: 130-2086-06**

Location DGW-BH-01 / MW-3

Monitored By: B. Works, E. White | Date 5/17/18 | Time 1450

Well Piezometer Data

(circle one)

Depth of Well (from top of PVC or ground)	19.55	feet
Depth of Water (from top of PVC or ground)	5.02	feet
Radius of Casing	1	inches
	0.08	feet
Casing Volume	14.53	cubic feet
	2.37	gallons

on 05/18/18 @ 1100

S.S. bailer from 1455 to 1515, ~5 gal removed
WL: 9.51 FT BTOC

on 05/18/18
WL @ 1100 5.19 FT BTOC

Development / Purging Discharge Data

Purging Method: SS. bailer / Monsoon

Start Purging: Date ~~1455~~ 5/17/18 -05/18/18 Time 1455; 1122

Stop Purging: Date 5/17/18 -05/18/18 Time 1050; 1214

Monitoring

Date	Time	Volume Discharge (gals)	Temp (°C)	pH	Spec.Cond. (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Redox Potential (+/- mV)	WL (ft BTOC)	Appearance of Water and Comments
5/17/18	1515	5	23.74	7.33	1.565	>1000	5.53	-29.9	9.51	Milky brown
"	1600	15	21.36	6.80	1.340	>1000	5.32	-11.1	15.01	" "
"	1630	20	22.80	6.47	1.780	2660	4.69	-5.2	16.35	Cloudy
"	1650	24	22.44	6.43	2.036	>1000	4.20	22.0	DRY	"
05/18/18	1122	~~30~~ 26	21.64	6.67	1.051	130	3.93	-5.1	7.26	Slightly Cloudy
"	1140	28	21.68	6.74	1.193	27.1	2.63	-25.9	8.16	Clear
"	1155	30	21.54	6.76	1.096	20.6	2.21	-33.6	9.30	Clear
"	1214	32	21.79	6.81	1.100	16.8	1.56	-42.9	9.80	Clear
					DEVELOPMENT COMPLETE					

GOLDER

WELL DEVELOPMENT/PURGING FORM

Project Ref: Exide - Deep GW PDI | **Project No.: 130-2086-06**

Location DGW-MW-4

Monitored By: E. White | Date 05/18/18 | Time 1315

Well Piezometer Data

(circle one)

Depth of Well (from top of PVC or ground)	18.50	feet
Depth of Water (from top of PVC or ground)	3.56	feet
Radius of Casing	1	inches
	0.08	feet
Casing Volume	15.94	~~cubic~~ feet
	2.60	gallons

Total depth following development = 19.51 FT BTOC

Development / Purging Discharge Data

Purging Method: SS Bailer; SS Monsoon

Start Purging: Date 05/18/18 | Time 1315

Stop Purging: Date 05/18/18 | Time 1623

Monitoring

Date	Time	Volume Discharge (gals)	Temp (°C)	pH	Spec.Cond. (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Redox Potential (+/- mV)	WL (ft BTOC)	Appearance of Water and Comments
Bailer → pump → 05/18/18	1332	5.0	22.21	6.65	2.476	71000	0.72	-30.3	4.65	Milky grey/brown
	1400	15.0	21.80	6.54	2.366	71000	0.160	-49.8	3.89	"
	1428	25.0	21.47	6.53	2.335	>1000	0.27	-53.7	3.83	"
	1447	35.0	21.37	6.54	2.331	2600	0.14	-55.4	3.81	Start Surging "
	1458	40.0	21.40	6.53	2.333	939	0.12	-55.7	3.81	Cloudy
	1519	45.0	21.35	6.55	2.325	618	0.07	-59.5	3.80	Cloudy
	1530	50.0	21.37	6.55	2.327	513	0.016	-60.2	3.80	Cloudy
	1540	55.0	21.34	6.55	2.330	384	0.10	-56.0	3.80	Slightly Cloudy
	1551	60.0	21.36	6.54	2.330	364	0.05	-58.6	3.79	"
	1600	65.0	21.27	6.55	2.325	252	0.05	-59.3	3.79	"
	1612	70.0	21.41	6.55	2.332	160	0.09	-57.5	3.76	Mostly clear
	1623	75.0	21.34	6.55	2.328	84.1	0.05	-59.5	3.77	Clear
					- DEVELOPMENT COMPLETE -					

GOLDER

WELL DEVELOPMENT/PURGING FORM

Project Ref: Exide - Deep GW PDI | **Project No.: 130-2086-06**

Location DGW-MW-5

Monitored By: EPW | Date 05/17/18 | Time 0925

Well Piezometer Data

(circle one)

Depth of Well (from top of PVC or ground)	23.21	feet → 23.05 (1225)
Depth of Water (from top of PVC or ground)	10.03	feet → 9.95
Radius of Casing	1	inches
	0.08	feet
Casing Volume	13.18	cubic feet
	2.15	gallons

Development / Purging Discharge Data

Purging Method: SS Bailer ; SS Monsoon Pump

Start Purging: Date 05/17/18 | Time 0925

Stop Purging: Date 05/17/18 | Time 1222

Monitoring

Date	Time	Volume Discharge (gals)	Temp (°C)	pH	Spec.Cond. (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Redox Potential (+/- mV)	WL (ft BTOC)	Appearance of Water and Comments
Bailer 05/18	0945	5.0	19.38	6.85	2.390	>1000	3.11	75.4	NM	milky brown-gray
	1015	10.0	19.55	6.82	2.343	>1000	1.70	44.5	10.11	"
	1033	15.0	19.64	6.84	2.366	>1000	2.50	32.7	10.10	"
	1050	20.0	19.58	6.78	2.471	>1000	1.47	26.1	10.06	"
monsoon	1139	35.0	19.48	6.67	2.577	>1000	0.21	-12.8	10.10	V. Cloudy Brown/Gray
	1200	50.0	19.40	6.67	2.595	>1000	0.16	-25.5	10.12	" (Stopped Sampling)
	1204	55.0	19.51	6.67	2.651	225	0.19	-26.3	10.05	Slightly Cloudy
	1213	60.0	19.55	6.67	2.642	110	0.22	-28.3	10.05	"
	1222	65.0	19.60	6.65	2.645	70.9	0.19	-29.8	10.05	clear
					-DEVELOPMENT COMPLETE-					

GOLDER

WELL DEVELOPMENT/PURGING FORM

Project Ref: Exide - Deep GW PDI | **Project No.: 130-2086-06**

Location DGW-MW-6

Monitored By: B. Works | Date 5/19/18 | Time 1140

Well Piezometer Data

(circle one)

Depth of Well (from top of PVC or ground)	32.61	feet
Depth of Water (from top of PVC or ground)	13.18	feet
Radius of Casing	1	inches
	0.08	feet
Casing Volume	9.43	cubic feet
	3.17	gallons

5/19/18
1150 - 1230
~ 10 gal removed with S.S. bailer

Development / Purging Discharge Data

Purging Method: S.S. bailer

Start Purging: Date 5/19/18 | Time 1243

Stop Purging: Date 5/19/18 | Time 1405

Final @ 1420
WL: 14.78 FT BTOC
TD: 32.62 FT BTOC

Monitoring

Date	Time	Volume Discharge (gals)	Temp (°C)	pH	Spec.Cond. (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Redox Potential (+/- mV)	WL (ft BTOC)	Appearance of Water and Comments
5/19/18	1230	10	22.41	6.51	3.521	>1000	3.33	-29.8	13.59	Milky brown
	1300	20	22.07	6.33	3.486	>1000	1.11	-62.3	18.05	" "
	1320	30	22.10	6.48	3.428	>1000	0.70	-84.7	20.45	" "
	1335	40	22.21	6.51	3.386	>1000	0.90	-83.9	20.89	" "
	1345	45	22.09	6.53	3.376	77.1	1.41	-82.2	21.18	Slightly Cloudy
	1355	50	22.08	6.55	3.377	53.0	1.36	-79.3	21.31	" "
	1405	55	22.09	6.55	3.376	19.7	1.40	-76.8	21.38	Clear
		DEVELOPMENT COMPLETE								

*Stop surging

GOLDER

WELL DEVELOPMENT/PURGING FORM

Project Ref: Exide - Deep GW PDI | **Project No.: 130-2086-06**

Location DGW-MW-7

Monitored By: E. White | Date 05/19/18 | Time 1100

Well Piezometer Data

(circle one)

Depth of Well (from top of PVC or ground)	32.80	feet
Depth of Water (from top of PVC or ground)	13.35	feet
Radius of Casing	1	inches
	0.08	feet
Casing Volume	19.45	cubic feet
	3.2	gallons

TD on 05/19/18 @ = 32.79 FT BTOC

Development / Purging Discharge Data

Purging Method: SS Bailer; SS Monsoon

Start Purging: Date 05/19/18 | Time 1100

Stop Purging: Date 05/19/18 | Time 1438

Monitoring

Date	Time	Volume Discharge (gals)	Temp (°C)	pH	Spec.Cond. mS/cm	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Redox Potential (+/- mV)	WL (ft BTOC)	Appearance of Water and Comments
Bailer 05/19/18	1120	5.0	22.06	6.92	4.325	>1000	0.63	-37.2	13.96	Milky Brown
Pump	1147	15.0	22.02	6.74	4.179	>1000	0.13	-49.9	14.09	"
	1206	25.0	22.00	6.72	4.139	>1000	0.10	-52.6	14.19	Very cloudy Brown
	1223	35.0	21.93	6.71	4.092	>1000	0.08	-51.3	14.27	" Stop Surging after read
	1231	40.0	22.05	6.70	4.114	>1000	0.11	-48.7	14.16	Very cloudy
	1243	45.0	22.03	6.69	4.111	>1000	0.05	-46.5	14.10	"
	1258	50.0	22.27	6.69	4.125	>1000	0.08	-48.3	13.96	"
	1310	55.0	22.05	6.69	4.094	>1000	0.06	-48.3	14.04	"
	1319	60.0	21.80	6.69	4.064	542	0.06	-47.6	14.24	"
	1325	65.0	21.87	6.68	4.053	564	0.08	-46.3	14.36	Cloudy
	1330	70.0	21.86	6.68	4.047	354	0.09	-46.5	14.16	"
	1336	75.0	21.86	6.68	4.036	373	0.09	-45.6	14.46	"
	1342	80.0	22.01	6.68	4.046	318	0.05	-45.7	14.35	Slightly cloudy
	1354	85.0	22.18	6.68	4.069	440	0.09	-47.9	14.11	"
	1402	90.0	21.89	6.68	4.024	136	0.08	-46.9	14.30	"
	1409	95.0	21.92	6.67	4.017	222	0.07	-46.4	14.31	"
	1417	100.0	21.94	6.67	4.022	142	0.09	-46.3	14.35	"
	1423	105.0	21.93	6.67	4.012	112	0.04	-46.6	14.34	Mostly clear
	1430	110.0	21.96	6.67	4.013	108	0.06	-46.6	14.35	"
	1438	115.0	21.95	6.67	4.014	52.3	0.10	-46.5	14.36	Clear
				- DEVELOPMENT COMPLETE -						

GOLDER

WELL DEVELOPMENT/PURGING FORM

Project Ref: Exide - Deep GW PDI | **Project No.: 130-2086-06**

Location DGW-MW-8

Monitored By: B. Works | Date 5/19/18 | Time 0810

Well Piezometer Data

(circle one)

Depth of Well (from top of PVC or ground)	34.42	feet
Depth of Water (from top of PVC or ground)	24.22	feet
Radius of Casing	1	inches
	0.08	feet
Casing Volume	10.2	cubic feet
	1.66	gallons

0830-
5/19/18 0910
~5 gal removed with S.S. bailer

Development / Purging Discharge Data

Purging Method: S.S. bailer / Monsoon

Start Purging: Date 5/19/18 | Time 0920

Stop Purging: Date 5/19/18 | Time 1105

Final: @ 1120
WL: 26.10 FT BTOC
TD: 34.44 FT BTOC

Monitoring

Date	Time	Volume Discharge (gals)	Temp (°C)	pH	Spec.Cond. (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Redox Potential (+/- mV)	WL (ft BTOC)	Appearance of Water and Comments
5/19/18	0910	5	22.45	6.36	4.810	>1000	4.58	128.1	27.10	Milky Brown
	0940	10	22.01	6.35	4.521	>1000	3.05	19.1	29.35	" "
	1005	15	22.11	6.37	4.442	>1000	2.84	5.0	29.01	" "
	1020	20	21.79	6.37	4.416	>1000	1.46	-4.4	30.36	" "
	1037	25	21.96	6.39	4.455	25.2	1.37	-6.1	29.75	Clear
	1055	30	22.04	6.39	4.481	98.2	1.28	0.2	29.56	"
↓	1105	32	22.18	6.39	4.488	7.51	1.36	-0.1	29.25	"
			DEVELOPMENT COMPLETE							

*stop surging

GOLDER

WELL DEVELOPMENT/PURGING FORM

Project Ref: Exide - Deep GW PDI **Project No.: 130-2086-06**

Location DGW-MW-9

Monitored By: B. Works Date 5/20/18 Time 0730

Well Piezometer Data

(circle one)

Depth of Well (from top of PVC or ground)	27.58	feet
Depth of Water (from top of PVC or ground)	16.90	feet
Radius of Casing	1.0	inches
	0.08	feet
Casing Volume	10.68	cubic feet
	1.74	gallons

0740 - 0750
S.S. bailer:
~5 gal removed

Development / Purging Discharge Data

Purging Method S.S. bailer / monsoon

Start Purging Date 5/20/18 Time 0805

Stop Purging Date 5/20/18 Time 0952

Monitoring

Date	Time	Volume Discharge (gals)	Temp (°C)	pH	Spec.Cond. (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Redox Potential (+/- mV)	WL (ft BTOC)	Appearance of Water and Comments
5/20/18	0750	5	20.39	6.27	5.185	>1000	2.16	90.0	17.25	Murky brown
	0827	15	20.45	6.22	5.335	>1000	0.31	3.1	17.96	" "
	0840	25	20.41	6.22	5.347	>1000	0.21	-10.4	18.04	" "
	0850	30	20.42	6.22	5.363	>1000	0.13	-15.3	18.08	" "
	0900	35	20.41	6.22	5.353	826	0.14	-17.6	18.32	" "
	0915	40	20.42	6.22	5.357	421	0.24	-19.7	18.32	Cloudy
	0923	45	20.41	6.21	5.325	329	0.21	-21.1	18.32	"
	0928	50	20.41	6.21	5.329	239	0.21	-22.2	18.33	"
	0938	55	20.42	6.22	5.331	186	0.22	-22.4	18.33	Slightly Cloudy
	0945	60	20.41	6.22	5.329	110	0.21	-22.6	18.34	" "
	0952	65	20.42	6.21	5.329	94.5	0.21	-22.7	18.34	" "
		DEVELOPMENT COMPLETE								

*Stop surging

GOLDER

WELL DEVELOPMENT/PURGING FORM

Project Ref: Exide - Deep GW PDI **Project No.: 130-2086-06**

Location DGW-MW-10

Monitored By: E. White Date 05/19/18 Time 0715

Well Piezometer Data

(circle one)

Depth of Well (from top of PVC or ground)	20.20	feet
Depth of Water (from top of PVC or ground)	2.41	feet
Radius of Casing	1	inches
	0.08	feet
Casing Volume	17.79	cubic feet
	2.90	gallons

TD on 05/19/18 @ = 20.21 FT BTOC

Borehole

GW Well Volume = 7.25 → 20.20 - 2 = 40.40

Development / Purging Discharge Data

Purging Method: SS Bailer; SS Minscan

Start Purging Date: 05/19/18 Time: 0730

Stop Purging Date: 05/19/18 Time: 1030

Monitoring

Date	Time	Volume Discharge (gals)	Temp (°C)	pH	Spec.Cond. (µS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Redox Potential (+/- mV)	WL (ft BTOC)	Appearance of Water and Comments
05/19/18	0744	5.0	21.30	6.50	4.714	>1000	1.77	-10.5	3.16	milky gray/brown
	0830	15.0	21.10	6.40	4.525	71000	0.15	-27.0	4.95	"
	0900	25.0	21.01	6.40	4.468	519	0.13	-34.8	6.50	Cloudy Stop surging after reading
	0913	30.0	20.98	6.40	4.430	387	0.09	-36.4	5.70	Cloudy
	0926	35.0	21.02	6.41	4.427	225	0.09	-37.5	5.61	slightly Cloudy
	0938	40.0	21.01	6.41	4.396	2616	0.07	-39.7	5.71	"
	0950	45.0	21.00	6.41	4.369	250	0.08	-40.0	6.05	"
	1000	50.0	20.27	6.42	4.344	217	0.09	-41.4	6.51	"
	1010	55.0	20.97	6.42	4.349	187	0.11	-41.9	6.91	"
	1020	60.0	20.96	6.42	4.340	126	0.08	-42.6	6.98	"
	1030	65.0	20.92	6.42	4.325	86.4	0.09	-43.2	7.05	Clear
				- DEVELOPMENT COMPLETE -						

Bailer pump

GOLDER

WELL DEVELOPMENT/PURGING FORM

Project Ref: Exide - Deep GW PDI | **Project No.: 130-2086-06**

Location DGW-MW-105

Monitored By: E. White | Date: 05/21/18 | Time: 0825

Well Piezometer Data

(circle one)

Depth of Well (from top of PVC or ground)	7.71	feet
Depth of Water (from top of PVC or ground)	7.21	feet
Radius of Casing	1	inches
	0.08	feet
Casing Volume	0.5	cubic feet
	0.08	gallons

Development / Purging Discharge Data

Purging Method: S.S. Bailer

Start Purging: Date 05/21/18; 05/22/18; 5/27/18 | Time 0825; 1030; 1728

Stop Purging: Date 05/21/18; 05/22/18; 5/27/18 | Time 0835; 1083; 1732

Monitoring

Date	Time	Volume Discharge (gals)	Temp (°C)	pH	Spec.Cond. (µS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Redox Potential (+/- mV)	WL (ft BTOC)	Appearance of Water and Comments
05/19/18	0712	—	—	—	—	—	—	—	DRY	TD = 7.71 FT BTOC
05/20/18	0700	—	—	—	—	—	—	—	DRY	TD = 7.71 FT BTOC
05/21/18	0820	—	—	—	—	—	—	—	7.21	TD = 7.71 FT BTOC
1	0830	0.01	21.97	7.20	6.093	>1000	6.41	207.6	DRY	(Almost)
1	0835	0.25	—	—	—	—	—	—	DRY	Very cloudy brown/gray
05/22/18	0727	—	—	—	—	—	—	—	7.08	TD = 7.71 ft BTOC
1	1033	0.5	—	—	—	—	—	—	DRY	Very cloudy brown/gray
5/27/18	1407	—gw	—	—	—	—	—	—	5.60	—
1	1732	~~0.5~~ 1.0	—	—	—	—	—	—	DRY	Very cloudy brown
				DEVELOPMENT COMPLETE						

05/21/18 → WL @ 1620 = 7.31 FT BTOC

GOLDER

WELL DEVELOPMENT/PURGING FORM

Project Ref: Exide - Deep GW PDI **Project No.: 130-2086-06**

Location DGW-MW-11

Monitored By: E. White/R. Woods Date 05/21/18 Time 0848

Well Piezometer Data

(circle one)

	on 05/21/18	
Depth of Well (from top of PVC or ground)	17.72	feet
Depth of Water (from top of PVC or ground)	17.18	feet
Radius of Casing	1	inches
	0.08	feet
Casing Volume	0.54	cubic feet
	0.09	gallons

Development / Purging Discharge Data

Purging Method S. S. Bailer

Start Purging Date 05/21/18; 05/22/18; 5/27/18 Time 0848; 0729; 1710

Stop Purging Date 05/21/18; 05/22/18; 5/27/18 Time 0852; 0730; 1715

Monitoring

Date	Time	Volume Discharge (gals)	Temp (°C)	pH	Spec.Cond. (µS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Redox Potential (+/- mV)	WL (ft BTOC)	Appearance of Water and Comments
5/19/18	0740	—	—	—	—	—	—	—	DRY	TD: 17.72 FT BTOC
5/20/18	0700	—	—	—	—	—	—	—	DRY	TD = 17.72 FT BTOC
5/24/18	0825	—	—	—	—	—	—	—	17.18	TD = 17.72 FT BTOC
Bailer	0850	0.01	21.05	6.81	7.802	>1000	5.64	178.2	Almost	Dry; milky brown
1	0852	0.25	—	—	—	—	—	—	DRY	Very cloudy brown
05/22/18	0729	0.25	—	—	—	—	—	—	16.86	TD = 17.71 FT BTOC
1	1028	0.50	—	—	—	—	—	—	DRY	Very cloudy brown
5/27/18	1412	— GW	—	—	—	—	—	—	10.00	—
1	1715	2.5 3.0	—	—	—	—	—	—	DRY	Cloudy brown
				— DEVELOPMENT COMPLETE —						

05/21/18 → wl @ 1023 = 17.24 FT BTOC

GOLDER

WELL DEVELOPMENT/PURGING FORM

Project Ref: Exide - Deep GW PDI **Project No.: 130-2086-06**

Location DGW-MW-115

Monitored By: E. White/R. Wells Date 05/19/18 Time 0730

Well Piezometer Data

(circle one)

Depth of Well (from top of PVC or ground)	7.35	feet
Depth of Water (from top of PVC or ground)	6.016	feet
Radius of Casing	1	inches
	0.08	feet
Casing Volume	1.29	cubic feet
	0.21	gallons

Development / Purging Discharge Data

Purging Method S.S. Bailer

Start Purging Date 05/19/18, 05/21/18, 05/22/18; 05/27/18 Time 0730; 0835; 0729; 1720

Stop Purging Date 05/19/18, 05/21/18, 05/22/18; 5/27/18 Time 0755; 0842; 0738; 1723

Monitoring

Date	Time	Volume Discharge (gals)	Temp (°C)	pH	Spec.Cond. (µS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Redox Potential (+/- mV)	WL (ft BTOC)	Appearance of Water and Comments
05/19/18	0755	0.5	—	—	—	—	—	—	DRY	—
05/21/18	0835	—	—	—	—	—	—	—	4.95	TD=7.34 ft BTOC
〃	0838	0.75	21.82	7.52	7.157	>1000	7.65	215.2	Almost Dry	very cloudy brown
〃	0842	1.00	21.83	7.61	7.565	>1000	7.91	201.7	DRY	〃
05/22/18	0729	—	—	—	—	—	—	—	5.47	TD=7.32 FT BTOC
〃	1022	1.75	—	—	—	—	—	—	DRY	Cloudy brown
05/27/18	1411	— GW	—	—	—	—	—	—	4.71	—
〃	1723	~~0.5~~ 2.5	—	—	—	—	—	—	DRY	Cloudy brown
				- DEVELOPMENT COMPLETE -						

05/21/18 → WL @ 1026 - 6.32 FT BTOC

ATTACHMENT C

GROUNDWATER SAMPLING FORMS

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide Deep Groundwater PDI **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 82°F Weather Sunny, humid

SAMPLE INFORMATION

Sample Location Sample No. DGW-MW-1

Sample Date 5/31/18 Time 1030 Sample By JME

Sample Method Peristaltic Pump Sample Type Grab

Start purge @ 0954

Water Level Before Purging: 11.20 FT BTOC TD: 33.04 FT BTOC

Well Volume: 21.84 FT x 0.163 gal/FT = 3.56 gallons

Volume Water Removed Before Sampling: 1.50 gallons

Water Level Before Sampling: 11.36 FT BTOC

Water Level After Sampling: NM FT BTOC

Appearance of Sample: Clear

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement		Measurement	Sample
Time	hhmm	1000	1005	1010	1020		1030
Volume Discharge	gals	~0.50	0.75	1.0	1.25		1.50
pH	Standard	6.43	6.43	6.49	6.50		6.48
Spec. Cond.	mS/cm	2.559	2.549	2.541	2.520		2.507
Turbidity	NTU	18.8	20.2	21.6	13.0		9.16
Temperature	°C	21.28	21.24	21.11	21.19		21.25
Dissolved Oxygen	mg/l	0.37	0.23	0.16	0.11		0.09
Redox Potential	+/- mV	~~80.04~~ 80.4	22.0	8.4	1.8		2.3
Pump Rate	mL/min	~300	~300	~300	~300		~300
Water Level	FT BTOC	11.34	11.36	11.36	11.37		11.36

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals	60 mL Poly	No	HNO_3
2	Dissolved Metals	60 mL Poly	Yes (0.45 µm)	HNO_3
3	Anions (Cl, SO4, NO3/NO2) / Alkalinity	250 mL Poly	No	None
5	TOC	2 x 40 mL Vial (amber)	No	H_2SO_4 ~~None~~
6	DOC	2 x 40 mL Vial (amber)	Yes (0.45 µm)	H_2SO_4 ~~None~~
7				
8				

REMARKS: None

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE | Stainless Steel | Teflon

[Peristaltic Pump] | Submersible Pump | Hand Pump

Air-Lift Pump | Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide Deep Groundwater PDI **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 90s Weather Sunny

SAMPLE INFORMATION

Sample Location DGW-MW-2 Sample No. DGW-MW-2

Sample Date 5/31/18 Time 1145 Sample By B. Works

Sample Method Peristaltic Pump Sample Type Grab

Start purge @ 1115

Water Level Before Purging: 6.51 FT BTOC TD: 19.72 FT BTOC

Well Volume: 13.21 FT x 0.163 gal/FT = 2.15 gallons

Volume Water Removed Before Sampling: 1.50 gallons

Water Level Before Sampling: 6.51 FT BTOC

Water Level After Sampling: 6.51 FT BTOC

Appearance of Sample: Clear

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Measurement	Sample	Measurement	Sample
Time	hhmm	1120	1125	1130	1135	1040	1145		
Volume Discharge	gals	0.25	0.50	0.75	1.0	1.25	1.50		
pH	Standard	6.42	6.40	6.42	6.42	6.43	6.43		
Spec. Cond.	mS/cm	2.589	2.573	2.560	2.538	2.507	2.486		
Turbidity	NTU	73.5	25.9	20.7	19.3	13.0	9.77		
Temperature	°C	23.95	23.76	23.67	23.64	23.67	23.61		
Dissolved Oxygen	mg/l	6.33	1.70	1.07	0.74	0.63	0.58		
Redox Potential	+/- mV	-5.7	-7.3	-7.6	-8.2	-10.2	-11.7		
Pump Rate	mL/min	300	300	300	300	300	300		
Water Level	FT BTOC	6.51	6.51	6.51	6.51	6.51	6.51		

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals	60 mL Poly	NO	HNO_3
2	Dissolved Metals	60 mL Poly	Yes (0.45 µm)	HNO_3
3	Anions (Cl, SO4, NO3/NO2) / Alkalinity	250 mL Poly	No	None
5	TOC	2 x 40 mL Vial (amber)	No	~~None~~ H_2SO_4
6	DOC	2 x 40 mL Vial (amber)	Yes (0.45 µm)	~~None~~ H_2SO_4
7	TPH	3 x 40mL Vial	No	HCL
8				

REMARKS: Tubing left in hole, no sheen observed.

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE | Stainless Steel | Teflon

Peristaltic Pump | Submersible Pump | Hand Pump

Air-Lift Pump | Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide Deep Groundwater PDI **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 90s Weather Sunny

SAMPLE INFORMATION

Sample Location DGW-MW-3 Sample No. DGW-MW-3

Sample Date 5/31/18 Time 1035 Sample By B. Workes

Sample Method Peristaltic Pump Sample Type Grab

start @ purge @ 1000

Water Level Before Purging: 5.50 FT BTOC TD: 19.60 FT BTOC

Well Volume: 14.1 FT x 0.163 gal/FT = 2.29 gallons

Volume Water Removed Before Sampling: 1.75 gallons

Water Level Before Sampling: 6.80 FT BTOC

Water Level After Sampling: 6.94 FT BTOC

Appearance of Sample: clear

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	~~Measurement~~ Sample
Time	hhmm	1005 1010	1015 1020	1025 1030	1035
Volume Discharge	gals	0.25 0.50	0.75 1.0	1.25 1.50	1.75
pH	Standard	6.28 6.19	6.37 6.57	6.67 6.70	6.72
Spec. Cond.	mS/cm	3.261 2.932	1.896 1.368	1.249 1.205	1.178
Turbidity	NTU	28.0 19.7	17.9 7.88	7.90 9.60	8.64
Temperature	°C	22.36 22.31	22.14 22.09	22.16 22.11	22.45
Dissolved Oxygen	mg/l	6.75 2.38	1.36 0.94	0.76 0.65	0.60
Redox Potential	+/- mV	43.0 34.3	2.1 -47.0	-65.2 -69.9	-73.9
Pump Rate	mL/min	300 300	300 300	300 300	300
Water Level	FT BTOC	5.55 6.11	6.28 6.44	6.61 6.69	6.80

Sample @

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals	60 mL Poly	NO	HNO_3
2	Dissolved Metals	60 mL Poly	Yes (0.45 µm)	HNO_3
3	Anions (Cl, SO4, NO3/NO2) / Alkalinity	250 mL Poly	No	None
5	TOC	2 x 40 mL Vial (amber)	No	~~H_2SO_4~~ ~~None~~
6	DOC	2 x 40 mL Vial (amber)	Yes (0.45 µm)	~~H_2SO_4~~ ~~None~~
7	TPH	3 x 40mL Vial	No	HCL
8				

REMARKS: Tubing left in well, no sheen observed.

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE Stainless Steel Teflon

[Peristaltic Pump] Submersible Pump Hand Pump

Air-Lift Pump Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide Deep Groundwater PDI **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 90s Weather Sunny

SAMPLE INFORMATION

Sample Location DGW-MW-4 Sample No. DGW-MW-4

Sample Date 05/30/18 Time 1845 Sample By B. Works

Sample Method Peristaltic Pump Sample Type Grab

start purge @ 1820

Water Level Before Purging: 3.75 FT BTOC TD: 19.52 FT BTOC

Well Volume: 15.77 FT x 0.163 gal/FT = 2.57 gallons

Volume Water Removed Before Sampling: 1.25 gallons

Water Level Before Sampling: 3.78 FT BTOC

Water Level After Sampling: 3.78 FT BTOC

Appearance of Sample: clear

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Sample	Measurement	Sample
Time	hhmm	1825	1830	1835	1840	1845		
Volume Discharge	gals	0.25	0.50	0.75	1.0	1.25		
pH	Standard	6.46	6.46	6.47	6.48	6.48		
Spec. Cond.	mS/cm	2.467	2.467	2.464	2.460	2.469		
Turbidity	NTU	56.6	25.7	17.3	11.4	6.17		
Temperature	°C	23.56	23.23	23.15	23.09	22.96		
Dissolved Oxygen	mg/l	5.12	1.78	1.23	0.95	0.78		
Redox Potential	+/- mV	-34.6	-36.6	-34.1	-33.7	-32.2		
Pump Rate	mL/min	300	300	300	300	300		
Water Level	FT BTOC	3.78	3.78	3.78	3.78	3.78		

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals	60 mL Poly	NO	HNO_3
2	Dissolved Metals	60 mL Poly	Yes (0.45 µm)	HNO_3
3	Anions (Cl, SO4, NO3/NO2) / Alkalinity	250 mL Poly	No	None
5	TOC	2 x 40 mL Vial (amber)	No	~~None~~ H_2SO_4
6	DOC	2 x 40 mL Vial (amber)	Yes (0.45 µm)	~~None~~ H_2SO_4
7	TPH	3 x 40mL Vial	No	HCL
8				

REMARKS: Tubing left in well, no sheen observed.

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE | Stainless Steel | Teflon

[Peristaltic Pump] | Submersible Pump | Hand Pump

Air-Lift Pump | Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide Deep Groundwater PDI **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 94°F Weather Sunny, breezy

SAMPLE INFORMATION

Sample Location Sample No. DGW-MW-5

Sample Date 5/30/18 Time 1905 Sample By JME

Sample Method Peristaltic Pump Sample Type Grab

start purge @ 1830

Water Level Before Purging: 9.99 FT BTOC TD: 23.07 FT BTOC

Well Volume: 13.08 FT x 0.163 gal/FT = 2.132 gallons

Volume Water Removed Before Sampling: ~4.5 gallons

Water Level Before Sampling: 10.01 FT BTOC

Water Level After Sampling: 9.99 FT BTOC

Appearance of Sample: clear, odorless

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement		Measurement	Sample
Time	hhmm	1835	1840	~~1848~~ 1845	1855	~~1855~~ 1900	1905
Volume Discharge	gals	~0.75	~1.5	~2.25	~3.0	~3.75	~4.5
pH	Standard	6.40	6.42	6.47	6.53	6.54	6.59
Spec. Cond.	mS/cm	3.621	3.607	3.555	3.383	3.255	3.237
Turbidity	NTU	27.6	27.5	15.4	18.4	14.7	9.4
Temperature	°C	21.51	21.27	21.17	21.09	20.88	20.72
Dissolved Oxygen	mg/l	1.62	0.51	0.31	0.19	0.23	0.18
Redox Potential	+/- mV	5.2	-3.8	-22.8	-25.3	-28.4	-27.1
Pump Rate	mL/min	~300	~300	~300	~300	~300	~300
Water Level	FT BTOC	10.00	10.00	10.00	10.00	10.07	10.07

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals	60 mL Poly	NO	HNO_3
2	Dissolved Metals	60 mL Poly	Yes (0.45 µm)	HNO_3
3	Anions (Cl, SO4, NO3/NO2) / Alkalinity	250 mL Poly	No	None
5	TOC	2 x 40 mL Vial (amber)	No	H_2SO_4 ~~None~~
6	DOC	2 x 40 mL Vial (amber)	Yes (0.45 µm)	H_2SO_4 ~~None~~
7				
8				

REMARKS: None.

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE | Stainless Steel | Teflon

Peristaltic Pump | Submersible Pump | Hand Pump

Air-Lift Pump | Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide Deep Groundwater PDI **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 90s Weather Sunny

SAMPLE INFORMATION

Sample Location DGW-MW-6 Sample No. DGW-MW-6

Sample Date 5/30/18 Time 1430 Sample By B. Works

Sample Method Peristaltic Pump Sample Type Grab

start purge @ 1140

Water Level Before Purging: 13.20 FT BTOC TD: 32.61 FT BTOC

Well Volume: 19.41 FT x 0.163 gal/FT = 3.16 gallons

Volume Water Removed Before Sampling: 4.0 gallons

Water Level Before Sampling: 13.99 FT BTOC

Water Level After Sampling: 13.79 FT BTOC

Appearance of Sample: clear

FIELD MEASUREMENTS

measurement sample

Parameter	Units	Measurement *	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	1145 1150	1300 1330	1335 1340	1350 1400	1410 1420	1430
Volume Discharge	gals	0.25 0.5	0.75 1.0	1.25 1.5	2.0 2.5	3.0 3.5	4.0
pH	Standard	1.61** 1.52**	1.61** 6.33	6.34 6.36	6.37 6.39	6.39 6.43	6.44
Spec. Cond.	mS/cm	3.938 3.897	3.858 3.632	3.582 3.546	3.526 3.520	3.455 3.433	3.421
Turbidity	NTU	63.5 —	48.0 45.1	41.5 36.3	29.7 17.8	13.7 11.1	9.30
Temperature	°C	24.64 24.09	24.08 23.91	23.65 23.57	23.59 23.62	23.59 23.65	23.73
Dissolved Oxygen	mg/l	4.99 1.88	0.73 1.26	0.63 0.49	0.31 0.29	0.39 0.23	0.28
Redox Potential	+/- mV	279.3 261.5	258.9 -47.8	-47.7 -44.0	-37.4 -38.9	-43.8 -50.5	-55.7
Pump Rate	mL/min	200 300	300 300	300 300	300 300	300 300	300
Water Level	FT BTOC	13.65 —	13.79 13.79	13.87 13.92	13.94 13.96	13.98 13.99	13.99

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals	60 mL Poly	NO	HNO_3
2	Dissolved Metals	60 mL Poly	Yes (0.45 µm)	HNO_3
3	Anions (Cl, SO4, NO3/NO2) / Alkalinity	250 mL Poly	No	None
5	TOC	2 x 40 mL Vial (amber)	No	~~H_2SO_4~~ ~~None~~
6	DOC	2 x 40 mL Vial (amber)	Yes (0.45 µm)	~~H_2SO_4~~ ~~None~~
7				
8				

MARKS: *1150 pump shut off in middle of reading, resume purge @ 1255 **YSI reading not accurate - JME's reading in 5's → stop purging at 1305 to re-calibrate YSI Resume purging @ 1325

Not applicable

Tubing left in well.

LING METHODS:

Bailer: PVC/PE Stainless Steel Teflon

Peristaltic Pump Submersible Pump Hand Pump

Air-Lift Pump Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide Deep Groundwater PDI **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 88° F Weather Sunny, breezy

SAMPLE INFORMATION

Sample Location Sample No. DGW-MW7

Sample Date 5/30/2018 Time 1230 Sample By JME

Sample Method Peristaltic Pump Sample Type Grab

Start purge @ 1155

Water Level Before Purging: 13.42 FT BTOC TD: 33.81 FT BTOC

Well Volume: 20.39 FT x 0.163 gal/FT = 3.323 gallons

Volume Water Removed Before Sampling: 2.5 gallons

Water Level Before Sampling: 13.49 FT BTOC

Water Level After Sampling: 13.48 FT BTOC

Appearance of Sample: clear

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	~~Measurement~~ Sample	Sample
Time	hhmm	1200	1210	1220	1230	
Volume Discharge	gals	~0.55	~0.55	~0.55	~0.55	
pH	Standard	6.79	6.78	6.84	6.83	
Spec. Cond.	mS/cm	4.820	4.812	4.795	4.752	
Turbidity	NTU	26.8	15.8	12.3	8.10	
Temperature	°C	22.75	22.60	22.64	22.70	
Dissolved Oxygen	mg/l	0.55	0.37	0.29	0.35	
Redox Potential	+/- mV	-102.0	-10.9	-11.7	-11.6	
Pump Rate	mL/min	~200	~200	~200	~200	
Water Level	FT BTOC	13.49	13.49	13.50	13.49	

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals	60 mL Poly	No	HNO_3
2	Dissolved Metals	60 mL Poly	Yes (0.45 µm)	HNO_3
3	Anions (Cl, SO4, NO3/NO2) / Alkalinity	250 mL Poly	No	None
5	TOC	2 x 40 mL Vial (amber)	No	~~H_2SO_4 None~~
6	DOC	2 x 40 mL Vial (amber)	Yes (0.45 µm)	None
7				
8				

REMARKS: First redox potential reading is ORP value and not ± mV.

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE Stainless Steel Teflon

Peristaltic Pump Submersible Pump Hand Pump

Air-Lift Pump Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide Deep Groundwater PDI **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 90 °F Weather Sunny, breezy

SAMPLE INFORMATION

Sample Location Sample No. DGW-MW-8

Sample Date 5/30/18 Time 1500 Sample By JME

Sample Method Peristaltic Pump Sample Type Grab

start purge @1350

Water Level Before Purging: 24.41 FT BTOC TD: 34.40 FT BTOC

Well Volume: 9.99 FT x 0.163 gal/FT = 1.63 gallons

Volume Water Removed Before Sampling: ~0.75 gallons

Water Level Before Sampling: 24.61 FT BTOC

Water Level After Sampling: 24.57 FT BTOC

Appearance of Sample: clear, yellow tint

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement		Measurement	Measurement ~~Sample~~	Sp
Time	hhmm	1357	1405	1410	1420	1430	1440	1500
Volume Discharge	gals	<0.25	<0.25	<0.25		<0.25	<0.25	<0.25
pH	Standard	6.33	6.26	~~6.34~~ 6.35	6.40	6.41	6.42	6.43
Spec. Cond.	mS/cm	5.115	5.098	4.965	4.922	4.813	4.764	4.765
Turbidity	NTU	82	55.4	43.9	31.1	25.3	16.3	9.6
Temperature	°C	29.11	28.94	29.46	29.69	28.58	28.46	30.32
Dissolved Oxygen	mg/l	2.20	1.53	1.72	2.33	2.73	2.71	3.1
Redox Potential	+/- mV	+20	+19.9	16.8	14.5	12.5	11.8	9.2
Pump Rate	mL/min	~200	~200	~200	~110	~200	~200	~200
Water Level	FT BTOC	24.57	24.57	24.59	24.61	24.63	24.61	24.61

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals	60 mL Poly	No	HNO_3
2	Dissolved Metals	60 mL Poly	Yes (0.45 µm)	HNO_3
3	Anions (Cl, SO4, NO3/NO2) / Alkalinity	250 mL Poly	No	None
5	TOC	2 x 40 mL Vial (amber)	No	~~H_2SO_4~~ ~~None~~
6	DOC	2 x 40 mL Vial (amber)	Yes (0.45 µm)	None
7				
8				

REMARKS: None.

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE Stainless Steel Teflon

Peristaltic Pump Submersible Pump Hand Pump

Air-Lift Pump Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide Deep Groundwater PDI **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 84 °F Weather Sunny, breezy

SAMPLE INFORMATION

Sample Location Sample No. DGW-MW-9

Sample Date 5/31/18 Time 1135 Sample By JME

Sample Method Peristaltic Pump Sample Type Grab

Start purge @~~0954~~ 1103

Water Level Before Purging: ~~17.09~~ 17.13 FT BTOC TD: 27.54 FT BTOC

Well Volume: 10.41 FT x 0.163 gal/FT = 1.67 gallons

Volume Water Removed Before Sampling: ~21.5 gallons

Water Level Before Sampling: 17.22 FT BTOC

Water Level After Sampling: 17.18 FT BTOC

Appearance of Sample: clear

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	1110	1115 / 1120	1125	1130	1135	
Volume Discharge	gals	~0.25	~~0~~ 0.5 / 0.75	1.0	1.25	1.5	
pH	Standard	6.17	6.16 / 6.15	6.15	6.16	6.13	
Spec. Cond.	mS/cm	4.888	4.899 / 5.159	5.264	5.295	5.301	
Turbidity	NTU	62.4	65.2 / 32.7	12.9	10.5	8.69	
Temperature	°C	21.58	21.68 / 21.65	21.91	22.12	22.94	
Dissolved Oxygen	mg/l	0.42	0.20 / 0.14	0.08	0.07	0.06	
Redox Potential	+/- mV	77.9	31.6 / 16.7	5.8	2.8	-3.0	
Pump Rate	mL/min	~300	~300 / ~300	~300	~300	~300	
Water Level	FT BTOC	17.23	17.25 / 17.25	17.25	17.25	~~17.28~~ 17.22	

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals	60 mL Poly	No	HNO_3
2	Dissolved Metals	60 mL Poly	Yes (0.45 µm)	HNO_3
3	Anions (Cl, SO4, NO3/NO2) / Alkalinity	250 mL Poly	No	None
5	TOC	2 x 40 mL Vial (amber)	No	~~H_2SO_4 None~~
6	DOC	2 x 40 mL Vial (amber)	Yes (0.45 µm)	~~H_2SO_4 None~~
7				
8				

REMARKS: None

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE Stainless Steel Teflon

Peristaltic Pump Submersible Pump Hand Pump

Air-Lift Pump Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide Deep Groundwater PDI **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 90s Weather Sunny

SAMPLE INFORMATION

Sample Location DGW-MW-10 Sample No. DGW-MW-10

Sample Date 5/30/18 Time 1630 Sample By B. Works

Sample Method Peristaltic Pump Sample Type Grab

starts purge @ 1605

Water Level Before Purging: 2.68 FT BTOC TD: 20.25 FT BTOC

Well Volume: 17.57 FT x 0.163 gal/FT = 2.86 gallons

Volume Water Removed Before Sampling: 1.5 gallons

Water Level Before Sampling: 3.04 FT BTOC

Water Level After Sampling: 3.01 FT BTOC

Appearance of Sample: Clear

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	1610 1615	1620 1625	1630		
Volume Discharge	gals	0.25 0.50	0.75 1.0	1.5		
pH	Standard	6.37 6.29	6.26 6.26	6.25		
Spec. Cond.	mS/cm	4.768 4.790	4.768 4.749	4.755		
Turbidity	NTU	29.9 15.2	4.59 4.02	3.89		
Temperature	°C	23.39 23.10	22.94 22.85	22.80		
Dissolved Oxygen	mg/l	4.43 1.77	0.73 0.65	0.63		
Redox Potential	+/- mV	-27.2 -31.3	-31.4 -29.2	-29.3		
Pump Rate	mL/min	300 300	300 300	300		
Water Level	FT BTOC	2.98 3.01	3.03 3.04	3.04		

Sample

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals	60 mL Poly	NO	HNO_3
2	Dissolved Metals	60 mL Poly	Yes (0.45 µm)	HNO_3
3	Anions (Cl, SO4, NO3/NO2) / Alkalinity	250 mL Poly	No	None
5	TOC	2 x 40 mL Vial (amber)	No	H_2SO_4 ~~None~~
6	DOC	2 x 40 mL Vial (amber)	Yes (0.45 µm)	H_2SO_4 ~~None~~
7	TPH	3 x 40mL Vial	No	HCL
8				

REMARKS: Dup-01 collected, Tubing left in well.. No sheen observed

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE | Stainless Steel | Teflon

[Peristaltic Pump] | Submersible Pump | Hand Pump

Air-Lift Pump | Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide Deep Groundwater PDI **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 905 Weather Sunny

SAMPLE INFORMATION

Sample Location DGW-MW-10S Sample No. DGW-MW-10S

Sample Date 5/31/18 Time 1530 Sample By B. Works

Sample Method Peristaltic Pump Sample Type Grab

start purge @ 1525

Water Level Before Purging: 5.11 FT BTOC TD: 7.75 FT BTOC

Well Volume: 2.64 FT x 0.163 gal/FT = 0.43 gallons

Volume Water Removed Before Sampling: 0.70 gallons

Water Level Before Sampling: 7.07 FT BTOC

Water Level After Sampling: DRY FT BTOC

Appearance of Sample: Slightly cloudy

WL: 7.07 FT BTOC @ 1520 on 5/31/18

FIELD MEASUREMENTS

Parameter	Units	5/30/18 Measurement	5/30/18 Measurement	5/30/18 Measurement	Measurement	Sample
Time	hhmm	1630 1535	1540 1545	1550 1555		
Volume Discharge	gals	0.20 0.30	0.40 0.50	0.60 0.70		
pH	Standard	7.09 7.01	6.99 6.97	6.95 6.95		
Spec. Cond.	mS/cm	7.414 7.364	7.328 7.321	7.308 7.223		
Turbidity	NTU	62.1 22.0	11.6 12.1	16.2 25.3		
Temperature	°C	25.68 25.62	25.35 26.22	25.00 26.12		
Dissolved Oxygen	mg/l	4.33 2.64	2.01 2.11	2.24 1.81		
Redox Potential	+/- mV	15.0 17.0	23.7 29.3	32.0 13.6		
Pump Rate	mL/min	100 100	100 100	100 100		
Water Level	FT BTOC	6.51 6.67	6.90 7.18	7.35 DRY		

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals	60 mL Poly	NO	HNO_3
2	Dissolved Metals	60 mL Poly	Yes (0.45 µm)	HNO_3
3	Anions (Cl, SO4, NO3/NO2) / Alkalinity	250 mL Poly	No	None
5	TOC	2 x 40 mL Vial (amber)	No	~~H_2SO_4~~ ~~None~~
6	DOC	2 x 40 mL Vial (amber)	Yes (0.45 µm)	~~H_2SO_4~~ ~~None~~
7	TPH	3 x 40mL Vial	No	HCL
8				

REMARKS: * No sheen observed, tubing left in well. All vials filled except only 2 and 1/2 out of 3 TPH

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE, Stainless Steel, Teflon

Peristaltic Pump, Submersible Pump, Hand Pump

Air-Lift Pump, Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide Deep Groundwater PDI **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 90s Weather Sunny

SAMPLE INFORMATION

Sample Location DGW-MW-11 Sample No. DGW-MW-11
Sample Date 5/30/18 Time 1000 Sample By B. Weeks
Sample Method Peristaltic Pump Sample Type Grab

Start purge @ 0835

Water Level Before Purging: 9.32 FT BTOC TD: 17.75 FT BTOC
Well Volume: 8.43 FT x 0.163 gal/FT = 1.37 gallons
Volume Water Removed Before Sampling: 2.25 gallons
Water Level Before Sampling: 13.70 FT BTOC
Water Level After Sampling: 14.51 FT BTOC
Appearance of Sample: clear

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	0840 0845	0850 0900	0910 0920	0930 0940	0950 1000
Volume Discharge	gals	0.25 0.35	0.5 0.75	1.0 1.25	1.5 1.75	2.0 2.25
pH	Standard	5.21 5.14	5.16 5.18	5.34 5.47	5.58 5.72	5.83 5.95
Spec. Cond.	mS/cm	8.567 8.552	8.562 8.530	8.579 8.604	8.637 8.684	8.717 8.736
Turbidity	NTU	93.3 70.2	71.7 63.6	47.4 37.9	31.3 22.3	11.8 7.57
Temperature	°C	22.11 21.88	21.54 21.54	21.34 21.01	21.04 21.02	21.06 21.09
Dissolved Oxygen	mg/l	7.29 5.28	5.01 4.17	3.68 3.68	3.75 3.81	4.14 4.43
Redox Potential	+/- mV	97.4 96.0	96.0 94.4	88.1 77.7	69.2 60.1	51.6 47.6
Pump Rate	mL/min	100 100	100 100	200 200	200 200	200 200
Water Level	FT BTOC	9.94 10.11	10.31 10.61	10.98 11.51	12.08 12.62	13.35 13.70

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals	60 mL Poly	No	HNO_3
2	Dissolved Metals	60 mL Poly	Yes (0.45 µm)	HNO_3
3	Anions (Cl, SO4, NO3/NO2) / Alkalinity	250 mL Poly	No	None
5	TOC	2 x 40 mL Vial (amber)	No	~~H_2SO_4 None~~
6	DOC	2 x 40 mL Vial (amber)	Yes (0.45 µm)	~~H_2SO_4 None~~
7				
8				

REMARKS: ~~Hose~~ Tubing left in well.

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE / Stainless Steel / Teflon
[Peristaltic Pump] / Submersible Pump / Hand Pump
Air-Lift Pump / Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide Deep Groundwater PDI **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 90s Weather Sunny

SAMPLE INFORMATION

Sample Location DGW-MW-11S Sample No. DGW-MW-11S

Sample Date 5/30/18+5/31/18 Time 1730/1630 Sample By B. Works

Sample Method Peristaltic Pump Sample Type Grab

start purge @ 1715

Water Level Before Purging: 5.94 FT BTOC TD: 7.37 FT BTOC

Well Volume: 1.43 FT x 0.163 gal/FT = 0.23 gallons

Volume Water Removed Before Sampling: 0.85 gallons

Water Level Before Sampling: 6.91 / 7.10 FT BTOC

Water Level After Sampling: DRY / DRY FT BTOC

Appearance of Sample: slightly cloudy

WL: 6.91 FT BTOC @ 1700 on 5/30/18

WL: 7.10 FT BTOC @ 1626 on 5/31/18

FIELD MEASUREMENTS

Parameter	Units	5/29/18 Measurement	Measurement	5/29/18 Measurement	Measurement	5/29/18 Measurement	Measurement	Measurement	Sample
Time	hhmm	1805	1810	1815	1820	1825	1830		
Volume Discharge	gals	0.25	0.35	0.50	0.65	0.75	0.85		
pH	Standard	7.08	7.10	7.19	7.21	7.17	7.16		
Spec. Cond.	mS/cm	8.355	8.278	8.535	8.435	8.434	8.438		
Turbidity	NTU	4.14	5.05	38.3*	31.0	15.6	16.5		
Temperature	°C	26.17	26.71	25.14	25.28	24.90	25.13		
Dissolved Oxygen	mg/l	5.57	5.29	5.21	3.10	3.06	3.03		
Redox Potential	+/- mV	212.1	210.0	203.8	196.1	190.0	184.5		
Pump Rate	mL/min	100	100	100	100	100	100		
Water Level	FT BTOC	6.36	6.48	6.61	6.82	7.01	7.32		

LABORATORY CONTAINERS

DRY @ 1832 on 5/29/18

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals	60 mL Poly	YES	HNO_3
2	Dissolved Metals	60 mL Poly	Yes (0.45 µm)	HNO_3
3	Anions (Cl, SO4, NO3/NO2) / Alkalinity	250 mL Poly	No	None
5	TOC	2 x 40 mL Vial (amber)	No	H_2SO_4 ~~None~~
6	DOC	2 x 40 mL Vial (amber)	Yes (0.45 µm)	H_2SO_4 ~~None~~
7				
8				

REMARKS: *high turbidity due to moving tubing deeper
* 10µm filter used on total metals during sampling

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE | Stainless Steel | Teflon

[Peristaltic Pump] | Submersible Pump | Hand Pump

Air-Lift Pump | Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide Deep Groundwater PDI

Project No. : 130-2086-06

WEATHER CONDITIONS

Temperature 95 °F Weather Sunny, breezy

SAMPLE INFORMATION

Sample Location

Sample No. MW-10

Sample Date 5/31/18 Time 1900 Sample By JME

Sample Method Peristaltic Pump Sample Type Grab

Start purge @ 1835

Water Level Before Purging: 6.75 FT BTOC TD: 16.90 FT BTOC

Well Volume: 10.15 FT x 0.163 gal/FT = 1.654 gallons

Volume Water Removed Before Sampling: ~1.25 gallons

Water Level Before Sampling: 7.38 FT BTOC

Water Level After Sampling: 7.49 FT BTOC

Appearance of Sample: Clear

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	1840	1845	1850		1900
Volume Discharge	gals	~0.50	~0.75	~1.0		~1.25
pH	Standard	6.57	6.54	6.53		6.53
Spec. Cond.	mS/cm	1.353	1.354	1.350		1.352
Turbidity	NTU	11.8	5.43	7.76		8.68
Temperature	°C	22.84	22.65	22.73		22.74
Dissolved Oxygen	mg/l	0.45	0.34	0.27		0.20
Redox Potential	+/- mV	71.7	66.6	62.7		55.2
Pump Rate	mL/min	~300	~300	~300		~300
Water Level	FT BTOC	7.12	7.20	7.30		7.38

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals	60 mL Poly	No.	HNO_3
2	Dissolved Metals	60 mL Poly	Yes (0.45 µm)	HNO_3
3	Anions (Cl, SO4, NO3/NO2) / Alkalinity	250 mL Poly	No	None
5	TOC	2 x 40 mL Vial (amber)	No	~~H_2SO_4 None~~
6	DOC	2 x 40 mL Vial (amber)	Yes (0.45 µm)	~~H_2SO_4 None~~
7				
8				

REMARKS: None.

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE Stainless Steel Teflon

[Peristaltic Pump] Submersible Pump Hand Pump

Air-Lift Pump Other_____

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GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide Deep Groundwater PDI **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 80s Weather Sunny

SAMPLE INFORMATION

Sample Location MW-16 Sample No. MW-16

Sample Date 5/31/18 Time 0855 Sample By B. Works

Sample Method Peristaltic Pump Sample Type Grab

start purge @ 0835

Water Level Before Purging: 9.16 FT BTOC TD: 78.62 FT BTOC

Well Volume: 69.46 FT x 0.163 gal/FT = 11.32 gallons

Volume Water Removed Before Sampling: 1.0 gallons

Water Level Before Sampling: 11.40 FT BTOC

Water Level After Sampling: 12.46 FT BTOC

Appearance of Sample: Clear

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	0840 0845	0850 0855			
Volume Discharge	gals	0.25 0.5	0.75 1.0			
pH	Standard	6.30 6.37	6.47 6.52			
Spec. Cond.	mS/cm	4.470 4.505	4.508 4.509			
Turbidity	NTU	2.64 2.77	2.99 2.89			
Temperature	°C	20.68 20.59	20.60 20.57			
Dissolved Oxygen	mg/l	6.65 2.19	1.31 1.08			
Redox Potential	+/- mV	230.6 219.4	208.3 200.9			
Pump Rate	mL/min	300 300	300 300			
Water Level	FT BTOC	9.98 10.37	10.94 11.40			

Sample

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals	60 mL Poly	NO	HNO_3
2	Dissolved Metals	60 mL Poly	Yes (0.45 µm)	HNO_3
3	Anions (Cl, SO4, NO3/NO2) / Alkalinity	250 mL Poly	No	None
5	TOC	2 x 40 mL Vial (amber)	No	H_2SO_4 ~~None~~
6	DOC	2 x 40 mL Vial (amber)	Yes (0.45 µm)	H_2SO_4 ~~None~~
7				
8				

REMARKS: Used tubing already in well.

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE | Stainless Steel | Teflon

[Peristaltic Pump] | Submersible Pump | Hand Pump

Air-Lift Pump | Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide Deep Groundwater PDI **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 78 °F Weather Sunny, breezy

SAMPLE INFORMATION

Sample Location
Sample No. MW-16S
Sample Date 5/31/18 Time 0855 Sample By JME
Sample Method Peristaltic Pump Sample Type Grab

start purge @0833

Water Level Before Purging: 9.38 FT BTOC TD: 18.81 FT BTOC
Well Volume: 9.43 FT x 0.163 gal/FT = 1.537 gallons
Volume Water Removed Before Sampling: ~0.75 gallons
Water Level Before Sampling: 9.69 FT BTOC
Water Level After Sampling: 9.62 FT BTOC
Appearance of Sample: clear, odorless

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	0840	0845	0850		0855
Volume Discharge	gals	0.25	—	—		0.75
pH	Standard	5.94	5.96	5.98		5.98
Spec. Cond.	mS/cm	7.672	7.662	7.653		7.639
Turbidity	NTU	22.5	19.6	10.2		6.11
Temperature	°C	20.39	20.35	20.35		20.35
Dissolved Oxygen	mg/l	0.58	0.30	0.15		0.10
Redox Potential	+/- mV	121.5	119.9	117.4		114.8
Pump Rate	mL/min	~250	~250	~250		~250
Water Level	FT BTOC	9.61	9.63	9.66		9.69

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals	60 mL Poly	No	HNO_3
2	Dissolved Metals	60 mL Poly	Yes (0.45 µm)	HNO_3
3	Anions (Cl, SO4, NO3/NO2) / Alkalinity	250 mL Poly	No	None
5	TOC	2 x 40 mL Vial (amber)	No	~~H_2SO_4 None~~
6	DOC	2 x 40 mL Vial (amber)	Yes (0.45 µm)	~~H_2SO_4 None~~
7				
8				

REMARKS: Used tubing in well; left tubing in well.

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE / Stainless Steel / Teflon
[Peristaltic Pump] / Submersible Pump / Hand Pump
Air-Lift Pump / Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide Deep Groundwater PDI **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 80 °F Weather cloudy, humid, sprinkling

SAMPLE INFORMATION

Sample Location Sample No. MW-17

Sample Date 06/04/18 Time 1625 Sample By JME

Sample Method Peristaltic Pump Sample Type Grab

start purge @1533

Water Level Before Purging: 8.51 FT BTOC TD: 18.82 FT BTOC

Well Volume: 10.31 FT x 0.163 gal/FT = 1.68 gallons

Volume Water Removed Before Sampling: ~2.25 gallons

Water Level Before Sampling: 8.70 FT BTOC

Water Level After Sampling: 8.65 FT BTOC

Appearance of Sample: clear

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	1540 1545	1550 1600	1605 1610	1615 1620	1625
Volume Discharge	gals	~0.25 ~0.5	~0.75 ~1.0	~1.25 ~1.50	~1.75 ~2.0	~2.25
pH	Standard	6.31 6.29	6.30 6.33	6.34 6.34	6.35 6.35	6.36
Spec. Cond.	mS/cm	4.726 4.724	4.721 4.721	4.721 4.721	4.721 4.719	4.720
Turbidity	NTU	22.0 21.6	20.8 19.6	17.1 15.4	16.7 15.3	15.8
Temperature	°C	20.62 20.38	20.21 20.13	20.15 20.15	20.19 20.22	20.34
Dissolved Oxygen	mg/l	0.93 0.37	0.22 0.18	0.20 0.20	0.19 0.19	0.17
Redox Potential	+/- mV	130.1 93.2	76.0 63.4	59.5 57.7	56.3 55.7	55.0
Pump Rate	mL/min	~200 ~200	~200 ~200	~200 ~200	~200 ~200	~200
Water Level	FT BTOC	8.66 8.68	8.69 8.69	8.69 8.71	8.69 8.71	8.70

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals	60 mL Poly	Yes.	HNO_3
2	Dissolved Metals	60 mL Poly	Yes (0.45 µm)	HNO_3
3	Anions (Cl, SO4, NO3/NO2) / Alkalinity	250 mL Poly	No	None
5	TOC	2 x 40 mL Vial (amber)	No	~~H_2SO_4, None~~
6	DOC	2 x 40 mL Vial (amber)	Yes (0.45 µm)	~~H_2SO_4, None~~
7				
8				

REMARKS: Metals (total) filtered w/ 0.10µm filter due to turbidity

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE, Stainless Steel, Teflon

[Peristaltic Pump], Submersible Pump, Hand Pump

Air-Lift Pump

Other_____

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GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide Deep Groundwater PDI **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 73 °F Weather cloudy, drizzling

SAMPLE INFORMATION

Sample Location
Sample No. MW-18
Sample Date 06/04/18 Time 1300 Sample By JME
Sample Method Peristaltic Pump Sample Type Grab

start purge @ 1239

Water Level Before Purging: 4.43 FT BTOC TD: 16.94 FT BTOC
Well Volume: 12.51 FT x 0.163 gal/FT = 2.039 gallons
Volume Water Removed Before Sampling: ~1.00 gallons
Water Level Before Sampling: 5.04 FT BTOC
Water Level After Sampling: 5.03 FT BTOC
Appearance of Sample: Clear

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	1245	1250	1255		1300
Volume Discharge	gals	~0.25	~0.50	~0.75		~1.00
pH	Standard	6.35	6.44	6.47		6.44
Spec. Cond.	mS/cm	1.008	1.008	1.006		1.008
Turbidity	NTU	2.05	2.23	2.69		3.16
Temperature	°C	19.55	19.29	19.24		19.23
Dissolved Oxygen	mg/l	0.73	0.44	0.28		0.26
Redox Potential	+/- mV	224.9	222.0	219.4		213.4
Pump Rate	mL/min	~250	~250	~250		~250
Water Level	FT BTOC	4.77	4.93	4.99		5.04

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals	60 mL Poly	No.	HNO_3
2	Dissolved Metals	60 mL Poly	Yes (0.45 µm)	HNO_3
3	Anions (Cl, SO4, NO3/NO2) / Alkalinity	250 mL Poly	No	None
5	TOC	2 x 40 mL Vial (amber)	No	~~H_2SO_4~~ None
6	DOC	2 x 40 mL Vial (amber)	Yes (0.45 µm)	~~H_2SO_4~~ None
7				
8				

REMARKS: None.

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE
Stainless Steel
Teflon

[x] Peristaltic Pump
Submersible Pump
Hand Pump

Air-Lift Pump
Other_____

Scanned by CamScanner

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide Deep Groundwater PDI **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 94 °F Weather Sunny, breezy

SAMPLE INFORMATION

Sample Location
Sample No. MW-24
Sample Date 5/30/18 Time 1725 Sample By JME
Sample Method Peristaltic Pump Sample Type Grab

start purge @ 1613

Water Level Before Purging: 22.38 FT BTOC TD: 32.68 FT BTOC
Well Volume: 10.3 FT x 0.163 gal/FT = 1.679 gallons
Volume Water Removed Before Sampling: ~2.75 gallons
Water Level Before Sampling: 22.57 FT BTOC
Water Level After Sampling: 22.45 FT BTOC
Appearance of Sample: clear, odorless

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement		Measurement		~~Measurement~~ Sample	
Time	hhmm	1620/1625	1630	1635	1640	1645	1655	1705	1717
Volume Discharge	gals	0.5/~0.3	~0.3	~0.3	~0.3	~0.3	~0.3	~0.3	~0.3
pH	Standard	6.18/6.23	6.28	6.31	6.33	6.35	6.40	6.42	6.44
Spec. Cond.	mS/cm	4.701/4.494	4.473	4.482	4.492	4.523	4.548	4.560	4.547
Turbidity	NTU	201/124	64.6	44.9	41.5	37.1	26.3	20.1	14.7
Temperature	°C	21.87/21.91	21.70	21.52	21.68	21.62	21.66	~~21.55~~ 21.53	21.52
Dissolved Oxygen	mg/l	0.58/0.36	0.28	0.19	0.17	0.14	0.12	0.11	0.10
Redox Potential	+/- mV	-2.7/-2.7	-0.1	3.0	5.1	7.2	12.5	14.0	16.3
Pump Rate	mL/min	~225/~225	~225	~225	~225	~225	~225	~225	~225
Water Level	FT BTOC	22.57/22.57	22.57	22.57	22.57	22.57	22.57	22.57	22.57

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals	60 mL Poly	NO	HNO_3
2	Dissolved Metals	60 mL Poly	Yes (0.45 µm)	HNO_3
3	Anions (Cl, SO4, NO3/NO2) / Alkalinity	250 mL Poly	No	None
5	TOC	2 x 40 mL Vial (amber)	No	~~H_2SO_4~~ ~~None~~
6	DOC	2 x 40 mL Vial (amber)	Yes (0.45 µm)	None
7				
8				

REMARKS: See page 2

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE | Peristaltic Pump | Air-Lift Pump
Stainless Steel | Submersible Pump | Other_____
Teflon | Hand Pump

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide Deep Groundwater PDI **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 94 °F Weather Sunny, breezy

SAMPLE INFORMATION

Sample Location
Sample No. MW-24
Sample Date 5/30/18 Time 1725 Sample By JME
Sample Method Peristaltic Pump Sample Type Grab

Water Level Before Purging: 22.38 FT BTOC TD: 32.68 FT BTOC
Well Volume: 10.3 FT x 0.163 gal/FT = 1.679 gallons
Volume Water Removed Before Sampling: ~5 gallons
Water Level Before Sampling: 22.57 FT BTOC
Water Level After Sampling: 22.45 FT BTOC
Appearance of Sample: clear, odorless

FIELD MEASUREMENTS

Parameter	Units	~~Measurement~~ Sample	Measurement	Measurement	Measurement	Sample
Time	hhmm	1725				
Volume Discharge	gals	5.0				
pH	Standard	6.45				
Spec. Cond.	mS/cm	4.549				
Turbidity	NTU	9.2				
Temperature	°C	21.58				
Dissolved Oxygen	mg/l	0.10				
Redox Potential	+/- mV	17.6				
Pump Rate	mL/min	~225				
Water Level	FT BTOC	22.57				

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals	60 mL Poly	No	HNO_3
2	Dissolved Metals	60 mL Poly	(Yes) (0.45 µm)	HNO_3
3	Anions (Cl, SO4, NO3/NO2) / Alkalinity	250 mL Poly	No	None
5	TOC	2 x 40 mL Vial (amber)	No	~~H_2SO_4 None~~
6	DOC	2 x 40 mL Vial (amber)	(Yes) (0.45 µm)	None
7				
8				

REMARKS: None.

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE Stainless Steel Teflon
[Peristaltic Pump] Submersible Pump Hand Pump
Air-Lift Pump Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide Deep Groundwater PDI **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 78 °F Weather cloudy, humid

SAMPLE INFORMATION

Sample Location Sample No. MW-26

Sample Date 06/04/18 Time 1425 Sample By

Sample Method Peristaltic Pump Sample Type Grab

start purge @ 1350

Water Level Before Purging: 5.72 FT BTOC TD: 17.56 FT BTOC

Well Volume: 11.84 FT x 0.163 gal/FT = 1.93 gallons

Volume Water Removed Before Sampling: ~1.75 gallons

Water Level Before Sampling: 9.87 FT BTOC

Water Level After Sampling: 10.21 FT BTOC

Appearance of Sample: clear

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	1355	1400	1405	1410	1415	1420	~~1425~~ 1425	1425
Volume Discharge	gals	~0.25	~0.5	~0.75	~1.0	~1.25	~1.5		~1.75
pH	Standard	6.25	6.22	6.25	6.28	6.33	6.33		6.32
Spec. Cond.	mS/cm	6.875	6.870	6.841	~~6.835~~	6.705	6.737		6.785
Turbidity	NTU	29.0	40.3	39.1	31.3	25.5	16.9		9.81
Temperature	°C	20.78	20.74	20.89	21.01	20.99	20.81		20.70
Dissolved Oxygen	mg/l	1.12	0.25	0.19	0.19	0.25	0.30		0.27
Redox Potential	+/- mV	163.5	105.0	89.3	73.7	67.4	65.4		63.8
Pump Rate	mL/min	~250	~250	~250	~250	~250	~250		~250
Water Level	FT BTOC	7.81	8.21	8.52	8.85	9.19	9.55		9.87

spec. cond. 6.735

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals	60 mL Poly	No.	HNO_3
2	Dissolved Metals	60 mL Poly	Yes (0.45 µm)	HNO_3
3	Anions (Cl, SO4, NO3/NO2) / Alkalinity	250 mL Poly	No	None
5	TOC	2 x 40 mL Vial (amber)	No	~~H_2SO_4 None~~
6	DOC	2 x 40 mL Vial (amber)	Yes (0.45 µm)	~~H_2SO_4 None~~
7				
8				

REMARKS: None.

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE Stainless Steel Teflon

[Peristaltic Pump] Submersible Pump Hand Pump

Air-Lift Pump Other_____

Scanned by CamScanner

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide Deep Groundwater PDI **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 87°F Weather Sunny, breezy

SAMPLE INFORMATION

Sample Location
Sample Date 5/31/18 Time 1325 Sample No. MW-27
Sample By JME
Sample Method Peristaltic Pump Sample Type Grab

Water Level Before Purging: 6.13 FT BTOC TD: 17.17 FT BTOC
Well Volume: 11.04 FT x 0.163 gal/FT = ~~1.80~~ 1.8 gallons
Volume Water Removed Before Sampling: ~~1.8~~ 1.5 gallons
Water Level Before Sampling: 10.31 FT BTOC
Water Level After Sampling: 10.96 FT BTOC
Appearance of Sample: clear

start purge @ 1233

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Sample Measurement	Sample
Time	hhmm	1240	1250	~~1255~~ 1305	~~1305~~ 1315	1325	
Volume Discharge	gals	<0.25	"	—	—	1.5	
pH	Standard	5.65	6.36	6.38	6.34	6.33	
Spec. Cond.	mS/cm	3.129	2.009	1.893	1.952	2.008	
Turbidity	NTU	53.1	58.3	~~81.9~~ 38.4	27.2	8.59	
Temperature	°C	21.59	21.82	22.60	22.82	22.91	
Dissolved Oxygen	mg/l	0.35	0.12	0.18	0.14	0.10	
Redox Potential	+/- mV	41.2	-38	-42.5	-43.4	-45.4	
Pump Rate	mL/min	≈300	≈300	≈250	≈250	≈250	
Water Level	FT BTOC	7.88	8.81	9.58	9.87	10.31	

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals	60 mL Poly	NO	HNO_3
2	Dissolved Metals	60 mL Poly	Yes (0.45 µm)	HNO_3
3	Anions (Cl, SO4, NO3/NO2) / Alkalinity	250 mL Poly	No	None
5	TOC	2 x 40 mL Vial (amber)	No	~~H_2SO_4 None~~
6	DOC	2 x 40 mL Vial (amber)	Yes (0.45 µm)	~~H_2SO_4 None~~
7				
8				

REMARKS: None

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE / Stainless Steel / Teflon
[Peristaltic Pump] / Submersible Pump / Hand Pump
Air-Lift Pump / Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide Deep Groundwater PDI **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 90s Weather Sunny

SAMPLE INFORMATION

Sample Location MW-29 Sample No. MW-29

Sample Date 5/31/18 Time 1425 Sample By B. Works

Sample Method Peristaltic Pump Sample Type Grab

start purge @ 1240

Water Level Before Purging: 6.09 FT BTOC TD: 17.32 FT BTOC

Well Volume: 11.23 FT x 0.163 gal/FT = 1.83 gallons

Volume Water Removed Before Sampling: 1.75 gallons

Water Level Before Sampling: 11.95 FT BTOC

Water Level After Sampling: 12.61 FT BTOC

Appearance of Sample: Clear

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	~~Measurement~~	Sample
Time	hhmm	1245 1250	1255 1300	1415 1420	1425	
Volume Discharge	gals	0.25 0.50	0.75 1.0	1.25 1.50	1.75	
pH	Standard	6.00 5.89	5.92 5.94	5.97 5.93	5.94	
Spec. Cond.	mS/cm	9.955 9.933	9.884 9.953	9.951 9.921	9.931	
Turbidity	NTU	104 72.1	68.0 74.8	20.7 8.47	7.03	
Temperature	°C	21.49 21.08	21.30 21.44	21.30 21.62	21.71	
Dissolved Oxygen	mg/l	10.92 3.16	1.46 1.19	0.61 0.47	0.49	
Redox Potential	+/- mV	53.4 52.5	46.8 47.0	55.5 58.6	60.3	
Pump Rate	mL/min	300 300	300 300	300 200	200	
Water Level	FT BTOC	7.46 8.62	9.31 9.76	11.08 11.50	11.95	

Sample

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals	60 mL Poly	NO	HNO_3
2	Dissolved Metals	60 mL Poly	Yes (0.45 µm)	HNO_3
3	Anions (Cl, SO4, NO3/NO2) / Alkalinity	250 mL Poly	No	None
5	TOC	2 x 40 mL Vial (amber)	No	~~H_2SO_4 None~~
6	DOC	2 x 40 mL Vial (amber)	Yes (0.45 µm)	~~H_2SO_4 None~~
7	TPH	3 x 40mL Vial	No	HCL
8				

REMARKS: *pump died @ 1310, Resume purge @ 1410
Tubing left in well, no screen observed

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE Stainless Steel Teflon

Peristaltic Pump Submersible Pump Hand Pump

Air-Lift Pump Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide Deep Groundwater PDI

Project No. : 130-2086-06

WEATHER CONDITIONS

Temperature 95°F Weather Sunny, Windy

SAMPLE INFORMATION

Sample Location Sample No. MW-30

Sample Date 5/31/18 Time 1725 Sample By JME

Sample Method Peristaltic Pump Sample Type Grab

start purge @ 1533

Water Level Before Purging: 11.38 FT BTOC TD: 32.14 FT BTOC

Well Volume: 20.76 FT x 0.163 gal/FT = 3.384 gallons

Volume Water Removed Before Sampling: ~5 gallons

Water Level Before Sampling: 11.40 FT BTOC

Water Level After Sampling: 11.32 FT BTOC

Appearance of Sample: clear

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	1640	1650	1700	1705	1715		1725
Volume Discharge	gals	~0.85	~1.5	~2.0	~3.0	~4.0		~5.0
pH	Standard	6.44	6.53	6.54	6.53	6.54		6.53
Spec. Cond.	mS/cm	2.050	2.087	2.269	2.423	2.522		2.601
Turbidity	NTU	89.3	38.9	30.1	23.4	17.3	9.17	~~9.896~~ ~~9.667~~
Temperature	°C	23.22	23.05	23.08	22.99	22.91		22.89
Dissolved Oxygen	mg/l	0.39	0.16	0.08	0.08	0.05		0.05
Redox Potential	+/- mV	-100.9	-101.6	-97.7	-91.8	-85.2		-79
Pump Rate	mL/min	~300	~300	~300	~300	~300		~300
Water Level	FT BTOC	11.41	11.40	11.40	11.40	11.40		11.40

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals	60 mL Poly	No.	HNO_3
2	Dissolved Metals	60 mL Poly	Yes (0.45 µm)	HNO_3
3	Anions (Cl, SO4, NO3/NO2) / Alkalinity	250 mL Poly	No	None
5	TOC	2 x 40 mL Vial (amber)	No	~~H_2SO_4 None~~
6	DOC	2 x 40 mL Vial (amber)	Yes (0.45 µm)	~~H_2SO_4 None~~
~~7~~	~~TPH~~	3 x 40mL Vial	~~No~~	~~HCL~~
8				

REMARKS: DUP-02.

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE, Stainless Steel, Teflon

[Peristaltic Pump], Submersible Pump, Hand Pump

Air-Lift Pump, Other_____

Scanned by CamScanner

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide Deep Groundwater PDI **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 78°F Weather Sunny, breezy, humid

SAMPLE INFORMATION

Sample Location Sample No. MW-31

Sample Date 6/1/18 Time 0935 Sample By JME

Sample Method Peristaltic Pump Sample Type Grab

start purge @ 0857

Water Level Before Purging: 10.61 FT BTOC TD: 23.31 FT BTOC

Well Volume: FT x 0.163 gal/FT = gallons

Volume Water Removed Before Sampling: ~2 gallons

Water Level Before Sampling: 11.15 FT BTOC

Water Level After Sampling: 11.10 FT BTOC

Appearance of Sample: Clear

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	0905 0910	0915 0920	0925 0930		0935
Volume Discharge	gals	<0.25 ~0.50	~1.00 ~1.25	~1.50 ~1.75		~2
pH	Standard	6.36 6.41	6.44 6.43	6.43 6.47		6.47
Spec. Cond.	mS/cm	4.585 4.580	4.566 4.554	4.554 ~~23.10~~ 4.472		4.325
Turbidity	NTU	225 65.1	37.5 23.1	18.8 16.7		9.42
Temperature	°C	23.59 23.21	23.12 23.11	23.08 23.16		23.12
Dissolved Oxygen	mg/l	0.45 0.17	0.18 0.12	0.11 0.08		0.09
Redox Potential	+/- mV	39.5 -23.4	-26.0 -28.8	-31.0 -23.3		-20.4
Pump Rate	mL/min	~200 ~300	~300 ~300	~300 ~300		~300
Water Level	FT BTOC	10.90 11.03	11.06 11.09	11.10 11.13		11.15

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals	60 mL Poly	N.D.	HNO_3
2	Dissolved Metals	60 mL Poly	Yes (0.45 µm)	HNO_3
3	Anions (Cl, SO4, NO3/NO2) / Alkalinity	250 mL Poly	No	None
5	TOC	2 x 40 mL Vial (amber)	No	~~H_2SO_4 None~~
6	DOC	2 x 40 mL Vial (amber)	Yes (0.45 µm)	~~H_2SO_4 None~~
7				
8				

REMARKS: None.

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE, Stainless Steel, Teflon

[Peristaltic Pump], Submersible Pump, Hand Pump, Air-Lift Pump, Other_____

Scanned by CamScanner

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide Deep Groundwater PDI

Project No. : 130-2086-06

WEATHER CONDITIONS

Temperature 91°F Weather Sunny, breezy

SAMPLE INFORMATION

Sample Location SG / 06/01/18

Sample Date ~~5/31/18~~ Time 1315

Sample Method Peristaltic Pump

Sample No. MW-44

Sample By JME

Sample Type Grab

start purge @ 1417

Water Level Before Purging: 10.52 FT BTOC TD: 18.21 FT BTOC

Well Volume: 7.69 FT x 0.163 gal/FT = 1.25 gallons

Volume Water Removed Before Sampling: ~1.25 gallons

Water Level Before Sampling: 12.47 FT BTOC

Water Level After Sampling: 10.58 FT BTOC

Appearance of Sample: Clear

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	1425	1435	1445		1450/dry
Volume Discharge	gals	~0.25	~0.75	~1.25		
pH	Standard	6.25	6.28	6.25		
Spec. Cond.	mS/cm	3.738	3.647	3.710		
Turbidity	NTU	38.5	15.7	10.8		
Temperature	°C	22.26	21.97	22.59		
Dissolved Oxygen	mg/l	0.41	0.16	0.15		
Redox Potential	+/- mV	30.8	22.1	17.2		
Pump Rate	mL/min	~800	~300	~200		
Water Level	FT BTOC	11.28	11.95	12.47		

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals	60 mL Poly	No.	HNO_3
2	Dissolved Metals	60 mL Poly	Yes (0.45 µm)	HNO_3
3	Anions (Cl, SO4, NO3/NO2) / Alkalinity	250 mL Poly	No	None
5	TOC	2 x 40 mL Vial (amber)	No	H_2SO_4 ~~None~~
6	DOC	2 x 40 mL Vial (amber)	Yes (0.45 µm)	H_2SO_4 ~~None~~
7				
8				

REMARKS: Well dry at 1450 on 5/31. (~1.25 gal. removed). Sampled on 06/01/18.

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE / Stainless Steel / Teflon

Peristaltic Pump / Submersible Pump / Hand Pump

Air-Lift Pump / Other_____

Scanned by CamScanner

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide Deep Groundwater PDI Project No. : 130-2086-06

WEATHER CONDITIONS

Temperature 80 °F Weather Sunny, windy

SAMPLE INFORMATION

Sample Location Sample No. MW-46

Sample Date 6/1/18 Time 1110 Sample By JME

Sample Method Peristaltic Pump Sample Type Grab

start purge @ 1035

Water Level Before Purging: 5.54 FT BTOC TD: ~~10.09~~ 19.35 FT BTOC

Well Volume: 14.79 FT x 0.163 gal/FT = 2.411 gallons

Volume Water Removed Before Sampling: ~1.75 gallons

Water Level Before Sampling: 8.57 FT BTOC

Water Level After Sampling: 8.98 FT BTOC

Appearance of Sample: Clear

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	1040 1045	1050 1055	1100 1105		1110
Volume Discharge	gals	~0.25 ~0.50	~0.75 ~1	~1.25 ~1.5		~1.75
pH	Standard	5.47 5.42	5.40 5.42	5.43 5.43		5.40
Spec. Cond.	mS/cm	5.635 4.884	4.689 4.737	4.883 4.813		4.724
Turbidity	NTU	36.1 47.9	41.5 46.3	42.9 54.3		105.2
Temperature	°C	22.43 22.44	22.50 22.71	22.85 23.16		23.08
Dissolved Oxygen	mg/l	0.73 0.27	0.19 0.17	0.17 0.27		0.28
Redox Potential	+/- mV	71.0 51.3	49.2 45.0	41.5 40.7		42.5
Pump Rate	mL/min	~~350~~ ~350	~250 ~250	~250 ~250		~250
Water Level	FT BTOC	5.80 6.85	7.32 7.68	7.98 8.39		8.57

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals	60 mL Poly	Yes	HNO_3
2	Dissolved Metals	60 mL Poly	Yes (0.45 µm)	HNO_3
3	Anions (Cl, SO4, NO3/NO2) / Alkalinity	250 mL Poly	No	None
5	TOC	2 x 40 mL Vial (amber)	No	H_2SO_4, ~~None~~
6	DOC	2 x 40 mL Vial (amber)	Yes (0.45 µm)	H_2SO_4, ~~None~~
7				
8				

REMARKS: Total metals filtered due to high/stable turbidity.

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE [Peristaltic Pump] Air-Lift Pump

Stainless Steel Submersible Pump Other_____

Teflon Hand Pump

Scanned by CamScanner

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide DGW PDI Resample Event **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 75°F Weather Sunny

SAMPLE INFORMATION

Sample Lcoation MW-10 Sample No. MW-10

Sample Date 08/01/18 Time 1005 Sample By E. White

Sample Method Peristaltic Pump Sample Type Grab

Begin Purge @0945 @300 mL/min

Water Level Before Purging: 8.15 FT BTOC TD: 17.12 FT BTOC

Well Volume: 8.97 FT x 0.653 gal/FT = 5.86 gallons

Volume Water Removed Before Sampling: 1.6 gallons

Water Level Before Sampling: 9.66 FT BTOC

Water Level After Sampling: 9.90 FT BTOC

Appearance of Sample: clear, no odor

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	0950	0955	1000		1005
Volume Discharge	gals	0.4	0.8	1.2		1.6
pH	Standard	6.41	6.46	6.49		6.50
Spec. Cond.	mS/cm	1.816	1.810	1.802		1.812
Turbidity	NTU	5.80	4.74	4.60		3.81
Temperature	°C	23.07	23.34	23.42		23.72
Dissolved Oxygen	mg/l	0.67	0.34	0.31		0.26
Redox Potential	+/- mV	50.4	51.0	56.2		59.8
Pump Rate	mL/min	300	300	300		300
Water Level	FT BTOC	8.95	9.34	9.51		9.66

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	NO	HNO_3
2	Dissolved Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	Yes (0.45 µm)	HNO_3
3				
5				
6				
7				
8				

REMARKS: Tubing replaced, left in well

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE | Stainless Steel | Teflon

[Peristaltic Pump] | Submersible Pump | Hand Pump

Air-Lift Pump | Other_____

ATTACHMENT D

LABORATORY ANALYTICAL DATA PACKAGES

10450 Stancliff Rd. Suite 210
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June 21, 2018

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS18051492**

Revision: **1**

Laboratory Results for: **Exide DGW PDI**

Dear Emily,

ALS Environmental received 10 sample(s) on May 31, 2018 for the analysis presented in the following report.

This is a REVISED REPORT. Please see the Case Narrative for discussion concerning this revision.

Regards,

Generated By: DANE.WACASEY

Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide DGW PDI	
WorkOrder:	**HS18051492**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide DGW PDI
WorkOrder:	**HS18051492**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data								
Laboratory Name: ALS Laboratory Group			LRC Date: 06/05/2018					
Project Name: Exide DGW PDI			Laboratory Job Number: HS18051492					
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 128966,128972,129015,R317265,R317270,R317285,R317316					
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?	X				
		Were surrogate percent recoveries in all samples within the laboratory QC limits?	X				
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?	X				
		Were analytical duplicates analyzed at the appropriate frequency?	X				
		Were RPDs or relative standard deviations within the laboratory QC limits?	X				
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				4
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				2
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 06/05/2018				
Project Name: Exide DGW PDI			Laboratory Job Number: HS18051492				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 128966,128972,129015,R317265,R317270,R317285,R317316				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			3
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Data	
Laboratory Name: ALS Laboratory Group	LRC Date: 06/05/2018
Project Name: Exide DGW PDI	Laboratory Job Number: HS18051492
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 128966,128972,129015,R317265,R317270,R317285,R317316,129454

ER#[5]	Description
4	This report was revised June 21, 2018 in order to include results for additional dissolved metals per client request.
1	Batch 129015, Metals Method SW6020, sample DGW-MW-11, MS and or MSD recovered outside the control limits for Magnesium and Calcium, however, the result in the parent sample is greater than 4x the spike amount. Batch R317265, Anions Method E300, sample DGW-MW-11S, MS and or MSD recovered outside the control limit for Sulfate, however, the result in the parent sample is greater than 4x the spike amount. Batch 129015, Metals Method SW6020, sample DGW-MW-11, MS and or MSD recovered outside the control limits for Selenium and Lead, however, the result in the parent sample is greater than 4x the spike amount. Batch R317265, Anions Method E300, sample DGW-MW-11S, MS and or MSD recovered outside the control limit for Sulfate, however, the result in the parent sample is greater than 4x the spike amount. Batch 129454, Metals Method SW6020, sample DGW-MW-6, MS and or MSD recovered outside the control limits for and Calcium and/or Magnesium, however, the result in the parent sample is greater than 4x the spike amount.
2	Batch R312270, TOC Method SM5310B, samples were diluted due to high salt content. Batch 129015, Metals Method SW6020, sample DGW-MW-11 was analyzed at a 5x dilution due to high Sodium concentration Batch 128972, Dissolved Metals Method SW6020, sample DGW-MW-11 was analyzed at a 5x dilution due to high Sodium concentration
3	See Run Log and CCB Exceptions Report.

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18051492
Start Date: 04-Jun-2018 End Date: 05-Jun-2018

Run ID:ICPMS05_317305
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	04-Jun-2018 11:19	011_ICV.d	AS CA CD FE MG PB SB SE
LLICV2	1	04-Jun-2018 11:21	012SMPL.d	AS CA CD FE MG PB SB SE
LLICV5	1	04-Jun-2018 11:23	013LICV.d	AS CA CD FE MG PB SB SE
ICB	1	04-Jun-2018 11:25	014_ICB.d	AS CA CD FE MG PB SB SE
ICSA	1	04-Jun-2018 11:28	015ICSA.d	AS CA CD FE MG PB SB SE
ICSAB	1	04-Jun-2018 11:30	016ICSB.d	AS CA CD FE MG PB SB SE
CCB 1	1	04-Jun-2018 11:53	024_CCB.d	AS CA CD FE MG PB SB SE
CCV 1	1	04-Jun-2018 11:55	025_CCV.d	AS CA CD FE MG PB SB SE
CCV 2	1	04-Jun-2018 12:17	036_CCV.d	AS CA CD FE MG PB SB SE
CCB 2	1	04-Jun-2018 12:19	037_CCB.d	AS CA CD FE MG PB SB SE
CCV 3	1	04-Jun-2018 12:45	048_CCV.d	AS CA CD FE MG PB SB SE
CCB 3	1	04-Jun-2018 12:47	049_CCB.d	AS CA CD FE MG PB SB SE
CCV 4	1	04-Jun-2018 13:28	069_CCV.d	AS CA CD FE MG PB SB SE
CCB 4	1	04-Jun-2018 13:31	070_CCB.d	AS CA CD FE MG PB SB SE
CCV 5	1	04-Jun-2018 13:53	081_CCV.d	AS CA CD FE MG PB SB SE
CCB 5	1	04-Jun-2018 13:55	082_CCB.d	AS CA CD FE MG PB SB SE
CCV 6	1	04-Jun-2018 14:17	093_CCV.d	AS CA CD FE MG PB SB SE
CCB 6	1	04-Jun-2018 14:19	094_CCB.d	AS CA CD FE MG PB SB SE
CCV 7	1	04-Jun-2018 14:41	105_CCV.d	AS CA CD FE MG PB SB SE
CCB 7	1	04-Jun-2018 14:43	106_CCB.d	AS CA CD FE MG PB SB SE
CCV 8	1	04-Jun-2018 15:15	122_CCV.d	AS CA CD FE MG PB SB SE
CCB 8	1	04-Jun-2018 15:17	123_CCB.d	AS CA CD FE MG PB SB SE
ICCV 9	1	04-Jun-2018 15:39	134_ICV.d	AS CA CD FE MG PB SB SE
LLCCV2	1	04-Jun-2018 15:41	135SMPL.d	AS CA CD FE MG PB SB SE
LLCCV5	1	04-Jun-2018 15:43	136LICV.d	AS CA CD FE MG PB SB SE
ICCB 9	1	04-Jun-2018 15:45	137_ICB.d	AS CA CD FE MG PB SB SE
CCV 10	1	04-Jun-2018 16:10	149_CCV.d	AS CA CD FE MG PB SB SE
CCB 10	1	04-Jun-2018 16:12	150_CCB.d	AS CA CD FE MG PB SB SE
CCV 11	1	04-Jun-2018 16:34	161_CCV.d	AS CA CD FE MG PB SB SE
CCB 11	1	04-Jun-2018 16:36	162_CCB.d	AS CA CD FE MG PB SB SE
MBLK-128972	1	04-Jun-2018 16:38	163SMPL.d	AS CD PB SB SE
LCS-128972	1	04-Jun-2018 16:40	164SMPL.d	AS CD SB SE
DGW-MW-11	5	04-Jun-2018 16:42	165SMPL.d	AS CD SB SE
DGW-MW-11SD	25	04-Jun-2018 16:44	166SMPL.d	AS CD SB SE
DGW-MW-11MS	5	04-Jun-2018 16:46	167SMPL.d	AS CD SB SE
DGW-MW-11MSD	5	04-Jun-2018 16:48	168SMPL.d	AS CD SB SE
DGW-MW-11PDS	5	04-Jun-2018 16:50	169SMPL.d	AS CD SB SE
DGW-MW-7	1	04-Jun-2018 16:52	170SMPL.d	AS CD PB SB SE
DGW-MW-6	1	04-Jun-2018 16:54	171SMPL.d	AS CD PB SB SE
DGW-MW-8	1	04-Jun-2018 16:56	172SMPL.d	AS CD PB SB SE
CCV 12	1	04-Jun-2018 16:58	173_CCV.d	AS CA CD FE MG PB SB SE
CCB 12	1	04-Jun-2018 17:00	174_CCB.d	AS CA CD FE MG PB SB SE
DGW-MW-10	1	04-Jun-2018 17:02	175SMPL.d	AS CD PB SB SE
MW-24	1	04-Jun-2018 17:04	176SMPL.d	AS CD PB SB SE
DGW-MW-11S	1	04-Jun-2018 17:06	177SMPL.d	AS CD SB SE
DGW-MW-4	1	04-Jun-2018 17:08	178SMPL.d	AS CD PB SB SE
DGW-MW-5	1	04-Jun-2018 17:10	179SMPL.d	AS CD PB SB SE
DUP-01	1	04-Jun-2018 17:12	180SMPL.d	AS CD PB SB SE
MBLK-129015	1	04-Jun-2018 17:16	182SMPL.d	AS CD FE MG SB SE
LCS-129015	1	04-Jun-2018 17:18	183SMPL.d	AS CD FE MG SB SE
DGW-MW-11	5	04-Jun-2018 17:20	184SMPL.d	AS CD FE MG SB SE
CCV 13	1	04-Jun-2018 17:22	185_CCV.d	AS CA CD FE MG PB SB SE
CCB 13	1	04-Jun-2018 17:24	186_CCB.d	AS CA CD FE MG PB SB SE
DGW-MW-11SD	25	04-Jun-2018 17:26	187SMPL.d	AS CD FE MG SB SE

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18051492
Start Date: 04-Jun-2018 End Date: 05-Jun-2018

Run ID:ICPMS05_317305
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
DGW-MW-11MS	5	04-Jun-2018 17:28	188SMPL.d	AS CD FE MG SB SE
DGW-MW-11MSD	5	04-Jun-2018 17:30	189SMPL.d	AS CD FE MG SB SE
DGW-MW-11PDS	5	04-Jun-2018 17:32	190SMPL.d	AS CD FE MG SB SE
DGW-MW-7	1	04-Jun-2018 17:34	191SMPL.d	AS CD FE MG PB SB SE
DGW-MW-6	1	04-Jun-2018 17:36	192SMPL.d	AS CD FE MG PB SB SE
DGW-MW-8	1	04-Jun-2018 17:38	193SMPL.d	AS CD FE MG PB SB SE
DGW-MW-10	1	04-Jun-2018 17:40	194SMPL.d	AS CD FE MG PB SB SE
MW-24	1	04-Jun-2018 17:42	195SMPL.d	AS CD FE MG PB SB SE
DGW-MW-11S	1	04-Jun-2018 17:44	196SMPL.d	AS CD FE MG PB SB SE
CCV 14	1	04-Jun-2018 17:46	197_CCV.d	AS CA CD FE MG PB SB SE
CCB 14	1	04-Jun-2018 17:48	198_CCB.d	AS CA CD FE MG PB SB SE
DGW-MW-4	1	04-Jun-2018 17:50	199SMPL.d	AS CD FE MG PB SB SE
DGW-MW-5	1	04-Jun-2018 17:52	200SMPL.d	AS CD FE MG PB SB SE
DUP-01	1	04-Jun-2018 17:54	201SMPL.d	AS CD FE MG PB SB SE
CCV 15	1	04-Jun-2018 18:10	209_CCV.d	AS CA CD FE MG PB SB SE
CCB 15	1	04-Jun-2018 18:12	210_CCB.d	AS CA CD FE MG PB SB SE
CCV 16	1	04-Jun-2018 18:22	215_CCV.d	AS CA CD FE MG PB SB SE
CCB 16	1	04-Jun-2018 18:24	216_CCB.d	AS CA CD FE MG PB SB SE
CCV 17	1	04-Jun-2018 18:38	223_CCV.d	AS CA CD FE MG PB SB SE
CCB 17	1	04-Jun-2018 18:40	224_CCB.d	AS CA CD FE MG PB SB SE
ICCV 18	1	04-Jun-2018 22:50	234_ICV.d	AS CA CD FE MG PB SB SE
LLCCV2	1	04-Jun-2018 22:52	235SMPL.d	AS CA CD FE MG PB SB SE
LLCCV5	1	04-Jun-2018 22:54	236LICV.d	AS CA CD FE MG PB SB SE
ICCB 18	1	04-Jun-2018 22:56	237_ICB.d	AS CA CD FE MG PB SB SE
ICSA	1	04-Jun-2018 23:05	239ICSA.d	AS CA CD FE MG PB SB SE
ICSAB	1	04-Jun-2018 23:07	240ICSB.d	AS CA CD FE MG PB SB SE
MBLK-128972	1	04-Jun-2018 23:15	244SMPL.d	PB
LCS-128972	1	04-Jun-2018 23:17	245SMPL.d	PB
CCV 19	1	04-Jun-2018 23:19	246_CCV.d	AS CA CD FE MG PB SB SE
CCB 19	1	04-Jun-2018 23:21	247_CCB.d	AS CA CD FE MG PB SB SE
ICCV 20	1	05-Jun-2018 00:08	267_ICV.d	AS CA CD FE MG PB SB SE
LLCCV2	1	05-Jun-2018 00:10	268SMPL.d	AS CA CD FE MG PB SB SE
LLCCV5	1	05-Jun-2018 00:12	269LICV.d	AS CA CD FE MG PB SB SE
ICCB 20	1	05-Jun-2018 00:14	270_ICB.d	AS CA CD FE MG PB SB SE
MBLK-129015	1	05-Jun-2018 00:18	272SMPL.d	CA PB
LCS-129015	1	05-Jun-2018 00:20	273SMPL.d	CA PB
DGW-MW-11	5	05-Jun-2018 00:22	274SMPL.d	CA PB
DGW-MW-11SD	25	05-Jun-2018 00:24	275SMPL.d	CA PB
DGW-MW-11MS	5	05-Jun-2018 00:26	276SMPL.d	CA PB
DGW-MW-11MSD	5	05-Jun-2018 00:28	277SMPL.d	CA PB
DGW-MW-11PDS	5	05-Jun-2018 00:30	278SMPL.d	CA PB
CCV 21	1	05-Jun-2018 00:32	279_CCV.d	AS CA CD FE MG PB SB SE
CCB 21	1	05-Jun-2018 00:34	280_CCB.d	AS CA CD FE MG PB SB SE
DGW-MW-7	10	05-Jun-2018 00:36	281SMPL.d	CA
DGW-MW-6	10	05-Jun-2018 00:38	282SMPL.d	CA
DGW-MW-8	10	05-Jun-2018 00:40	283SMPL.d	CA
DGW-MW-10	10	05-Jun-2018 00:42	284SMPL.d	CA
MW-24	10	05-Jun-2018 00:44	285SMPL.d	CA
DGW-MW-11S	10	05-Jun-2018 00:46	286SMPL.d	CA
CCV 22	1	05-Jun-2018 00:48	287_CCV.d	AS CA CD FE MG PB SB SE
CCB 22	1	05-Jun-2018 00:50	288_CCB.d	AS CA CD FE MG PB SB SE
DGW-MW-4	10	05-Jun-2018 00:52	289SMPL.d	CA
DGW-MW-5	10	05-Jun-2018 00:54	290SMPL.d	CA
DUP-01	10	05-Jun-2018 00:56	291SMPL.d	CA

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18051492

Run ID:ICPMS05_317305
Instrument:ICPMS05
Method:SW6020

CCB 1	Date: 04-Jun-2018 11:53	Seq: 4585123	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Magnesium	15.1	10	200	

CCB 2	Date: 04-Jun-2018 12:19	Seq: 4585348	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Magnesium	12.92	10	200	

CCB 3	Date: 04-Jun-2018 12:47	Seq: 4585357	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.986	0.4	2	
Magnesium	17.12	10	200	

CCB 4	Date: 04-Jun-2018 13:31	Seq: 4585864	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Magnesium	11.42	10	200	

CCB 5	Date: 04-Jun-2018 13:55	Seq: 4585876	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Magnesium	20.72	10	200	

CCB 6	Date: 04-Jun-2018 14:19	Seq: 4585888	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Cadmium	0.274	0.2	2	
Magnesium	26.52	10	200	

CCB 7	Date: 04-Jun-2018 14:43	Seq: 4585900	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Cadmium	0.247	0.2	2	
Magnesium	22.4	10	200	

CCB 8	Date: 04-Jun-2018 15:17	Seq: 4585917	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Magnesium	16.55	10	200	

CCB 10	Date: 04-Jun-2018 16:12	Seq: 4586435	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Magnesium	15.8	10	200	

CCB 11	Date: 04-Jun-2018 16:36	Seq: 4586447	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Magnesium	16.05	10	200	

CCB 12	Date: 04-Jun-2018 17:00	Seq: 4586459	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Cadmium	0.226	0.2	2	
Calcium	36.73	34	500	
Magnesium	22.01	10	200	

CCB 13	Date: 04-Jun-2018 17:24	Seq: 4586471	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Magnesium	16.82	10	200	

CCB 14	Date: 04-Jun-2018 17:48	Seq: 4586483	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Magnesium	21.51	10	200	

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18051492

Run ID:ICPMS05_317305
Instrument:ICPMS05
Method:SW6020

CCB 15	Date: 04-Jun-2018 18:12	Seq: 4586495	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Cadmium	0.263	0.2	2	
Iron	13.26	12	200	
Magnesium	24.19	10	200	

CCB 16	Date: 04-Jun-2018 18:24	Seq: 4586501	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Cadmium	0.255	0.2	2	
Iron	13.1	12	200	
Magnesium	26.09	10	200	

CCB 17	Date: 04-Jun-2018 18:40	Seq: 4586509	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Magnesium	20.37	10	200	

ICCB 18	Date: 04-Jun-2018 22:56	Seq: 4586520	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	-0.403	0.4	2	

CCB 19	Date: 04-Jun-2018 23:21	Seq: 4586609	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Magnesium	23.55	10	200	
Selenium	1.135	1.1	2	

CCB 21	Date: 05-Jun-2018 00:34	Seq: 4586630	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Magnesium	22.51	10	200	

CCB 22	Date: 05-Jun-2018 00:50	Seq: 4586638	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Cadmium	0.256	0.2	2	
Magnesium	25.77	10	200	

CCB 23	Date: 05-Jun-2018 01:06	Seq: 4586646	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Cadmium	0.212	0.2	2	
Magnesium	20.72	10	200	

CCB 24	Date: 05-Jun-2018 01:30	Seq: 4586658	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Cadmium	0.273	0.2	2	
Calcium	42.74	34	500	
Magnesium	35.54	10	200	
Selenium	1.461	1.1	2	

CCB 25	Date: 05-Jun-2018 01:54	Seq: 4586670	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Cadmium	0.221	0.2	2	
Calcium	35.27	34	500	
Magnesium	32.62	10	200	

CCB 26	Date: 05-Jun-2018 02:12	Seq: 4586679	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Cadmium	0.333	0.2	2	
Calcium	47.42	34	500	
Iron	14.93	12	200	

Client: Golder Associates
Project: Exide DGW PDI
Work Order: HS18051492

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18051492-01	DGW-MW-11	Water		30-May-2018 10:00	31-May-2018 09:00	☐
HS18051492-02	DGW-MW-7	Water		30-May-2018 12:30	31-May-2018 09:00	☐
HS18051492-03	DGW-MW-6	Water		30-May-2018 14:30	31-May-2018 09:00	☐
HS18051492-04	DGW-MW-8	Water		30-May-2018 15:00	31-May-2018 09:00	☐
HS18051492-05	DGW-MW-10	Water		30-May-2018 16:30	31-May-2018 09:00	☐
HS18051492-06	MW-24	Water		30-May-2018 17:25	31-May-2018 09:00	☐
HS18051492-07	DGW-MW-11S	Water		30-May-2018 17:30	31-May-2018 09:00	☐
HS18051492-08	DGW-MW-4	Water		30-May-2018 18:45	31-May-2018 09:00	☐
HS18051492-09	DGW-MW-5	Water		30-May-2018 19:05	31-May-2018 09:00	☐
HS18051492-10	DUP-01	Water		30-May-2018 00:00	31-May-2018 09:00	☐

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
Sample ID: DGW-MW-11
Collection Date: 30-May-2018 10:00

ANALYTICAL REPORT
WorkOrder:HS18051492
Lab ID:HS18051492-01
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 01-Jun-2018		Analyst: JDE
Antimony	**0.00467**	J	**0.00200**	**0.0100**	**mg/L**	5	04-Jun-2018 17:20
Arsenic	U		0.00200	0.0100	mg/L	5	04-Jun-2018 17:20
Cadmium	**0.0254**		**0.00100**	**0.0100**	**mg/L**	5	04-Jun-2018 17:20
Calcium	**544**		**0.170**	**2.50**	**mg/L**	5	05-Jun-2018 00:22
Iron	**13.6**		**0.0600**	**1.00**	**mg/L**	5	04-Jun-2018 17:20
Lead	**0.0362**		**0.00300**	**0.0100**	**mg/L**	5	05-Jun-2018 00:22
Magnesium	**302**		**0.0500**	**1.00**	**mg/L**	5	04-Jun-2018 17:20
Selenium	U		0.00550	0.0100	mg/L	5	04-Jun-2018 17:20
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**			Prep:SW3010A / 31-May-2018		Analyst: JDE
Antimony	**0.00448**	J	**0.00200**	**0.0100**	**mg/L**	5	04-Jun-2018 16:42
Arsenic	U		0.00200	0.0100	mg/L	5	04-Jun-2018 16:42
Cadmium	**0.0259**		**0.00100**	**0.0100**	**mg/L**	5	04-Jun-2018 16:42
Calcium	**510**		**0.170**	**2.50**	**mg/L**	5	05-Jun-2018 13:50
Iron	**14.0**		**0.0600**	**1.00**	**mg/L**	5	04-Jun-2018 16:42
Lead	**0.0338**		**0.00300**	**0.0100**	**mg/L**	5	05-Jun-2018 13:50
Magnesium	**323**		**0.0500**	**1.00**	**mg/L**	5	04-Jun-2018 16:42
Selenium	U		0.00550	0.0100	mg/L	5	04-Jun-2018 16:42
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**215**		**2.00**	**5.00**	**mg/L**	10	31-May-2018 20:07
Nitrate/Nitrite (as N)	**1.33**	J	**0.300**	**2.00**	**mg/L**	10	31-May-2018 20:07
Sulfate	**5,010**		**20.0**	**50.0**	**mg/L**	100	31-May-2018 20:29
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**318**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 14:43
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 14:43
Alkalinity, Hydroxide (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 14:43
Alkalinity, Total (As CaCO3)	**318**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 14:43
TOC, DISSOLVED - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Dissolved	**5.07**		**1.00**	**2.00**	**mg/L**	2	01-Jun-2018 20:55
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Total	**4.94**		**0.500**	**1.00**	**mg/L**	1	02-Jun-2018 17:43

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
Sample ID: DGW-MW-7
Collection Date: 30-May-2018 12:30

ANALYTICAL REPORT
WorkOrder:HS18051492
Lab ID:HS18051492-02
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 01-Jun-2018		Analyst: JDE
Antimony	**0.00160**		**0.000400**	**0.00200**	**mg/L**	1	04-Jun-2018 17:34
Arsenic	**0.0218**	*	**0.000400**	**0.00200**	**mg/L**	1	04-Jun-2018 17:34
Cadmium	**0.000250**	J	**0.000200**	**0.00200**	**mg/L**	1	04-Jun-2018 17:34
Calcium	**333**		**0.340**	**5.00**	**mg/L**	10	05-Jun-2018 00:36
Iron	**21.8**		**0.0120**	**0.200**	**mg/L**	1	04-Jun-2018 17:34
Lead	U		0.000600	0.00200	mg/L	1	04-Jun-2018 17:34
Magnesium	**24.6**		**0.0100**	**0.200**	**mg/L**	1	04-Jun-2018 17:34
Selenium	**0.00585**		**0.00110**	**0.00200**	**mg/L**	1	04-Jun-2018 17:34
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**			Prep:SW3010A / 31-May-2018		Analyst: JDE
Antimony	**0.00157**	J	**0.000400**	**0.00200**	**mg/L**	1	04-Jun-2018 16:52
Arsenic	**0.0209**		**0.000400**	**0.00200**	**mg/L**	1	04-Jun-2018 16:52
Cadmium	U		0.000200	0.00200	mg/L	1	04-Jun-2018 16:52
Calcium	**367**		**0.340**	**5.00**	**mg/L**	10	15-Jun-2018 22:35
Iron	**21.4**		**0.0120**	**0.200**	**mg/L**	1	04-Jun-2018 16:52
Lead	U		0.000600	0.00200	mg/L	1	04-Jun-2018 16:52
Magnesium	**26.7**		**0.0100**	**0.200**	**mg/L**	1	04-Jun-2018 16:52
Selenium	**0.00584**		**0.00110**	**0.00200**	**mg/L**	1	04-Jun-2018 16:52
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**167**		**2.00**	**5.00**	**mg/L**	10	31-May-2018 21:12
Nitrate/Nitrite (as N)	U		0.0300	0.200	mg/L	1	31-May-2018 20:50
Sulfate	**1,940**		**20.0**	**50.0**	**mg/L**	100	31-May-2018 21:34
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**531**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 14:50
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 14:50
Alkalinity, Hydroxide (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 14:50
Alkalinity, Total (As CaCO3)	**531**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 14:50
TOC, DISSOLVED - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Dissolved	**7.07**		**1.00**	**2.00**	**mg/L**	2	01-Jun-2018 21:09
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Total	**7.66**		**0.500**	**1.00**	**mg/L**	1	02-Jun-2018 17:56

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
Sample ID: DGW-MW-6
Collection Date: 30-May-2018 14:30

ANALYTICAL REPORT
WorkOrder:HS18051492
Lab ID:HS18051492-03
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 01-Jun-2018		Analyst: JDE
Antimony	**0.00117**	J	**0.000400**	**0.00200**	**mg/L**	1	04-Jun-2018 17:36
Arsenic	**0.0134**		**0.000400**	**0.00200**	**mg/L**	1	04-Jun-2018 17:36
Cadmium	**0.000699**	J	**0.000200**	**0.00200**	**mg/L**	1	04-Jun-2018 17:36
Calcium	**250**		**0.340**	**5.00**	**mg/L**	10	05-Jun-2018 00:38
Iron	**28.3**		**0.0120**	**0.200**	**mg/L**	1	04-Jun-2018 17:36
Lead	**0.00106**	J	**0.000600**	**0.00200**	**mg/L**	1	04-Jun-2018 17:36
Magnesium	**39.4**		**0.0100**	**0.200**	**mg/L**	1	04-Jun-2018 17:36
Selenium	**0.00242**		**0.00110**	**0.00200**	**mg/L**	1	04-Jun-2018 17:36
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**			Prep:SW3010A / 31-May-2018		Analyst: JDE
Antimony	**0.00122**	J	**0.000400**	**0.00200**	**mg/L**	1	04-Jun-2018 16:54
Arsenic	**0.0136**		**0.000400**	**0.00200**	**mg/L**	1	04-Jun-2018 16:54
Cadmium	U		0.000200	0.00200	mg/L	1	04-Jun-2018 16:54
Calcium	**466**		**0.340**	**5.00**	**mg/L**	10	18-Jun-2018 12:58
Iron	**29.1**		**0.0120**	**0.200**	**mg/L**	1	04-Jun-2018 16:54
Lead	U		0.000600	0.00200	mg/L	1	04-Jun-2018 16:54
Magnesium	**43.0**		**0.0100**	**0.200**	**mg/L**	1	04-Jun-2018 16:54
Selenium	**0.00246**		**0.00110**	**0.00200**	**mg/L**	1	04-Jun-2018 16:54
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**120**		**2.00**	**5.00**	**mg/L**	10	31-May-2018 23:22
Nitrate/Nitrite (as N)	U		0.0300	0.200	mg/L	1	31-May-2018 23:01
Sulfate	**1,330**		**20.0**	**50.0**	**mg/L**	100	31-May-2018 23:44
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**520**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 15:15
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 15:15
Alkalinity, Hydroxide (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 15:15
Alkalinity, Total (As CaCO3)	**520**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 15:15
TOC, DISSOLVED - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Dissolved	**6.82**		**1.00**	**2.00**	**mg/L**	2	01-Jun-2018 21:37
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Total	**7.24**		**0.500**	**1.00**	**mg/L**	1	02-Jun-2018 18:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
Sample ID: DGW-MW-8
Collection Date: 30-May-2018 15:00

ANALYTICAL REPORT
WorkOrder:HS18051492
Lab ID:HS18051492-04
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 01-Jun-2018		Analyst: JDE
Antimony	**0.000919**	J	**0.000400**	**0.00200**	**mg/L**	1	04-Jun-2018 17:38
Arsenic	**0.00271**		**0.000400**	**0.00200**	**mg/L**	1	04-Jun-2018 17:38
Cadmium	U		0.000200	0.00200	mg/L	1	04-Jun-2018 17:38
Calcium	**440**		**0.340**	**5.00**	**mg/L**	10	05-Jun-2018 00:40
Iron	**0.704**		**0.0120**	**0.200**	**mg/L**	1	04-Jun-2018 17:38
Lead	U		0.000600	0.00200	mg/L	1	04-Jun-2018 17:38
Magnesium	**108**		**0.0100**	**0.200**	**mg/L**	1	04-Jun-2018 17:38
Selenium	**0.00723**		**0.00110**	**0.00200**	**mg/L**	1	04-Jun-2018 17:38
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**			Prep:SW3010A / 31-May-2018		Analyst: JDE
Antimony	**0.000895**	J	**0.000400**	**0.00200**	**mg/L**	1	04-Jun-2018 16:56
Arsenic	**0.00232**		**0.000400**	**0.00200**	**mg/L**	1	04-Jun-2018 16:56
Cadmium	U		0.000200	0.00200	mg/L	1	04-Jun-2018 16:56
Calcium	**231**		**0.340**	**5.00**	**mg/L**	10	15-Jun-2018 22:43
Iron	**0.332**		**0.0120**	**0.200**	**mg/L**	1	04-Jun-2018 16:56
Lead	U		0.000600	0.00200	mg/L	1	04-Jun-2018 16:56
Magnesium	**112**		**0.0100**	**0.200**	**mg/L**	1	04-Jun-2018 16:56
Selenium	**0.00736**		**0.00110**	**0.00200**	**mg/L**	1	04-Jun-2018 16:56
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**421**		**2.00**	**5.00**	**mg/L**	10	01-Jun-2018 00:27
Nitrate/Nitrite (as N)	U		0.0300	0.200	mg/L	1	01-Jun-2018 00:06
Sulfate	**1,680**		**20.0**	**50.0**	**mg/L**	100	01-Jun-2018 00:49
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**693**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 15:22
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 15:22
Alkalinity, Hydroxide (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 15:22
Alkalinity, Total (As CaCO3)	**693**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 15:22
TOC, DISSOLVED - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Dissolved	**7.61**		**1.00**	**2.00**	**mg/L**	2	01-Jun-2018 21:52
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Total	**7.75**		**0.500**	**1.00**	**mg/L**	1	02-Jun-2018 18:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
Sample ID: DGW-MW-10
Collection Date: 30-May-2018 16:30

ANALYTICAL REPORT
WorkOrder:HS18051492
Lab ID:HS18051492-05
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL TEXAS TPH BY TX1005		**Method:TX1005**			Prep:TX1005PR / 31-May-2018		Analyst: MBG
nC6 to nC12	U		0.19	0.48	mg/L	1	02-Jun-2018 00:46
>nC12 to nC28	U		0.19	0.48	mg/L	1	02-Jun-2018 00:46
>nC28 to nC35	U		0.19	0.48	mg/L	1	02-Jun-2018 00:46
Total Petroleum Hydrocarbon	U		0.19	0.48	mg/L	1	02-Jun-2018 00:46
Surr: 2-Fluorobiphenyl	*75.9*			*70-130*	*%REC*	*1*	*02-Jun-2018 00:46*
Surr: Trifluoromethyl benzene	*78.3*			*70-130*	*%REC*	*1*	*02-Jun-2018 00:46*
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 01-Jun-2018		Analyst: JDE
Antimony	**0.000459**	J	**0.000400**	**0.00200**	**mg/L**	1	04-Jun-2018 17:40
Arsenic	**0.0113**		**0.000400**	**0.00200**	**mg/L**	1	04-Jun-2018 17:40
Cadmium	U		0.000200	0.00200	mg/L	1	04-Jun-2018 17:40
Calcium	**308**		**0.340**	**5.00**	**mg/L**	10	05-Jun-2018 00:42
Iron	**9.53**		**0.0120**	**0.200**	**mg/L**	1	04-Jun-2018 17:40
Lead	**0.000855**	J	**0.000600**	**0.00200**	**mg/L**	1	04-Jun-2018 17:40
Magnesium	**54.0**		**0.0100**	**0.200**	**mg/L**	1	04-Jun-2018 17:40
Selenium	**0.00814**		**0.00110**	**0.00200**	**mg/L**	1	04-Jun-2018 17:40
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**			Prep:SW3010A / 31-May-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	04-Jun-2018 17:02
Arsenic	**0.0112**		**0.000400**	**0.00200**	**mg/L**	1	04-Jun-2018 17:02
Cadmium	U		0.000200	0.00200	mg/L	1	04-Jun-2018 17:02
Calcium	**291**		**0.340**	**5.00**	**mg/L**	10	15-Jun-2018 22:45
Iron	**9.22**		**0.0120**	**0.200**	**mg/L**	1	04-Jun-2018 17:02
Lead	U		0.000600	0.00200	mg/L	1	04-Jun-2018 17:02
Magnesium	**56.6**		**0.0100**	**0.200**	**mg/L**	1	04-Jun-2018 17:02
Selenium	**0.00848**		**0.00110**	**0.00200**	**mg/L**	1	04-Jun-2018 17:02
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**279**		**2.00**	**5.00**	**mg/L**	10	01-Jun-2018 01:33
Nitrate/Nitrite (as N)	U		0.0300	0.200	mg/L	1	01-Jun-2018 01:11
Sulfate	**1,770**		**20.0**	**50.0**	**mg/L**	100	01-Jun-2018 01:54
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**803**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 15:30
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 15:30
Alkalinity, Hydroxide (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 15:30
Alkalinity, Total (As CaCO3)	**803**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 15:30
TOC, DISSOLVED - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Dissolved	**9.56**		**1.00**	**2.00**	**mg/L**	2	01-Jun-2018 22:06
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Total	**10.0**		**0.500**	**1.00**	**mg/L**	1	02-Jun-2018 18:55

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
Sample ID: MW-24
Collection Date: 30-May-2018 17:25

ANALYTICAL REPORT
WorkOrder:HS18051492
Lab ID:HS18051492-06
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 01-Jun-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	04-Jun-2018 17:42
Arsenic	**0.00361**		**0.000400**	**0.00200**	**mg/L**	1	04-Jun-2018 17:42
Cadmium	U		0.000200	0.00200	mg/L	1	04-Jun-2018 17:42
Calcium	**305**		**0.340**	**5.00**	**mg/L**	10	05-Jun-2018 00:44
Iron	**2.42**		**0.0120**	**0.200**	**mg/L**	1	04-Jun-2018 17:42
Lead	U		0.000600	0.00200	mg/L	1	04-Jun-2018 17:42
Magnesium	**32.3**		**0.0100**	**0.200**	**mg/L**	1	04-Jun-2018 17:42
Selenium	**0.00687**		**0.00110**	**0.00200**	**mg/L**	1	04-Jun-2018 17:42
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**			Prep:SW3010A / 31-May-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	04-Jun-2018 17:04
Arsenic	**0.00113**	J	**0.000400**	**0.00200**	**mg/L**	1	04-Jun-2018 17:04
Cadmium	U		0.000200	0.00200	mg/L	1	04-Jun-2018 17:04
Calcium	**507**		**0.340**	**5.00**	**mg/L**	10	15-Jun-2018 22:47
Iron	**1.39**		**0.0120**	**0.200**	**mg/L**	1	04-Jun-2018 17:04
Lead	U		0.000600	0.00200	mg/L	1	04-Jun-2018 17:04
Magnesium	**32.9**		**0.0100**	**0.200**	**mg/L**	1	04-Jun-2018 17:04
Selenium	**0.00571**		**0.00110**	**0.00200**	**mg/L**	1	04-Jun-2018 17:04
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**285**		**2.00**	**5.00**	**mg/L**	10	01-Jun-2018 03:43
Nitrate/Nitrite (as N)	U		0.0300	0.200	mg/L	1	01-Jun-2018 03:21
Sulfate	**1,910**		**20.0**	**50.0**	**mg/L**	100	01-Jun-2018 04:04
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**515**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 15:37
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 15:37
Alkalinity, Hydroxide (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 15:37
Alkalinity, Total (As CaCO3)	**515**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 15:37
TOC, DISSOLVED - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Dissolved	**4.85**		**1.00**	**2.00**	**mg/L**	2	01-Jun-2018 23:03
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Total	**4.34**		**0.500**	**1.00**	**mg/L**	1	02-Jun-2018 19:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
Sample ID: DGW-MW-11S
Collection Date: 30-May-2018 17:30

ANALYTICAL REPORT
WorkOrder:HS18051492
Lab ID:HS18051492-07
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 01-Jun-2018		Analyst: JDE
Antimony	**0.0240**		**0.000400**	**0.00200**	**mg/L**	1	04-Jun-2018 17:44
Arsenic	**0.00338**		**0.000400**	**0.00200**	**mg/L**	1	04-Jun-2018 17:44
Cadmium	**0.00346**		**0.000200**	**0.00200**	**mg/L**	1	04-Jun-2018 17:44
Calcium	**368**		**0.340**	**5.00**	**mg/L**	10	05-Jun-2018 00:46
Iron	**0.0631**	J	**0.0120**	**0.200**	**mg/L**	1	04-Jun-2018 17:44
Lead	**0.0285**		**0.000600**	**0.00200**	**mg/L**	1	04-Jun-2018 17:44
Magnesium	**105**		**0.0100**	**0.200**	**mg/L**	1	04-Jun-2018 17:44
Selenium	**0.00911**		**0.00110**	**0.00200**	**mg/L**	1	04-Jun-2018 17:44
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 31-May-2018		Analyst: JDE
Antimony	**0.0245**		**0.000400**	**0.00200**	**mg/L**	1	04-Jun-2018 17:06
Arsenic	**0.00376**		**0.000400**	**0.00200**	**mg/L**	1	04-Jun-2018 17:06
Cadmium	**0.00382**		**0.000200**	**0.00200**	**mg/L**	1	04-Jun-2018 17:06
Calcium	**306**		**0.340**	**5.00**	**mg/L**	10	15-Jun-2018 22:49
Iron	**0.473**		**0.0120**	**0.200**	**mg/L**	1	04-Jun-2018 17:06
Lead	**0.0411**		**0.000600**	**0.00200**	**mg/L**	1	05-Jun-2018 14:00
Magnesium	**115**		**0.0100**	**0.200**	**mg/L**	1	04-Jun-2018 17:06
Selenium	**0.0110**		**0.00110**	**0.00200**	**mg/L**	1	04-Jun-2018 17:06
ANIONS BY E300.0	**Method:E300**						Analyst: KMU
Chloride	**209**		**2.00**	**5.00**	**mg/L**	10	01-Jun-2018 04:26
Nitrate/Nitrite (as N)	**7.62**		**0.300**	**2.00**	**mg/L**	10	01-Jun-2018 04:26
Sulfate	**4,750**		**20.0**	**50.0**	**mg/L**	100	01-Jun-2018 05:31
ALKALINITY BY SM2320B	**Method:SM2320B**						Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**265**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 15:44
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 15:44
Alkalinity, Hydroxide (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 15:44
Alkalinity, Total (As CaCO3)	**265**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 15:44

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
Sample ID: DGW-MW-4
Collection Date: 30-May-2018 18:45

ANALYTICAL REPORT
WorkOrder:HS18051492
Lab ID:HS18051492-08
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL TEXAS TPH BY TX1005		**Method:TX1005**			Prep:TX1005PR / 31-May-2018		Analyst: MBG
nC6 to nC12	U		0.20	0.49	mg/L	1	02-Jun-2018 01:15
>nC12 to nC28	U		0.20	0.49	mg/L	1	02-Jun-2018 01:15
>nC28 to nC35	U		0.20	0.49	mg/L	1	02-Jun-2018 01:15
Total Petroleum Hydrocarbon	U		0.20	0.49	mg/L	1	02-Jun-2018 01:15
Surr: 2-Fluorobiphenyl	*73.3*			*70-130*	*%REC*	*1*	*02-Jun-2018 01:15*
Surr: Trifluoromethyl benzene	*73.3*			*70-130*	*%REC*	*1*	*02-Jun-2018 01:15*
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 01-Jun-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	04-Jun-2018 17:50
Arsenic	**0.00564**		**0.000400**	**0.00200**	**mg/L**	1	04-Jun-2018 17:50
Cadmium	U		0.000200	0.00200	mg/L	1	04-Jun-2018 17:50
Calcium	**229**		**0.340**	**5.00**	**mg/L**	10	05-Jun-2018 00:52
Iron	**4.03**		**0.0120**	**0.200**	**mg/L**	1	04-Jun-2018 17:50
Lead	U		0.000600	0.00200	mg/L	1	04-Jun-2018 17:50
Magnesium	**31.7**		**0.0100**	**0.200**	**mg/L**	1	04-Jun-2018 17:50
Selenium	**0.00174**	J	**0.00110**	**0.00200**	**mg/L**	1	04-Jun-2018 17:50
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**			Prep:SW3010A / 31-May-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	04-Jun-2018 17:08
Arsenic	**0.00546**		**0.000400**	**0.00200**	**mg/L**	1	04-Jun-2018 17:08
Cadmium	U		0.000200	0.00200	mg/L	1	04-Jun-2018 17:08
Calcium	**198**		**0.340**	**5.00**	**mg/L**	10	15-Jun-2018 22:51
Iron	**3.86**		**0.0120**	**0.200**	**mg/L**	1	04-Jun-2018 17:08
Lead	**0.000615**	J	**0.000600**	**0.00200**	**mg/L**	1	04-Jun-2018 17:08
Magnesium	**30.5**		**0.0100**	**0.200**	**mg/L**	1	04-Jun-2018 17:08
Selenium	**0.00318**		**0.00110**	**0.00200**	**mg/L**	1	04-Jun-2018 17:08
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**87.8**		**0.200**	**0.500**	**mg/L**	1	01-Jun-2018 05:53
Nitrate/Nitrite (as N)	U		0.0300	0.200	mg/L	1	01-Jun-2018 05:53
Sulfate	**810**		**2.00**	**5.00**	**mg/L**	10	01-Jun-2018 06:15
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**566**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 15:51
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 15:51
Alkalinity, Hydroxide (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 15:51
Alkalinity, Total (As CaCO3)	**566**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 15:51
TOC, DISSOLVED - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Dissolved	**5.74**		**1.00**	**2.00**	**mg/L**	2	01-Jun-2018 23:16
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Total	**6.20**		**0.500**	**1.00**	**mg/L**	1	02-Jun-2018 20:08

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
Sample ID: DGW-MW-5
Collection Date: 30-May-2018 19:05

ANALYTICAL REPORT
WorkOrder:HS18051492
Lab ID:HS18051492-09
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 01-Jun-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	04-Jun-2018 17:52
Arsenic	**0.00366**		**0.000400**	**0.00200**	**mg/L**	1	04-Jun-2018 17:52
Cadmium	U		0.000200	0.00200	mg/L	1	04-Jun-2018 17:52
Calcium	**197**		**0.340**	**5.00**	**mg/L**	10	05-Jun-2018 00:54
Iron	**7.14**		**0.0120**	**0.200**	**mg/L**	1	04-Jun-2018 17:52
Lead	U		0.000600	0.00200	mg/L	1	04-Jun-2018 17:52
Magnesium	**22.0**		**0.0100**	**0.200**	**mg/L**	1	04-Jun-2018 17:52
Selenium	**0.00272**		**0.00110**	**0.00200**	**mg/L**	1	04-Jun-2018 17:52
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**			Prep:SW3010A / 31-May-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	04-Jun-2018 17:10
Arsenic	**0.00340**		**0.000400**	**0.00200**	**mg/L**	1	04-Jun-2018 17:10
Cadmium	U		0.000200	0.00200	mg/L	1	04-Jun-2018 17:10
Calcium	**174**		**0.340**	**5.00**	**mg/L**	10	15-Jun-2018 22:53
Iron	**7.07**		**0.0120**	**0.200**	**mg/L**	1	04-Jun-2018 17:10
Lead	U		0.000600	0.00200	mg/L	1	04-Jun-2018 17:10
Magnesium	**22.1**		**0.0100**	**0.200**	**mg/L**	1	04-Jun-2018 17:10
Selenium	**0.00331**		**0.00110**	**0.00200**	**mg/L**	1	04-Jun-2018 17:10
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**172**		**2.00**	**5.00**	**mg/L**	10	01-Jun-2018 08:03
Nitrate/Nitrite (as N)	U		0.0300	0.200	mg/L	1	01-Jun-2018 07:41
Sulfate	**1,000**		**20.0**	**50.0**	**mg/L**	100	01-Jun-2018 08:25
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**573**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 15:58
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 15:58
Alkalinity, Hydroxide (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 15:58
Alkalinity, Total (As CaCO3)	**573**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 15:58
TOC, DISSOLVED - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Dissolved	**6.21**		**1.00**	**2.00**	**mg/L**	2	01-Jun-2018 23:29
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Total	**6.68**		**0.500**	**1.00**	**mg/L**	1	02-Jun-2018 20:23

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
Sample ID: DUP-01
Collection Date: 30-May-2018 00:00

ANALYTICAL REPORT
WorkOrder:HS18051492
Lab ID:HS18051492-10
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL TEXAS TPH BY TX1005		**Method:TX1005**			Prep:TX1005PR / 31-May-2018		Analyst: MBG
nC6 to nC12	U		0.19	0.47	mg/L	1	02-Jun-2018 02:42
>nC12 to nC28	U		0.19	0.47	mg/L	1	02-Jun-2018 02:42
>nC28 to nC35	U		0.19	0.47	mg/L	1	02-Jun-2018 02:42
Total Petroleum Hydrocarbon	U		0.19	0.47	mg/L	1	02-Jun-2018 02:42
Surr: 2-Fluorobiphenyl	*78.6*			*70-130*	*%REC*	*1*	*02-Jun-2018 02:42*
Surr: Trifluoromethyl benzene	*82.1*			*70-130*	*%REC*	*1*	*02-Jun-2018 02:42*
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 01-Jun-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	04-Jun-2018 17:54
Arsenic	**0.0118**		**0.000400**	**0.00200**	**mg/L**	1	04-Jun-2018 17:54
Cadmium	U		0.000200	0.00200	mg/L	1	04-Jun-2018 17:54
Calcium	**374**		**0.340**	**5.00**	**mg/L**	10	05-Jun-2018 00:56
Iron	**9.69**		**0.0120**	**0.200**	**mg/L**	1	04-Jun-2018 17:54
Lead	**0.000950**	J	**0.000600**	**0.00200**	**mg/L**	1	04-Jun-2018 17:54
Magnesium	**55.4**		**0.0100**	**0.200**	**mg/L**	1	04-Jun-2018 17:54
Selenium	**0.00889**		**0.00110**	**0.00200**	**mg/L**	1	04-Jun-2018 17:54
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**			Prep:SW3010A / 31-May-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	04-Jun-2018 17:12
Arsenic	**0.0107**		**0.000400**	**0.00200**	**mg/L**	1	04-Jun-2018 17:12
Cadmium	U		0.000200	0.00200	mg/L	1	04-Jun-2018 17:12
Calcium	**391**		**0.340**	**5.00**	**mg/L**	10	15-Jun-2018 22:59
Iron	**9.13**		**0.0120**	**0.200**	**mg/L**	1	04-Jun-2018 17:12
Lead	U		0.000600	0.00200	mg/L	1	04-Jun-2018 17:12
Magnesium	**53.9**		**0.0100**	**0.200**	**mg/L**	1	04-Jun-2018 17:12
Selenium	**0.00793**		**0.00110**	**0.00200**	**mg/L**	1	04-Jun-2018 17:12
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**285**		**2.00**	**5.00**	**mg/L**	10	01-Jun-2018 09:08
Nitrate/Nitrite (as N)	U		0.0300	0.200	mg/L	1	01-Jun-2018 08:46
Sulfate	**1,820**		**20.0**	**50.0**	**mg/L**	100	01-Jun-2018 09:30
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**806**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 16:06
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 16:06
Alkalinity, Hydroxide (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 16:06
Alkalinity, Total (As CaCO3)	**806**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 16:06
TOC, DISSOLVED - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Dissolved	**9.36**		**1.00**	**2.00**	**mg/L**	2	02-Jun-2018 00:00
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Total	**10.0**		**0.500**	**1.00**	**mg/L**	1	02-Jun-2018 20:51

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

WEIGHT LOG

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18051492

Batch ID: 128966 **Method:** LOW-LEVEL TEXAS TPH BY TX1005 **Prep:** TX 1005_W PR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18051492-05	1	31.24	3 (mL)	0.09603
HS18051492-08	1	30.74	3 (mL)	0.09759
HS18051492-10	1	32.21	3 (mL)	0.09314

Batch ID: 128972 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18051492-01	1	10	10 (mL)	1
HS18051492-02	1	10	10 (mL)	1
HS18051492-03	1	10	10 (mL)	1
HS18051492-04	1	10	10 (mL)	1
HS18051492-05	1	10	10 (mL)	1
HS18051492-06	1	10	10 (mL)	1
HS18051492-07	1	10	10 (mL)	1
HS18051492-08	1	10	10 (mL)	1
HS18051492-09	1	10	10 (mL)	1
HS18051492-10	1	10	10 (mL)	1

Batch ID: 129015 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18051492-01	1	10	10 (mL)	1
HS18051492-02	1	10	10 (mL)	1
HS18051492-03	1	10	10 (mL)	1
HS18051492-04	1	10	10 (mL)	1
HS18051492-05	1	10	10 (mL)	1
HS18051492-06	1	10	10 (mL)	1
HS18051492-07	1	10	10 (mL)	1
HS18051492-08	1	10	10 (mL)	1
HS18051492-09	1	10	10 (mL)	1
HS18051492-10	1	10	10 (mL)	1

Batch ID: 129454 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18051492-02	1	10	10 (mL)	1
HS18051492-03	1	10	10 (mL)	1
HS18051492-04	1	10	10 (mL)	1
HS18051492-05	1	10	10 (mL)	1
HS18051492-06	1	10	10 (mL)	1
HS18051492-07	1	10	10 (mL)	1
HS18051492-08	1	10	10 (mL)	1
HS18051492-09	1	10	10 (mL)	1
HS18051492-10	1	10	10 (mL)	1

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18051492

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 128966	**Test Name :** LOW-LEVEL TEXAS TPH BY TX1005			**Matrix:** Water		
HS18051492-05	DGW-MW-10	30 May 2018 16:30		31 May 2018 11:58	02 Jun 2018 00:46	1
HS18051492-08	DGW-MW-4	30 May 2018 18:45		31 May 2018 11:58	02 Jun 2018 01:15	1
HS18051492-10	DUP-01	30 May 2018 00:00		31 May 2018 11:58	02 Jun 2018 02:42	1
Batch ID 128972	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Water		
HS18051492-01	DGW-MW-11	30 May 2018 10:00		31 May 2018 13:28	05 Jun 2018 13:50	5
HS18051492-01	DGW-MW-11	30 May 2018 10:00		31 May 2018 13:28	04 Jun 2018 16:42	5
HS18051492-02	DGW-MW-7	30 May 2018 12:30		31 May 2018 13:28	04 Jun 2018 16:52	1
HS18051492-03	DGW-MW-6	30 May 2018 14:30		31 May 2018 13:28	04 Jun 2018 16:54	1
HS18051492-04	DGW-MW-8	30 May 2018 15:00		31 May 2018 13:28	04 Jun 2018 16:56	1
HS18051492-05	DGW-MW-10	30 May 2018 16:30		31 May 2018 13:28	04 Jun 2018 17:02	1
HS18051492-06	MW-24	30 May 2018 17:25		31 May 2018 13:28	04 Jun 2018 17:04	1
HS18051492-07	DGW-MW-11S	30 May 2018 17:30		31 May 2018 13:28	05 Jun 2018 14:00	1
HS18051492-07	DGW-MW-11S	30 May 2018 17:30		31 May 2018 13:28	04 Jun 2018 17:06	1
HS18051492-08	DGW-MW-4	30 May 2018 18:45		31 May 2018 13:28	04 Jun 2018 17:08	1
HS18051492-09	DGW-MW-5	30 May 2018 19:05		31 May 2018 13:28	04 Jun 2018 17:10	1
HS18051492-10	DUP-01	30 May 2018 00:00		31 May 2018 13:28	04 Jun 2018 17:12	1
Batch ID 129015	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Water		
HS18051492-01	DGW-MW-11	30 May 2018 10:00		01 Jun 2018 11:00	05 Jun 2018 00:22	5
HS18051492-01	DGW-MW-11	30 May 2018 10:00		01 Jun 2018 11:00	04 Jun 2018 17:20	5
HS18051492-02	DGW-MW-7	30 May 2018 12:30		01 Jun 2018 11:00	05 Jun 2018 00:36	10
HS18051492-02	DGW-MW-7	30 May 2018 12:30		01 Jun 2018 11:00	04 Jun 2018 17:34	1
HS18051492-03	DGW-MW-6	30 May 2018 14:30		01 Jun 2018 11:00	05 Jun 2018 00:38	10
HS18051492-03	DGW-MW-6	30 May 2018 14:30		01 Jun 2018 11:00	04 Jun 2018 17:36	1
HS18051492-04	DGW-MW-8	30 May 2018 15:00		01 Jun 2018 11:00	05 Jun 2018 00:40	10
HS18051492-04	DGW-MW-8	30 May 2018 15:00		01 Jun 2018 11:00	04 Jun 2018 17:38	1
HS18051492-05	DGW-MW-10	30 May 2018 16:30		01 Jun 2018 11:00	05 Jun 2018 00:42	10
HS18051492-05	DGW-MW-10	30 May 2018 16:30		01 Jun 2018 11:00	04 Jun 2018 17:40	1
HS18051492-06	MW-24	30 May 2018 17:25		01 Jun 2018 11:00	05 Jun 2018 00:44	10
HS18051492-06	MW-24	30 May 2018 17:25		01 Jun 2018 11:00	04 Jun 2018 17:42	1
HS18051492-07	DGW-MW-11S	30 May 2018 17:30		01 Jun 2018 11:00	05 Jun 2018 00:46	10
HS18051492-07	DGW-MW-11S	30 May 2018 17:30		01 Jun 2018 11:00	04 Jun 2018 17:44	1
HS18051492-08	DGW-MW-4	30 May 2018 18:45		01 Jun 2018 11:00	05 Jun 2018 00:52	10
HS18051492-08	DGW-MW-4	30 May 2018 18:45		01 Jun 2018 11:00	04 Jun 2018 17:50	1
HS18051492-09	DGW-MW-5	30 May 2018 19:05		01 Jun 2018 11:00	05 Jun 2018 00:54	10
HS18051492-09	DGW-MW-5	30 May 2018 19:05		01 Jun 2018 11:00	04 Jun 2018 17:52	1
HS18051492-10	DUP-01	30 May 2018 00:00		01 Jun 2018 11:00	05 Jun 2018 00:56	10
HS18051492-10	DUP-01	30 May 2018 00:00		01 Jun 2018 11:00	04 Jun 2018 17:54	1

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18051492

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 129454	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Water		
HS18051492-02	DGW-MW-7	30 May 2018 12:30		15 Jun 2018 14:00	15 Jun 2018 22:35	10
HS18051492-03	DGW-MW-6	30 May 2018 14:30		15 Jun 2018 14:00	18 Jun 2018 12:58	10
HS18051492-04	DGW-MW-8	30 May 2018 15:00		15 Jun 2018 14:00	15 Jun 2018 22:43	10
HS18051492-05	DGW-MW-10	30 May 2018 16:30		15 Jun 2018 14:00	15 Jun 2018 22:45	10
HS18051492-06	MW-24	30 May 2018 17:25		15 Jun 2018 14:00	15 Jun 2018 22:47	10
HS18051492-07	DGW-MW-11S	30 May 2018 17:30		15 Jun 2018 14:00	15 Jun 2018 22:49	10
HS18051492-08	DGW-MW-4	30 May 2018 18:45		15 Jun 2018 14:00	15 Jun 2018 22:51	10
HS18051492-09	DGW-MW-5	30 May 2018 19:05		15 Jun 2018 14:00	15 Jun 2018 22:53	10
HS18051492-10	DUP-01	30 May 2018 00:00		15 Jun 2018 14:00	15 Jun 2018 22:59	10
Batch ID R317265	**Test Name :** ANIONS BY E300.0			**Matrix:** Water		
HS18051492-01	DGW-MW-11	30 May 2018 10:00			31 May 2018 20:29	100
HS18051492-01	DGW-MW-11	30 May 2018 10:00			31 May 2018 20:07	10
HS18051492-02	DGW-MW-7	30 May 2018 12:30			31 May 2018 21:34	100
HS18051492-02	DGW-MW-7	30 May 2018 12:30			31 May 2018 21:12	10
HS18051492-02	DGW-MW-7	30 May 2018 12:30			31 May 2018 20:50	1
HS18051492-03	DGW-MW-6	30 May 2018 14:30			31 May 2018 23:44	100
HS18051492-03	DGW-MW-6	30 May 2018 14:30			31 May 2018 23:22	10
HS18051492-03	DGW-MW-6	30 May 2018 14:30			31 May 2018 23:01	1
HS18051492-04	DGW-MW-8	30 May 2018 15:00			01 Jun 2018 00:49	100
HS18051492-04	DGW-MW-8	30 May 2018 15:00			01 Jun 2018 00:27	10
HS18051492-04	DGW-MW-8	30 May 2018 15:00			01 Jun 2018 00:06	1
HS18051492-05	DGW-MW-10	30 May 2018 16:30			01 Jun 2018 01:54	100
HS18051492-05	DGW-MW-10	30 May 2018 16:30			01 Jun 2018 01:33	10
HS18051492-05	DGW-MW-10	30 May 2018 16:30			01 Jun 2018 01:11	1
HS18051492-06	MW-24	30 May 2018 17:25			01 Jun 2018 04:04	100
HS18051492-06	MW-24	30 May 2018 17:25			01 Jun 2018 03:43	10
HS18051492-06	MW-24	30 May 2018 17:25			01 Jun 2018 03:21	1
HS18051492-07	DGW-MW-11S	30 May 2018 17:30			01 Jun 2018 05:31	100
HS18051492-07	DGW-MW-11S	30 May 2018 17:30			01 Jun 2018 04:26	10
HS18051492-08	DGW-MW-4	30 May 2018 18:45			01 Jun 2018 06:15	10
HS18051492-08	DGW-MW-4	30 May 2018 18:45			01 Jun 2018 05:53	1
HS18051492-09	DGW-MW-5	30 May 2018 19:05			01 Jun 2018 08:25	100
HS18051492-09	DGW-MW-5	30 May 2018 19:05			01 Jun 2018 08:03	10
HS18051492-09	DGW-MW-5	30 May 2018 19:05			01 Jun 2018 07:41	1
HS18051492-10	DUP-01	30 May 2018 00:00			01 Jun 2018 09:30	100
HS18051492-10	DUP-01	30 May 2018 00:00			01 Jun 2018 09:08	10
HS18051492-10	DUP-01	30 May 2018 00:00			01 Jun 2018 08:46	1

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18051492

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R317270	**Test Name :** TOC, DISSOLVED - SM5310B				**Matrix:** Water	
HS18051492-01	DGW-MW-11	30 May 2018 10:00			01 Jun 2018 20:55	2
HS18051492-02	DGW-MW-7	30 May 2018 12:30			01 Jun 2018 21:09	2
HS18051492-03	DGW-MW-6	30 May 2018 14:30			01 Jun 2018 21:37	2
HS18051492-04	DGW-MW-8	30 May 2018 15:00			01 Jun 2018 21:52	2
HS18051492-05	DGW-MW-10	30 May 2018 16:30			01 Jun 2018 22:06	2
HS18051492-06	MW-24	30 May 2018 17:25			01 Jun 2018 23:03	2
HS18051492-08	DGW-MW-4	30 May 2018 18:45			01 Jun 2018 23:16	2
HS18051492-09	DGW-MW-5	30 May 2018 19:05			01 Jun 2018 23:29	2
HS18051492-10	DUP-01	30 May 2018 00:00			02 Jun 2018 00:00	2
Batch ID R317285	**Test Name :** ALKALINITY BY SM2320B				**Matrix:** Water	
HS18051492-01	DGW-MW-11	30 May 2018 10:00			02 Jun 2018 14:43	1
HS18051492-02	DGW-MW-7	30 May 2018 12:30			02 Jun 2018 14:50	1
HS18051492-03	DGW-MW-6	30 May 2018 14:30			02 Jun 2018 15:15	1
HS18051492-04	DGW-MW-8	30 May 2018 15:00			02 Jun 2018 15:22	1
HS18051492-05	DGW-MW-10	30 May 2018 16:30			02 Jun 2018 15:30	1
HS18051492-06	MW-24	30 May 2018 17:25			02 Jun 2018 15:37	1
HS18051492-07	DGW-MW-11S	30 May 2018 17:30			02 Jun 2018 15:44	1
HS18051492-08	DGW-MW-4	30 May 2018 18:45			02 Jun 2018 15:51	1
HS18051492-09	DGW-MW-5	30 May 2018 19:05			02 Jun 2018 15:58	1
HS18051492-10	DUP-01	30 May 2018 00:00			02 Jun 2018 16:06	1
Batch ID R317316	**Test Name :** TOTAL ORGANIC CARBON - SM5310B				**Matrix:** Water	
HS18051492-01	DGW-MW-11	30 May 2018 10:00			02 Jun 2018 17:43	1
HS18051492-02	DGW-MW-7	30 May 2018 12:30			02 Jun 2018 17:56	1
HS18051492-03	DGW-MW-6	30 May 2018 14:30			02 Jun 2018 18:27	1
HS18051492-04	DGW-MW-8	30 May 2018 15:00			02 Jun 2018 18:40	1
HS18051492-05	DGW-MW-10	30 May 2018 16:30			02 Jun 2018 18:55	1
HS18051492-06	MW-24	30 May 2018 17:25			02 Jun 2018 19:54	1
HS18051492-08	DGW-MW-4	30 May 2018 18:45			02 Jun 2018 20:08	1
HS18051492-09	DGW-MW-5	30 May 2018 19:05			02 Jun 2018 20:23	1
HS18051492-10	DUP-01	30 May 2018 00:00			02 Jun 2018 20:51	1

Revision:1

WorkOrder: HS18051492
InstrumentID: FID-12
Test Code: TX1005_W_Low
Test Number: TX1005
Test Name: Low-level Texas TPH by TX1005

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	nC6 to nC12	TPH-1005-1	0.20	0.21	0.20	0.50
A	>nC12 to nC28	TPH-1005-2	0.20	0.20	0.20	0.50
A	>nC28 to nC35	TPH-1005-4	0.20	0.20	0.20	0.50
A	Total Petroleum Hydrocarbon	TPH	0.20	0.20	0.20	0.50
S	2-Fluorobiphenyl	321-60-8	0	0	0	0
S	Trifluoromethyl benzene	98-08-8	0	0	0	0

Revision:1

WorkOrder: HS18051492
InstrumentID: ICPMS05
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.00100	0.000956	0.000400	0.00200
A	Arsenic	7440-38-2	0.00100	0.000990	0.000400	0.00200
A	Cadmium	7440-43-9	0.00100	0.00101	0.000200	0.00200
A	Calcium	7440-70-2	0.100	0.106	0.0340	0.500
A	Iron	7439-89-6	0.100	0.102	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.00115	0.000600	0.00200
A	Magnesium	7439-95-4	0.100	0.109	0.0100	0.200
A	Selenium	7782-49-2	0.00200	0.000378	0.00110	0.00200

Revision:1

WorkOrder: HS18051492
InstrumentID: ICPMS05
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.00100	0.000956	0.000400	0.00200
A	Arsenic	7440-38-2	0.00100	0.000990	0.000400	0.00200
A	Cadmium	7440-43-9	0.00100	0.00101	0.000200	0.00200
A	Calcium	7440-70-2	0.100	0.106	0.0340	0.500
A	Iron	7439-89-6	0.100	0.102	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.00115	0.000600	0.00200
A	Magnesium	7439-95-4	0.100	0.109	0.0100	0.200
A	Selenium	7782-49-2	0.00200	0.000378	0.00110	0.00200

Revision:1

WorkOrder: HS18051492
InstrumentID: ICS3K2
Test Code: 300_W
Test Number: E300
Test Name: Anions by E300.0

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Chloride	16887-00-6	0.250	0.531	0.200	0.500
A	Nitrate/Nitrite (as N)	ARC-NO3NO2N	0.100	0.317	0.0300	0.200
A	Sulfate	14808-79-8	0.250	0.552	0.200	0.500

Revision:1

WorkOrder: HS18051492
InstrumentID: ManTech01
Test Code: ALK_W 2320B
Test Number: SM2320B
Test Name: Alkalinity by SM2320B

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Alkalinity, Bicarbonate (As CaCO3)	ALK-Bicarb	5.00	4.55	5.00	5.00
A	Alkalinity, Carbonate (As CaCO3)	ALK-Carb	5.00	4.55	5.00	5.00
A	Alkalinity, Hydroxide (As CaCO3)	ALK-Hyd	5.00	4.55	5.00	5.00
A	Alkalinity, Total (As CaCO3)	ALK	5.00	4.55	5.00	5.00

Revision:1

WorkOrder: HS18051492
InstrumentID: TOC_02
Test Code: TOC_Diss_5310B
Test Number: SM5310B
Test Name: TOC, Dissolved - SM5310B

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Organic Carbon, Dissolved	DOC	0.600	0.585	0.500	1.00

Revision:1

WorkOrder: HS18051492
InstrumentID: TOC_02
Test Code: TOC_W 5310B
Test Number: SM5310B
Test Name: Total Organic Carbon - SM5310B

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Organic Carbon, Total	7440-44-0	0.600	0.585	0.500	1.00

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18051492

QC BATCH REPORT

Batch ID: 128966 **Instrument: FID-12** **Method: TX1005**

MBLK Sample ID: **MBLK-128966** Units: **mg/L** Analysis Date: **01-Jun-2018 17:02**
Client ID: Run ID: **FID-12_317342** SeqNo: **4585722** PrepDate: **31-May-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
nC6 to nC12	U	0.50								
>nC12 to nC28	U	0.50								
>nC28 to nC35	U	0.50								
Total Petroleum Hydrocarbon	U	0.50								
Surr: 2-Fluorobiphenyl	*2.194*	*0*	*2.5*	*0*	*87.7*	*70 - 130*				
Surr: Trifluoromethyl benzene	*2.179*	*0*	*2.5*	*0*	*87.2*	*70 - 130*				

LCS Sample ID: **LCS-128966** Units: **mg/L** Analysis Date: **01-Jun-2018 17:31**
Client ID: Run ID: **FID-12_317342** SeqNo: **4585723** PrepDate: **31-May-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
nC6 to nC12	23.43	0.50	25	0	93.7	75 - 125				
>nC12 to nC28	26.07	0.50	25	0	104	75 - 125				
Surr: 2-Fluorobiphenyl	*2.182*	*0*	*2.5*	*0*	*87.3*	*70 - 130*				
Surr: Trifluoromethyl benzene	*1.975*	*0*	*2.5*	*0*	*79.0*	*70 - 130*				

LCSD Sample ID: **LCSD-128966** Units: **mg/L** Analysis Date: **01-Jun-2018 18:00**
Client ID: Run ID: **FID-12_317342** SeqNo: **4585724** PrepDate: **31-May-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
nC6 to nC12	22.99	0.50	25	0	92.0	75 - 125	23.43	1.9	20	
>nC12 to nC28	26.05	0.50	25	0	104	75 - 125	26.07	0.0794	20	
Surr: 2-Fluorobiphenyl	*2.094*	*0*	*2.5*	*0*	*83.8*	*70 - 130*	*2.182*	*4.08*	*20*	
Surr: Trifluoromethyl benzene	*1.937*	*0*	*2.5*	*0*	*77.5*	*70 - 130*	*1.975*	*1.95*	*20*	

MS Sample ID: **HS18051493-01MS** Units: **mg/L** Analysis Date: **01-Jun-2018 18:58**
Client ID: Run ID: **FID-12_317342** SeqNo: **4585726** PrepDate: **31-May-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
nC6 to nC12	24.33	0.50	24.8	0	98.1	75 - 125				
>nC12 to nC28	29.2	0.50	24.8	0	118	75 - 125				
Surr: 2-Fluorobiphenyl	*2.28*	*0*	*2.48*	*0*	*91.9*	*70 - 130*				
Surr: Trifluoromethyl benzene	*2.05*	*0*	*2.48*	*0*	*82.7*	*70 - 130*				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18051492

QC BATCH REPORT

Batch ID: 128966 **Instrument: FID-12** **Method: TX1005**

MSD Sample ID: **HS18051493-01MSD** Units: **mg/L** Analysis Date: **01-Jun-2018 19:27**
Client ID: Run ID: **FID-12_317342** SeqNo: **4585727** PrepDate: **31-May-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
nC6 to nC12	22.98	0.48	24.13	0	95.2	75 - 125	24.33	5.74	20	
>nC12 to nC28	24.66	0.48	24.13	0	102	75 - 125	29.2	16.8	20	
Surr: 2-Fluorobiphenyl	*2.201*	*0*	*2.413*	*0*	*91.2*	*70 - 130*	*2.28*	*3.55*	*20*	
Surr: Trifluoromethyl benzene	*1.999*	*0*	*2.413*	*0*	*82.8*	*70 - 130*	*2.05*	*2.54*	*20*	

The following samples were analyzed in this batch: HS18051492-05 HS18051492-08 HS18051492-10

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18051492

QC BATCH REPORT

Batch ID: 128972 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLK-128972** Units: **mg/L** Analysis Date: **04-Jun-2018 16:38**
Client ID: Run ID: **ICPMS05_317305** SeqNo: **4586448** PrepDate: **31-May-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01329	0.200								J
Selenium	U	0.00200								

MBLK Sample ID: **MBLK-128972** Units: **mg/L** Analysis Date: **04-Jun-2018 23:15**
Client ID: Run ID: **ICPMS05_317305** SeqNo: **4586606** PrepDate: **31-May-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	U	0.00200								

LCS Sample ID: **LCS-128972** Units: **mg/L** Analysis Date: **04-Jun-2018 16:40**
Client ID: Run ID: **ICPMS05_317305** SeqNo: **4586449** PrepDate: **31-May-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04958	0.00200	0.05	0	99.2	80 - 120				
Arsenic	0.05027	0.00200	0.05	0	101	80 - 120				
Cadmium	0.04995	0.00200	0.05	0	99.9	80 - 120				
Iron	5.022	0.200	5	0	100	80 - 120				
Magnesium	4.891	0.200	5	0	97.8	80 - 120				
Selenium	0.05112	0.00200	0.05	0	102	80 - 120				

LCS Sample ID: **LCS-128972** Units: **mg/L** Analysis Date: **04-Jun-2018 23:17**
Client ID: Run ID: **ICPMS05_317305** SeqNo: **4586607** PrepDate: **31-May-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.04702	0.00200	0.05	0	94.0	80 - 120				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18051492

QC BATCH REPORT

Batch ID: 128972 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MS Sample ID: **HS18051492-01MS** Units: **mg/L** Analysis Date: **04-Jun-2018 16:46**
Client ID: **DGW-MW-11** Run ID: **ICPMS05_317305** SeqNo: **4586452** PrepDate: **31-May-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05118	0.0100	0.05	0.00448	93.4	75 - 125				
Arsenic	0.05048	0.0100	0.05	0.001896	97.2	75 - 125				
Cadmium	0.07386	0.0100	0.05	0.0259	95.9	75 - 125				
Calcium	539.7	2.50	5	529.3	209	75 - 125				SO
Iron	18.83	1.00	5	13.99	96.8	75 - 125				
Magnesium	321.4	1.00	5	323.2	-37.3	75 - 125				SO
Selenium	0.0573	0.0100	0.05	0.005442	104	75 - 125				

MS Sample ID: **HS18051492-01MS** Units: **mg/L** Analysis Date: **05-Jun-2018 13:54**
Client ID: **DGW-MW-11** Run ID: **ICPMS05_317395** SeqNo: **4587741** PrepDate: **31-May-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	490.7	2.50	5	509.8	-383	75 - 125				SO
Lead	0.0802	0.0100	0.05	0.0338	92.8	75 - 125				

MSD Sample ID: **HS18051492-01MSD** Units: **mg/L** Analysis Date: **04-Jun-2018 16:48**
Client ID: **DGW-MW-11** Run ID: **ICPMS05_317305** SeqNo: **4586453** PrepDate: **31-May-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05221	0.0100	0.05	0.00448	95.5	75 - 125	0.05118	1.99	20	
Arsenic	0.05315	0.0100	0.05	0.001896	103	75 - 125	0.05048	5.16	20	
Cadmium	0.07556	0.0100	0.05	0.0259	99.3	75 - 125	0.07386	2.28	20	
Calcium	529.9	2.50	5	529.3	13.0	75 - 125	539.7	1.83	20	SO
Iron	19.11	1.00	5	13.99	102	75 - 125	18.83	1.48	20	
Magnesium	326.2	1.00	5	323.2	58.7	75 - 125	321.4	1.48	20	SO
Selenium	0.05348	0.0100	0.05	0.005442	96.1	75 - 125	0.0573	6.91	20	

MSD Sample ID: **HS18051492-01MSD** Units: **mg/L** Analysis Date: **05-Jun-2018 13:56**
Client ID: **DGW-MW-11** Run ID: **ICPMS05_317395** SeqNo: **4587742** PrepDate: **31-May-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	493.7	2.50	5	509.8	-322	75 - 125	490.7	0.623	20	SO
Lead	0.07996	0.0100	0.05	0.0338	92.3	75 - 125	0.0802	0.301	20	

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18051492

QC BATCH REPORT

Batch ID: 128972 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

PDS Sample ID: **HS18051492-01PDS** Units: **mg/L** Analysis Date: **05-Jun-2018 13:58**
Client ID: **DGW-MW-11** Run ID: **ICPMS05_317395** SeqNo: **4587743** PrepDate: **31-May-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	576.7	2.50	50	509.8	134	75 - 125				SO
Lead	0.4961	0.0100	0.5	0.0338	92.5	75 - 125				

SD Sample ID: **HS18051492-01SD** Units: **mg/L** Analysis Date: **04-Jun-2018 16:44**
Client ID: **DGW-MW-11** Run ID: **ICPMS05_317305** SeqNo: **4586451** PrepDate: **31-May-2018** DF: **25**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0500					0.00448	0	10	
Arsenic	U	0.0500					0.001896	0	10	
Cadmium	0.02471	0.0500					0.0259	0	10	J
Iron	14.91	5.00					13.99	6.58	10	
Magnesium	313.8	5.00					323.2	2.93	10	
Selenium	U	0.0500					0.005442	0	10	

SD Sample ID: **HS18051492-01SD** Units: **mg/L** Analysis Date: **05-Jun-2018 13:52**
Client ID: **DGW-MW-11** Run ID: **ICPMS05_317395** SeqNo: **4587740** PrepDate: **31-May-2018** DF: **25**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	507.8	12.5					509.8	0.39	10	
Lead	0.03693	0.0500					0.0338	0	10	J

The following samples were analyzed in this batch:

HS18051492-01	HS18051492-02	HS18051492-03	HS18051492-04
HS18051492-05	HS18051492-06	HS18051492-07	HS18051492-08
HS18051492-09	HS18051492-10		

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18051492

QC BATCH REPORT

Batch ID: 129015 **Instrument: ICPMS05** **Method: SW6020**

MBLK Sample ID: **MBLK-129015** Units: **mg/L** Analysis Date: **04-Jun-2018 17:16**
Client ID: Run ID: **ICPMS05_317305** SeqNo: **4586467** PrepDate: **01-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Iron	U	0.200								
Magnesium	0.01506	0.200								J
Selenium	U	0.00200								

MBLK Sample ID: **MBLK-129015** Units: **mg/L** Analysis Date: **05-Jun-2018 00:18**
Client ID: Run ID: **ICPMS05_317305** SeqNo: **4586622** PrepDate: **01-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	U	0.500								
Lead	U	0.00200								

LCS Sample ID: **LCS-129015** Units: **mg/L** Analysis Date: **04-Jun-2018 17:18**
Client ID: Run ID: **ICPMS05_317305** SeqNo: **4586468** PrepDate: **01-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04901	0.00200	0.05	0	98.0	80 - 120				
Arsenic	0.04895	0.00200	0.05	0	97.9	80 - 120				
Cadmium	0.05082	0.00200	0.05	0	102	80 - 120				
Iron	5.026	0.200	5	0	101	80 - 120				
Magnesium	4.632	0.200	5	0	92.6	80 - 120				
Selenium	0.04964	0.00200	0.05	0	99.3	80 - 120				

LCS Sample ID: **LCS-129015** Units: **mg/L** Analysis Date: **05-Jun-2018 00:20**
Client ID: Run ID: **ICPMS05_317305** SeqNo: **4586623** PrepDate: **01-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	4.874	0.500	5	0	97.5	80 - 120				
Lead	0.04902	0.00200	0.05	0	98.0	80 - 120				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18051492

QC BATCH REPORT

Batch ID: 129015 **Instrument: ICPMS05** **Method: SW6020**

MS Sample ID: **HS18051492-01MS** Units: **mg/L** Analysis Date: **04-Jun-2018 17:28**
Client ID: **DGW-MW-11** Run ID: **ICPMS05_317305** SeqNo: **4586473** PrepDate: **01-Jun-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05367	0.0100	0.05	0.004668	98.0	80 - 120				
Arsenic	0.05232	0.0100	0.05	0.001542	102	80 - 120				
Cadmium	0.07397	0.0100	0.05	0.02544	97.1	80 - 120				
Iron	18.59	1.00	5	13.59	100.0	80 - 120				
Magnesium	286.9	1.00	5	301.9	-299	80 - 120				SO
Selenium	0.05217	0.0100	0.05	0.004925	94.5	80 - 120				

MS Sample ID: **HS18051492-01MS** Units: **mg/L** Analysis Date: **05-Jun-2018 00:26**
Client ID: **DGW-MW-11** Run ID: **ICPMS05_317305** SeqNo: **4586626** PrepDate: **01-Jun-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	516.7	2.50	5	543.6	-539	80 - 120				SO
Lead	0.0813	0.0100	0.05	0.03619	90.2	80 - 120				

MSD Sample ID: **HS18051492-01MSD** Units: **mg/L** Analysis Date: **04-Jun-2018 17:30**
Client ID: **DGW-MW-11** Run ID: **ICPMS05_317305** SeqNo: **4586474** PrepDate: **01-Jun-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05488	0.0100	0.05	0.004668	100	80 - 120	0.05367	2.22	20	
Arsenic	0.0529	0.0100	0.05	0.001542	103	80 - 120	0.05232	1.1	20	
Cadmium	0.07666	0.0100	0.05	0.02544	102	80 - 120	0.07397	3.58	20	
Iron	18.4	1.00	5	13.59	96.2	80 - 120	18.59	1.01	20	
Magnesium	288.2	1.00	5	301.9	-274	80 - 120	286.9	0.421	20	SO
Selenium	0.05895	0.0100	0.05	0.004925	108	80 - 120	0.05217	12.2	20	

MSD Sample ID: **HS18051492-01MSD** Units: **mg/L** Analysis Date: **05-Jun-2018 00:28**
Client ID: **DGW-MW-11** Run ID: **ICPMS05_317305** SeqNo: **4586627** PrepDate: **01-Jun-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	533.6	2.50	5	543.6	-201	80 - 120	516.7	3.22	20	SO
Lead	0.08505	0.0100	0.05	0.03619	97.7	80 - 120	0.0813	4.51	20	

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18051492

QC BATCH REPORT

Batch ID: 129015 **Instrument: ICPMS05** **Method: SW6020**

PDS Sample ID: **HS18051492-01PDS** Units: **mg/L** Analysis Date: **04-Jun-2018 17:32**
Client ID: **DGW-MW-11** Run ID: **ICPMS05_317305** SeqNo: **4586475** PrepDate: **01-Jun-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.4523	0.0100	0.5	0.004668	89.5	75 - 125				
Arsenic	0.4982	0.0100	0.5	0	99.6	75 - 125				
Cadmium	0.5339	0.0100	0.5	0.02544	102	75 - 125				
Iron	62.58	1.00	50	13.59	98.0	75 - 125				
Magnesium	342.3	1.00	50	301.9	80.9	75 - 125				O
Selenium	0.5212	0.0100	0.5	0	104	75 - 125				

PDS Sample ID: **HS18051492-01PDS** Units: **mg/L** Analysis Date: **05-Jun-2018 00:30**
Client ID: **DGW-MW-11** Run ID: **ICPMS05_317305** SeqNo: **4586628** PrepDate: **01-Jun-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	593.7	2.50	50	543.6	100	75 - 125				O
Lead	0.4985	0.0100	0.5	0.03619	92.5	75 - 125				

SD Sample ID: **HS18051492-01SD** Units: **mg/L** Analysis Date: **04-Jun-2018 17:26**
Client ID: **DGW-MW-11** Run ID: **ICPMS05_317305** SeqNo: **4586472** PrepDate: **01-Jun-2018** DF: **25**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0500					0.004668	0	10	
Arsenic	U	0.0500					0.001542	0	10	
Cadmium	0.02211	0.0500					0.02544	0	10	J
Iron	14.2	5.00					13.59	4.45	10	
Magnesium	291.2	5.00					301.9	3.52	10	
Selenium	U	0.0500					0.004925	0	10	

SD Sample ID: **HS18051492-01SD** Units: **mg/L** Analysis Date: **05-Jun-2018 00:24**
Client ID: **DGW-MW-11** Run ID: **ICPMS05_317305** SeqNo: **4586625** PrepDate: **01-Jun-2018** DF: **25**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	529.8	12.5					543.6	2.55	10	
Lead	0.03576	0.0500					0.03619	0	10	J

The following samples were analyzed in this batch:

HS18051492-01	HS18051492-02	HS18051492-03	HS18051492-04
HS18051492-05	HS18051492-06	HS18051492-07	HS18051492-08
HS18051492-09	HS18051492-10		

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18051492

QC BATCH REPORT

Batch ID: 129454 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLK-129454** Units: **mg/L** Analysis Date: **15-Jun-2018 22:27**
Client ID: Run ID: **ICPMS05_318049** SeqNo: **4612138** PrepDate: **15-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	U	0.500								
Magnesium	0.01532	0.200								J

LCS Sample ID: **LCS-129454** Units: **mg/L** Analysis Date: **15-Jun-2018 22:29**
Client ID: Run ID: **ICPMS05_318049** SeqNo: **4612139** PrepDate: **15-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	4.707	0.500	5	0	94.1	80 - 120				
Magnesium	4.781	0.200	5	0	95.6	80 - 120				

MS Sample ID: **HS18051492-03MS** Units: **mg/L** Analysis Date: **15-Jun-2018 23:27**
Client ID: **DGW-MW-6** Run ID: **ICPMS05_318049** SeqNo: **4612168** PrepDate: **15-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	467	0.500	5	485.9	-379	75 - 125				SEO
Magnesium	50.13	0.200	5	44.9	105	75 - 125				O

MSD Sample ID: **HS18051492-03MSD** Units: **mg/L** Analysis Date: **15-Jun-2018 23:29**
Client ID: **DGW-MW-6** Run ID: **ICPMS05_318049** SeqNo: **4612169** PrepDate: **15-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	498.5	0.500	5	485.9	251	75 - 125	467	6.52	20	SEO
Magnesium	52.73	0.200	5	44.9	157	75 - 125	50.13	5.05	20	SO

PDS Sample ID: **HS18051492-03PDS** Units: **mg/L** Analysis Date: **15-Jun-2018 22:41**
Client ID: **DGW-MW-6** Run ID: **ICPMS05_318049** SeqNo: **4612145** PrepDate: **15-Jun-2018** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	366	5.00	100	466.5	-101	75 - 125				SO
Magnesium	127	2.00	100	43.54	83.4	75 - 125				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18051492

QC BATCH REPORT

Batch ID: 129454 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

SD Sample ID: **HS18051492-03SD** Units: **mg/L** Analysis Date: **18-Jun-2018 13:00**
Client ID: **DGW-MW-6** Run ID: **ICPMS05_318132** SeqNo: **4613154** PrepDate: **15-Jun-2018** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	483.9	25.0					466.5	3.73	10	
Magnesium	44.96	10.0					43.54	3.27	10	

The following samples were analyzed in this batch: HS18051492-02 HS18051492-03 HS18051492-04 HS18051492-05 HS18051492-06 HS18051492-07 HS18051492-08 HS18051492-09 HS18051492-10

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18051492

QC BATCH REPORT

Batch ID: R317265 **Instrument: ICS3K2** **Method: E300**

MBLK Sample ID: **WBLKW1-053118** Units: **mg/L** Analysis Date: **31-May-2018 18:06**
Client ID: Run ID: **ICS3K2_317265** SeqNo: **4584006** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	0.500								
Nitrate/Nitrite (as N)	U	0.200								
Sulfate	U	0.500								

LCS Sample ID: **WLCSW1-053118** Units: **mg/L** Analysis Date: **31-May-2018 18:28**
Client ID: Run ID: **ICS3K2_317265** SeqNo: **4584007** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.04	0.500	20	0	100	90 - 110				
Nitrate/Nitrite (as N)	8.457	0.200	8	0	106	90 - 110				
Sulfate	18.6	0.500	20	0	93.0	90 - 110				

LCSD Sample ID: **WLCSDW1-053118** Units: **mg/L** Analysis Date: **31-May-2018 18:49**
Client ID: Run ID: **ICS3K2_317265** SeqNo: **4584008** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.14	0.500	20	0	101	90 - 110	20.04	0.508	20	
Nitrate/Nitrite (as N)	8.498	0.200	8	0	106	90 - 110	8.457	0.484	20	
Sulfate	18.75	0.500	20	0	93.8	90 - 110	18.6	0.782	20	

MS Sample ID: **HS18051515-01MS** Units: **mg/L** Analysis Date: **01-Jun-2018 12:23**
Client ID: Run ID: **ICS3K2_317265** SeqNo: **4584051** PrepDate: DF: **20**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	911.6	10.0	200	699.6	106	80 - 120				
Nitrate/Nitrite (as N)	263.2	4.00	80	173.6	112	80 - 120				
Sulfate	832.4	10.0	200	626.9	103	80 - 120				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18051492

QC BATCH REPORT

Batch ID: R317265 **Instrument: ICS3K2** **Method: E300**

MS Sample ID: **HS18051492-07MS** Units: **mg/L** Analysis Date: **01-Jun-2018 04:48**
Client ID: **DGW-MW-11S** Run ID: **ICS3K2_317265** SeqNo: **4585475** PrepDate: DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	309.4	5.00	100	209.1	100	80 - 120				
Nitrate/Nitrite (as N)	49.8	2.00	40	7.616	105	80 - 120				
Sulfate	4967	5.00	100	4949	18.3	80 - 120				SEO

MSD Sample ID: **HS18051515-01MSD** Units: **mg/L** Analysis Date: **01-Jun-2018 12:45**
Client ID: Run ID: **ICS3K2_317265** SeqNo: **4584052** PrepDate: DF: **20**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	907.6	10.0	200	699.6	104	80 - 120	911.6	0.441	20	
Nitrate/Nitrite (as N)	262.6	4.00	80	173.6	111	80 - 120	263.2	0.231	20	
Sulfate	830.1	10.0	200	626.9	102	80 - 120	832.4	0.277	20	

MSD Sample ID: **HS18051492-07MSD** Units: **mg/L** Analysis Date: **01-Jun-2018 05:10**
Client ID: **DGW-MW-11S** Run ID: **ICS3K2_317265** SeqNo: **4585476** PrepDate: DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	309.6	5.00	100	209.1	101	80 - 120	309.4	0.0481	20	
Nitrate/Nitrite (as N)	49.8	2.00	40	7.616	105	80 - 120	49.8	0.00402	20	
Sulfate	4964	5.00	100	4949	14.9	80 - 120	4967	0.0698	20	SEO

The following samples were analyzed in this batch:

HS18051492-01	HS18051492-02	HS18051492-03	HS18051492-04
HS18051492-05	HS18051492-06	HS18051492-07	HS18051492-08
HS18051492-09	HS18051492-10		

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18051492

QC BATCH REPORT

Batch ID: R317270 **Instrument: TOC_02** **Method: SM5310B**

MBLK Sample ID: **WBLKW1-180601** Units: **mg/L** Analysis Date: **01-Jun-2018 20:16**
Client ID: Run ID: **TOC_02_317270** SeqNo: **4584365** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Dissolved	U	1.00								

LCS Sample ID: **WLCSW1-180601** Units: **mg/L** Analysis Date: **01-Jun-2018 20:29**
Client ID: Run ID: **TOC_02_317270** SeqNo: **4584366** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Dissolved	9.857	1.00	10	0	98.6	85 - 115				

LCSD Sample ID: **WLCSDW1-180601** Units: **mg/L** Analysis Date: **01-Jun-2018 20:42**
Client ID: Run ID: **TOC_02_317270** SeqNo: **4584367** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Dissolved	9.85	1.00	10	0	98.5	85 - 115	9.857	0.071	20	

MS Sample ID: **HS18060008-01MS** Units: **mg/L** Analysis Date: **02-Jun-2018 00:26**
Client ID: Run ID: **TOC_02_317270** SeqNo: **4584380** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Dissolved	18.18	1.00	10	8.12	101	80 - 120				

The following samples were analyzed in this batch:

HS18051492-01	HS18051492-02	HS18051492-03	HS18051492-04
HS18051492-05	HS18051492-06	HS18051492-08	HS18051492-09
HS18051492-10			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18051492

QC BATCH REPORT

Batch ID: R317285 **Instrument: ManTech01** **Method: SM2320B**

MBLK Sample ID: **WBLKW1-180602** Units: **mg/L** Analysis Date: **02-Jun-2018 13:38**
Client ID: Run ID: **ManTech01_317285** SeqNo: **4584666** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	U	5.00								
Alkalinity, Carbonate (As CaCO3)	U	5.00								
Alkalinity, Hydroxide (As CaCO3)	U	5.00								
Alkalinity, Total (As CaCO3)	U	5.00								

LCS Sample ID: **LCS1-180602** Units: **mg/L** Analysis Date: **02-Jun-2018 13:48**
Client ID: Run ID: **ManTech01_317285** SeqNo: **4584667** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1084	5.00	1000	0	108	85 - 115				
Alkalinity, Total (As CaCO3)	1098	5.00	1000	0	110	85 - 115				

LCSD Sample ID: **LCSD1-180602** Units: **mg/L** Analysis Date: **02-Jun-2018 13:58**
Client ID: Run ID: **ManTech01_317285** SeqNo: **4584668** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1085	5.00	1000	0	108	85 - 115	1084	0.06	20	
Alkalinity, Total (As CaCO3)	1100	5.00	1000	0	110	85 - 115	1098	0.2	20	

DUP Sample ID: **HS18051369-01DUP** Units: **mg/L** Analysis Date: **02-Jun-2018 16:42**
Client ID: Run ID: **ManTech01_317285** SeqNo: **4584687** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	301.3	5.00					302	0.235	20	
Alkalinity, Carbonate (As CaCO3)	U	5.00					0	0	20	
Alkalinity, Hydroxide (As CaCO3)	U	5.00					0	0	20	
Alkalinity, Total (As CaCO3)	301.3	5.00					302	0.235	20	

The following samples were analyzed in this batch:

HS18051492-01	HS18051492-02	HS18051492-03	HS18051492-04
HS18051492-05	HS18051492-06	HS18051492-07	HS18051492-08
HS18051492-09	HS18051492-10		

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18051492

QC BATCH REPORT

Batch ID: R317316 **Instrument: TOC_02** **Method: SM5310B**

MBLK Sample ID: **WBLKW1-180602** Units: **mg/L** Analysis Date: **02-Jun-2018 17:04**
Client ID: Run ID: **TOC_02_317316** SeqNo: **4585253** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	U	1.00								

LCS Sample ID: **WLCSW1-180602** Units: **mg/L** Analysis Date: **02-Jun-2018 17:17**
Client ID: Run ID: **TOC_02_317316** SeqNo: **4585254** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.857	1.00	10	0	98.6	85 - 115				

LCSD Sample ID: **WLCSDW1-180602** Units: **mg/L** Analysis Date: **02-Jun-2018 17:30**
Client ID: Run ID: **TOC_02_317316** SeqNo: **4585255** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.05	1.00	10	0	100	85 - 115	9.857	1.94	20	

MS Sample ID: **HS18051419-01MS** Units: **mg/L** Analysis Date: **02-Jun-2018 21:20**
Client ID: Run ID: **TOC_02_317316** SeqNo: **4585268** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	15.74	1.00	10	6.248	94.9	80 - 120				

The following samples were analyzed in this batch:

HS18051492-01	HS18051492-02	HS18051492-03	HS18051492-04
HS18051492-05	HS18051492-06	HS18051492-08	HS18051492-09
HS18051492-10			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: **HS18051492**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
California	2919 2016-2018	31-Jul-2018
Oklahoma	2017-088	31-Aug-2018
North Carolina	624-2018	31-Dec-2018
Louisiana	03087 2017-2018	30-Jun-2018
Arkansas	88-0356	27-Mar-2019
Kansas	E-10352 2017-218	31-Jul-2018
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193	30-Apr-2019

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS18051492
Date/Time Received: **31-May-2018 09:00**
Received by: **NDR**

Checklist completed by: *Paresh M. Giga* eSignature — 31-May-2018 Date
Reviewed by: *Dane J. Wacasey* eSignature — 31-May-2018 Date

Matrices: **Water**
Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	2.6c/2.2c U/c	IR30	
Cooler(s)/Kit(s):	43534		
Date/Time sample(s) sent to storage:	5/31/18 11:55		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☑	N/A ☐
pH adjusted?	Yes ☑	No ☐	N/A ☐
pH adjusted by:	Nilesh D. Ranchod		

Login Notes: DGW-MW-7; DGW-MW-8 & MW-24: DOC received filed filtered in neat vials.
Transferred sampled to preserved amber vials 5/31/18 @ 11:00

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070

Chain of Custody Form

Page 1 of 1

HS18051492

WV

Golder Associates
Exide DGW PDI

Cooler # 43534, TRK# 4380 9529 4666 6 COC ID: 180498

ALS Project Manager:

Customer Information		Project Information	
Purchase Order	1302086	Project Name	Exide DGW PDI
Work Order		Project Number	1302086
Company Name	Golder Associates	Bill To Company	Golder Associates
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021
Phone	(314) 984-8800	Phone	(314) 984-8800
Fax		Fax	
e-Mail Address	ewhite@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com

A	300_W (E300 Cl, SO4, *NO3, NO2*)-*48hr HT*
B	ALK_W 2320B (2320B Alkalinity)
C	TOC_W 5310B (5310B TOC)
D	TOC_Diss_5310B (5310B Dissolved Organic Carbon (FdFltr)
E	ICP_TW (Total Sb, As, Ca, Cd, Fe, Pb, Mg, Se)
F	ICP_DISS (6020 Diss Sb, As, Cd, Pb, Se (FdFltr))
G	TX1005_W_Low (TX1005 TPH)
H	TX1006_W (TX1006 TPH (Contingent))
I	
J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	DGW-MW-11	5/30/18	1000	Water	2,3,8	~~10~~ 7	X	X	X	X	X	X	~~X~~	~~X~~			
2	DGW-MW-7		1230				X	X	X	X	X	X					
3	DGW-MW-6		1430				X	X	X	X	X	X					
4	DGW-MW-8		1600				X	X	X	X	X	X					
5	DGW-MW-10		1630		1,2,3,8	10	X	X	X	X	X	X	X	X			
6	MW-24		1725		2,3,8	7	X	X	X	X	X	X					
7	DGW-MW-115		1730		⊥	⊥	X	X	X	X	X	X					
8	DGW-MW-4		1845		1,2,3,8	10	X	X	X	X	X	X	X	X			
9	DGW-MW-5		1905		2,3,8	7	X	X	X	X	X	X					
10	DUP-01	⊥	—	⊥	1,2,3,8	10	X	X	X	X	X	X	X	X			

Sampler(s) Please Print & Sign: Brian Marks

Shipment Method: FedEX

Required Turnaround Time: (Check Box) ☒ 3 ☐ STD 10 Wk Days ☐ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour

Results Due Date:

	Date	Time	
Relinquished by:	5/30/18	1945	Received by:
Relinquished by:	5/31/18	09.00	Received by (Laboratory): NR
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes: Golder Exide DGW PDI

Cooler ID	Cooler Temp.
43534	4/C
	2.6

QC Package: (Check One Box Below)

- ☐ Level II Std QC
- ☐ Level III Std QC/Raw Data
- ☐ Level IV SW846/CLP
- ☐ Other
- ☒ TRRP Checklist
- ☐ TRRP Level IV

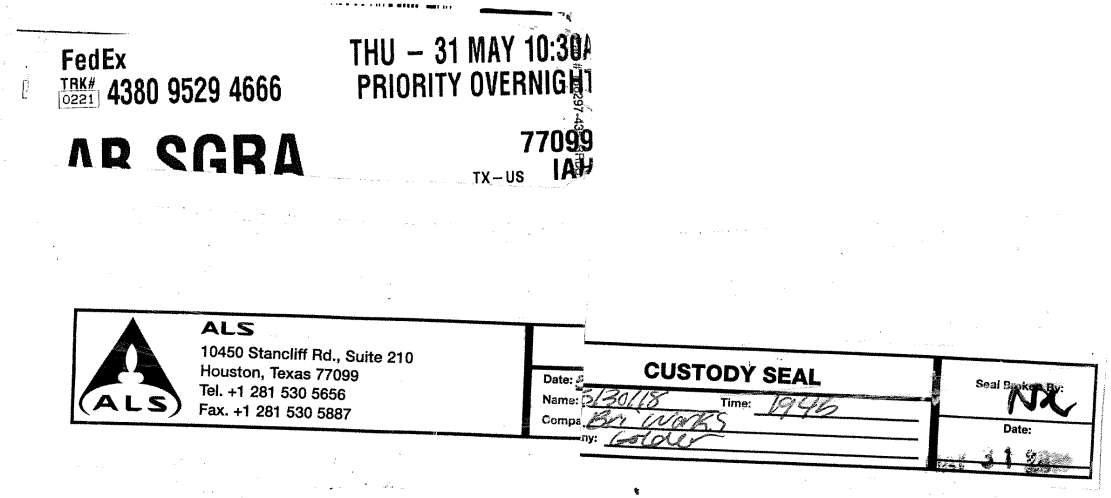
Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

IC # 30

C/C - 0.C

Copyright 2011 by ALS Environmental.


FedEx
TRK# 0221 4380 9529 4666
THU – 31 MAY 10:30
PRIORITY OVERNIGHT
77099
TX–US IAH
ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CUSTODY SEAL
Date: 5/30/18
Time: 1945
Name:
Company: BV WORKS
Seal Broken By:
Date:

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

June 18, 2018

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS18060008**

Revision: **1**

Laboratory Results for: **Exide DGW PDI**

Dear Emily,

ALS Environmental received 13 sample(s) on Jun 01, 2018 for the analysis presented in the following report.

This is a REVISED REPORT. Please see the TRRP LRC for discussion concerning this revision.

Regards,

Generated By: JUMOKE.LAWAL

Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide DGW PDI	
WorkOrder:	**HS18060008**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide DGW PDI
WorkOrder:	**HS18060008**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data								
Laboratory Name: ALS Laboratory Group			LRC Date: 06/18/2018					
Project Name: Exide DGW PDI			Laboratory Job Number: HS18060008					
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 129024, 129037, 129039, 129348, 129454, ,R317265, R317270, R317271, R317272, R317285, R317286, R317287, R317317, R317318, R317340					
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?	X				
		Were surrogate percent recoveries in all samples within the laboratory QC limits?	X				
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?	X				
		Were analytical duplicates analyzed at the appropriate frequency?	X				
		Were RPDs or relative standard deviations within the laboratory QC limits?	X				
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				2, 7
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				3
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				4

Laboratory Review Checklist: Supporting Data								
Laboratory Name: ALS Laboratory Group			LRC Date: 0618/2018					
Project Name: Exide DGW PDI			Laboratory Job Number: HS18060008					
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 129024, 129037, 129039, 129348, 129454, ,R317265, R317270, R317271, R317272, R317285, R317286, R317287, R317317, R317318, R317340					
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]	
S1	OI	**Initial calibration (ICAL)**						
		Were response factors and/or relative response factors for each analyte within QC limits?	X					
		Were percent RSDs or correlation coefficient criteria met?	X					
		Was the number of standards recommended in the method used for all analytes?	X					
		Were all points generated between the lowest and highest standard used to calculate the curve?	X					
		Are ICAL data available for all instruments used?	X					
		Has the initial calibration curve been verified using an appropriate second source standard?	X					
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**						
		Was the CCV analyzed at the method-required frequency?	X					
		Were percent differences for each analyte within the method-required QC limits?	X					
		Was the ICAL curve verified for each analyte?	X					
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			5	
S3	O	**Mass spectral tuning:**						
		Was the appropriate compound for the method used for tuning?	X					
		Were ion abundance data within the method-required QC limits?	X					
S4	O	**Internal standards (IS):**						
		Were IS area counts and retention times within the method-required QC limits?	X					
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section						
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X					
		Were data associated with manual integrations flagged on the raw data?	X					
S6	O	**Dual column confirmation**						
		Did dual column confirmation results meet the method-required QC?			X			
S7	O	**Tentatively identified compounds (TICs):**						
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X			
S8	I	**Interference Check Sample (ICS) results:**						
		Were percent recoveries within method QC limits?	X					
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**						
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		X			6	
S10	OI	**Method detection limit (MDL) studies**						
		Was a MDL study performed for each reported analyte?	X					
		Is the MDL either adjusted or supported by the analysis of DCSs?	X					
S11	OI	**Proficiency test reports:**						
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X					
S12	OI	**Standards documentation**						
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X					
S13	OI	**Compound/analyte identification procedures**						
		Are the procedures for compound/analyte identification documented?	X					
S14	OI	**Demonstration of analyst competency (DOC)**						
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X					
		Is documentation of the analyst's competency up-to-date and on file?	X					
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)						
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X					
S16	OI	**Laboratory standard operating procedures (SOPs):**						
		Are laboratory SOPs current and on file for each method performed?	X					

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports	
Laboratory Name: ALS Laboratory Group	LRC Date: 06/18/2018
Project Name: Exide DGW PDI	Laboratory Job Number: HS18060008
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 129024, 129037, 129039, 129348, 129454, ,R317265, R317270, R317271, R317272, R317285, R317286, R317287, R317317, R317318, R317340

ER#[5]	Description
7	This report was revised June 21, 2018 in order to include results for additional dissolved metals and results for TX1006 TPH analysis per client request.
1	Batch 129037, Metals Method SW6020, sample MW-16S, MS and MSD recovered above the upper control limit for Calcium and Magnesium; however, the result in the parent sample is greater than 4x the spike amount. Batch 129039, Dissolved Metals Method SW6020, sample MW-16, MS and MSD recovered outside the control limit for Calcium and Magnesium, however, the result in the parent sample is greater than 4x the spike amount. Batch 125454, Dissolved Metals Method SW6020, sample HS18051492-03, MS and MSD were performed on unrelated sample Batch R317265, Anions by Method E300, Sample HS18051492-07 MS and MSD were performed on an unrelated sample. Batch R317340, Anions by Method E300, sample DGW-MW-3, MS recovered below the lower control limits for Sulfate; however, the result in the parent sample is greater than 4x the spike amount.
2	Batch 129037, Metals by Method SW6020, Sample MW-16S: Sample analyzed at 5x due to internal standard 6 (Beryllium) failure when analyzed at 1x. The reporting limit is elevated proportionally with the dilution factor.
3	At the request of the client , Report was revised to add TPH 1006 and Dissolved Calcium, Iron and Magnesium
4	TPH TX 1006: ALS is NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package. Because TCEQ does not offer accreditation for TX 1006, the results are flagged with n.
5	See Run Log and CCB Exception Reports
6	Batch 129037, Metals Method SW6020, sample MW-16S, PDS recovered below lower control limit for Calcium and Magnesium; however, the result in the parent sample is greater than 4x the spike amount. The percent difference between the results of the sample and the serial dilution were greater than 10% for Calcium Batch 129039, Dissolved Metals Method SW6020, sample MW-16, PDS recovered outside the control limit for Magnesium. Batch 125454, Dissolved Metals Method SW6020, sample HS18051492-03, PDS was performed on unrelated sample.

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060008
Start Date: 01-Jun-2018 End Date: 04-Jun-2018

Run ID:ICS2100_317340
Instrument:ICS2100
Method:E300

Sample No.	D/F	Time	FileID	Analytes
CCV 1	1	01-Jun-2018 14:02		CL NO3N/NO2N SO4
CCB 1	1	01-Jun-2018 14:17		CL NO3N/NO2N SO4
WBLKW1-060118	1	01-Jun-2018 14:31		CL NO3N/NO2N SO4
WLCSW1-060118	1	01-Jun-2018 15:00		CL NO3N/NO2N SO4
WLCSDW1-060118	1	01-Jun-2018 15:18		CL NO3N/NO2N SO4
DGW-MW-1	1	01-Jun-2018 16:13		CL NO3N/NO2N
DGW-MW-1	10	01-Jun-2018 16:28		SO4
DGW-MW-3	1	01-Jun-2018 16:42		CL NO3N/NO2N
DGW-MW-3MS	1	01-Jun-2018 16:57		CL NO3N/NO2N SO4
DGW-MW-3MSD	1	01-Jun-2018 17:11		CL NO3N/NO2N SO4
DGW-MW-3	10	01-Jun-2018 17:26		SO4
CCB 2	1	01-Jun-2018 18:09		CL NO3N/NO2N SO4
DGW-MW-9	1	01-Jun-2018 18:24		CL NO3N/NO2N
DGW-MW-2	1	01-Jun-2018 18:53		NO3N/NO2N
DGW-MW-2	10	01-Jun-2018 19:08		CL SO4
MW-27	1	01-Jun-2018 19:22		CL NO3N/NO2N
MW-27	10	01-Jun-2018 19:37		SO4
MW-29	1	01-Jun-2018 19:51		NO3N/NO2N
MW-29	100	01-Jun-2018 20:20		CL SO4
CCV 2	1	01-Jun-2018 20:49		CL NO3N/NO2N SO4
CCB 3	1	01-Jun-2018 21:04		CL NO3N/NO2N SO4
DGW-MW-9	100	01-Jun-2018 21:18		SO4
DUP-02	1	01-Jun-2018 21:33		NO3N/NO2N
DUP-02	10	01-Jun-2018 21:48		CL SO4
DGW-MW-10S	1	01-Jun-2018 22:02		NO3N/NO2N
DGW-MW-10S	10	01-Jun-2018 22:17		CL
MW-30	1	01-Jun-2018 22:31		NO3N/NO2N
MW-30	10	01-Jun-2018 22:46		CL SO4
MW-10	1	01-Jun-2018 23:00		CL NO3N/NO2N
MW-10	10	01-Jun-2018 23:15		SO4
CCB 4	1	01-Jun-2018 23:58		CL NO3N/NO2N SO4
CCV 3	1	02-Jun-2018 11:16		CL NO3N/NO2N SO4
CCB 5	1	02-Jun-2018 11:31		CL NO3N/NO2N SO4
ZZZZZZMS	1	02-Jun-2018 12:58		CL NO3N/NO2N SO4
ZZZZZZMSD	1	02-Jun-2018 13:13		CL NO3N/NO2N SO4
CCB 6	1	02-Jun-2018 13:42		CL NO3N/NO2N SO4
CCV 4	1	04-Jun-2018 12:21		CL NO3N/NO2N SO4
CCB 7	1	04-Jun-2018 12:36		CL NO3N/NO2N SO4
DGW-MW-10S	100	04-Jun-2018 12:51		SO4
CCB 8	1	04-Jun-2018 13:29		CL NO3N/NO2N SO4

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060008

Run ID:ICS2100_317340
Instrument:ICS2100
Method:E300

CCB 1	Date: 01-Jun-2018 14:17	Seq: 4585670	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Nitrate/Nitrite (as N)	48	30	200	
Sulfate	270	200	500	

CCB 2	Date: 01-Jun-2018 18:09	Seq: 4585681	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	238	200	500	
Nitrate/Nitrite (as N)	53	30	200	
Sulfate	309	200	500	

CCB 4	Date: 01-Jun-2018 23:58	Seq: 4585703	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	232	200	500	
Nitrate/Nitrite (as N)	60	30	200	
Sulfate	402	200	500	

CCB 5	Date: 02-Jun-2018 11:31	Seq: 4585705	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sulfate	267	200	500	

CCB 6	Date: 02-Jun-2018 13:42	Seq: 4585712	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	263	200	500	
Nitrate/Nitrite (as N)	99	30	200	
Sulfate	333	200	500	

CCB 7	Date: 04-Jun-2018 12:36	Seq: 4585714	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sulfate	249	200	500	

CCB 8	Date: 04-Jun-2018 13:29	Seq: 4585717	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	282	200	500	
Nitrate/Nitrite (as N)	109	30	200	
Sulfate	351	200	500	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060008
Start Date: 05-Jun-2018 End Date: 06-Jun-2018

Run ID:ICPMS05_317395
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
LLICV2	1	05-Jun-2018 12:11	012SMPL.d	AS CA CD FE MG PB SB SE
LLICV5	1	05-Jun-2018 12:13	013LICV.d	AS CA CD FE MG PB SB SE
ICB	1	05-Jun-2018 12:15	014_ICB.d	AS CA CD FE MG PB SB SE
ICV	1	05-Jun-2018 12:17	015_ICV.d	AS CA CD FE MG PB SB SE
ICSA	1	05-Jun-2018 12:20	016ICSA.d	AS CA CD FE MG PB SB SE
ICSAB	1	05-Jun-2018 12:22	017ICSB.d	AS CA CD FE MG PB SB SE
CCV 1	1	05-Jun-2018 12:54	028_CCV.d	AS CA CD FE MG PB SB SE
CCB 1	1	05-Jun-2018 12:56	029_CCB.d	AS CA CD FE MG PB SB SE
CCV 2	1	05-Jun-2018 13:16	039_CCV.d	AS CA CD FE MG PB SB SE
CCB 2	1	05-Jun-2018 13:18	040_CCB.d	AS CA CD FE MG PB SB SE
CCV 3	1	05-Jun-2018 13:34	048_CCV.d	AS CA CD FE MG PB SB SE
CCB 3	1	05-Jun-2018 13:36	049_CCB.d	AS CA CD FE MG PB SB SE
CCV 4	1	05-Jun-2018 13:46	054_CCV.d	AS CA CD FE MG PB SB SE
CCB 4	1	05-Jun-2018 13:48	055_CCB.d	AS CA CD FE MG PB SB SE
CCV 5	1	05-Jun-2018 14:06	064_CCV.d	AS CA CD FE MG PB SB SE
CCB 5	1	05-Jun-2018 14:08	065_CCB.d	AS CA CD FE MG PB SB SE
CCV 6	1	05-Jun-2018 14:28	075_CCV.d	AS CA CD FE MG PB SB SE
CCB 6	1	05-Jun-2018 14:30	076_CCB.d	AS CA CD FE MG PB SB SE
CCV 7	1	05-Jun-2018 14:46	084_CCV.d	AS CA CD FE MG PB SB SE
CCB 7	1	05-Jun-2018 14:48	085_CCB.d	AS CA CD FE MG PB SB SE
MBLK-129039	1	05-Jun-2018 14:54	088SMPL.d	AS CA CD FE MG PB SB SE
LCS-129039	1	05-Jun-2018 14:56	089SMPL.d	AS CA CD FE MG PB SB SE
MW-16	1	05-Jun-2018 15:00	091SMPL.d	AS CD PB SB SE
MW-16SD	5	05-Jun-2018 15:02	092SMPL.d	AS CD FE MG PB SB
MW-16MS	1	05-Jun-2018 15:04	093SMPL.d	AS CA CD FE MG PB SB SE
MW-16MSD	1	05-Jun-2018 15:06	094SMPL.d	AS CA CD FE MG PB SB SE
MW-16PDS	1	05-Jun-2018 15:08	095SMPL.d	AS CD FE MG PB SB SE
CCV 8	1	05-Jun-2018 15:10	096_CCV.d	AS CA CD FE MG PB SB SE
CCB 8	1	05-Jun-2018 15:12	097_CCB.d	AS CA CD FE MG PB SB SE
MW-16S	1	05-Jun-2018 15:14	098SMPL.d	AS CD PB SB SE
DGW-MW-1	1	05-Jun-2018 15:16	099SMPL.d	AS CD PB SB SE
DGW-MW-3	1	05-Jun-2018 15:18	100SMPL.d	AS CD PB SB SE
DGW-MW-9	1	05-Jun-2018 15:20	101SMPL.d	AS CD PB SB SE
DGW-MW-2	1	05-Jun-2018 15:22	102SMPL.d	AS CD PB SB SE
MW-27	1	05-Jun-2018 15:24	103SMPL.d	AS CD PB SB SE
MW-29	1	05-Jun-2018 15:26	104SMPL.d	AS CD PB SB SE
DGW-MW-10S	1	05-Jun-2018 15:28	105SMPL.d	AS CD PB SB SE
MW-30	1	05-Jun-2018 15:30	106SMPL.d	AS CD PB SB SE
MW-10	1	05-Jun-2018 15:32	107SMPL.d	AS CD PB SB SE
CCB 9	1	05-Jun-2018 15:36	109_CCB.d	AS CA CD FE MG PB SB SE
CCV 9	1	05-Jun-2018 15:40	111_CCV.d	AS CA CD FE MG PB SB SE
DUP-02	1	05-Jun-2018 15:42	112SMPL.d	AS CD SB SE
CCV 10	1	05-Jun-2018 15:52	117_CCV.d	AS CA CD FE MG PB SB SE
CCB 10	1	05-Jun-2018 15:54	118_CCB.d	AS CA CD FE MG PB SB SE
ICCV 11	1	05-Jun-2018 16:29	135_ICV.d	AS CA CD FE MG PB SB SE
LLCCV2	1	05-Jun-2018 16:31	136SMPL.d	AS CA CD FE MG PB SB SE
LLCCV5	1	05-Jun-2018 16:33	137LICV.d	AS CA CD FE MG PB SB SE
ICCB 11	1	05-Jun-2018 16:35	138_ICB.d	AS CA CD FE MG PB SB SE
CCV 12	1	05-Jun-2018 16:53	147_CCV.d	AS CA CD FE MG PB SB SE
CCB 12	1	05-Jun-2018 16:55	148_CCB.d	AS CA CD FE MG PB SB SE
MBLK-129037	1	05-Jun-2018 16:57	149SMPL.d	AS CA CD FE MG PB SB SE
LCS-129037	1	05-Jun-2018 16:59	150SMPL.d	AS CA CD FE MG PB SB SE
MW-16	1	05-Jun-2018 17:01	151SMPL.d	AS CD FE MG PB SB SE
MW-16S	1	05-Jun-2018 17:03	152SMPL.d	AS CD FE MG PB SB SE

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060008
Start Date: 05-Jun-2018 End Date: 06-Jun-2018

Run ID:ICPMS05_317395
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
MW-16SSD	5	05-Jun-2018 17:05	153SMPL.d	AS CD FE MG PB SB
MW-16SMS	1	05-Jun-2018 17:07	154SMPL.d	AS CA CD FE MG PB SB SE
MW-16SMSD	1	05-Jun-2018 17:09	155SMPL.d	AS CA CD FE MG PB SB SE
MW-16SPDS	1	05-Jun-2018 17:11	156SMPL.d	AS CD FE MG PB SB SE
DGW-MW-1	1	05-Jun-2018 17:13	157SMPL.d	AS CD FE MG PB SB SE
DGW-MW-3	1	05-Jun-2018 17:15	158SMPL.d	AS CA CD FE MG PB SB SE
CCV 13	1	05-Jun-2018 17:17	159_CCV.d	AS CA CD FE MG PB SB SE
CCB 13	1	05-Jun-2018 17:19	160_CCB.d	AS CA CD FE MG PB SB SE
DGW-MW-9	1	05-Jun-2018 17:21	161SMPL.d	AS CD FE PB SB SE
DGW-MW-2	1	05-Jun-2018 17:23	162SMPL.d	AS CD FE MG PB SB SE
MW-27	1	05-Jun-2018 17:25	163SMPL.d	AS CD FE MG PB SB SE
MW-29	1	05-Jun-2018 17:27	164SMPL.d	AS CD FE PB SB SE
DGW-MW-10S	1	05-Jun-2018 17:29	165SMPL.d	AS CD FE MG PB SB SE
MW-30	1	05-Jun-2018 17:31	166SMPL.d	AS CD FE MG PB SB SE
MW-10	1	05-Jun-2018 17:33	167SMPL.d	AS CA CD FE MG PB SB SE
DUP-02	1	05-Jun-2018 17:35	168SMPL.d	AS CD FE MG PB SB SE
CCV 14	1	05-Jun-2018 17:41	171_CCV.d	AS CA CD FE MG PB SB SE
CCB 14	1	05-Jun-2018 17:43	172_CCB.d	AS CA CD FE MG PB SB SE
CCV 15	1	05-Jun-2018 17:59	180_CCV.d	AS CA CD FE MG PB SB SE
CCB 15	1	05-Jun-2018 18:01	181_CCB.d	AS CA CD FE MG PB SB SE
CCV 16	1	05-Jun-2018 21:40	184_CCV.d	AS CA CD FE MG PB SB SE
CCB 16	1	05-Jun-2018 21:42	185_CCB.d	AS CA CD FE MG PB SB SE
MW-16SD	5	05-Jun-2018 21:44	186SMPL.d	SE
CCV 17	1	05-Jun-2018 21:56	192_CCV.d	AS CA CD FE MG PB SB SE
CCB 17	1	05-Jun-2018 21:58	193_CCB.d	AS CA CD FE MG PB SB SE
ICCV 18	1	05-Jun-2018 22:36	205_ICV.d	AS CA CD FE MG PB SB SE
LLCCV2	1	05-Jun-2018 22:38	206SMPL.d	AS CA CD FE MG PB SB SE
LLCCV5	1	05-Jun-2018 22:40	207LICV.d	AS CA CD FE MG PB SB SE
ICCB 18	1	05-Jun-2018 22:42	208_ICB.d	AS CA CD FE MG PB SB SE
DUP-02	1	05-Jun-2018 22:46	210SMPL.d	PB
CCV 19	1	05-Jun-2018 22:54	214_CCV.d	AS CA CD FE MG PB SB SE
CCB 19	1	05-Jun-2018 22:56	215_CCB.d	AS CA CD FE MG PB SB SE
CCV 20	1	05-Jun-2018 23:06	220_CCV.d	AS CA CD FE MG PB SB SE
CCB 20	1	05-Jun-2018 23:08	221_CCB.d	AS CA CD FE MG PB SB SE
MW-16SSD	5	05-Jun-2018 23:12	223SMPL.d	
CCV 21	1	05-Jun-2018 23:18	226_CCV.d	AS CA CD FE MG PB SB SE
CCB 21	1	05-Jun-2018 23:20	227_CCB.d	AS CA CD FE MG PB SB SE
CCV 22	1	05-Jun-2018 23:48	230_CCV.d	AS CA CD FE MG PB SB SE
CCB 22	1	05-Jun-2018 23:50	231_CCB.d	AS CA CD FE MG PB SB SE
CCV 23	1	06-Jun-2018 00:12	242_CCV.d	AS CA CD FE MG PB SB SE
CCB 23	1	06-Jun-2018 00:14	243_CCB.d	AS CA CD FE MG PB SB SE
CCV 24	1	06-Jun-2018 00:22	247_CCV.d	AS CA CD FE MG PB SB SE
CCB 24	1	06-Jun-2018 00:24	248_CCB.d	AS CA CD FE MG PB SB SE
LLCCV5	1	06-Jun-2018 00:26	249LICV.d	AS CA CD FE MG PB SB SE
LLCCV2	1	06-Jun-2018 00:28	250SMPL.d	AS CA CD FE MG PB SB SE
ICSA	1	06-Jun-2018 00:30	251ICSA.d	AS CA CD FE MG PB SB SE
ICSAB	1	06-Jun-2018 00:32	252ICSB.d	AS CA CD FE MG PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060008

Run ID:ICPMS05_317395
Instrument:ICPMS05
Method:SW6020

CCB 12	Date: 05-Jun-2018 16:55	Seq: 4588336	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.642	0.4	2	
Selenium	1.208	1.1	2	

CCB 16	Date: 05-Jun-2018 21:42	Seq: 4588416	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.434	0.4	2	

CCB 17	Date: 05-Jun-2018 21:58	Seq: 4588420	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Magnesium	10.82	10	200	

Client: Golder Associates
Project: Exide DGW PDI
Work Order: HS18060008

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18060008-01	MW-16	Water		31-May-2018 08:55	01-Jun-2018 08:30	☐
HS18060008-02	MW-16S	Water		31-May-2018 08:55	01-Jun-2018 08:30	☐
HS18060008-03	DGW-MW-1	Water		31-May-2018 10:30	01-Jun-2018 08:30	☐
HS18060008-04	DGW-MW-3	Water		31-May-2018 10:35	01-Jun-2018 08:30	☐
HS18060008-05	DGW-MW-9	Water		31-May-2018 11:35	01-Jun-2018 08:30	☐
HS18060008-06	DGW-MW-2	Water		31-May-2018 11:45	01-Jun-2018 08:30	☐
HS18060008-07	MW-27	Water		31-May-2018 13:25	01-Jun-2018 08:30	☐
HS18060008-08	MW-29	Water		31-May-2018 14:25	01-Jun-2018 08:30	☐
HS18060008-09	DGW-MW-10S	Water		31-May-2018 15:30	01-Jun-2018 08:30	☐
HS18060008-10	DGW-MW-11S	Water		31-May-2018 16:30	01-Jun-2018 08:30	☐
HS18060008-11	MW-30	Water		31-May-2018 17:25	01-Jun-2018 08:30	☐
HS18060008-12	MW-10	Water		31-May-2018 19:00	01-Jun-2018 08:30	☐
HS18060008-13	DUP-02	Water		31-May-2018 00:01	01-Jun-2018 08:30	☐

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
Sample ID: MW-16
Collection Date: 31-May-2018 08:55

ANALYTICAL REPORT
WorkOrder:HS18060008
Lab ID:HS18060008-01
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 04-Jun-2018		Analyst: JDE
Antimony	**0.00110**	J	**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 17:01
Arsenic	**0.00265**		**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 17:01
Cadmium	U		0.000200	0.00200	mg/L	1	05-Jun-2018 17:01
Calcium	**366**		**0.340**	**5.00**	**mg/L**	10	06-Jun-2018 13:44
Iron	**0.0741**	J	**0.0120**	**0.200**	**mg/L**	1	05-Jun-2018 17:01
Lead	**0.00107**	J	**0.000600**	**0.00200**	**mg/L**	1	05-Jun-2018 17:01
Magnesium	**28.7**		**0.0100**	**0.200**	**mg/L**	1	05-Jun-2018 17:01
Selenium	**0.0325**		**0.00110**	**0.00200**	**mg/L**	1	05-Jun-2018 17:01
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 04-Jun-2018		Analyst: JDE
Antimony	**0.000763**	J	**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 15:00
Arsenic	**0.00246**		**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 15:00
Cadmium	U		0.000200	0.00200	mg/L	1	05-Jun-2018 15:00
Calcium	**341**		**1.70**	**25.0**	**mg/L**	50	06-Jun-2018 13:38
Iron	U		0.0120	0.200	mg/L	1	05-Jun-2018 15:00
Lead	U		0.000600	0.00200	mg/L	1	05-Jun-2018 15:00
Magnesium	**28.7**		**0.0100**	**0.200**	**mg/L**	1	05-Jun-2018 15:00
Selenium	**0.0279**		**0.00110**	**0.00200**	**mg/L**	1	05-Jun-2018 15:00
ANIONS BY E300.0	**Method:E300**						Analyst: KMU
Chloride	**1,070**		**20.0**	**50.0**	**mg/L**	100	01-Jun-2018 18:37
Nitrate/Nitrite (as N)	**1.51**		**0.0300**	**0.200**	**mg/L**	1	01-Jun-2018 17:54
Sulfate	**611**		**2.00**	**5.00**	**mg/L**	10	01-Jun-2018 18:15
ALKALINITY BY SM2320B	**Method:SM2320B**						Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**358**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 20:44
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 20:44
Alkalinity, Hydroxide (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 20:44
Alkalinity, Total (As CaCO3)	**358**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 20:44
TOC, DISSOLVED - SM5310B	**Method:SM5310B**						Analyst: AJH
Organic Carbon, Dissolved	**8.12**		**0.500**	**1.00**	**mg/L**	1	02-Jun-2018 00:13
TOTAL ORGANIC CARBON - SM5310B	**Method:SM5310B**						Analyst: AJH
Organic Carbon, Total	**8.36**		**0.500**	**1.00**	**mg/L**	1	02-Jun-2018 22:41

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
Sample ID: MW-16S
Collection Date: 31-May-2018 08:55

ANALYTICAL REPORT
WorkOrder:HS18060008
Lab ID:HS18060008-02
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 04-Jun-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	05-Jun-2018 17:03
Arsenic	**0.00392**		**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 17:03
Cadmium	**0.000733**	J	**0.000200**	**0.00200**	**mg/L**	1	05-Jun-2018 17:03
Calcium	**830**		**0.340**	**5.00**	**mg/L**	10	06-Jun-2018 13:46
Iron	**2.39**		**0.0120**	**0.200**	**mg/L**	1	05-Jun-2018 17:03
Lead	U		0.000600	0.00200	mg/L	1	05-Jun-2018 17:03
Magnesium	**80.1**		**0.0100**	**0.200**	**mg/L**	1	05-Jun-2018 17:03
Selenium	**0.0179**		**0.00110**	**0.00200**	**mg/L**	1	05-Jun-2018 17:03
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**			Prep:SW3010A / 04-Jun-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	05-Jun-2018 15:14
Arsenic	**0.000889**	J	**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 15:14
Cadmium	U		0.000200	0.00200	mg/L	1	05-Jun-2018 15:14
Calcium	**466**		**0.340**	**5.00**	**mg/L**	10	15-Jun-2018 23:01
Iron	**0.722**		**0.0120**	**0.200**	**mg/L**	1	05-Jun-2018 15:14
Lead	U		0.000600	0.00200	mg/L	1	05-Jun-2018 15:14
Magnesium	**82.9**		**0.0100**	**0.200**	**mg/L**	1	05-Jun-2018 15:14
Selenium	**0.0209**		**0.00110**	**0.00200**	**mg/L**	1	05-Jun-2018 15:14
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**1,780**		**20.0**	**50.0**	**mg/L**	100	01-Jun-2018 19:42
Nitrate/Nitrite (as N)	U		0.0300	0.200	mg/L	1	01-Jun-2018 18:59
Sulfate	**1,050**		**20.0**	**50.0**	**mg/L**	100	01-Jun-2018 19:42
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**654**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 16:50
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 16:50
Alkalinity, Hydroxide (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 16:50
Alkalinity, Total (As CaCO3)	**654**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 16:50
TOC, DISSOLVED - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Dissolved	**6.17**		**0.500**	**1.00**	**mg/L**	1	02-Jun-2018 01:48
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Total	**6.36**		**0.500**	**1.00**	**mg/L**	1	02-Jun-2018 22:55

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
Sample ID: DGW-MW-1
Collection Date: 31-May-2018 10:30

ANALYTICAL REPORT
WorkOrder:HS18060008
Lab ID:HS18060008-03
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 04-Jun-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	05-Jun-2018 17:13
Arsenic	**0.00533**		**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 17:13
Cadmium	U		0.000200	0.00200	mg/L	1	05-Jun-2018 17:13
Calcium	**294**		**0.340**	**5.00**	**mg/L**	10	06-Jun-2018 13:52
Iron	**1.92**		**0.0120**	**0.200**	**mg/L**	1	05-Jun-2018 17:13
Lead	U		0.000600	0.00200	mg/L	1	05-Jun-2018 17:13
Magnesium	**21.9**		**0.0100**	**0.200**	**mg/L**	1	05-Jun-2018 17:13
Selenium	**0.00398**		**0.00110**	**0.00200**	**mg/L**	1	05-Jun-2018 17:13
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**			Prep:SW3010A / 04-Jun-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	05-Jun-2018 15:16
Arsenic	**0.00497**		**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 15:16
Cadmium	U		0.000200	0.00200	mg/L	1	05-Jun-2018 15:16
Calcium	**276**		**0.340**	**5.00**	**mg/L**	10	15-Jun-2018 23:03
Iron	**1.62**		**0.0120**	**0.200**	**mg/L**	1	05-Jun-2018 15:16
Lead	U		0.000600	0.00200	mg/L	1	05-Jun-2018 15:16
Magnesium	**21.7**		**0.0100**	**0.200**	**mg/L**	1	05-Jun-2018 15:16
Selenium	**0.00321**		**0.00110**	**0.00200**	**mg/L**	1	05-Jun-2018 15:16
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**99.4**		**0.200**	**0.500**	**mg/L**	1	01-Jun-2018 16:13
Nitrate/Nitrite (as N)	U		0.0300	0.200	mg/L	1	01-Jun-2018 16:13
Sulfate	**825**		**2.00**	**5.00**	**mg/L**	10	01-Jun-2018 16:28
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**616**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 21:16
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 21:16
Alkalinity, Hydroxide (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 21:16
Alkalinity, Total (As CaCO3)	**616**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 21:16
TOC, DISSOLVED - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Dissolved	**3.32**		**0.500**	**1.00**	**mg/L**	1	02-Jun-2018 02:15
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Total	**3.24**		**0.500**	**1.00**	**mg/L**	1	02-Jun-2018 23:26

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
Sample ID: DGW-MW-3
Collection Date: 31-May-2018 10:35

ANALYTICAL REPORT
WorkOrder:HS18060008
Lab ID:HS18060008-04
Matrix:Water

ANALYSES	RESULT	QUAL		SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL TEXAS TPH BY TX1005		**Method:TX1005**				Prep:TX1005PR / 01-Jun-2018		Analyst: MBG
nC6 to nC12	U			0.20	0.50	mg/L	1	04-Jun-2018 22:43
>nC12 to nC28	**3.1**			**0.20**	**0.50**	**mg/L**	1	04-Jun-2018 22:43
>nC28 to nC35	U			0.20	0.50	mg/L	1	04-Jun-2018 22:43
Total Petroleum Hydrocarbon	**3.10**			**0.20**	**0.50**	**mg/L**	1	04-Jun-2018 22:43
Surr: 2-Fluorobiphenyl	*71.3*				*70-130*	*%REC*	*1*	*04-Jun-2018 22:43*
Surr: Trifluoromethyl benzene	*79.6*				*70-130*	*%REC*	*1*	*04-Jun-2018 22:43*
NC6 TO NC35 PETROLEUM HYDROCARBONS BY TX1006		**Method:TX1006**				Prep:TX1006PR / 13-Jun-2018		Analyst: MBG
Aliphatics nC6	U		n	0.498	0.995	mg/L	1	14-Jun-2018 17:56
Aliphatics >nC6 to nC8	U		n	0.498	0.995	mg/L	1	14-Jun-2018 17:56
Aliphatics >nC8 to nC10	U		n	0.498	0.995	mg/L	1	14-Jun-2018 17:56
Aliphatics >nC10 to nC12	U		n	0.498	0.995	mg/L	1	14-Jun-2018 17:56
Aliphatics >nC12 to nC16	U		n	0.498	0.995	mg/L	1	14-Jun-2018 17:56
Aliphatics >nC16 to nC21	U		n	0.498	0.995	mg/L	1	14-Jun-2018 17:56
Aliphatics >nC21 to nC35	U		n	0.498	0.995	mg/L	1	14-Jun-2018 17:56
Total Aliphatic Fraction	U		n	0.498	0.995	mg/L	1	14-Jun-2018 17:56
Aliphatics Relative % Distribution	**0**		n	**0**	**0**	**%**	1	14-Jun-2018 17:56
Aromatics >nC7 to nC8	U		n	0.498	0.995	mg/L	1	14-Jun-2018 17:56
Aromatics >nC8 to nC10	U		n	0.498	0.995	mg/L	1	14-Jun-2018 17:56
Aromatics >nC10 to nC12	U		n	0.498	0.995	mg/L	1	14-Jun-2018 17:56
Aromatics >nC12 to nC16	U		n	0.498	0.995	mg/L	1	14-Jun-2018 17:56
Aromatics >nC16 to nC21	U		n	0.498	0.995	mg/L	1	14-Jun-2018 17:56
Aromatics >nC21 to nC35	U		n	0.498	0.995	mg/L	1	14-Jun-2018 17:56
Total Aromatic Fraction	U		n	0.498	0.995	mg/L	1	14-Jun-2018 17:56
Aromatics Relative % Distribution	**0**		n	**0**	**0**	**%**	1	14-Jun-2018 17:56
Total Petroleum Hydrocarbons	U		n	0.498	0.995	mg/L	1	14-Jun-2018 17:56
ICP-MS METALS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 04-Jun-2018		Analyst: JDE
Antimony	U			0.000400	0.00200	mg/L	1	05-Jun-2018 17:15
Arsenic	**0.100**			**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 17:15
Cadmium	U			0.000200	0.00200	mg/L	1	05-Jun-2018 17:15
Calcium	**93.9**			**0.0340**	**0.500**	**mg/L**	1	05-Jun-2018 17:15
Iron	**7.04**			**0.0120**	**0.200**	**mg/L**	1	05-Jun-2018 17:15
Lead	**0.000802**		J	**0.000600**	**0.00200**	**mg/L**	1	05-Jun-2018 17:15
Magnesium	**11.5**			**0.0100**	**0.200**	**mg/L**	1	05-Jun-2018 17:15
Selenium	**0.00302**			**0.00110**	**0.00200**	**mg/L**	1	05-Jun-2018 17:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
Sample ID: DGW-MW-3
Collection Date: 31-May-2018 10:35

ANALYTICAL REPORT
WorkOrder:HS18060008
Lab ID:HS18060008-04
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 04-Jun-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	05-Jun-2018 15:18
Arsenic	**0.103**		**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 15:18
Cadmium	U		0.000200	0.00200	mg/L	1	05-Jun-2018 15:18
Calcium	**98.2**		**0.0340**	**0.500**	**mg/L**	1	05-Jun-2018 15:18
Iron	**7.05**		**0.0120**	**0.200**	**mg/L**	1	05-Jun-2018 15:18
Lead	U		0.000600	0.00200	mg/L	1	05-Jun-2018 15:18
Magnesium	**11.6**		**0.0100**	**0.200**	**mg/L**	1	05-Jun-2018 15:18
Selenium	**0.00335**		**0.00110**	**0.00200**	**mg/L**	1	05-Jun-2018 15:18
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**46.6**		**0.200**	**0.500**	**mg/L**	1	01-Jun-2018 16:42
Nitrate/Nitrite (as N)	**0.0320**	J	**0.0300**	**0.200**	**mg/L**	1	01-Jun-2018 16:42
Sulfate	**127**		**2.00**	**5.00**	**mg/L**	10	01-Jun-2018 17:26
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**548**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 21:30
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 21:30
Alkalinity, Hydroxide (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 21:30
Alkalinity, Total (As CaCO3)	**548**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 21:30
TOC, DISSOLVED - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Dissolved	**17.8**		**0.500**	**1.00**	**mg/L**	1	02-Jun-2018 02:30
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Total	**19.9**		**0.500**	**1.00**	**mg/L**	1	02-Jun-2018 23:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
Sample ID: DGW-MW-9
Collection Date: 31-May-2018 11:35

ANALYTICAL REPORT
WorkOrder:HS18060008
Lab ID:HS18060008-05
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 04-Jun-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	05-Jun-2018 17:21
Arsenic	**0.00270**		**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 17:21
Cadmium	U		0.000200	0.00200	mg/L	1	05-Jun-2018 17:21
Calcium	**556**		**0.340**	**5.00**	**mg/L**	10	06-Jun-2018 13:54
Iron	**17.6**		**0.0120**	**0.200**	**mg/L**	1	05-Jun-2018 17:21
Lead	**0.000738**	J	**0.000600**	**0.00200**	**mg/L**	1	05-Jun-2018 17:21
Magnesium	**217**		**0.100**	**2.00**	**mg/L**	10	06-Jun-2018 13:54
Selenium	**0.00350**		**0.00110**	**0.00200**	**mg/L**	1	05-Jun-2018 17:21
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**			Prep:SW3010A / 04-Jun-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	05-Jun-2018 15:20
Arsenic	**0.00245**		**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 15:20
Cadmium	U		0.000200	0.00200	mg/L	1	05-Jun-2018 15:20
Calcium	**546**		**0.340**	**5.00**	**mg/L**	10	15-Jun-2018 23:05
Iron	**17.6**		**0.0120**	**0.200**	**mg/L**	1	05-Jun-2018 15:20
Lead	U		0.000600	0.00200	mg/L	1	05-Jun-2018 15:20
Magnesium	**216**		**0.100**	**2.00**	**mg/L**	10	15-Jun-2018 23:05
Selenium	**0.00323**		**0.00110**	**0.00200**	**mg/L**	1	05-Jun-2018 15:20
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**89.9**		**0.200**	**0.500**	**mg/L**	1	01-Jun-2018 18:24
Nitrate/Nitrite (as N)	U		0.0300	0.200	mg/L	1	01-Jun-2018 18:24
Sulfate	**2,910**		**20.0**	**50.0**	**mg/L**	100	01-Jun-2018 21:18
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**744**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 21:54
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 21:54
Alkalinity, Hydroxide (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 21:54
Alkalinity, Total (As CaCO3)	**744**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 21:54
TOC, DISSOLVED - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Dissolved	**5.39**		**0.500**	**1.00**	**mg/L**	1	02-Jun-2018 02:43
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Total	**5.63**		**0.500**	**1.00**	**mg/L**	1	02-Jun-2018 23:52

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
Sample ID: DGW-MW-2
Collection Date: 31-May-2018 11:45

ANALYTICAL REPORT
WorkOrder:HS18060008
Lab ID:HS18060008-06
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL TEXAS TPH BY TX1005		**Method:TX1005**			Prep:TX1005PR / 01-Jun-2018		Analyst: MBG
nC6 to nC12	U		0.20	0.50	mg/L	1	04-Jun-2018 23:12
>nC12 to nC28	U		0.20	0.50	mg/L	1	04-Jun-2018 23:12
>nC28 to nC35	U		0.20	0.50	mg/L	1	04-Jun-2018 23:12
Total Petroleum Hydrocarbon	U		0.20	0.50	mg/L	1	04-Jun-2018 23:12
Surr: 2-Fluorobiphenyl	*77.1*			*70-130*	*%REC*	*1*	*04-Jun-2018 23:12*
Surr: Trifluoromethyl benzene	*78.8*			*70-130*	*%REC*	*1*	*04-Jun-2018 23:12*
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 04-Jun-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	05-Jun-2018 17:23
Arsenic	**0.0132**		**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 17:23
Cadmium	U		0.000200	0.00200	mg/L	1	05-Jun-2018 17:23
Calcium	**277**		**0.340**	**5.00**	**mg/L**	10	06-Jun-2018 13:56
Iron	**5.41**		**0.0120**	**0.200**	**mg/L**	1	05-Jun-2018 17:23
Lead	U		0.000600	0.00200	mg/L	1	05-Jun-2018 17:23
Magnesium	**36.8**		**0.0100**	**0.200**	**mg/L**	1	05-Jun-2018 17:23
Selenium	**0.00375**		**0.00110**	**0.00200**	**mg/L**	1	05-Jun-2018 17:23
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**			Prep:SW3010A / 04-Jun-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	05-Jun-2018 15:22
Arsenic	**0.0127**		**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 15:22
Cadmium	U		0.000200	0.00200	mg/L	1	05-Jun-2018 15:22
Calcium	**125**		**0.340**	**5.00**	**mg/L**	10	15-Jun-2018 23:07
Iron	**5.38**		**0.0120**	**0.200**	**mg/L**	1	05-Jun-2018 15:22
Lead	U		0.000600	0.00200	mg/L	1	05-Jun-2018 15:22
Magnesium	**35.6**		**0.0100**	**0.200**	**mg/L**	1	05-Jun-2018 15:22
Selenium	**0.00296**		**0.00110**	**0.00200**	**mg/L**	1	05-Jun-2018 15:22
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**103**		**2.00**	**5.00**	**mg/L**	10	01-Jun-2018 19:08
Nitrate/Nitrite (as N)	U		0.0300	0.200	mg/L	1	01-Jun-2018 18:53
Sulfate	**812**		**2.00**	**5.00**	**mg/L**	10	01-Jun-2018 19:08
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**656**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 22:01
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 22:01
Alkalinity, Hydroxide (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 22:01
Alkalinity, Total (As CaCO3)	**656**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 22:01
TOC, DISSOLVED - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Dissolved	**6.38**		**0.500**	**1.00**	**mg/L**	1	02-Jun-2018 02:59
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Total	**6.24**		**0.500**	**1.00**	**mg/L**	1	03-Jun-2018 00:51

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
Sample ID: MW-27
Collection Date: 31-May-2018 13:25

ANALYTICAL REPORT
WorkOrder:HS18060008
Lab ID:HS18060008-07
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 04-Jun-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	05-Jun-2018 17:25
Arsenic	**0.0112**		**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 17:25
Cadmium	**0.000578**	J	**0.000200**	**0.00200**	**mg/L**	1	05-Jun-2018 17:25
Calcium	**288**		**0.340**	**5.00**	**mg/L**	10	06-Jun-2018 14:02
Iron	**26.3**		**0.0120**	**0.200**	**mg/L**	1	05-Jun-2018 17:25
Lead	**0.00726**		**0.000600**	**0.00200**	**mg/L**	1	05-Jun-2018 17:25
Magnesium	**24.1**		**0.0100**	**0.200**	**mg/L**	1	05-Jun-2018 17:25
Selenium	**0.00299**		**0.00110**	**0.00200**	**mg/L**	1	05-Jun-2018 17:25
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**			Prep:SW3010A / 04-Jun-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	05-Jun-2018 15:24
Arsenic	**0.0102**		**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 15:24
Cadmium	U		0.000200	0.00200	mg/L	1	05-Jun-2018 15:24
Calcium	**290**		**0.340**	**5.00**	**mg/L**	10	15-Jun-2018 23:09
Iron	**25.5**		**0.0120**	**0.200**	**mg/L**	1	05-Jun-2018 15:24
Lead	U		0.000600	0.00200	mg/L	1	05-Jun-2018 15:24
Magnesium	**23.6**		**0.0100**	**0.200**	**mg/L**	1	05-Jun-2018 15:24
Selenium	**0.00300**		**0.00110**	**0.00200**	**mg/L**	1	05-Jun-2018 15:24
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**85.7**		**0.200**	**0.500**	**mg/L**	1	01-Jun-2018 19:22
Nitrate/Nitrite (as N)	U		0.0300	0.200	mg/L	1	01-Jun-2018 19:22
Sulfate	**896**		**2.00**	**5.00**	**mg/L**	10	01-Jun-2018 19:37
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**269**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 22:07
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 22:07
Alkalinity, Hydroxide (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 22:07
Alkalinity, Total (As CaCO3)	**269**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 22:07
TOC, DISSOLVED - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Dissolved	**6.76**		**0.500**	**1.00**	**mg/L**	1	05-Jun-2018 14:24
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Total	**6.96**		**0.500**	**1.00**	**mg/L**	1	03-Jun-2018 01:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
Sample ID: MW-29
Collection Date: 31-May-2018 14:25

ANALYTICAL REPORT
WorkOrder:HS18060008
Lab ID:HS18060008-08
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL TEXAS TPH BY TX1005		**Method:TX1005**			Prep:TX1005PR / 01-Jun-2018		Analyst: MBG
nC6 to nC12	U		0.20	0.49	mg/L	1	04-Jun-2018 23:40
>nC12 to nC28	U		0.20	0.49	mg/L	1	04-Jun-2018 23:40
>nC28 to nC35	U		0.20	0.49	mg/L	1	04-Jun-2018 23:40
Total Petroleum Hydrocarbon	U		0.20	0.49	mg/L	1	04-Jun-2018 23:40
Surr: 2-Fluorobiphenyl	*74.1*			*70-130*	*%REC*	*1*	*04-Jun-2018 23:40*
Surr: Trifluoromethyl benzene	*75.6*			*70-130*	*%REC*	*1*	*04-Jun-2018 23:40*
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 04-Jun-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	05-Jun-2018 17:27
Arsenic	**0.00191**	J	**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 17:27
Cadmium	U		0.000200	0.00200	mg/L	1	05-Jun-2018 17:27
Calcium	**546**		**0.340**	**5.00**	**mg/L**	10	06-Jun-2018 14:04
Iron	**8.01**		**0.0120**	**0.200**	**mg/L**	1	05-Jun-2018 17:27
Lead	U		0.000600	0.00200	mg/L	1	05-Jun-2018 17:27
Magnesium	**232**		**0.100**	**2.00**	**mg/L**	10	06-Jun-2018 14:04
Selenium	**0.0190**		**0.00110**	**0.00200**	**mg/L**	1	05-Jun-2018 17:27
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**			Prep:SW3010A / 04-Jun-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	05-Jun-2018 15:26
Arsenic	**0.00152**	J	**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 15:26
Cadmium	U		0.000200	0.00200	mg/L	1	05-Jun-2018 15:26
Calcium	**393**		**0.340**	**5.00**	**mg/L**	10	15-Jun-2018 23:11
Iron	**7.74**		**0.0120**	**0.200**	**mg/L**	1	05-Jun-2018 15:26
Lead	U		0.000600	0.00200	mg/L	1	05-Jun-2018 15:26
Magnesium	**207**		**0.100**	**2.00**	**mg/L**	10	15-Jun-2018 23:11
Selenium	**0.0197**		**0.00110**	**0.00200**	**mg/L**	1	05-Jun-2018 15:26
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**1,160**		**20.0**	**50.0**	**mg/L**	100	01-Jun-2018 20:20
Nitrate/Nitrite (as N)	U		0.0300	0.200	mg/L	1	01-Jun-2018 19:51
Sulfate	**4,420**		**20.0**	**50.0**	**mg/L**	100	01-Jun-2018 20:20
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**658**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 22:14
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 22:14
Alkalinity, Hydroxide (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 22:14
Alkalinity, Total (As CaCO3)	**658**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 22:14
TOC, DISSOLVED - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Dissolved	**10.9**		**0.500**	**1.00**	**mg/L**	1	02-Jun-2018 03:56
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Total	**11.5**		**0.500**	**1.00**	**mg/L**	1	03-Jun-2018 01:20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
Sample ID: DGW-MW-10S
Collection Date: 31-May-2018 15:30

ANALYTICAL REPORT
WorkOrder:HS18060008
Lab ID:HS18060008-09
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL TEXAS TPH BY TX1005		**Method:TX1005**			Prep:TX1005PR / 01-Jun-2018		Analyst: MBG
nC6 to nC12	U		0.20	0.50	mg/L	1	05-Jun-2018 00:09
>nC12 to nC28	U		0.20	0.50	mg/L	1	05-Jun-2018 00:09
>nC28 to nC35	U		0.20	0.50	mg/L	1	05-Jun-2018 00:09
Total Petroleum Hydrocarbon	U		0.20	0.50	mg/L	1	05-Jun-2018 00:09
Surr: 2-Fluorobiphenyl	*76.5*			*70-130*	*%REC*	*1*	*05-Jun-2018 00:09*
Surr: Trifluoromethyl benzene	*75.6*			*70-130*	*%REC*	*1*	*05-Jun-2018 00:09*
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 04-Jun-2018		Analyst: JDE
Antimony	**0.00433**		**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 17:29
Arsenic	**0.00852**		**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 17:29
Cadmium	**0.000930**	J	**0.000200**	**0.00200**	**mg/L**	1	05-Jun-2018 17:29
Calcium	**264**		**0.340**	**5.00**	**mg/L**	10	06-Jun-2018 14:06
Iron	**2.69**		**0.0120**	**0.200**	**mg/L**	1	05-Jun-2018 17:29
Lead	**0.00772**		**0.000600**	**0.00200**	**mg/L**	1	05-Jun-2018 17:29
Magnesium	**29.8**		**0.0100**	**0.200**	**mg/L**	1	05-Jun-2018 17:29
Selenium	**0.00676**		**0.00110**	**0.00200**	**mg/L**	1	05-Jun-2018 17:29
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**			Prep:SW3010A / 04-Jun-2018		Analyst: JDE
Antimony	**0.00402**		**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 15:28
Arsenic	**0.00522**		**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 15:28
Cadmium	**0.000655**	J	**0.000200**	**0.00200**	**mg/L**	1	05-Jun-2018 15:28
Calcium	**184**		**0.340**	**5.00**	**mg/L**	10	15-Jun-2018 23:13
Iron	**0.0424**	J	**0.0120**	**0.200**	**mg/L**	1	05-Jun-2018 15:28
Lead	U		0.000600	0.00200	mg/L	1	05-Jun-2018 15:28
Magnesium	**31.1**		**0.0100**	**0.200**	**mg/L**	1	05-Jun-2018 15:28
Selenium	**0.00715**		**0.00110**	**0.00200**	**mg/L**	1	05-Jun-2018 15:28
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**140**		**2.00**	**5.00**	**mg/L**	10	01-Jun-2018 22:17
Nitrate/Nitrite (as N)	**0.164**	J	**0.0300**	**0.200**	**mg/L**	1	01-Jun-2018 22:02
Sulfate	**4,740**		**20.0**	**50.0**	**mg/L**	100	04-Jun-2018 12:51
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**529**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 22:22
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 22:22
Alkalinity, Hydroxide (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 22:22
Alkalinity, Total (As CaCO3)	**529**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 22:22
TOC, DISSOLVED - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Dissolved	**18.5**		**0.500**	**1.00**	**mg/L**	1	05-Jun-2018 14:37
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Total	**18.0**		**0.500**	**1.00**	**mg/L**	1	03-Jun-2018 01:48

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
Sample ID: DGW-MW-11S
Collection Date: 31-May-2018 16:30

ANALYTICAL REPORT
WorkOrder:HS18060008
Lab ID:HS18060008-10
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
TOC, DISSOLVED - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Dissolved	**12.2**		**0.500**	**1.00**	**mg/L**	1	05-Jun-2018 15:05
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Total	**11.7**		**0.500**	**1.00**	**mg/L**	1	03-Jun-2018 02:01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
Sample ID: MW-30
Collection Date: 31-May-2018 17:25

ANALYTICAL REPORT
WorkOrder:HS18060008
Lab ID:HS18060008-11
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 04-Jun-2018		Analyst: JDE
Antimony	**0.00868**		**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 17:31
Arsenic	**0.0657**		**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 17:31
Cadmium	U		0.000200	0.00200	mg/L	1	05-Jun-2018 17:31
Calcium	**378**		**0.340**	**5.00**	**mg/L**	10	06-Jun-2018 14:08
Iron	**23.1**		**0.0120**	**0.200**	**mg/L**	1	05-Jun-2018 17:31
Lead	**0.0225**		**0.000600**	**0.00200**	**mg/L**	1	05-Jun-2018 17:31
Magnesium	**29.2**		**0.0100**	**0.200**	**mg/L**	1	05-Jun-2018 17:31
Selenium	**0.00328**		**0.00110**	**0.00200**	**mg/L**	1	05-Jun-2018 17:31
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**			Prep:SW3010A / 04-Jun-2018		Analyst: JDE
Antimony	**0.00885**		**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 15:30
Arsenic	**0.0166**		**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 15:30
Cadmium	U		0.000200	0.00200	mg/L	1	05-Jun-2018 15:30
Calcium	**194**		**0.340**	**5.00**	**mg/L**	10	15-Jun-2018 23:15
Iron	**6.35**		**0.0120**	**0.200**	**mg/L**	1	05-Jun-2018 15:30
Lead	**0.0132**		**0.000600**	**0.00200**	**mg/L**	1	05-Jun-2018 15:30
Magnesium	**32.5**		**0.0100**	**0.200**	**mg/L**	1	05-Jun-2018 15:30
Selenium	**0.00163**	J	**0.00110**	**0.00200**	**mg/L**	1	05-Jun-2018 15:30
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**114**		**2.00**	**5.00**	**mg/L**	10	01-Jun-2018 22:46
Nitrate/Nitrite (as N)	U		0.0300	0.200	mg/L	1	01-Jun-2018 22:31
Sulfate	**950**		**2.00**	**5.00**	**mg/L**	10	01-Jun-2018 22:46
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**547**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 22:29
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 22:29
Alkalinity, Hydroxide (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 22:29
Alkalinity, Total (As CaCO3)	**547**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 22:29
TOC, DISSOLVED - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Dissolved	**6.40**		**0.500**	**1.00**	**mg/L**	1	02-Jun-2018 04:36
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**					Analyst: KMU
Organic Carbon, Total	**8.28**		**0.500**	**1.00**	**mg/L**	1	03-Jun-2018 04:57

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
Sample ID: MW-10
Collection Date: 31-May-2018 19:00

ANALYTICAL REPORT
WorkOrder:HS18060008
Lab ID:HS18060008-12
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 04-Jun-2018		Analyst: JDE
Antimony	**0.00283**		**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 17:33
Arsenic	**0.000977**	J	**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 17:33
Cadmium	**0.00138**	J	**0.000200**	**0.00200**	**mg/L**	1	05-Jun-2018 17:33
Calcium	**146**		**0.0340**	**0.500**	**mg/L**	1	05-Jun-2018 17:33
Iron	**1.11**		**0.0120**	**0.200**	**mg/L**	1	05-Jun-2018 17:33
Lead	**0.0390**		**0.000600**	**0.00200**	**mg/L**	1	05-Jun-2018 17:33
Magnesium	**12.1**		**0.0100**	**0.200**	**mg/L**	1	05-Jun-2018 17:33
Selenium	**0.00328**		**0.00110**	**0.00200**	**mg/L**	1	05-Jun-2018 17:33
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**			Prep:SW3010A / 04-Jun-2018		Analyst: JDE
Antimony	**0.00230**		**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 15:32
Arsenic	U		0.000400	0.00200	mg/L	1	05-Jun-2018 15:32
Cadmium	**0.000881**	J	**0.000200**	**0.00200**	**mg/L**	1	05-Jun-2018 15:32
Calcium	**142**		**0.0340**	**0.500**	**mg/L**	1	05-Jun-2018 15:32
Iron	**0.0188**	J	**0.0120**	**0.200**	**mg/L**	1	05-Jun-2018 15:32
Lead	**0.000654**	J	**0.000600**	**0.00200**	**mg/L**	1	05-Jun-2018 15:32
Magnesium	**11.5**		**0.0100**	**0.200**	**mg/L**	1	05-Jun-2018 15:32
Selenium	**0.00252**		**0.00110**	**0.00200**	**mg/L**	1	05-Jun-2018 15:32
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**32.4**		**0.200**	**0.500**	**mg/L**	1	01-Jun-2018 23:00
Nitrate/Nitrite (as N)	**3.28**		**0.0300**	**0.200**	**mg/L**	1	01-Jun-2018 23:00
Sulfate	**810**		**2.00**	**5.00**	**mg/L**	10	01-Jun-2018 23:15
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**315**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 22:36
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 22:36
Alkalinity, Hydroxide (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 22:36
Alkalinity, Total (As CaCO3)	**315**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 22:36
TOC, DISSOLVED - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Dissolved	**2.34**		**0.500**	**1.00**	**mg/L**	1	05-Jun-2018 15:18
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**					Analyst: KMU
Organic Carbon, Total	**2.16**		**0.500**	**1.00**	**mg/L**	1	03-Jun-2018 05:11

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
Sample ID: DUP-02
Collection Date: 31-May-2018 00:01

ANALYTICAL REPORT
WorkOrder:HS18060008
Lab ID:HS18060008-13
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 04-Jun-2018		Analyst: JDE
Antimony	**0.0101**		**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 17:35
Arsenic	**0.0681**		**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 17:35
Cadmium	U		0.000200	0.00200	mg/L	1	05-Jun-2018 17:35
Calcium	**392**		**0.340**	**5.00**	**mg/L**	10	06-Jun-2018 14:09
Iron	**23.9**		**0.0120**	**0.200**	**mg/L**	1	05-Jun-2018 17:35
Lead	**0.0278**		**0.000600**	**0.00200**	**mg/L**	1	05-Jun-2018 17:35
Magnesium	**30.7**		**0.0100**	**0.200**	**mg/L**	1	05-Jun-2018 17:35
Selenium	**0.00200**	J	**0.00110**	**0.00200**	**mg/L**	1	05-Jun-2018 17:35
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**			Prep:SW3010A / 04-Jun-2018		Analyst: JDE
Antimony	**0.00822**		**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 15:42
Arsenic	**0.0154**		**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 15:42
Cadmium	U		0.000200	0.00200	mg/L	1	05-Jun-2018 15:42
Calcium	**304**		**0.340**	**5.00**	**mg/L**	10	15-Jun-2018 23:17
Iron	**6.11**		**0.0120**	**0.200**	**mg/L**	1	05-Jun-2018 15:42
Lead	**0.0174**		**0.000600**	**0.00200**	**mg/L**	1	05-Jun-2018 22:46
Magnesium	**31.1**		**0.0100**	**0.200**	**mg/L**	1	05-Jun-2018 15:42
Selenium	U		0.00110	0.00200	mg/L	1	05-Jun-2018 15:42
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**115**		**2.00**	**5.00**	**mg/L**	10	01-Jun-2018 21:48
Nitrate/Nitrite (as N)	U		0.0300	0.200	mg/L	1	01-Jun-2018 21:33
Sulfate	**963**		**2.00**	**5.00**	**mg/L**	10	01-Jun-2018 21:48
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**551**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 22:43
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 22:43
Alkalinity, Hydroxide (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 22:43
Alkalinity, Total (As CaCO3)	**551**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 22:43
TOC, DISSOLVED - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Dissolved	**7.42**		**0.500**	**1.00**	**mg/L**	1	02-Jun-2018 06:24
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**					Analyst: KMU
Organic Carbon, Total	**8.29**		**0.500**	**1.00**	**mg/L**	1	03-Jun-2018 05:26

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

WEIGHT LOG

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060008

Batch ID: 129024 **Method:** LOW-LEVEL TEXAS TPH BY TX1005 **Prep:** TX 1005_W PR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18060008-04	1	30.14	3 (mL)	0.09954
HS18060008-06	1	30.17	3 (mL)	0.09944
HS18060008-08	1	30.51	3 (mL)	0.09833
HS18060008-09	1	30.1	3 (mL)	0.09967

Batch ID: 129037 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18060008-01	1	10	10 (mL)	1
HS18060008-02	1	10	10 (mL)	1
HS18060008-03	1	10	10 (mL)	1
HS18060008-04	1	10	10 (mL)	1
HS18060008-05	1	10	10 (mL)	1
HS18060008-06	1	10	10 (mL)	1
HS18060008-07	1	10	10 (mL)	1
HS18060008-08	1	10	10 (mL)	1
HS18060008-09	1	10	10 (mL)	1
HS18060008-11	1	10	10 (mL)	1
HS18060008-12	1	10	10 (mL)	1
HS18060008-13	1	10	10 (mL)	1

Batch ID: 129039 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18060008-01	1	10	10 (mL)	1
HS18060008-02	1	10	10 (mL)	1
HS18060008-03	1	10	10 (mL)	1
HS18060008-04	1	10	10 (mL)	1
HS18060008-05	1	10	10 (mL)	1
HS18060008-06	1	10	10 (mL)	1
HS18060008-07	1	10	10 (mL)	1
HS18060008-08	1	10	10 (mL)	1
HS18060008-09	1	10	10 (mL)	1
HS18060008-11	1	10	10 (mL)	1
HS18060008-12	1	10	10 (mL)	1
HS18060008-13	1	10	10 (mL)	1

Batch ID: 129348 **Method:** NC6 TO NC35 PETROLEUM HYDROCARBONS BY TX1006 **Prep:** TX 1006_W PR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18060008-04	1	30.14	3 (mL)	0.09954

WEIGHT LOG

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060008

Batch ID: 129454 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18060008-02	1	10	10 (mL)	1
HS18060008-03	1	10	10 (mL)	1
HS18060008-05	1	10	10 (mL)	1
HS18060008-06	1	10	10 (mL)	1
HS18060008-07	1	10	10 (mL)	1
HS18060008-08	1	10	10 (mL)	1
HS18060008-09	1	10	10 (mL)	1
HS18060008-11	1	10	10 (mL)	1
HS18060008-13	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060008

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 129024	**Test Name :** LOW-LEVEL TEXAS TPH BY TX1005			**Matrix:** Water		
HS18060008-04	DGW-MW-3	31 May 2018 10:35		01 Jun 2018 15:55	04 Jun 2018 22:43	1
HS18060008-06	DGW-MW-2	31 May 2018 11:45		01 Jun 2018 15:55	04 Jun 2018 23:12	1
HS18060008-08	MW-29	31 May 2018 14:25		01 Jun 2018 15:55	04 Jun 2018 23:40	1
HS18060008-09	DGW-MW-10S	31 May 2018 15:30		01 Jun 2018 15:55	05 Jun 2018 00:09	1
Batch ID 129037	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Water		
HS18060008-01	MW-16	31 May 2018 08:55		04 Jun 2018 10:09	06 Jun 2018 13:44	10
HS18060008-01	MW-16	31 May 2018 08:55		04 Jun 2018 10:09	05 Jun 2018 17:01	1
HS18060008-02	MW-16S	31 May 2018 08:55		04 Jun 2018 10:09	06 Jun 2018 13:46	10
HS18060008-02	MW-16S	31 May 2018 08:55		04 Jun 2018 10:09	05 Jun 2018 17:03	1
HS18060008-03	DGW-MW-1	31 May 2018 10:30		04 Jun 2018 10:09	06 Jun 2018 13:52	10
HS18060008-03	DGW-MW-1	31 May 2018 10:30		04 Jun 2018 10:09	05 Jun 2018 17:13	1
HS18060008-04	DGW-MW-3	31 May 2018 10:35		04 Jun 2018 10:09	05 Jun 2018 17:15	1
HS18060008-05	DGW-MW-9	31 May 2018 11:35		04 Jun 2018 10:09	06 Jun 2018 13:54	10
HS18060008-05	DGW-MW-9	31 May 2018 11:35		04 Jun 2018 10:09	05 Jun 2018 17:21	1
HS18060008-06	DGW-MW-2	31 May 2018 11:45		04 Jun 2018 10:09	06 Jun 2018 13:56	10
HS18060008-06	DGW-MW-2	31 May 2018 11:45		04 Jun 2018 10:09	05 Jun 2018 17:23	1
HS18060008-07	MW-27	31 May 2018 13:25		04 Jun 2018 10:09	06 Jun 2018 14:02	10
HS18060008-07	MW-27	31 May 2018 13:25		04 Jun 2018 10:09	05 Jun 2018 17:25	1
HS18060008-08	MW-29	31 May 2018 14:25		04 Jun 2018 10:09	06 Jun 2018 14:04	10
HS18060008-08	MW-29	31 May 2018 14:25		04 Jun 2018 10:09	05 Jun 2018 17:27	1
HS18060008-09	DGW-MW-10S	31 May 2018 15:30		04 Jun 2018 10:09	06 Jun 2018 14:06	10
HS18060008-09	DGW-MW-10S	31 May 2018 15:30		04 Jun 2018 10:09	05 Jun 2018 17:29	1
HS18060008-11	MW-30	31 May 2018 17:25		04 Jun 2018 10:09	06 Jun 2018 14:08	10
HS18060008-11	MW-30	31 May 2018 17:25		04 Jun 2018 10:09	05 Jun 2018 17:31	1
HS18060008-12	MW-10	31 May 2018 19:00		04 Jun 2018 10:09	05 Jun 2018 17:33	1
HS18060008-13	DUP-02	31 May 2018 00:01		04 Jun 2018 10:09	06 Jun 2018 14:09	10
HS18060008-13	DUP-02	31 May 2018 00:01		04 Jun 2018 10:09	05 Jun 2018 17:35	1

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060008

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 129039	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Water		
HS18060008-01	MW-16	31 May 2018 08:55		04 Jun 2018 10:13	06 Jun 2018 13:38	50
HS18060008-01	MW-16	31 May 2018 08:55		04 Jun 2018 10:13	05 Jun 2018 15:00	1
HS18060008-02	MW-16S	31 May 2018 08:55		04 Jun 2018 10:13	05 Jun 2018 15:14	1
HS18060008-03	DGW-MW-1	31 May 2018 10:30		04 Jun 2018 10:13	05 Jun 2018 15:16	1
HS18060008-04	DGW-MW-3	31 May 2018 10:35		04 Jun 2018 10:13	05 Jun 2018 15:18	1
HS18060008-05	DGW-MW-9	31 May 2018 11:35		04 Jun 2018 10:13	05 Jun 2018 15:20	1
HS18060008-06	DGW-MW-2	31 May 2018 11:45		04 Jun 2018 10:13	05 Jun 2018 15:22	1
HS18060008-07	MW-27	31 May 2018 13:25		04 Jun 2018 10:13	05 Jun 2018 15:24	1
HS18060008-08	MW-29	31 May 2018 14:25		04 Jun 2018 10:13	05 Jun 2018 15:26	1
HS18060008-09	DGW-MW-10S	31 May 2018 15:30		04 Jun 2018 10:13	05 Jun 2018 15:28	1
HS18060008-11	MW-30	31 May 2018 17:25		04 Jun 2018 10:13	05 Jun 2018 15:30	1
HS18060008-12	MW-10	31 May 2018 19:00		04 Jun 2018 10:13	05 Jun 2018 15:32	1
HS18060008-13	DUP-02	31 May 2018 00:01		04 Jun 2018 10:13	05 Jun 2018 22:46	1
HS18060008-13	DUP-02	31 May 2018 00:01		04 Jun 2018 10:13	05 Jun 2018 15:42	1
Batch ID 129348	**Test Name :** NC6 TO NC35 PETROLEUM HYDROCARBONS BY TX1006			**Matrix:** Water		
HS18060008-04	DGW-MW-3	31 May 2018 10:35		13 Jun 2018 15:03	14 Jun 2018 17:56	1
HS18060008-04	DGW-MW-3	31 May 2018 10:35		13 Jun 2018 15:03	14 Jun 2018 17:56	1
Batch ID 129454	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Water		
HS18060008-02	MW-16S	31 May 2018 08:55		15 Jun 2018 14:00	15 Jun 2018 23:01	10
HS18060008-03	DGW-MW-1	31 May 2018 10:30		15 Jun 2018 14:00	15 Jun 2018 23:03	10
HS18060008-05	DGW-MW-9	31 May 2018 11:35		15 Jun 2018 14:00	15 Jun 2018 23:05	10
HS18060008-06	DGW-MW-2	31 May 2018 11:45		15 Jun 2018 14:00	15 Jun 2018 23:07	10
HS18060008-07	MW-27	31 May 2018 13:25		15 Jun 2018 14:00	15 Jun 2018 23:09	10
HS18060008-08	MW-29	31 May 2018 14:25		15 Jun 2018 14:00	15 Jun 2018 23:11	10
HS18060008-09	DGW-MW-10S	31 May 2018 15:30		15 Jun 2018 14:00	15 Jun 2018 23:13	10
HS18060008-11	MW-30	31 May 2018 17:25		15 Jun 2018 14:00	15 Jun 2018 23:15	10
HS18060008-13	DUP-02	31 May 2018 00:01		15 Jun 2018 14:00	15 Jun 2018 23:17	10
Batch ID R317265	**Test Name :** ANIONS BY E300.0			**Matrix:** Water		
HS18060008-01	MW-16	31 May 2018 08:55			01 Jun 2018 18:37	100
HS18060008-01	MW-16	31 May 2018 08:55			01 Jun 2018 18:15	10
HS18060008-01	MW-16	31 May 2018 08:55			01 Jun 2018 17:54	1
HS18060008-02	MW-16S	31 May 2018 08:55			01 Jun 2018 19:42	100
HS18060008-02	MW-16S	31 May 2018 08:55			01 Jun 2018 18:59	1
Batch ID R317270	**Test Name :** TOC, DISSOLVED - SM5310B			**Matrix:** Water		
HS18060008-01	MW-16	31 May 2018 08:55			02 Jun 2018 00:13	1

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060008

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R317271	**Test Name :** TOC, DISSOLVED - SM5310B			**Matrix:** Water		
HS18060008-02	MW-16S	31 May 2018 08:55			02 Jun 2018 01:48	1
HS18060008-03	DGW-MW-1	31 May 2018 10:30			02 Jun 2018 02:15	1
HS18060008-04	DGW-MW-3	31 May 2018 10:35			02 Jun 2018 02:30	1
HS18060008-05	DGW-MW-9	31 May 2018 11:35			02 Jun 2018 02:43	1
HS18060008-06	DGW-MW-2	31 May 2018 11:45			02 Jun 2018 02:59	1
HS18060008-07	MW-27	31 May 2018 13:25			05 Jun 2018 14:24	1
HS18060008-08	MW-29	31 May 2018 14:25			02 Jun 2018 03:56	1
HS18060008-09	DGW-MW-10S	31 May 2018 15:30			05 Jun 2018 14:37	1
HS18060008-10	DGW-MW-11S	31 May 2018 16:30			05 Jun 2018 15:05	1
HS18060008-11	MW-30	31 May 2018 17:25			02 Jun 2018 04:36	1
Batch ID R317272	**Test Name :** TOC, DISSOLVED - SM5310B			**Matrix:** Water		
HS18060008-12	MW-10	31 May 2018 19:00			05 Jun 2018 15:18	1
HS18060008-13	DUP-02	31 May 2018 00:01			02 Jun 2018 06:24	1
Batch ID R317285	**Test Name :** ALKALINITY BY SM2320B			**Matrix:** Water		
HS18060008-02	MW-16S	31 May 2018 08:55			02 Jun 2018 16:50	1
Batch ID R317286	**Test Name :** ALKALINITY BY SM2320B			**Matrix:** Water		
HS18060008-01	MW-16	31 May 2018 08:55			02 Jun 2018 20:44	1
Batch ID R317287	**Test Name :** ALKALINITY BY SM2320B			**Matrix:** Water		
HS18060008-03	DGW-MW-1	31 May 2018 10:30			02 Jun 2018 21:16	1
HS18060008-04	DGW-MW-3	31 May 2018 10:35			02 Jun 2018 21:30	1
HS18060008-05	DGW-MW-9	31 May 2018 11:35			02 Jun 2018 21:54	1
HS18060008-06	DGW-MW-2	31 May 2018 11:45			02 Jun 2018 22:01	1
HS18060008-07	MW-27	31 May 2018 13:25			02 Jun 2018 22:07	1
HS18060008-08	MW-29	31 May 2018 14:25			02 Jun 2018 22:14	1
HS18060008-09	DGW-MW-10S	31 May 2018 15:30			02 Jun 2018 22:22	1
HS18060008-11	MW-30	31 May 2018 17:25			02 Jun 2018 22:29	1
HS18060008-12	MW-10	31 May 2018 19:00			02 Jun 2018 22:36	1
HS18060008-13	DUP-02	31 May 2018 00:01			02 Jun 2018 22:43	1

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060008

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R317317	**Test Name :** TOTAL ORGANIC CARBON - SM5310B			**Matrix:** Water		
HS18060008-01	MW-16	31 May 2018 08:55			02 Jun 2018 22:41	1
HS18060008-02	MW-16S	31 May 2018 08:55			02 Jun 2018 22:55	1
HS18060008-03	DGW-MW-1	31 May 2018 10:30			02 Jun 2018 23:26	1
HS18060008-04	DGW-MW-3	31 May 2018 10:35			02 Jun 2018 23:39	1
HS18060008-05	DGW-MW-9	31 May 2018 11:35			02 Jun 2018 23:52	1
HS18060008-06	DGW-MW-2	31 May 2018 11:45			03 Jun 2018 00:51	1
HS18060008-07	MW-27	31 May 2018 13:25			03 Jun 2018 01:04	1
HS18060008-08	MW-29	31 May 2018 14:25			03 Jun 2018 01:20	1
HS18060008-09	DGW-MW-10S	31 May 2018 15:30			03 Jun 2018 01:48	1
HS18060008-10	DGW-MW-11S	31 May 2018 16:30			03 Jun 2018 02:01	1
Batch ID R317318	**Test Name :** TOTAL ORGANIC CARBON - SM5310B			**Matrix:** Water		
HS18060008-11	MW-30	31 May 2018 17:25			03 Jun 2018 04:57	1
HS18060008-12	MW-10	31 May 2018 19:00			03 Jun 2018 05:11	1
HS18060008-13	DUP-02	31 May 2018 00:01			03 Jun 2018 05:26	1
Batch ID R317340	**Test Name :** ANIONS BY E300.0			**Matrix:** Water		
HS18060008-03	DGW-MW-1	31 May 2018 10:30			01 Jun 2018 16:28	10
HS18060008-03	DGW-MW-1	31 May 2018 10:30			01 Jun 2018 16:13	1
HS18060008-04	DGW-MW-3	31 May 2018 10:35			01 Jun 2018 17:26	10
HS18060008-04	DGW-MW-3	31 May 2018 10:35			01 Jun 2018 16:42	1
HS18060008-05	DGW-MW-9	31 May 2018 11:35			01 Jun 2018 21:18	100
HS18060008-05	DGW-MW-9	31 May 2018 11:35			01 Jun 2018 18:24	1
HS18060008-06	DGW-MW-2	31 May 2018 11:45			01 Jun 2018 19:08	10
HS18060008-06	DGW-MW-2	31 May 2018 11:45			01 Jun 2018 18:53	1
HS18060008-07	MW-27	31 May 2018 13:25			01 Jun 2018 19:37	10
HS18060008-07	MW-27	31 May 2018 13:25			01 Jun 2018 19:22	1
HS18060008-08	MW-29	31 May 2018 14:25			01 Jun 2018 20:20	100
HS18060008-08	MW-29	31 May 2018 14:25			01 Jun 2018 19:51	1
HS18060008-09	DGW-MW-10S	31 May 2018 15:30			04 Jun 2018 12:51	100
HS18060008-09	DGW-MW-10S	31 May 2018 15:30			01 Jun 2018 22:17	10
HS18060008-09	DGW-MW-10S	31 May 2018 15:30			01 Jun 2018 22:02	1
HS18060008-11	MW-30	31 May 2018 17:25			01 Jun 2018 22:46	10
HS18060008-11	MW-30	31 May 2018 17:25			01 Jun 2018 22:31	1
HS18060008-12	MW-10	31 May 2018 19:00			01 Jun 2018 23:15	10
HS18060008-12	MW-10	31 May 2018 19:00			01 Jun 2018 23:00	1
HS18060008-13	DUP-02	31 May 2018 00:01			01 Jun 2018 21:48	10
HS18060008-13	DUP-02	31 May 2018 00:01			01 Jun 2018 21:33	1

Revision:1

WorkOrder: HS18060008
InstrumentID: FID-12
Test Code: TX1005_W_Low
Test Number: TX1005
Test Name: Low-level Texas TPH by TX1005

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	nC6 to nC12	TPH-1005-1	0.20	0.21	0.20	0.50
A	>nC12 to nC28	TPH-1005-2	0.20	0.20	0.20	0.50
A	>nC28 to nC35	TPH-1005-4	0.20	0.20	0.20	0.50
A	Total Petroleum Hydrocarbon	TPH	0.20	0.20	0.20	0.50
S	2-Fluorobiphenyl	321-60-8	0	0	0	0
S	Trifluoromethyl benzene	98-08-8	0	0	0	0

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WorkOrder: HS18060008
InstrumentID: FID-12
Test Code: TX1006_W
Test Number: TX1006
Test Name: nC6 to nC35 Petroleum

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Aliphatics nC6	PHC6ALIP	0	0	0.500	1.00
A	Aliphatics >nC6 to nC8	PHCG68ALIP	0	0	0.500	1.00
A	Aliphatics >nC8 to nC10	PHCG810ALIP	0	0	0.500	1.00
A	Aliphatics >nC10 to nC12	PHCG1012ALIP	0	0	0.500	1.00
A	Aliphatics >nC12 to nC16	PHCG1216ALIP	0	0	0.500	1.00
A	Aliphatics >nC16 to nC21	PHCG1621ALIP	0	0	0.500	1.00
A	Aliphatics >nC21 to nC35	PHCG2135ALIP	0	0	0.500	1.00
A	Total Aliphatic Fraction	TOTALIPFRACT	0	0	0.500	1.00
A	Aliphatics Relative % Distribution	ALPRELPERDIST	0	0	0	0
A	Total Petroleum Hydrocarbons	PHCG635AROMALIP	0	0	0.500	1.00

WorkOrder: HS18060008
InstrumentID: FID-13
Test Code: TX1006_W
Test Number: TX1006
Test Name: nC6 to nC35 Petroleum

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Aromatics >nC7 to nC8	PHCG78AROM	0	0	0.500	1.00
A	Aromatics >nC8 to nC10	PHCG810AROM	0	0	0.500	1.00
A	Aromatics >nC10 to nC12	PHCG1012AROM	0	0	0.500	1.00
A	Aromatics >nC12 to nC16	PHCG1216AROM	0	0	0.500	1.00
A	Aromatics >nC16 to nC21	PHCG1621AROM	0	0	0.500	1.00
A	Aromatics >nC21 to nC35	PHCG2135AROM	0	0	0.500	1.00
A	Total Aromatic Fraction	TOTAROFRACT	0	0	0.500	1.00
A	Aromatics Relative % Distribution	ARORELPERCDIST	0	0	0	0

WorkOrder: HS18060008
InstrumentID: ICPMS05
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.00100	0.000956	0.000400	0.00200
A	Arsenic	7440-38-2	0.00100	0.000990	0.000400	0.00200
A	Cadmium	7440-43-9	0.00100	0.00101	0.000200	0.00200
A	Calcium	7440-70-2	0.100	0.106	0.0340	0.500
A	Iron	7439-89-6	0.100	0.102	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.00115	0.000600	0.00200
A	Magnesium	7439-95-4	0.100	0.109	0.0100	0.200
A	Selenium	7782-49-2	0.00200	0.000378	0.00110	0.00200

Revision:1

WorkOrder: HS18060008
InstrumentID: ICPMS05
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.00100	0.000956	0.000400	0.00200
A	Arsenic	7440-38-2	0.00100	0.000990	0.000400	0.00200
A	Cadmium	7440-43-9	0.00100	0.00101	0.000200	0.00200
A	Calcium	7440-70-2	0.100	0.106	0.0340	0.500
A	Iron	7439-89-6	0.100	0.102	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.00115	0.000600	0.00200
A	Magnesium	7439-95-4	0.100	0.109	0.0100	0.200
A	Selenium	7782-49-2	0.00200	0.000378	0.00110	0.00200

Revision:1

WorkOrder: HS18060008
InstrumentID: ICS3K2
Test Code: 300_W
Test Number: E300
Test Name: Anions by E300.0

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Chloride	16887-00-6	0.250	0.531	0.200	0.500
A	Nitrate/Nitrite (as N)	ARC-NO3NO2N	0.100	0.317	0.0300	0.200
A	Sulfate	14808-79-8	0.250	0.552	0.200	0.500

WorkOrder: HS18060008
InstrumentID: ICS2100
Test Code: 300_W
Test Number: E300
Test Name: Anions by E300.0

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Chloride	16887-00-6	0.500	0.707	0.200	0.500
A	Nitrate/Nitrite (as N)	ARC-NO3NO2N	0.200	0.224	0.0300	0.200
A	Sulfate	14808-79-8	0.500	0.509	0.200	0.500

Revision:1

WorkOrder: HS18060008
InstrumentID: ManTech01
Test Code: ALK_W 2320B
Test Number: SM2320B
Test Name: Alkalinity by SM2320B

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Alkalinity, Bicarbonate (As CaCO3)	ALK-Bicarb	5.00	4.55	5.00	5.00
A	Alkalinity, Carbonate (As CaCO3)	ALK-Carb	5.00	4.55	5.00	5.00
A	Alkalinity, Hydroxide (As CaCO3)	ALK-Hyd	5.00	4.55	5.00	5.00
A	Alkalinity, Total (As CaCO3)	ALK	5.00	4.55	5.00	5.00

WorkOrder: HS18060008
InstrumentID: TOC_02
Test Code: TOC_Diss_5310B
Test Number: SM5310B
Test Name: TOC, Dissolved - SM5310B

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Organic Carbon, Dissolved	DOC	0.600	0.585	0.500	1.00

WorkOrder: HS18060008
InstrumentID: TOC_02
Test Code: TOC_W 5310B
Test Number: SM5310B
Test Name: Total Organic Carbon - SM5310B

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Organic Carbon, Total	7440-44-0	0.600	0.585	0.500	1.00

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060008

QC BATCH REPORT

Batch ID: 129024 **Instrument: FID-12** **Method: TX1005**

MBLK Sample ID: **MBLK-129024** Units: **mg/L** Analysis Date: **02-Jun-2018 06:04**
Client ID: Run ID: **FID-12_317300** SeqNo: **4584959** PrepDate: **01-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
nC6 to nC12	U	0.50								
>nC12 to nC28	U	0.50								
>nC28 to nC35	U	0.50								
Total Petroleum Hydrocarbon	U	0.50								
Surr: 2-Fluorobiphenyl	*1.842*	*0*	*2.5*	*0*	*73.7*	*70 - 130*				
Surr: Trifluoromethyl benzene	*1.895*	*0*	*2.5*	*0*	*75.8*	*70 - 130*				

LCS Sample ID: **LCS-129024** Units: **mg/L** Analysis Date: **02-Jun-2018 06:33**
Client ID: Run ID: **FID-12_317300** SeqNo: **4584960** PrepDate: **01-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
nC6 to nC12	21.31	0.50	25	0	85.3	75 - 125				
>nC12 to nC28	23.97	0.50	25	0	95.9	75 - 125				
Surr: 2-Fluorobiphenyl	*2.001*	*0*	*2.5*	*0*	*80.0*	*70 - 130*				
Surr: Trifluoromethyl benzene	*1.921*	*0*	*2.5*	*0*	*76.9*	*70 - 130*				

LCSD Sample ID: **LCSD-129024** Units: **mg/L** Analysis Date: **02-Jun-2018 07:02**
Client ID: Run ID: **FID-12_317300** SeqNo: **4584961** PrepDate: **01-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
nC6 to nC12	20.8	0.50	25	0	83.2	75 - 125	21.31	2.45	20	
>nC12 to nC28	24.52	0.50	25	0	98.1	75 - 125	23.97	2.26	20	
Surr: 2-Fluorobiphenyl	*1.936*	*0*	*2.5*	*0*	*77.5*	*70 - 130*	*2.001*	*3.26*	*20*	
Surr: Trifluoromethyl benzene	*1.855*	*0*	*2.5*	*0*	*74.2*	*70 - 130*	*1.921*	*3.53*	*20*	

MS Sample ID: **HS18051396-16MS** Units: **mg/L** Analysis Date: **02-Jun-2018 08:01**
Client ID: Run ID: **FID-12_317300** SeqNo: **4584963** PrepDate: **01-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
nC6 to nC12	21.26	0.50	24.82	0	85.6	75 - 125				
>nC12 to nC28	28.94	0.50	24.82	2.213	108	75 - 125				
Surr: 2-Fluorobiphenyl	*2.177*	*0*	*2.482*	*0*	*87.7*	*70 - 130*				
Surr: Trifluoromethyl benzene	*1.999*	*0*	*2.482*	*0*	*80.5*	*70 - 130*				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060008

QC BATCH REPORT

Batch ID: 129024 **Instrument: FID-12** **Method: TX1005**

MSD Sample ID: **HS18051396-16MSD** Units: **mg/L** Analysis Date: **02-Jun-2018 08:30**
Client ID: Run ID: **FID-12_317300** SeqNo: **4584964** PrepDate: **01-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
nC6 to nC12	22.29	0.50	25.19	0	88.5	75 - 125	21.26	4.77	20	
>nC12 to nC28	28.7	0.50	25.19	2.213	105	75 - 125	28.94	0.819	20	
Surr: 2-Fluorobiphenyl	*2.393*	*0*	*2.519*	*0*	*95.0*	*70 - 130*	*2.177*	*9.47*	*20*	
Surr: Trifluoromethyl benzene	*2.148*	*0*	*2.519*	*0*	*85.3*	*70 - 130*	*1.999*	*7.2*	*20*	

The following samples were analyzed in this batch: HS18060008-04 HS18060008-06 HS18060008-08 HS18060008-09

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060008

QC BATCH REPORT

Batch ID: 129348 **Instrument: FID-12** **Method: TX1006**

MBLK Sample ID: **MBLK-129348** Units: **mg/L** Analysis Date: **14-Jun-2018 16:29**
Client ID: Run ID: **FID-12_318079** SeqNo: **4611674** PrepDate: **13-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aliphatics nC6	U	1.00								
Aliphatics >nC6 to nC8	U	1.00								
Aliphatics >nC8 to nC10	U	1.00								
Aliphatics >nC10 to nC12	U	1.00								
Aliphatics >nC12 to nC16	U	1.00								
Aliphatics >nC16 to nC21	U	1.00								
Aliphatics >nC21 to nC35	U	1.00								
Total Aliphatic Fraction	U	1.00								
Aliphatics Relative % Distribution		0								
Total Petroleum Hydrocarbons	U	1.00								

MBLK Sample ID: **MBLK-129348** Units: **mg/L** Analysis Date: **14-Jun-2018 16:29**
Client ID: Run ID: **FID-13_318083** SeqNo: **4611705** PrepDate: **13-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aromatics >nC7 to nC8	U	1.00								
Aromatics >nC8 to nC10	U	1.00								
Aromatics >nC10 to nC12	U	1.00								
Aromatics >nC12 to nC16	U	1.00								
Aromatics >nC16 to nC21	U	1.00								
Aromatics >nC21 to nC35	U	1.00								
Total Aromatic Fraction	U	1.00								
Aromatics Relative % Distribution		0								

LCS Sample ID: **LCS-129348** Units: **mg/L** Analysis Date: **14-Jun-2018 16:58**
Client ID: Run ID: **FID-12_318079** SeqNo: **4611675** PrepDate: **13-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Petroleum Hydrocarbons	45.31	1.00	50	0	90.6	60 - 140				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060008

QC BATCH REPORT

Batch ID: 129348 **Instrument: FID-12** **Method: TX1006**

LCSD Sample ID: **LCSD-129348** Units: **mg/L** Analysis Date: **14-Jun-2018 17:27**
Client ID: Run ID: **FID-12_318079** SeqNo: **4611676** PrepDate: **13-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Petroleum Hydrocarbons	45.09	1.00	50	0	90.2	60 - 140	45.31	0.487	30	

The following samples were analyzed in this batch: HS18060008-04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060008

QC BATCH REPORT

Batch ID: 129037 **Instrument: ICPMS05** **Method: SW6020**

MBLK Sample ID: **MBLK-129037** Units: **mg/L** Analysis Date: **05-Jun-2018 16:57**
Client ID: Run ID: **ICPMS05_317395** SeqNo: **4588337** PrepDate: **04-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01518	0.200								J
Selenium	U	0.00200								

LCS Sample ID: **LCS-129037** Units: **mg/L** Analysis Date: **05-Jun-2018 16:59**
Client ID: Run ID: **ICPMS05_317395** SeqNo: **4588338** PrepDate: **04-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05079	0.00200	0.05	0	102	80 - 120				
Arsenic	0.05043	0.00200	0.05	0	101	80 - 120				
Cadmium	0.04892	0.00200	0.05	0	97.8	80 - 120				
Calcium	4.989	0.500	5	0	99.8	80 - 120				
Iron	4.963	0.200	5	0	99.3	80 - 120				
Lead	0.04609	0.00200	0.05	0	92.2	80 - 120				
Magnesium	4.673	0.200	5	0	93.5	80 - 120				
Selenium	0.04918	0.00200	0.05	0	98.4	80 - 120				

MS Sample ID: **HS18060008-02MS** Units: **mg/L** Analysis Date: **05-Jun-2018 17:07**
Client ID: **MW-16S** Run ID: **ICPMS05_317395** SeqNo: **4588342** PrepDate: **04-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05148	0.00200	0.05	0.000256	102	80 - 120				
Arsenic	0.05538	0.00200	0.05	0.003918	103	80 - 120				
Cadmium	0.04846	0.00200	0.05	0.000733	95.5	80 - 120				
Calcium	839.3	0.500	5	788.8	1010	80 - 120				SEO
Iron	7.337	0.200	5	2.395	98.8	80 - 120				
Lead	0.04486	0.00200	0.05	0.000231	89.2	80 - 120				
Magnesium	90.1	0.200	5	80.1	200	80 - 120				SO
Selenium	0.07068	0.00200	0.05	0.01793	105	80 - 120				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060008

QC BATCH REPORT

Batch ID: 129037 **Instrument: ICPMS05** **Method: SW6020**

MSD Sample ID: **HS18060008-02MSD** Units: **mg/L** Analysis Date: **05-Jun-2018 17:09**
Client ID: **MW-16S** Run ID: **ICPMS05_317395** SeqNo: **4588343** PrepDate: **04-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.0515	0.00200	0.05	0.000256	102	80 - 120	0.05148	0.0427	20	
Arsenic	0.05513	0.00200	0.05	0.003918	102	80 - 120	0.05538	0.452	20	
Cadmium	0.04859	0.00200	0.05	0.000733	95.7	80 - 120	0.04846	0.264	20	
Calcium	833.2	0.500	5	788.8	887	80 - 120	839.3	0.737	20	SEO
Iron	7.225	0.200	5	2.395	96.6	80 - 120	7.337	1.54	20	
Lead	0.04395	0.00200	0.05	0.000231	87.4	80 - 120	0.04486	2.03	20	
Magnesium	88.89	0.200	5	80.1	176	80 - 120	90.1	1.36	20	SO
Selenium	0.07044	0.00200	0.05	0.01793	105	80 - 120	0.07068	0.343	20	

PDS Sample ID: **HS18060008-02PDS** Units: **mg/L** Analysis Date: **05-Jun-2018 17:11**
Client ID: **MW-16S** Run ID: **ICPMS05_317395** SeqNo: **4588344** PrepDate: **04-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09444	0.00200	0.1	0.000256	94.2	75 - 125				
Arsenic	0.09769	0.00200	0.1	0.003918	93.8	75 - 125				
Cadmium	0.08932	0.00200	0.1	0.000733	88.6	75 - 125				
Iron	11.05	0.200	10	2.395	86.6	75 - 125				
Lead	0.08815	0.00200	0.1	0.000231	87.9	75 - 125				
Magnesium	86.22	0.200	10	80.1	61.1	75 - 125				SO
Selenium	0.1212	0.00200	0.1	0.01793	103	75 - 125				

PDS Sample ID: **HS18060008-02PDS** Units: **mg/L** Analysis Date: **06-Jun-2018 13:50**
Client ID: **MW-16S** Run ID: **ICPMS05_317492** SeqNo: **4589734** PrepDate: **04-Jun-2018** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	862.8	5.00	100	829.5	33.3	75 - 125				SO

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060008

QC BATCH REPORT

Batch ID: 129037 **Instrument: ICPMS05** **Method: SW6020**

SD Sample ID: **HS18060008-02SD** Units: **mg/L** Analysis Date: **05-Jun-2018 17:05**
Client ID: **MW-16S** Run ID: **ICPMS05_317395** SeqNo: **4588341** PrepDate: **04-Jun-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000256	0	10	
Arsenic	0.003989	0.0100					0.003918	0	10	J
Cadmium	U	0.0100					0.000733	0	10	
Iron	2.489	1.00					2.395	3.92	10	
Lead	U	0.0100					0.000231	0	10	
Magnesium	83.29	1.00					80.1	3.97	10	

SD Sample ID: **HS18060008-02SD** Units: **mg/L** Analysis Date: **06-Jun-2018 13:48**
Client ID: **MW-16S** Run ID: **ICPMS05_317492** SeqNo: **4589733** PrepDate: **04-Jun-2018** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	741.7	25.0					829.5	10.6	10	R

The following samples were analyzed in this batch:

HS18060008-01	HS18060008-02	HS18060008-03	HS18060008-04
HS18060008-05	HS18060008-06	HS18060008-07	HS18060008-08
HS18060008-09	HS18060008-11	HS18060008-12	HS18060008-13

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060008

QC BATCH REPORT

Batch ID: 129039 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLK-129039** Units: **mg/L** Analysis Date: **05-Jun-2018 14:54**
Client ID: Run ID: **ICPMS05_317395** SeqNo: **4588115** PrepDate: **04-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01279	0.200								J
Selenium	U	0.00200								

LCS Sample ID: **LCS-129039** Units: **mg/L** Analysis Date: **05-Jun-2018 14:56**
Client ID: Run ID: **ICPMS05_317395** SeqNo: **4588116** PrepDate: **04-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04828	0.00200	0.05	0	96.6	80 - 120				
Arsenic	0.04885	0.00200	0.05	0	97.7	80 - 120				
Cadmium	0.04737	0.00200	0.05	0	94.7	80 - 120				
Calcium	4.751	0.500	5	0	95.0	80 - 120				
Iron	4.942	0.200	5	0	98.8	80 - 120				
Lead	0.05027	0.00200	0.05	0	101	80 - 120				
Magnesium	4.675	0.200	5	0	93.5	80 - 120				
Selenium	0.05016	0.00200	0.05	0	100	80 - 120				

MS Sample ID: **HS18060008-01MS** Units: **mg/L** Analysis Date: **05-Jun-2018 15:04**
Client ID: **MW-16** Run ID: **ICPMS05_317395** SeqNo: **4588120** PrepDate: **04-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05005	0.00200	0.05	0.000763	98.6	75 - 125				
Arsenic	0.05331	0.00200	0.05	0.002462	102	75 - 125				
Cadmium	0.04768	0.00200	0.05	0	95.4	75 - 125				
Calcium	385.8	0.500	5	378.5	147	75 - 125				SEO
Iron	4.817	0.200	5	0	96.3	75 - 125				
Lead	0.0441	0.00200	0.05	0	88.2	75 - 125				
Magnesium	32.74	0.200	5	28.75	79.8	75 - 125				O
Selenium	0.07581	0.00200	0.05	0.02788	95.9	75 - 125				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060008

QC BATCH REPORT

Batch ID: 129039 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MSD Sample ID: **HS18060008-01MSD** Units: **mg/L** Analysis Date: **05-Jun-2018 15:06**
Client ID: **MW-16** Run ID: **ICPMS05_317395** SeqNo: **4588121** PrepDate: **04-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04884	0.00200	0.05	0.000763	96.2	75 - 125	0.05005	2.44	20	
Arsenic	0.05278	0.00200	0.05	0.002462	101	75 - 125	0.05331	1	20	
Cadmium	0.04748	0.00200	0.05	0	95.0	75 - 125	0.04768	0.429	20	
Calcium	400.6	0.500	5	378.5	442	75 - 125	385.8	3.76	20	SEO
Iron	4.732	0.200	5	0	94.6	75 - 125	4.817	1.78	20	
Lead	0.04532	0.00200	0.05	0	90.6	75 - 125	0.0441	2.72	20	
Magnesium	35.31	0.200	5	28.75	131	75 - 125	32.74	7.56	20	SO
Selenium	0.08224	0.00200	0.05	0.02788	109	75 - 125	0.07581	8.14	20	

PDS Sample ID: **HS18060008-01PDS** Units: **mg/L** Analysis Date: **05-Jun-2018 15:08**
Client ID: **MW-16** Run ID: **ICPMS05_317395** SeqNo: **4588127** PrepDate: **04-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.0836	0.00200	0.1	0.000763	82.8	75 - 125				
Arsenic	0.09549	0.00200	0.1	0.002462	93.0	75 - 125				
Cadmium	0.08798	0.00200	0.1	0.000038	87.9	75 - 125				
Iron	8.905	0.200	10	0.002457	89.0	75 - 125				
Lead	0.08684	0.00200	0.1	0.000383	86.5	75 - 125				
Magnesium	36.22	0.200	10	28.75	74.7	75 - 125				S
Selenium	0.1217	0.00200	0.1	0.02788	93.8	75 - 125				

PDS Sample ID: **HS18060008-01PDS** Units: **mg/L** Analysis Date: **06-Jun-2018 13:42**
Client ID: **MW-16** Run ID: **ICPMS05_317492** SeqNo: **4589730** PrepDate: **04-Jun-2018** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	916.3	25.0	500	340.5	115	75 - 125				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060008

QC BATCH REPORT

Batch ID: 129039 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

SD Sample ID: **HS18060008-01SD** Units: **mg/L** Analysis Date: **05-Jun-2018 15:02**
Client ID: **MW-16** Run ID: **ICPMS05_317395** SeqNo: **4588119** PrepDate: **04-Jun-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000763	0	10	
Arsenic	0.002362	0.0100					0.002462	0	10	J
Cadmium	U	0.0100					0.000038	0	10	
Iron	U	1.00					0.002457	0	10	
Lead	U	0.0100					0.000383	0	10	
Magnesium	30.31	1.00					28.75	5.43	10	

SD Sample ID: **HS18060008-01SD** Units: **mg/L** Analysis Date: **06-Jun-2018 13:40**
Client ID: **MW-16** Run ID: **ICPMS05_317492** SeqNo: **4589729** PrepDate: **04-Jun-2018** DF: **250**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	345	125					340.5	1.32	10	

SD Sample ID: **HS18060008-01SD** Units: **mg/L** Analysis Date: **05-Jun-2018 21:44**
Client ID: **MW-16** Run ID: **ICPMS05_317395** SeqNo: **4588417** PrepDate: **04-Jun-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Selenium	0.02935	0.0100					0.02788	5.28	10	

The following samples were analyzed in this batch:

HS18060008-01	HS18060008-02	HS18060008-03	HS18060008-04
HS18060008-05	HS18060008-06	HS18060008-07	HS18060008-08
HS18060008-09	HS18060008-11	HS18060008-12	HS18060008-13

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060008

QC BATCH REPORT

Batch ID: 129454 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLK-129454** Units: **mg/L** Analysis Date: **15-Jun-2018 22:27**
Client ID: Run ID: **ICPMS05_318049** SeqNo: **4612138** PrepDate: **15-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	U	0.500								
Magnesium	0.01532	0.200								J

LCS Sample ID: **LCS-129454** Units: **mg/L** Analysis Date: **15-Jun-2018 22:29**
Client ID: Run ID: **ICPMS05_318049** SeqNo: **4612139** PrepDate: **15-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	4.707	0.500	5	0	94.1	80 - 120				
Magnesium	4.781	0.200	5	0	95.6	80 - 120				

MS Sample ID: **HS18051492-03MS** Units: **mg/L** Analysis Date: **15-Jun-2018 23:27**
Client ID: Run ID: **ICPMS05_318049** SeqNo: **4612168** PrepDate: **15-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	467	0.500	5	485.9	-379	75 - 125				SEO
Magnesium	50.13	0.200	5	44.9	105	75 - 125				O

MSD Sample ID: **HS18051492-03MSD** Units: **mg/L** Analysis Date: **15-Jun-2018 23:29**
Client ID: Run ID: **ICPMS05_318049** SeqNo: **4612169** PrepDate: **15-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	498.5	0.500	5	485.9	251	75 - 125	467	6.52	20	SEO
Magnesium	52.73	0.200	5	44.9	157	75 - 125	50.13	5.05	20	SO

PDS Sample ID: **HS18051492-03PDS** Units: **mg/L** Analysis Date: **15-Jun-2018 22:41**
Client ID: Run ID: **ICPMS05_318049** SeqNo: **4612145** PrepDate: **15-Jun-2018** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	366	5.00	100	466.5	-101	75 - 125				SO
Magnesium	127	2.00	100	43.54	83.4	75 - 125				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060008

QC BATCH REPORT

Batch ID: 129454 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

SD Sample ID: **HS18051492-03SD** Units: **mg/L** Analysis Date: **18-Jun-2018 13:00**
Client ID: Run ID: **ICPMS05_318132** SeqNo: **4613154** PrepDate: **15-Jun-2018** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	483.9	25.0					466.5	3.73	10	
Magnesium	44.96	10.0					43.54	3.27	10	

The following samples were analyzed in this batch:

HS18060008-02	HS18060008-03	HS18060008-05	HS18060008-06
HS18060008-07	HS18060008-08	HS18060008-09	HS18060008-11
HS18060008-13			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060008

QC BATCH REPORT

Batch ID: R317265 **Instrument: ICS3K2** **Method: E300**

MBLK Sample ID: **WBLKW1-053118** Units: **mg/L** Analysis Date: **31-May-2018 18:06**
Client ID: Run ID: **ICS3K2_317265** SeqNo: **4584006** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	0.500								
Nitrate/Nitrite (as N)	U	0.200								
Sulfate	U	0.500								

LCS Sample ID: **WLCSW1-053118** Units: **mg/L** Analysis Date: **31-May-2018 18:28**
Client ID: Run ID: **ICS3K2_317265** SeqNo: **4584007** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.04	0.500	20	0	100	90 - 110				
Nitrate/Nitrite (as N)	8.457	0.200	8	0	106	90 - 110				
Sulfate	18.6	0.500	20	0	93.0	90 - 110				

LCSD Sample ID: **WLCSDW1-053118** Units: **mg/L** Analysis Date: **31-May-2018 18:49**
Client ID: Run ID: **ICS3K2_317265** SeqNo: **4584008** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.14	0.500	20	0	101	90 - 110	20.04	0.508	20	
Nitrate/Nitrite (as N)	8.498	0.200	8	0	106	90 - 110	8.457	0.484	20	
Sulfate	18.75	0.500	20	0	93.8	90 - 110	18.6	0.782	20	

MS Sample ID: **HS18051515-01MS** Units: **mg/L** Analysis Date: **01-Jun-2018 12:23**
Client ID: Run ID: **ICS3K2_317265** SeqNo: **4584051** PrepDate: DF: **20**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	911.6	10.0	200	699.6	106	80 - 120				
Nitrate/Nitrite (as N)	263.2	4.00	80	173.6	112	80 - 120				
Sulfate	832.4	10.0	200	626.9	103	80 - 120				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060008

QC BATCH REPORT

Batch ID: R317265 **Instrument: ICS3K2** **Method: E300**

MS Sample ID: **HS18051492-07MS** Units: **mg/L** Analysis Date: **01-Jun-2018 04:48**
Client ID: Run ID: **ICS3K2_317265** SeqNo: **4585475** PrepDate: DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	309.4	5.00	100	209.1	100	80 - 120				
Nitrate/Nitrite (as N)	49.8	2.00	40	7.616	105	80 - 120				
Sulfate	4967	5.00	100	4949	18.3	80 - 120				SEO

MSD Sample ID: **HS18051515-01MSD** Units: **mg/L** Analysis Date: **01-Jun-2018 12:45**
Client ID: Run ID: **ICS3K2_317265** SeqNo: **4584052** PrepDate: DF: **20**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	907.6	10.0	200	699.6	104	80 - 120	911.6	0.441	20	
Nitrate/Nitrite (as N)	262.6	4.00	80	173.6	111	80 - 120	263.2	0.231	20	
Sulfate	830.1	10.0	200	626.9	102	80 - 120	832.4	0.277	20	

MSD Sample ID: **HS18051492-07MSD** Units: **mg/L** Analysis Date: **01-Jun-2018 05:10**
Client ID: Run ID: **ICS3K2_317265** SeqNo: **4585476** PrepDate: DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	309.6	5.00	100	209.1	101	80 - 120	309.4	0.0481	20	
Nitrate/Nitrite (as N)	49.8	2.00	40	7.616	105	80 - 120	49.8	0.00402	20	
Sulfate	4964	5.00	100	4949	14.9	80 - 120	4967	0.0698	20	SEO

The following samples were analyzed in this batch: HS18060008-01 HS18060008-02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060008

QC BATCH REPORT

Batch ID: R317270 **Instrument: TOC_02** **Method: SM5310B**

MBLK Sample ID: **WBLKW1-180601** Units: **mg/L** Analysis Date: **01-Jun-2018 20:16**
Client ID: Run ID: **TOC_02_317270** SeqNo: **4584365** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Dissolved	U	1.00								

LCS Sample ID: **WLCSW1-180601** Units: **mg/L** Analysis Date: **01-Jun-2018 20:29**
Client ID: Run ID: **TOC_02_317270** SeqNo: **4584366** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Dissolved	9.857	1.00	10	0	98.6	85 - 115				

LCSD Sample ID: **WLCSDW1-180601** Units: **mg/L** Analysis Date: **01-Jun-2018 20:42**
Client ID: Run ID: **TOC_02_317270** SeqNo: **4584367** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Dissolved	9.85	1.00	10	0	98.5	85 - 115	9.857	0.071	20	

MS Sample ID: **HS18060008-01MS** Units: **mg/L** Analysis Date: **02-Jun-2018 00:26**
Client ID: **MW-16** Run ID: **TOC_02_317270** SeqNo: **4584380** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Dissolved	18.18	1.00	10	8.12	101	80 - 120				

The following samples were analyzed in this batch: HS18060008-01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060008

QC BATCH REPORT

Batch ID: R317271 **Instrument: TOC_02** **Method: SM5310B**

MBLK Sample ID: **WBLKW2-180601** Units: **mg/L** Analysis Date: **02-Jun-2018 01:08**
Client ID: Run ID: **TOC_02_317271** SeqNo: **4584314** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Dissolved	U	1.00								

LCS Sample ID: **WLCSW2-180601** Units: **mg/L** Analysis Date: **02-Jun-2018 01:22**
Client ID: Run ID: **TOC_02_317271** SeqNo: **4584315** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Dissolved	9.849	1.00	10	0	98.5	85 - 115				

LCSD Sample ID: **WLCSDW2-180601** Units: **mg/L** Analysis Date: **02-Jun-2018 01:35**
Client ID: Run ID: **TOC_02_317271** SeqNo: **4584316** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Dissolved	9.98	1.00	10	0	99.8	85 - 115	9.849	1.32	20	

MS Sample ID: **HS18060008-02MS** Units: **mg/L** Analysis Date: **02-Jun-2018 02:02**
Client ID: **MW-16S** Run ID: **TOC_02_317271** SeqNo: **4584318** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Dissolved	15.67	1.00	10	6.169	95.0	80 - 120				

The following samples were analyzed in this batch:

HS18060008-02	HS18060008-03	HS18060008-04	HS18060008-05
HS18060008-06	HS18060008-07	HS18060008-08	HS18060008-09
HS18060008-10	HS18060008-11		

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060008

QC BATCH REPORT

Batch ID: R317272 **Instrument: TOC_02** **Method: SM5310B**

MBLK Sample ID: **WBLKW3-180601** Units: **mg/L** Analysis Date: **02-Jun-2018 05:18**
Client ID: Run ID: **TOC_02_317272** SeqNo: **4584334** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Dissolved	U	1.00								

LCS Sample ID: **WLCSW3-180601** Units: **mg/L** Analysis Date: **02-Jun-2018 05:31**
Client ID: Run ID: **TOC_02_317272** SeqNo: **4584335** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Dissolved	9.899	1.00	10	0	99.0	85 - 115				

LCSD Sample ID: **WLCSDW3-180601** Units: **mg/L** Analysis Date: **02-Jun-2018 05:45**
Client ID: Run ID: **TOC_02_317272** SeqNo: **4584336** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Dissolved	9.997	1.00	10	0	100.0	85 - 115	9.899	0.985	20	

MS Sample ID: **HS18060008-12MS** Units: **mg/L** Analysis Date: **02-Jun-2018 06:11**
Client ID: **MW-10** Run ID: **TOC_02_317272** SeqNo: **4584338** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Dissolved	13.3	1.00	10	3.864	94.4	80 - 120				

The following samples were analyzed in this batch: HS18060008-12 HS18060008-13

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060008

QC BATCH REPORT

Batch ID: R317285 **Instrument: ManTech01** **Method: SM2320B**

MBLK Sample ID: **WBLKW1-180602** Units: **mg/L** Analysis Date: **02-Jun-2018 13:38**
Client ID: Run ID: **ManTech01_317285** SeqNo: **4584666** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	U	5.00								
Alkalinity, Carbonate (As CaCO3)	U	5.00								
Alkalinity, Hydroxide (As CaCO3)	U	5.00								
Alkalinity, Total (As CaCO3)	U	5.00								

LCS Sample ID: **LCS1-180602** Units: **mg/L** Analysis Date: **02-Jun-2018 13:48**
Client ID: Run ID: **ManTech01_317285** SeqNo: **4584667** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1084	5.00	1000	0	108	85 - 115				
Alkalinity, Total (As CaCO3)	1098	5.00	1000	0	110	85 - 115				

LCSD Sample ID: **LCSD1-180602** Units: **mg/L** Analysis Date: **02-Jun-2018 13:58**
Client ID: Run ID: **ManTech01_317285** SeqNo: **4584668** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1085	5.00	1000	0	108	85 - 115	1084	0.06	20	
Alkalinity, Total (As CaCO3)	1100	5.00	1000	0	110	85 - 115	1098	0.2	20	

DUP Sample ID: **HS18051369-01DUP** Units: **mg/L** Analysis Date: **02-Jun-2018 16:42**
Client ID: Run ID: **ManTech01_317285** SeqNo: **4584687** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	301.3	5.00					302	0.235	20	
Alkalinity, Carbonate (As CaCO3)	U	5.00					0	0	20	
Alkalinity, Hydroxide (As CaCO3)	U	5.00					0	0	20	
Alkalinity, Total (As CaCO3)	301.3	5.00					302	0.235	20	

The following samples were analyzed in this batch: HS18060008-02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060008

QC BATCH REPORT

Batch ID: R317286 **Instrument: ManTech01** **Method: SM2320B**

MBLK Sample ID: **WBLKW2-180602** Units: **mg/L** Analysis Date: **02-Jun-2018 17:14**
Client ID: Run ID: **ManTech01_317286** SeqNo: **4584694** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	U	5.00								
Alkalinity, Carbonate (As CaCO3)	U	5.00								
Alkalinity, Hydroxide (As CaCO3)	U	5.00								
Alkalinity, Total (As CaCO3)	U	5.00								

LCS Sample ID: **WLCS2-180602** Units: **mg/L** Analysis Date: **02-Jun-2018 17:23**
Client ID: Run ID: **ManTech01_317286** SeqNo: **4584695** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1081	5.00	1000	0	108	85 - 115				
Alkalinity, Total (As CaCO3)	1089	5.00	1000	0	109	85 - 115				

LCSD Sample ID: **WLCSD2-180602** Units: **mg/L** Analysis Date: **02-Jun-2018 17:33**
Client ID: Run ID: **ManTech01_317286** SeqNo: **4584696** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1080	5.00	1000	0	108	85 - 115	1081	0.137	20	
Alkalinity, Total (As CaCO3)	1089	5.00	1000	0	109	85 - 115	1089	0.0808	20	

DUP Sample ID: **HS18051396-01DUP** Units: **mg/L** Analysis Date: **02-Jun-2018 18:02**
Client ID: Run ID: **ManTech01_317286** SeqNo: **4584699** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	262	5.00					262.4	0.175	20	
Alkalinity, Carbonate (As CaCO3)	U	5.00					0	0	20	
Alkalinity, Hydroxide (As CaCO3)	U	5.00					0	0	20	
Alkalinity, Total (As CaCO3)	262	5.00					262.4	0.175	20	

The following samples were analyzed in this batch: HS18060008-01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060008

QC BATCH REPORT

Batch ID: R317287 **Instrument: ManTech01** **Method: SM2320B**

MBLK Sample ID: **WBLKW3-180602** Units: **mg/L** Analysis Date: **02-Jun-2018 20:49**
Client ID: Run ID: **ManTech01_317287** SeqNo: **4584747** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	U	5.00								
Alkalinity, Carbonate (As CaCO3)	U	5.00								
Alkalinity, Hydroxide (As CaCO3)	U	5.00								
Alkalinity, Total (As CaCO3)	U	5.00								

LCS Sample ID: **LCS3-180602** Units: **mg/L** Analysis Date: **02-Jun-2018 20:59**
Client ID: Run ID: **ManTech01_317287** SeqNo: **4584748** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1069	5.00	1000	0	107	85 - 115				
Alkalinity, Total (As CaCO3)	1095	5.00	1000	0	109	85 - 115				

LCSD Sample ID: **LCSD3-180602** Units: **mg/L** Analysis Date: **02-Jun-2018 21:08**
Client ID: Run ID: **ManTech01_317287** SeqNo: **4584749** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1066	5.00	1000	0	107	85 - 115	1069	0.278	20	
Alkalinity, Total (As CaCO3)	1091	5.00	1000	0	109	85 - 115	1095	0.369	20	

DUP Sample ID: **HS18060008-03DUP** Units: **mg/L** Analysis Date: **02-Jun-2018 21:23**
Client ID: **DGW-MW-1** Run ID: **ManTech01_317287** SeqNo: **4584751** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	614.5	5.00					616	0.249	20	
Alkalinity, Carbonate (As CaCO3)	U	5.00					0	0	20	
Alkalinity, Hydroxide (As CaCO3)	U	5.00					0	0	20	
Alkalinity, Total (As CaCO3)	614.5	5.00					616	0.249	20	

The following samples were analyzed in this batch:

HS18060008-03	HS18060008-04	HS18060008-05	HS18060008-06
HS18060008-07	HS18060008-08	HS18060008-09	HS18060008-11
HS18060008-12	HS18060008-13		

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060008

QC BATCH REPORT

Batch ID: R317317 **Instrument: TOC_02** **Method: SM5310B**

MBLK Sample ID: **WBLKW2-180602** Units: **mg/L** Analysis Date: **02-Jun-2018 22:02**
Client ID: Run ID: **TOC_02_317317** SeqNo: **4585273** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	U	1.00								

LCS Sample ID: **WLCSW2-180602** Units: **mg/L** Analysis Date: **02-Jun-2018 22:15**
Client ID: Run ID: **TOC_02_317317** SeqNo: **4585274** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.994	1.00	10	0	99.9	85 - 115				

LCSD Sample ID: **WLCSDW2-180602** Units: **mg/L** Analysis Date: **02-Jun-2018 22:28**
Client ID: Run ID: **TOC_02_317317** SeqNo: **4585275** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.944	1.00	10	0	99.4	85 - 115	9.994	0.502	20	

MS Sample ID: **HS18060008-10MS** Units: **mg/L** Analysis Date: **03-Jun-2018 02:15**
Client ID: **DGW-MW-11S** Run ID: **TOC_02_317317** SeqNo: **4585288** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	21.15	1.00	10	11.69	94.6	80 - 120				

The following samples were analyzed in this batch:

HS18060008-01	HS18060008-02	HS18060008-03	HS18060008-04
HS18060008-05	HS18060008-06	HS18060008-07	HS18060008-08
HS18060008-09	HS18060008-10		

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060008

QC BATCH REPORT

Batch ID: R317318 **Instrument: TOC_02** **Method: SM5310B**

MBLK Sample ID: **WBLKW3-180602** Units: **mg/L** Analysis Date: **03-Jun-2018 02:55**
Client ID: Run ID: **TOC_02_317318** SeqNo: **4585293** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	U	1.00								

LCS Sample ID: **WLCSW3-180602** Units: **mg/L** Analysis Date: **03-Jun-2018 03:08**
Client ID: Run ID: **TOC_02_317318** SeqNo: **4585294** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.993	1.00	10	0	99.9	85 - 115				

LCSD Sample ID: **WLCSDW3-180602** Units: **mg/L** Analysis Date: **03-Jun-2018 03:22**
Client ID: Run ID: **TOC_02_317318** SeqNo: **4585295** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.659	1.00	10	0	96.6	85 - 115	9.993	3.4	20	

MS Sample ID: **HS18051443-01MS** Units: **mg/L** Analysis Date: **03-Jun-2018 03:48**
Client ID: Run ID: **TOC_02_317318** SeqNo: **4585297** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	24.11	1.00	10	14	101	80 - 120				

The following samples were analyzed in this batch: HS18060008-11 HS18060008-12 HS18060008-13

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060008

QC BATCH REPORT

Batch ID: R317340 **Instrument: ICS2100** **Method: E300**

MBLK Sample ID: **WBLKW1-060118** Units: **mg/L** Analysis Date: **01-Jun-2018 14:31**
Client ID: Run ID: **ICS2100_317340** SeqNo: **4585671** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	0.500								
Nitrate/Nitrite (as N)	U	0.200								
Sulfate	U	0.500								

LCS Sample ID: **WLCSW1-060118** Units: **mg/L** Analysis Date: **01-Jun-2018 15:00**
Client ID: Run ID: **ICS2100_317340** SeqNo: **4585672** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.01	0.500	20	0	100	90 - 110				
Nitrate/Nitrite (as N)	8.293	0.200	8	0	104	90 - 110				
Sulfate	20.2	0.500	20	0	101	90 - 110				

LCSD Sample ID: **WLCSDW1-060118** Units: **mg/L** Analysis Date: **01-Jun-2018 15:18**
Client ID: Run ID: **ICS2100_317340** SeqNo: **4585673** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.1	0.500	20	0	101	90 - 110	20.01	0.479	20	
Nitrate/Nitrite (as N)	8.338	0.200	8	0	104	90 - 110	8.293	0.541	20	
Sulfate	20.34	0.500	20	0	102	90 - 110	20.2	0.715	20	

MS Sample ID: **HS18060008-04MS** Units: **mg/L** Analysis Date: **01-Jun-2018 16:57**
Client ID: **DGW-MW-3** Run ID: **ICS2100_317340** SeqNo: **4585677** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	55.24	0.500	10	46.56	86.8	80 - 120				O
Nitrate/Nitrite (as N)	4.197	0.200	4	0.032	104	80 - 120				
Sulfate	130.7	0.500	10	124.4	63.0	80 - 120				SEO

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060008

QC BATCH REPORT

Batch ID: R317340 **Instrument: ICS2100** **Method: E300**

MS Sample ID: **HS18051459-02MS** Units: **mg/L** Analysis Date: **02-Jun-2018 12:58**
Client ID: Run ID: **ICS2100_317340** SeqNo: **4585709** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	10.03	0.500	10	0	100	80 - 120				
Nitrate/Nitrite (as N)	4.093	0.200	4	0	102	80 - 120				
Sulfate	9.861	0.500	10	0	98.6	80 - 120				

MSD Sample ID: **HS18060008-04MSD** Units: **mg/L** Analysis Date: **01-Jun-2018 17:11**
Client ID: **DGW-MW-3** Run ID: **ICS2100_317340** SeqNo: **4585678** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	55.96	0.500	10	46.56	94.0	80 - 120	55.24	1.3	20	O
Nitrate/Nitrite (as N)	4.26	0.200	4	0.032	106	80 - 120	4.197	1.49	20	
Sulfate	132.8	0.500	10	124.4	83.4	80 - 120	130.7	1.55	20	EO

MSD Sample ID: **HS18051459-02MSD** Units: **mg/L** Analysis Date: **02-Jun-2018 13:13**
Client ID: Run ID: **ICS2100_317340** SeqNo: **4585710** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	10.5	0.500	10	0	105	80 - 120	10.03	4.66	20	
Nitrate/Nitrite (as N)	4.276	0.200	4	0	107	80 - 120	4.093	4.37	20	
Sulfate	10.38	0.500	10	0	104	80 - 120	9.861	5.09	20	

The following samples were analyzed in this batch:

HS18060008-03	HS18060008-04	HS18060008-05	HS18060008-06
HS18060008-07	HS18060008-08	HS18060008-09	HS18060008-11
HS18060008-12	HS18060008-13		

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: **HS18060008**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
California	2919 2016-2018	31-Jul-2018
Oklahoma	2017-088	31-Aug-2018
North Carolina	624-2018	31-Dec-2018
Louisiana	03087 2017-2018	30-Jun-2018
Arkansas	88-0356	27-Mar-2019
Kansas	E-10352 2017-218	31-Jul-2018
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193	30-Apr-2019

Client: Golder Associates
Project: Exide DGW PDI
Work Order: HS18060008

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS18060008-01	MW-16	Login	6/1/2018 10:35:08 AM	DQ	WET069
HS18060008-01	MW-16	Login	6/1/2018 10:35:08 AM	DQ	MET021
HS18060008-01	MW-16	Login	6/1/2018 10:35:08 AM	DQ	MET021
HS18060008-01	MW-16	Login	6/1/2018 10:35:08 AM	DQ	WET069
HS18060008-01	MW-16	Login	6/1/2018 10:35:08 AM	DQ	WET069
HS18060008-02	MW-16S	Login	6/1/2018 10:45:27 AM	DQ	WET069
HS18060008-02	MW-16S	Login	6/1/2018 10:45:27 AM	DQ	MET021
HS18060008-02	MW-16S	Login	6/1/2018 10:45:27 AM	DQ	MET021
HS18060008-02	MW-16S	Login	6/1/2018 10:45:27 AM	DQ	WET069
HS18060008-02	MW-16S	Login	6/1/2018 10:45:27 AM	DQ	WET069
HS18060008-03	DGW-MW-1	Login	6/1/2018 10:45:28 AM	DQ	WET069
HS18060008-03	DGW-MW-1	Login	6/1/2018 10:45:28 AM	DQ	MET021
HS18060008-03	DGW-MW-1	Login	6/1/2018 10:45:28 AM	DQ	MET021
HS18060008-03	DGW-MW-1	Login	6/1/2018 10:45:28 AM	DQ	WET069
HS18060008-03	DGW-MW-1	Login	6/1/2018 10:45:28 AM	DQ	WET069
HS18060008-04	DGW-MW-3	Login	6/1/2018 10:45:28 AM	DQ	WET069
HS18060008-04	DGW-MW-3	Login	6/1/2018 10:45:28 AM	DQ	MET021
HS18060008-04	DGW-MW-3	Login	6/1/2018 10:45:28 AM	DQ	MET021
HS18060008-04	DGW-MW-3	Login	6/1/2018 10:45:28 AM	DQ	TPH050
HS18060008-04	DGW-MW-3	Login	6/1/2018 10:45:28 AM	DQ	WET069
HS18060008-04	DGW-MW-3	Login	6/1/2018 10:45:28 AM	DQ	WET069
HS18060008-05	DGW-MW-9	Login	6/1/2018 10:45:28 AM	DQ	WET069
HS18060008-05	DGW-MW-9	Login	6/1/2018 10:45:28 AM	DQ	MET021
HS18060008-05	DGW-MW-9	Login	6/1/2018 10:45:28 AM	DQ	MET021
HS18060008-05	DGW-MW-9	Login	6/1/2018 10:45:28 AM	DQ	WET069
HS18060008-05	DGW-MW-9	Login	6/1/2018 10:45:28 AM	DQ	WET069
HS18060008-06	DGW-MW-2	Login	6/1/2018 10:45:28 AM	DQ	WET069
HS18060008-06	DGW-MW-2	Login	6/1/2018 10:45:28 AM	DQ	MET021
HS18060008-06	DGW-MW-2	Login	6/1/2018 10:45:28 AM	DQ	MET021
HS18060008-06	DGW-MW-2	Login	6/1/2018 10:45:28 AM	DQ	TPH050
HS18060008-06	DGW-MW-2	Login	6/1/2018 10:45:28 AM	DQ	WET069
HS18060008-06	DGW-MW-2	Login	6/1/2018 10:45:28 AM	DQ	WET069
HS18060008-07	MW-27	Login	6/1/2018 10:45:28 AM	DQ	WET069
HS18060008-07	MW-27	Login	6/1/2018 10:45:28 AM	DQ	MET021
HS18060008-07	MW-27	Login	6/1/2018 10:45:28 AM	DQ	MET021
HS18060008-07	MW-27	Login	6/1/2018 10:45:28 AM	DQ	WET069
HS18060008-07	MW-27	Login	6/1/2018 10:45:28 AM	DQ	WET069
HS18060008-08	MW-29	Login	6/1/2018 10:45:28 AM	DQ	WET069
HS18060008-08	MW-29	Login	6/1/2018 10:45:28 AM	DQ	MET021
HS18060008-08	MW-29	Login	6/1/2018 10:45:28 AM	DQ	MET021

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
Work Order: HS18060008

SAMPLE TRACKING

HS18060008-08	MW-29	Login	6/1/2018 10:45:28 AM	DQ	TPH050
HS18060008-08	MW-29	Login	6/1/2018 10:45:28 AM	DQ	WET069
HS18060008-08	MW-29	Login	6/1/2018 10:45:28 AM	DQ	WET069
HS18060008-09	DGW-MW-10S	Login	6/1/2018 10:45:28 AM	DQ	WET069
HS18060008-09	DGW-MW-10S	Login	6/1/2018 10:45:28 AM	DQ	MET021
HS18060008-09	DGW-MW-10S	Login	6/1/2018 10:45:28 AM	DQ	MET021
HS18060008-09	DGW-MW-10S	Login	6/1/2018 10:45:28 AM	DQ	TPH050
HS18060008-09	DGW-MW-10S	Login	6/1/2018 10:45:28 AM	DQ	WET069
HS18060008-09	DGW-MW-10S	Login	6/1/2018 10:45:28 AM	DQ	WET069
HS18060008-10	DGW-MW-11S	Login	6/1/2018 10:45:28 AM	DQ	WET069
HS18060008-10	DGW-MW-11S	Login	6/1/2018 10:45:28 AM	DQ	WET069
HS18060008-11	MW-30	Login	6/1/2018 10:45:28 AM	DQ	WET069
HS18060008-11	MW-30	Login	6/1/2018 10:45:28 AM	DQ	MET021
HS18060008-11	MW-30	Login	6/1/2018 10:45:28 AM	DQ	MET021
HS18060008-11	MW-30	Login	6/1/2018 10:45:28 AM	DQ	WET069
HS18060008-11	MW-30	Login	6/1/2018 10:45:28 AM	DQ	WET069
HS18060008-12	MW-10	Login	6/1/2018 10:45:28 AM	DQ	WET069
HS18060008-12	MW-10	Login	6/1/2018 10:45:28 AM	DQ	MET021
HS18060008-12	MW-10	Login	6/1/2018 10:45:28 AM	DQ	MET021
HS18060008-12	MW-10	Login	6/1/2018 10:45:28 AM	DQ	WET069
HS18060008-12	MW-10	Login	6/1/2018 10:45:28 AM	DQ	WET069
HS18060008-13	DUP-02	Login	6/1/2018 10:45:28 AM	DQ	WET069
HS18060008-13	DUP-02	Login	6/1/2018 10:45:28 AM	DQ	MET021
HS18060008-13	DUP-02	Login	6/1/2018 10:45:28 AM	DQ	MET021
HS18060008-13	DUP-02	Login	6/1/2018 10:45:28 AM	DQ	WET069
HS18060008-13	DUP-02	Login	6/1/2018 10:45:28 AM	DQ	WET069

Sample Receipt Checklist

Client Name:	Golder St Louis	Date/Time Received:	**01-Jun-2018 08:30**
Work Order:	HS18060008	Received by:	**RPG**

Checklist completed by: *Raegen Giga* eSignature — 1-Jun-2018 Date

Reviewed by: *Dane J. Wacasey* eSignature — 5-Jun-2018 Date

Matrices: **Water**

Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	2.5c/2.1c - 2.7c/2.3c uc/c	IR 30	
Cooler(s)/Kit(s):	43588/43065		
Date/Time sample(s) sent to storage:	06/01/2018 10:52		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070

Chain of Custody Fo

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COC ID: 180503

HS18060008

Golder Associates
Exide DGW PDI

ton, WV
68

:80

Cooler #43588 (TRK # 4380 9529 4677)

ALS Project Manager:

Customer Information		Project Information	
Purchase Order	1302086	Project Name	Exide DGW PDI
Work Order		Project Number	1302086
Company Name	Golder Associates	Bill To Company	Golder Associates
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021
Phone	(314) 984-8800	Phone	(314) 984-8800
Fax		Fax	
e-Mail Address	ewhite@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com

A	300_W (E300 Cl, SO4, *NO3, NO2*)-*48hr HT*
B	ALK_W 2320B (2320B Alkalinity)
C	TOC_W 5310B (5310B TOC)
D	TOC_Diss_5310B (5310B Dissolved Organic Carbon (FdFltr)
E	ICP_TW (Total Sb, As, Ca, Cd, Fe, Pb, Mg, Se)
F	ICP_DISS (6020 Diss Sb, As, Cd, Pb, Se (FdFltr))
G	TX1005_W_Low (TX1005 TPH)
H	TX1006_W (TX1006 TPH (Contingent))
I	
J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-16	5/31/18	0855	Water	2,3,8	~~10~~ 7	X	X	X	X	X	X	~~X~~	~~X~~			
2	MW-16S		0855		1	1	X	X	X	X	X	X					
3	DGW-MW-1		1030		1	1	X	X	X	X	X	X					
4	DGW-MW-3		1035		1,2,3,8	10	X	X	X	X	X	X	X	X			
5	DGW-MW-9		1135		2,3,8	7	X	X	X	X	X	X					
6	DGW-MW-2		1145		1,2,3,8	10	X	X	X	X	X	X	X	X			
7	MW-27		1325		2,3,8	7	X	X	X	X	X	X					
8	MW-29		1425		1,2,3,8	10	X	X	X	X	X	X	X	X			
9	DGW-MW-10S		1530		1,2,3,8	10	X	X	X	X	X	X	X	X			
10	DGW-MW-11S		1630		3,8	4			X	X							

Sampler(s) Please Print & Sign: Bri Works

Shipment Method: FedEX

Required Turnaround Time: (Check Box) [X] 3 [ ] STD 10 Wk Days [ ] 5 Wk Days [ ] 2 Wk Days [ ] 24 Hour

Results Due Date:

Relinquished by: Date: 5/31/18 Time: 1800 Received by:

Relinquished by: Date: Time: Received by (Laboratory): R Ciya 6/1/18 0530

Logged by (Laboratory): Date: Time: Checked by (Laboratory):

Notes: Golder Exide DGW PDI

Cooler ID	Cooler Temp.
43588	2.7c
#2 30	
CS-0-4	

QC Package: (Check One Box Below)

- [ ] Level II Std QC
- [ ] Level III Std QC/Raw Data
- [ ] Level IV SW846/CLP
- [ ] ~~Other~~
- [X] TRRP Checklist
- [ ] TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

ote:
1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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+1 970 490 1511

Holland, MI
+1 616 399 6070

Chain of Custody Form

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COC ID: 180460

HS18060008

Golder Associates
Exide DGW PDI

ALS Project Manager:

Customer Information		Project Information	
Purchase Order	1302086-06	Project Name	Exide DGW PDI
Work Order		Project Number	
Company Name	Golder Associates	Bill To Company	Golder Associates
Send Report To	Emily White	Invoice Attn	Emily White
Address	13515 Barrett Parkway,Suite 260	Address	13515 Barrett Parkway, Suite 260
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021
Phone		Phone	
Fax		Fax	
e-Mail Address	Emily_White@golder.com	e-Mail Address	

A	300_W (*NO3, NO2*, Cl, SO4)
B	ALK_W 2320B (Alkalinity)
C	ICP_TW (Tot Sb,As,Ca,Cd,Fe,Pb,Mg,Se)
D	ICP_DISS (Diss Sb,As,Cd,Pb,Se)
E	TOC_W 5310B (Total Organic Carbon)
F	TOC_Diss_5310B (TOC, Dissolved-FldFlter)
G	
H	
I	
J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-30	5/31/2018	1725	Water	2,3,8	7	X	X	X	X	X	X					
2	MW-10	"	1900	"	"	"	X	X	X	X	X	X					
3	DUP-02	"	—	"	"	"	X	X	X	X	X	X					
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Jacqueline Engel

Shipment Method: FedEx

Required Turnaround Time: (Check Box) ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by: Date: 5/31/2018 Time: 1930 Received by:

Relinquished by: Date: Time: Received by (Laboratory): R Cruz 6/1/18 03:30

Logged by (Laboratory): Date: Time: Checked by (Laboratory):

Notes: EXIDE DGW/PDI

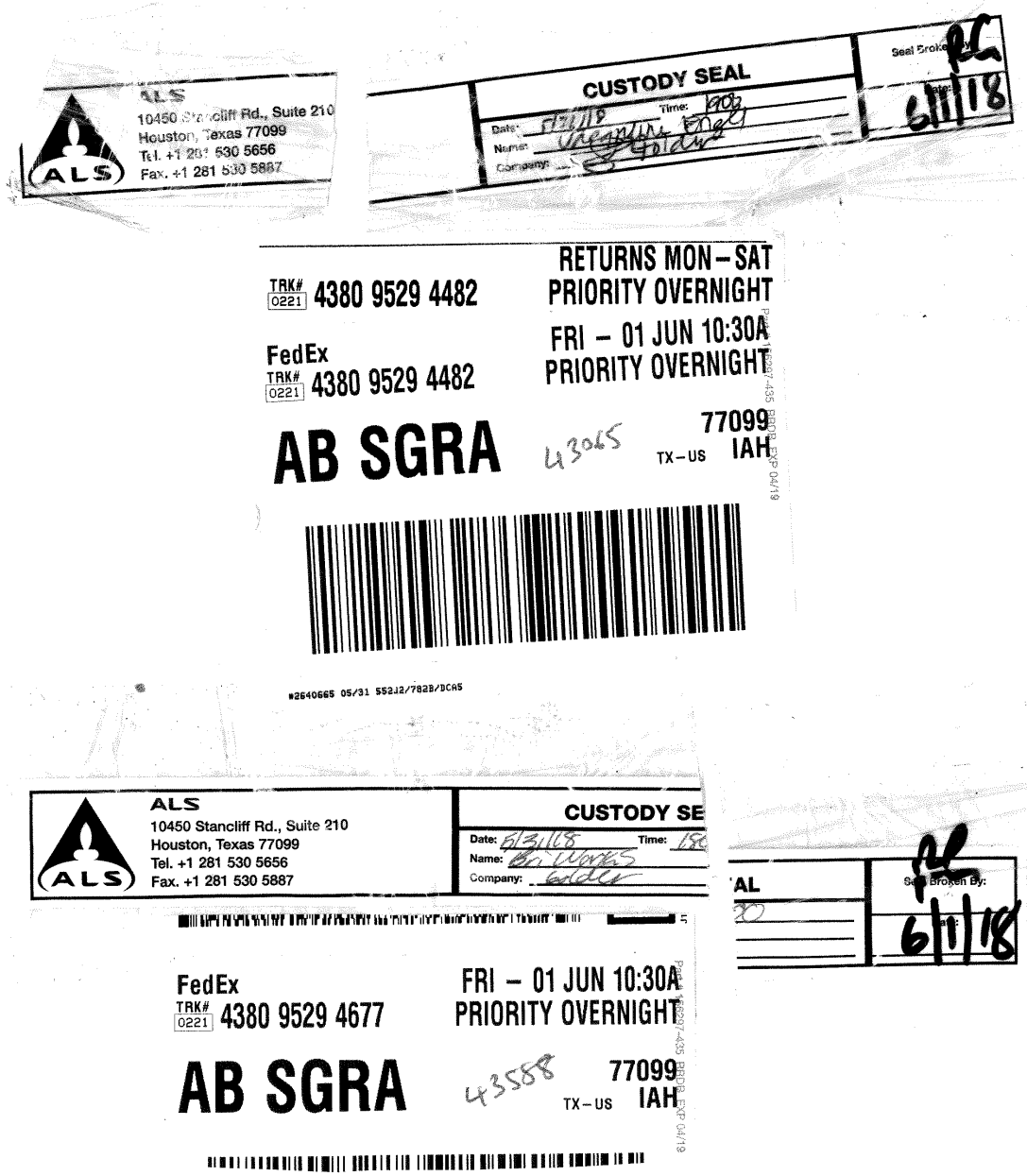
Cooler ID	Cooler Temp.
430565	2.5C
IR 30	
CF-0.4	

QC Package: (Check One Box Below)
☐ Level II Std QC
☐ Level III Std QC/Raw Data
☐ Level IV SW846/CLP
☐ Other
☒ TRRP Checklist
☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note:
1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

Copyright 2011 by ALS Environmental.


ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CUSTODY SEAL
Date:
Time:
Name:
Company:
Seal Broken By:
Date:
6/1/18
TRK# 0221 4380 9529 4482
RETURNS MON-SAT
PRIORITY OVERNIGHT
FedEx
TRK# 0221 4380 9529 4482
FRI - 01 JUN 10:30A
PRIORITY OVERNIGHT
AB SGRA
43065
77099
TX-US IAH
#2640665 05/31 5523J/7828/DCA5
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CUSTODY SE
Date:
Time:
Name:
Company:
AL
Seal Broken By:
Date:
6/1/18
FedEx
TRK# 0221 4380 9529 4677
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PRIORITY OVERNIGHT
AB SGRA
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June 21, 2018

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS18060068**

Revision: **1**

Laboratory Results for: **Exide DGW PDI**

Dear Emily,

ALS Environmental received 3 sample(s) on Jun 02, 2018 for the analysis presented in the following report.

This is a REVISED REPORT. Please see the Case Narrative for discussion concerning this revision.

Regards,

Generated By: DANE.WACASEY

Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide DGW PDI	
WorkOrder:	**HS18060068**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

ALS Group Houston, Corp Date: 21-Jun-18

Client:	Golder Associates
Project:	Exide DGW PDI
WorkOrder:	**HS18060068**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data								
Laboratory Name: ALS Laboratory Group			LRC Date: 06/07/2018					
Project Name: Exide DGW PDI			Laboratory Job Number: HS18060068					
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 129037,129039,R317287,R317486,R317563					
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?	X				
		Were analytical duplicates analyzed at the appropriate frequency?	X				
		Were RPDs or relative standard deviations within the laboratory QC limits?	X				
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				3
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				4
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 06/07/2018				
Project Name: Exide DGW PDI			Laboratory Job Number: HS18060068				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 129037,129039,R317287,R317486,R317563				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		X			2
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				3
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Data	
Laboratory Name: ALS Laboratory Group	LRC Date: 06/07/2018
Project Name: Exide DGW PDI	Laboratory Job Number: HS18060068
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 129037,129039,R317287,R317486,R317563

ER#[5]	Description
4	This report was revised June 21, 2018 in order to include results for additional dissolved metals per client request.
1	Batch 129037, Metals Method SW6020, sample HS18060008-02, MS and MSD were performed on unrelated sample. Batch R317563, Anions Method E300, sample MW-31, MS and MSD recovered outside the control limit for Sulfate, however, the result in the parent sample is greater than 4x the spike amount.
2	Batch 129037, Metals Method SW6020, sample HS18060008-02, PDS was performed on unrelated sample. Batch 129037, Metals Method SW6020, sample HS18060008-02, Serial Dilution was performed on unrelated sample.
3	This report does not include a DCS for Nitrate/Nitrite (as N) because the laboratory PQL is lower than the associated protection standard.

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Client: Golder Associates
Project: Exide DGW PDI
Work Order: HS18060068

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18060068-01	MW-31	Water		01-Jun-2018 09:35	02-Jun-2018 08:05	☐
HS18060068-02	MW-46	Water		01-Jun-2018 11:10	02-Jun-2018 08:05	☐
HS18060068-03	MW-44	Water		01-Jun-2018 13:15	02-Jun-2018 08:05	☐

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
Sample ID: MW-31
Collection Date: 01-Jun-2018 09:35

ANALYTICAL REPORT
WorkOrder:HS18060068
Lab ID:HS18060068-01
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 04-Jun-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	05-Jun-2018 17:37
Arsenic	**0.0106**		**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 17:37
Cadmium	U		0.000200	0.00200	mg/L	1	05-Jun-2018 17:37
Calcium	**391**		**0.340**	**5.00**	**mg/L**	10	06-Jun-2018 14:11
Iron	**7.05**		**0.0120**	**0.200**	**mg/L**	1	05-Jun-2018 17:37
Lead	U		0.000600	0.00200	mg/L	1	05-Jun-2018 17:37
Magnesium	**31.9**		**0.0100**	**0.200**	**mg/L**	1	05-Jun-2018 17:37
Selenium	**0.00595**		**0.00110**	**0.00200**	**mg/L**	1	05-Jun-2018 17:37
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**			Prep:SW3010A / 04-Jun-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	05-Jun-2018 15:44
Arsenic	**0.0101**		**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 15:44
Cadmium	U		0.000200	0.00200	mg/L	1	05-Jun-2018 15:44
Calcium	**301**		**0.340**	**5.00**	**mg/L**	10	15-Jun-2018 21:51
Iron	**6.73**		**0.0120**	**0.200**	**mg/L**	1	05-Jun-2018 22:48
Lead	**0.000633**	J	**0.000600**	**0.00200**	**mg/L**	1	05-Jun-2018 22:48
Magnesium	**32.3**		**0.0100**	**0.200**	**mg/L**	1	05-Jun-2018 22:48
Selenium	**0.00550**		**0.00110**	**0.00200**	**mg/L**	1	05-Jun-2018 15:44
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**130**		**2.00**	**5.00**	**mg/L**	10	02-Jun-2018 21:01
Nitrate/Nitrite (as N)	U		0.0300	0.200	mg/L	1	02-Jun-2018 19:56
Sulfate	**1,650**		**4.00**	**10.0**	**mg/L**	20	04-Jun-2018 13:49
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**761**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 22:50
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 22:50
Alkalinity, Hydroxide (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 22:50
Alkalinity, Total (As CaCO3)	**761**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 22:50
TOC, DISSOLVED - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Dissolved	**9.83**		**0.500**	**1.00**	**mg/L**	1	06-Jun-2018 08:38
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Total	**10.4**		**0.500**	**1.00**	**mg/L**	1	05-Jun-2018 22:13

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
Sample ID: MW-46
Collection Date: 01-Jun-2018 11:10

ANALYTICAL REPORT
WorkOrder:HS18060068
Lab ID:HS18060068-02
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 04-Jun-2018		Analyst: JDE
Antimony	**0.00263**		**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 17:39
Arsenic	**0.00461**		**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 17:39
Cadmium	**0.00204**		**0.000200**	**0.00200**	**mg/L**	1	05-Jun-2018 17:39
Calcium	**338**		**0.340**	**5.00**	**mg/L**	10	06-Jun-2018 14:13
Iron	**73.5**		**0.0120**	**0.200**	**mg/L**	1	05-Jun-2018 17:39
Lead	**0.0354**		**0.000600**	**0.00200**	**mg/L**	1	05-Jun-2018 17:39
Magnesium	**175**		**0.100**	**2.00**	**mg/L**	10	06-Jun-2018 14:13
Selenium	**0.00754**		**0.00110**	**0.00200**	**mg/L**	1	05-Jun-2018 17:39
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**			Prep:SW3010A / 04-Jun-2018		Analyst: JDE
Antimony	**0.000569**	J	**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 15:46
Arsenic	**0.00187**	J	**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 15:46
Cadmium	**0.00219**		**0.000200**	**0.00200**	**mg/L**	1	05-Jun-2018 15:46
Calcium	**208**		**0.340**	**5.00**	**mg/L**	10	15-Jun-2018 21:53
Iron	**69.3**		**0.0120**	**0.200**	**mg/L**	1	05-Jun-2018 22:50
Lead	**0.00183**	J	**0.000600**	**0.00200**	**mg/L**	1	05-Jun-2018 22:50
Magnesium	**109**		**0.100**	**2.00**	**mg/L**	10	15-Jun-2018 21:53
Selenium	**0.00793**		**0.00110**	**0.00200**	**mg/L**	1	05-Jun-2018 15:46
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**360**		**2.00**	**5.00**	**mg/L**	10	02-Jun-2018 21:44
Nitrate/Nitrite (as N)	**0.150**	J	**0.0300**	**0.200**	**mg/L**	1	02-Jun-2018 21:23
Sulfate	**2,700**		**8.00**	**20.0**	**mg/L**	40	04-Jun-2018 16:39
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**170**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 23:13
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 23:13
Alkalinity, Hydroxide (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 23:13
Alkalinity, Total (As CaCO3)	**170**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 23:13
TOC, DISSOLVED - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Dissolved	**4.15**		**0.500**	**1.00**	**mg/L**	1	06-Jun-2018 09:05
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Total	**4.46**		**0.500**	**1.00**	**mg/L**	1	05-Jun-2018 22:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
Sample ID: MW-44
Collection Date: 01-Jun-2018 13:15

ANALYTICAL REPORT
WorkOrder:HS18060068
Lab ID:HS18060068-03
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 04-Jun-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	05-Jun-2018 17:45
Arsenic	**0.00326**		**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 17:45
Cadmium	U		0.000200	0.00200	mg/L	1	05-Jun-2018 17:45
Calcium	**492**		**0.340**	**5.00**	**mg/L**	10	06-Jun-2018 14:15
Iron	**11.1**		**0.0120**	**0.200**	**mg/L**	1	05-Jun-2018 17:45
Lead	**0.000842**	J	**0.000600**	**0.00200**	**mg/L**	1	05-Jun-2018 17:45
Magnesium	**65.3**		**0.0100**	**0.200**	**mg/L**	1	05-Jun-2018 17:45
Selenium	**0.00627**		**0.00110**	**0.00200**	**mg/L**	1	05-Jun-2018 17:45
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**			Prep:SW3010A / 04-Jun-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	05-Jun-2018 15:48
Arsenic	**0.00108**	J	**0.000400**	**0.00200**	**mg/L**	1	05-Jun-2018 15:48
Cadmium	U		0.000200	0.00200	mg/L	1	05-Jun-2018 15:48
Calcium	**367**		**0.340**	**5.00**	**mg/L**	10	15-Jun-2018 21:55
Iron	**8.27**		**0.0120**	**0.200**	**mg/L**	1	05-Jun-2018 22:52
Lead	U		0.000600	0.00200	mg/L	1	05-Jun-2018 22:52
Magnesium	**64.7**		**0.0100**	**0.200**	**mg/L**	1	05-Jun-2018 22:52
Selenium	**0.00661**		**0.00110**	**0.00200**	**mg/L**	1	05-Jun-2018 15:48
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**301**		**2.00**	**5.00**	**mg/L**	10	02-Jun-2018 23:11
Nitrate/Nitrite (as N)	U		0.0300	0.200	mg/L	1	02-Jun-2018 22:50
Sulfate	**1,680**		**4.00**	**10.0**	**mg/L**	20	04-Jun-2018 14:33
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**567**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 23:20
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 23:20
Alkalinity, Hydroxide (As CaCO3)	U		5.00	5.00	mg/L	1	02-Jun-2018 23:20
Alkalinity, Total (As CaCO3)	**567**		**5.00**	**5.00**	**mg/L**	1	02-Jun-2018 23:20
TOC, DISSOLVED - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Dissolved	**6.28**		**0.500**	**1.00**	**mg/L**	1	06-Jun-2018 09:20
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Total	**6.14**		**0.500**	**1.00**	**mg/L**	1	05-Jun-2018 22:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

WEIGHT LOG

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060068

Batch ID: 129037 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18060068-01	1	10	10 (mL)	1
HS18060068-02	1	10	10 (mL)	1
HS18060068-03	1	10	10 (mL)	1

Batch ID: 129039 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18060068-01	1	10	10 (mL)	1
HS18060068-02	1	10	10 (mL)	1
HS18060068-03	1	10	10 (mL)	1

Batch ID: 129455 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18060068-01	1	10	10 (mL)	1
HS18060068-02	1	10	10 (mL)	1
HS18060068-03	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060068

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 129037	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Water		
HS18060068-01	MW-31	01 Jun 2018 09:35		04 Jun 2018 10:09	06 Jun 2018 14:11	10
HS18060068-01	MW-31	01 Jun 2018 09:35		04 Jun 2018 10:09	05 Jun 2018 17:37	1
HS18060068-02	MW-46	01 Jun 2018 11:10		04 Jun 2018 10:09	06 Jun 2018 14:13	10
HS18060068-02	MW-46	01 Jun 2018 11:10		04 Jun 2018 10:09	05 Jun 2018 17:39	1
HS18060068-03	MW-44	01 Jun 2018 13:15		04 Jun 2018 10:09	06 Jun 2018 14:15	10
HS18060068-03	MW-44	01 Jun 2018 13:15		04 Jun 2018 10:09	05 Jun 2018 17:45	1
Batch ID 129039	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Water		
HS18060068-01	MW-31	01 Jun 2018 09:35		04 Jun 2018 10:13	05 Jun 2018 22:48	1
HS18060068-01	MW-31	01 Jun 2018 09:35		04 Jun 2018 10:13	05 Jun 2018 15:44	1
HS18060068-02	MW-46	01 Jun 2018 11:10		04 Jun 2018 10:13	05 Jun 2018 22:50	1
HS18060068-02	MW-46	01 Jun 2018 11:10		04 Jun 2018 10:13	05 Jun 2018 15:46	1
HS18060068-03	MW-44	01 Jun 2018 13:15		04 Jun 2018 10:13	05 Jun 2018 22:52	1
HS18060068-03	MW-44	01 Jun 2018 13:15		04 Jun 2018 10:13	05 Jun 2018 15:48	1
Batch ID 129455	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Water		
HS18060068-01	MW-31	01 Jun 2018 09:35		15 Jun 2018 14:00	15 Jun 2018 21:51	10
HS18060068-02	MW-46	01 Jun 2018 11:10		15 Jun 2018 14:00	15 Jun 2018 21:53	10
HS18060068-03	MW-44	01 Jun 2018 13:15		15 Jun 2018 14:00	15 Jun 2018 21:55	10
Batch ID R317287	**Test Name :** ALKALINITY BY SM2320B			**Matrix:** Water		
HS18060068-01	MW-31	01 Jun 2018 09:35			02 Jun 2018 22:50	1
HS18060068-02	MW-46	01 Jun 2018 11:10			02 Jun 2018 23:13	1
HS18060068-03	MW-44	01 Jun 2018 13:15			02 Jun 2018 23:20	1
Batch ID R317486	**Test Name :** TOTAL ORGANIC CARBON - SM5310B			**Matrix:** Water		
HS18060068-01	MW-31	01 Jun 2018 09:35			05 Jun 2018 22:13	1
HS18060068-02	MW-46	01 Jun 2018 11:10			05 Jun 2018 22:27	1
HS18060068-03	MW-44	01 Jun 2018 13:15			05 Jun 2018 22:42	1
Batch ID R317489	**Test Name :** TOC, DISSOLVED - SM5310B			**Matrix:** Water		
HS18060068-01	MW-31	01 Jun 2018 09:35			06 Jun 2018 08:38	1
HS18060068-02	MW-46	01 Jun 2018 11:10			06 Jun 2018 09:05	1
HS18060068-03	MW-44	01 Jun 2018 13:15			06 Jun 2018 09:20	1

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060068

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R317563	**Test Name :** ANIONS BY E300.0			**Matrix:** Water		
HS18060068-01	MW-31	01 Jun 2018 09:35			04 Jun 2018 13:49	20
HS18060068-01	MW-31	01 Jun 2018 09:35			02 Jun 2018 21:01	10
HS18060068-01	MW-31	01 Jun 2018 09:35			02 Jun 2018 19:56	1
HS18060068-02	MW-46	01 Jun 2018 11:10			04 Jun 2018 16:39	40
HS18060068-02	MW-46	01 Jun 2018 11:10			02 Jun 2018 21:44	10
HS18060068-02	MW-46	01 Jun 2018 11:10			02 Jun 2018 21:23	1
HS18060068-03	MW-44	01 Jun 2018 13:15			04 Jun 2018 14:33	20
HS18060068-03	MW-44	01 Jun 2018 13:15			02 Jun 2018 23:11	10
HS18060068-03	MW-44	01 Jun 2018 13:15			02 Jun 2018 22:50	1

Revision:1

WorkOrder: HS18060068
InstrumentID: ICPMS05
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.00100	0.000956	0.000400	0.00200
A	Arsenic	7440-38-2	0.00100	0.000990	0.000400	0.00200
A	Cadmium	7440-43-9	0.00100	0.00101	0.000200	0.00200
A	Calcium	7440-70-2	0.100	0.106	0.0340	0.500
A	Iron	7439-89-6	0.100	0.102	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.00115	0.000600	0.00200
A	Magnesium	7439-95-4	0.100	0.109	0.0100	0.200
A	Selenium	7782-49-2	0.00200	0.000378	0.00110	0.00200

Revision:1

WorkOrder: HS18060068
InstrumentID: ICPMS05
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.00100	0.000956	0.000400	0.00200
A	Arsenic	7440-38-2	0.00100	0.000990	0.000400	0.00200
A	Cadmium	7440-43-9	0.00100	0.00101	0.000200	0.00200
A	Calcium	7440-70-2	0.100	0.106	0.0340	0.500
A	Iron	7439-89-6	0.100	0.102	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.00115	0.000600	0.00200
A	Magnesium	7439-95-4	0.100	0.109	0.0100	0.200
A	Selenium	7782-49-2	0.00200	0.000378	0.00110	0.00200

Revision:1

WorkOrder: HS18060068
InstrumentID: ICS3K2
Test Code: 300_W
Test Number: E300
Test Name: Anions by E300.0

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Chloride	16887-00-6	0	0	0.200	0.500
A	Nitrate/Nitrite (as N)	ARC-NO3NO2N	0	0	0.0300	0.200
A	Sulfate	14808-79-8	0	0	0.200	0.500

Revision:1

WorkOrder: HS18060068
InstrumentID: ManTech01
Test Code: ALK_W 2320B
Test Number: SM2320B
Test Name: Alkalinity by SM2320B

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Alkalinity, Bicarbonate (As CaCO3)	ALK-Bicarb	5.00	4.55	5.00	5.00
A	Alkalinity, Carbonate (As CaCO3)	ALK-Carb	5.00	4.55	5.00	5.00
A	Alkalinity, Hydroxide (As CaCO3)	ALK-Hyd	5.00	4.55	5.00	5.00
A	Alkalinity, Total (As CaCO3)	ALK	5.00	4.55	5.00	5.00

WorkOrder: HS18060068
InstrumentID: TOC_02
Test Code: TOC_Diss_5310B
Test Number: SM5310B
Test Name: TOC, Dissolved - SM5310B

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Organic Carbon, Dissolved	DOC	0.600	0.585	0.500	1.00

WorkOrder: HS18060068
InstrumentID: TOC_02
Test Code: TOC_W 5310B
Test Number: SM5310B
Test Name: Total Organic Carbon - SM5310B

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Organic Carbon, Total	7440-44-0	0.600	0.585	0.500	1.00

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060068

QC BATCH REPORT

Batch ID: 129037 **Instrument: ICPMS05** **Method: SW6020**

MBLK Sample ID: **MBLK-129037** Units: **mg/L** Analysis Date: **05-Jun-2018 16:57**
Client ID: Run ID: **ICPMS05_317395** SeqNo: **4588337** PrepDate: **04-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01518	0.200								J
Selenium	U	0.00200								

LCS Sample ID: **LCS-129037** Units: **mg/L** Analysis Date: **05-Jun-2018 16:59**
Client ID: Run ID: **ICPMS05_317395** SeqNo: **4588338** PrepDate: **04-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05079	0.00200	0.05	0	102	80 - 120				
Arsenic	0.05043	0.00200	0.05	0	101	80 - 120				
Cadmium	0.04892	0.00200	0.05	0	97.8	80 - 120				
Calcium	4.989	0.500	5	0	99.8	80 - 120				
Iron	4.963	0.200	5	0	99.3	80 - 120				
Lead	0.04609	0.00200	0.05	0	92.2	80 - 120				
Magnesium	4.673	0.200	5	0	93.5	80 - 120				
Selenium	0.04918	0.00200	0.05	0	98.4	80 - 120				

MS Sample ID: **HS18060008-02MS** Units: **mg/L** Analysis Date: **05-Jun-2018 17:07**
Client ID: Run ID: **ICPMS05_317395** SeqNo: **4588342** PrepDate: **04-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05148	0.00200	0.05	0.000256	102	80 - 120				
Arsenic	0.05538	0.00200	0.05	0.003918	103	80 - 120				
Cadmium	0.04846	0.00200	0.05	0.000733	95.5	80 - 120				
Calcium	839.3	0.500	5	788.8	1010	80 - 120				SEO
Iron	7.337	0.200	5	2.395	98.8	80 - 120				
Lead	0.04486	0.00200	0.05	0.000231	89.2	80 - 120				
Magnesium	90.1	0.200	5	80.1	200	80 - 120				SO
Selenium	0.07068	0.00200	0.05	0.01793	105	80 - 120				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060068

QC BATCH REPORT

Batch ID: 129037 **Instrument: ICPMS05** **Method: SW6020**

MSD Sample ID: **HS18060008-02MSD** Units: **mg/L** Analysis Date: **05-Jun-2018 17:09**
Client ID: Run ID: **ICPMS05_317395** SeqNo: **4588343** PrepDate: **04-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.0515	0.00200	0.05	0.000256	102	80 - 120	0.05148	0.0427	20	
Arsenic	0.05513	0.00200	0.05	0.003918	102	80 - 120	0.05538	0.452	20	
Cadmium	0.04859	0.00200	0.05	0.000733	95.7	80 - 120	0.04846	0.264	20	
Calcium	833.2	0.500	5	788.8	887	80 - 120	839.3	0.737	20	SEO
Iron	7.225	0.200	5	2.395	96.6	80 - 120	7.337	1.54	20	
Lead	0.04395	0.00200	0.05	0.000231	87.4	80 - 120	0.04486	2.03	20	
Magnesium	88.89	0.200	5	80.1	176	80 - 120	90.1	1.36	20	SO
Selenium	0.07044	0.00200	0.05	0.01793	105	80 - 120	0.07068	0.343	20	

PDS Sample ID: **HS18060008-02PDS** Units: **mg/L** Analysis Date: **05-Jun-2018 17:11**
Client ID: Run ID: **ICPMS05_317395** SeqNo: **4588344** PrepDate: **04-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09444	0.00200	0.1	0.000256	94.2	75 - 125				
Arsenic	0.09769	0.00200	0.1	0.003918	93.8	75 - 125				
Cadmium	0.08932	0.00200	0.1	0.000733	88.6	75 - 125				
Iron	11.05	0.200	10	2.395	86.6	75 - 125				
Lead	0.08815	0.00200	0.1	0.000231	87.9	75 - 125				
Magnesium	86.22	0.200	10	80.1	61.1	75 - 125				SO
Selenium	0.1212	0.00200	0.1	0.01793	103	75 - 125				

PDS Sample ID: **HS18060008-02PDS** Units: **mg/L** Analysis Date: **06-Jun-2018 13:50**
Client ID: Run ID: **ICPMS05_317492** SeqNo: **4589734** PrepDate: **04-Jun-2018** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	862.8	5.00	100	829.5	33.3	75 - 125				SO

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060068

QC BATCH REPORT

Batch ID: 129037 **Instrument: ICPMS05** **Method: SW6020**

SD Sample ID: **HS18060008-02SD** Units: **mg/L** Analysis Date: **05-Jun-2018 17:05**
Client ID: Run ID: **ICPMS05_317395** SeqNo: **4588341** PrepDate: **04-Jun-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000256	0	10	
Arsenic	0.003989	0.0100					0.003918	0	10	J
Cadmium	U	0.0100					0.000733	0	10	
Iron	2.489	1.00					2.395	3.92	10	
Lead	U	0.0100					0.000231	0	10	
Magnesium	83.29	1.00					80.1	3.97	10	

SD Sample ID: **HS18060008-02SD** Units: **mg/L** Analysis Date: **06-Jun-2018 13:48**
Client ID: Run ID: **ICPMS05_317492** SeqNo: **4589733** PrepDate: **04-Jun-2018** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	741.7	25.0					829.5	10.6	10	R

The following samples were analyzed in this batch: HS18060068-01 HS18060068-02 HS18060068-03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060068

QC BATCH REPORT

Batch ID: 129039 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLK-129039** Units: **mg/L** Analysis Date: **05-Jun-2018 14:54**
Client ID: Run ID: **ICPMS05_317395** SeqNo: **4588115** PrepDate: **04-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01279	0.200								J
Selenium	U	0.00200								

LCS Sample ID: **LCS-129039** Units: **mg/L** Analysis Date: **05-Jun-2018 14:56**
Client ID: Run ID: **ICPMS05_317395** SeqNo: **4588116** PrepDate: **04-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04828	0.00200	0.05	0	96.6	80 - 120				
Arsenic	0.04885	0.00200	0.05	0	97.7	80 - 120				
Cadmium	0.04737	0.00200	0.05	0	94.7	80 - 120				
Calcium	4.751	0.500	5	0	95.0	80 - 120				
Iron	4.942	0.200	5	0	98.8	80 - 120				
Lead	0.05027	0.00200	0.05	0	101	80 - 120				
Magnesium	4.675	0.200	5	0	93.5	80 - 120				
Selenium	0.05016	0.00200	0.05	0	100	80 - 120				

MS Sample ID: **HS18060008-01MS** Units: **mg/L** Analysis Date: **05-Jun-2018 15:04**
Client ID: Run ID: **ICPMS05_317395** SeqNo: **4588120** PrepDate: **04-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05005	0.00200	0.05	0.000763	98.6	75 - 125				
Arsenic	0.05331	0.00200	0.05	0.002462	102	75 - 125				
Cadmium	0.04768	0.00200	0.05	0	95.4	75 - 125				
Calcium	385.8	0.500	5	378.5	147	75 - 125				SEO
Iron	4.817	0.200	5	0	96.3	75 - 125				
Lead	0.0441	0.00200	0.05	0	88.2	75 - 125				
Magnesium	32.74	0.200	5	28.75	79.8	75 - 125				O
Selenium	0.07581	0.00200	0.05	0.02788	95.9	75 - 125				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060068

QC BATCH REPORT

Batch ID: 129039 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MSD Sample ID: **HS18060008-01MSD** Units: **mg/L** Analysis Date: **05-Jun-2018 15:06**
Client ID: Run ID: **ICPMS05_317395** SeqNo: **4588121** PrepDate: **04-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04884	0.00200	0.05	0.000763	96.2	75 - 125	0.05005	2.44	20	
Arsenic	0.05278	0.00200	0.05	0.002462	101	75 - 125	0.05331	1	20	
Cadmium	0.04748	0.00200	0.05	0	95.0	75 - 125	0.04768	0.429	20	
Calcium	400.6	0.500	5	378.5	442	75 - 125	385.8	3.76	20	SEO
Iron	4.732	0.200	5	0	94.6	75 - 125	4.817	1.78	20	
Lead	0.04532	0.00200	0.05	0	90.6	75 - 125	0.0441	2.72	20	
Magnesium	35.31	0.200	5	28.75	131	75 - 125	32.74	7.56	20	SO
Selenium	0.08224	0.00200	0.05	0.02788	109	75 - 125	0.07581	8.14	20	

PDS Sample ID: **HS18060008-01PDS** Units: **mg/L** Analysis Date: **05-Jun-2018 15:08**
Client ID: Run ID: **ICPMS05_317395** SeqNo: **4588127** PrepDate: **04-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.0836	0.00200	0.1	0.000763	82.8	75 - 125				
Arsenic	0.09549	0.00200	0.1	0.002462	93.0	75 - 125				
Cadmium	0.08798	0.00200	0.1	0.000038	87.9	75 - 125				
Iron	8.905	0.200	10	0.002457	89.0	75 - 125				
Lead	0.08684	0.00200	0.1	0.000383	86.5	75 - 125				
Magnesium	36.22	0.200	10	28.75	74.7	75 - 125				S
Selenium	0.1217	0.00200	0.1	0.02788	93.8	75 - 125				

PDS Sample ID: **HS18060008-01PDS** Units: **mg/L** Analysis Date: **06-Jun-2018 13:42**
Client ID: Run ID: **ICPMS05_317492** SeqNo: **4589730** PrepDate: **04-Jun-2018** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	916.3	25.0	500	340.5	115	75 - 125				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060068

QC BATCH REPORT

Batch ID: 129039 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

SD Sample ID: **HS18060008-01SD** Units: **mg/L** Analysis Date: **05-Jun-2018 15:02**
Client ID: Run ID: **ICPMS05_317395** SeqNo: **4588119** PrepDate: **04-Jun-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000763	0	10	
Arsenic	0.002362	0.0100					0.002462	0	10	J
Cadmium	U	0.0100					0.000038	0	10	
Iron	U	1.00					0.002457	0	10	
Lead	U	0.0100					0.000383	0	10	
Magnesium	30.31	1.00					28.75	5.43	10	

SD Sample ID: **HS18060008-01SD** Units: **mg/L** Analysis Date: **06-Jun-2018 13:40**
Client ID: Run ID: **ICPMS05_317492** SeqNo: **4589729** PrepDate: **04-Jun-2018** DF: **250**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	345	125					340.5	1.32	10	

SD Sample ID: **HS18060008-01SD** Units: **mg/L** Analysis Date: **05-Jun-2018 21:44**
Client ID: Run ID: **ICPMS05_317395** SeqNo: **4588417** PrepDate: **04-Jun-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Selenium	0.02935	0.0100					0.02788	5.28	10	

The following samples were analyzed in this batch: HS18060068-01 HS18060068-02 HS18060068-03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060068

QC BATCH REPORT

Batch ID: 129455 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLK-129455** Units: **mg/L** Analysis Date: **15-Jun-2018 21:47**
Client ID: Run ID: **ICPMS05_318049** SeqNo: **4612123** PrepDate: **15-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	U	0.500								
Magnesium	0.01349	0.200								J

LCS Sample ID: **LCS-129455** Units: **mg/L** Analysis Date: **15-Jun-2018 21:49**
Client ID: Run ID: **ICPMS05_318049** SeqNo: **4612124** PrepDate: **15-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	4.673	0.500	5	0	93.5	80 - 120				
Magnesium	4.786	0.200	5	0	95.7	80 - 120				

MS Sample ID: **HS18060151-02MS** Units: **mg/L** Analysis Date: **15-Jun-2018 22:11**
Client ID: Run ID: **ICPMS05_318049** SeqNo: **4612135** PrepDate: **15-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	489.8	0.500	5	515.6	-516	75 - 125				SEO
Magnesium	226.6	0.200	5	248.4	-434	75 - 125				SEO

MSD Sample ID: **HS18060151-02MSD** Units: **mg/L** Analysis Date: **15-Jun-2018 22:13**
Client ID: Run ID: **ICPMS05_318049** SeqNo: **4612136** PrepDate: **15-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	498.7	0.500	5	515.6	-337	75 - 125	489.8	1.81	20	SEO
Magnesium	229.3	0.200	5	248.4	-382	75 - 125	226.6	1.15	20	SEO

PDS Sample ID: **HS18060151-02PDS** Units: **mg/L** Analysis Date: **15-Jun-2018 22:01**
Client ID: Run ID: **ICPMS05_318049** SeqNo: **4612130** PrepDate: **15-Jun-2018** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	430.8	5.00	100	505.1	-74.3	75 - 125				SO
Magnesium	269.5	2.00	100	248.6	20.9	75 - 125				S

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060068

QC BATCH REPORT

Batch ID: 129455 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

SD Sample ID: **HS18060151-02SD** Units: **mg/L** Analysis Date: **18-Jun-2018 12:56**
Client ID: Run ID: **ICPMS05_318132** SeqNo: **4613152** PrepDate: **15-Jun-2018** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	525.8	25.0					505.1	4.09	10	
Magnesium	244.5	10.0					248.6	1.64	10	

The following samples were analyzed in this batch: HS18060068-01 HS18060068-02 HS18060068-03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060068

QC BATCH REPORT

Batch ID: R317287 **Instrument: ManTech01** **Method: SM2320B**

MBLK Sample ID: **WBLKW3-180602** Units: **mg/L** Analysis Date: **02-Jun-2018 20:49**
Client ID: Run ID: **ManTech01_317287** SeqNo: **4584747** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	U	5.00								
Alkalinity, Carbonate (As CaCO3)	U	5.00								
Alkalinity, Hydroxide (As CaCO3)	U	5.00								
Alkalinity, Total (As CaCO3)	U	5.00								

LCS Sample ID: **LCS3-180602** Units: **mg/L** Analysis Date: **02-Jun-2018 20:59**
Client ID: Run ID: **ManTech01_317287** SeqNo: **4584748** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1069	5.00	1000	0	107	85 - 115				
Alkalinity, Total (As CaCO3)	1095	5.00	1000	0	109	85 - 115				

LCSD Sample ID: **LCSD3-180602** Units: **mg/L** Analysis Date: **02-Jun-2018 21:08**
Client ID: Run ID: **ManTech01_317287** SeqNo: **4584749** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1066	5.00	1000	0	107	85 - 115	1069	0.278	20	
Alkalinity, Total (As CaCO3)	1091	5.00	1000	0	109	85 - 115	1095	0.369	20	

DUP Sample ID: **HS18060008-03DUP** Units: **mg/L** Analysis Date: **02-Jun-2018 21:23**
Client ID: Run ID: **ManTech01_317287** SeqNo: **4584751** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	614.5	5.00					616	0.249	20	
Alkalinity, Carbonate (As CaCO3)	U	5.00					0	0	20	
Alkalinity, Hydroxide (As CaCO3)	U	5.00					0	0	20	
Alkalinity, Total (As CaCO3)	614.5	5.00					616	0.249	20	

The following samples were analyzed in this batch: HS18060068-01 HS18060068-02 HS18060068-03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060068

QC BATCH REPORT

Batch ID: R317486 **Instrument: TOC_02** **Method: SM5310B**

MBLK Sample ID: **WBLKW1-180605** Units: **mg/L** Analysis Date: **05-Jun-2018 20:52**
Client ID: Run ID: **TOC_02_317486** SeqNo: **4589268** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	U	1.00								

LCS Sample ID: **WLCSW1-180605** Units: **mg/L** Analysis Date: **05-Jun-2018 21:07**
Client ID: Run ID: **TOC_02_317486** SeqNo: **4589269** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.835	1.00	10	0	98.4	85 - 115				

LCSD Sample ID: **WLCSDW1-180605** Units: **mg/L** Analysis Date: **05-Jun-2018 21:20**
Client ID: Run ID: **TOC_02_317486** SeqNo: **4589270** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.941	1.00	10	0	99.4	85 - 115	9.835	1.07	20	

MS Sample ID: **HS18060046-01MS** Units: **mg/L** Analysis Date: **05-Jun-2018 23:54**
Client ID: Run ID: **TOC_02_317486** SeqNo: **4589281** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	24.67	1.00	10	14.52	102	80 - 120				

The following samples were analyzed in this batch: HS18060068-01 HS18060068-02 HS18060068-03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060068

QC BATCH REPORT

Batch ID: R317489 **Instrument: TOC_02** **Method: SM5310B**

MBLK Sample ID: **WBLKW4-180605** Units: **mg/L** Analysis Date: **06-Jun-2018 07:58**
Client ID: Run ID: **TOC_02_317489** SeqNo: **4589352** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Dissolved	U	1.00								

LCS Sample ID: **WLCSW4-180605** Units: **mg/L** Analysis Date: **06-Jun-2018 08:12**
Client ID: Run ID: **TOC_02_317489** SeqNo: **4589353** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Dissolved	9.909	1.00	10	0	99.1	85 - 115				

LCSD Sample ID: **WLCSDW4-180605** Units: **mg/L** Analysis Date: **06-Jun-2018 08:25**
Client ID: Run ID: **TOC_02_317489** SeqNo: **4589354** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Dissolved	9.546	1.00	10	0	95.5	85 - 115	9.909	3.73	20	

MS Sample ID: **HS18060068-01MS** Units: **mg/L** Analysis Date: **06-Jun-2018 08:51**
Client ID: **MW-31** Run ID: **TOC_02_317489** SeqNo: **4589356** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Dissolved	19.47	1.00	10	9.829	96.4	80 - 120				

The following samples were analyzed in this batch: HS18060068-01 HS18060068-02 HS18060068-03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060068

QC BATCH REPORT

Batch ID: R317563 **Instrument: ICS3K2** **Method: E300**

MBLK Sample ID: **WBLKW1-060218** Units: **mg/L** Analysis Date: **02-Jun-2018 18:51**
Client ID: Run ID: **ICS3K2_317563** SeqNo: **4590933** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	0.500								
Nitrate/Nitrite (as N)	U	0.200								
Sulfate	U	0.500								

LCS Sample ID: **WLCSW1-060218** Units: **mg/L** Analysis Date: **02-Jun-2018 19:13**
Client ID: Run ID: **ICS3K2_317563** SeqNo: **4590934** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.28	0.500	20	0	101	90 - 110				
Nitrate/Nitrite (as N)	8.536	0.200	8	0	107	90 - 110				
Sulfate	18.88	0.500	20	0	94.4	90 - 110				

LCSD Sample ID: **WLCSDW1-060218** Units: **mg/L** Analysis Date: **02-Jun-2018 19:34**
Client ID: Run ID: **ICS3K2_317563** SeqNo: **4590935** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.29	0.500	20	0	101	90 - 110	20.28	0.0394	20	
Nitrate/Nitrite (as N)	8.524	0.200	8	0	107	90 - 110	8.536	0.141	20	
Sulfate	18.89	0.500	20	0	94.5	90 - 110	18.88	0.0371	20	

MS Sample ID: **HS18060068-01MS** Units: **mg/L** Analysis Date: **02-Jun-2018 20:18**
Client ID: **MW-31** Run ID: **ICS3K2_317563** SeqNo: **4590937** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	139.9	0.500	10	131.7	82.3	80 - 120				EO
Nitrate/Nitrite (as N)	4.219	0.200	4	0	105	80 - 120				
Sulfate	1525	0.500	10	1543	-181	80 - 120				SEO

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060068

QC BATCH REPORT

Batch ID: R317563 **Instrument: ICS3K2** **Method: E300**

MSD Sample ID: **HS18060068-01MSD** Units: **mg/L** Analysis Date: **02-Jun-2018 20:39**
Client ID: **MW-31** Run ID: **ICS3K2_317563** SeqNo: **4590938** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	140.5	0.500	10	131.7	87.6	80 - 120	139.9	0.377	20	EO
Nitrate/Nitrite (as N)	4.237	0.200	4	0	106	80 - 120	4.219	0.426	20	
Sulfate	1531	0.500	10	1543	-122	80 - 120	1525	0.385	20	SEO

The following samples were analyzed in this batch: HS18060068-01 HS18060068-02 HS18060068-03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: **HS18060068**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
California	2919 2016-2018	31-Jul-2018
Oklahoma	2017-088	31-Aug-2018
North Carolina	624-2018	31-Dec-2018
Louisiana	03087 2017-2018	30-Jun-2018
Arkansas	88-0356	27-Mar-2019
Kansas	E-10352 2017-218	31-Jul-2018
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193	30-Apr-2019

Client: Golder Associates
Project: Exide DGW PDI
Work Order: HS18060068

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS18060068-01	MW-31	Login	6/2/2018 8:46:41 AM	PMG	WET063
HS18060068-01	MW-31	Login	6/2/2018 8:46:41 AM	PMG	MET013
HS18060068-01	MW-31	Login	6/2/2018 8:46:41 AM	PMG	MET013
HS18060068-01	MW-31	Login	6/2/2018 8:46:41 AM	PMG	WET063
HS18060068-01	MW-31	Login	6/2/2018 8:46:41 AM	PMG	WET063

Revision:1

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS18060068

Date/Time Received: **02-Jun-2018 08:05**
Received by: **PMG**

Checklist completed by: *Paresh M. Giga* eSignature — 2-Jun-2018 Date

Reviewed by: *Dane J. Wacasey* eSignature — 5-Jun-2018 Date

Matrices: **Water**

Carrier name: **Greyhound**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	1.6c/1.2c U/c	IR30	
Cooler(s)/Kit(s):	43662		
Date/Time sample(s) sent to storage:	6/2/18 09:00		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes: No airbill on cooler

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Middletown, PA +1 717 944 5541
Spring City, PA +1 610 948 4903
Salt Lake City, UT +1 801 266 7700
WV

Chain of Custody Form

Page 1 of 1

SHORT HOLDING TIME

COC ID: 180462 med red 43662

ALS Project Manager:

ALS Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order	1302086-06	Project Name	Exide DGW PDI	A	300_W (*NO3, NO2*, Cl, SO4)
Work Order		Project Number		B	ALK_W 2320B (Alkalinity)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ICP_TW (Tot Sb,As,Ca,Cd,Fe,Pb,Mg,Se)
Send Report To	Emily White	Invoice Attn	Emily White	D	ICP_DISS (Diss Sb,As,Cd,Pb,Se)
Address	13515 Barrett Parkway, Suite 260	Address	13515 Barrett Parkway, Suite 260	E	TOC_W 5310B (Total Organic Carbon)
				F	TOC_Diss_5310B (TOC, Dissolved-FldFlter)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	G	
Phone		Phone		H	
Fax		Fax		I	
e-Mail Address	Emily_White@golder.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-31	06/01/2018	0935	Water	2,3,8	7	X	X	X	X	X	X					
2	MW-46	↓	1110	↓	↓	7	X	X	X	X	X	X					
3	MW-44	↓	1315	↓	↓	7	X	X	X	X	X	X					
4																	
5																	
6																	
7																	
8																	
9																	
10																	

HS18060068

Golder Associates

Exide DGW PDI

Sampler(s) Please Print & Sign: Jacqueline Engel

Shipment Method: Greyhound

Required Turnaround Time: (Check Box) ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other

Results Due Date:

Relinquished by: Date: 06/01/2018 Time: 1500 Received by:

Relinquished by: Date: Time: Received by (Laboratory): 6/2/18 0805

Logged by (Laboratory): Date: Time: Checked by (Laboratory):

Notes: EXIDE DGWPDI

Cooler ID	Cooler Temp.
43662	0.1°C 1.6° +3 corr-3.4°

QC Package: (Check One Box Below)

☐ Level II Std QC ☒ TRRP Checklist
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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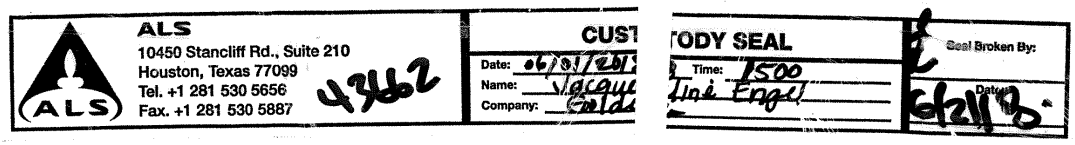

No Tracking Received

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June 21, 2018

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS18060151**

Revision: **1**

Laboratory Results for: **Exide DGW PDI**

Dear Emily,

ALS Environmental received 3 sample(s) on Jun 05, 2018 for the analysis presented in the following report.

This is a REVISED REPORT. Please see the Case Narrative for discussion concerning this revision.

Regards,

Generated By: DANE.WACASEY

Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide DGW PDI	
WorkOrder:	**HS18060151**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide DGW PDI
WorkOrder:	**HS18060151**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data								
Laboratory Name: ALS Laboratory Group			LRC Date: 06/11/2018					
Project Name: Exide DGW PDI			Laboratory Job Number: HS18060151					
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 129121, 129131, R317432, R317466, R317489, R317654					
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?	X				
		Were surrogate percent recoveries in all samples within the laboratory QC limits?	X				
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?	X				
		Were analytical duplicates analyzed at the appropriate frequency?	X				
		Were RPDs or relative standard deviations within the laboratory QC limits?	X				
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				4
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 06/11/2018				
Project Name: Exide DGW PDI			Laboratory Job Number: HS18060151				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 129121, 129131, R317432, R317466, R317489, R317654				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			2
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		X			3
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports	
Laboratory Name: ALS Laboratory Group	LRC Date: 06/11/2018
Project Name: Exide DGW PDI	Laboratory Job Number: HS18060151
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 129121, 129131, R317432, R317466, R317489, R317654, 129455

ER#[5]	Description
4	This report was revised June 21, 2018 in order to include results for additional dissolved metals per client request.
1	Batch 129131, Metals Method SW6020, sample HS18060198-02, MS and MSD were performed on unrelated sample. Batch R317466, Metals Method SW6020, sample MW-26, MS and MSD recovered outside the control limits for Calcium and Magnesium, however, the result in the parent sample is greater than 4x the spike amount. Batch R317466, Anions Method E300, sample MW-18, MS and MSD recovered outside the control limits for Chloride and Sulfate, however, the result in the parent sample is greater than 4x the spike amount.
2	See Run Log and CCB Exceptions Report.
3	Batch 129131, Metals Method SW6020, sample HS18060198-02, PDS was performed on unrelated sample. Batch R317466, Metals Method SW6020, sample MW-26, PDS failed recovery criteria, however, the result in the parent sample is greater than 4x the spike amount.

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060151
Start Date: 05-Jun-2018 End Date: 06-Jun-2018

Run ID:ICS2100_317466
Instrument:ICS2100
Method:E300

Sample No.	D/F	Time	FileID	Analytes
CCV 1	1	05-Jun-2018 15:20		CL NO3N/NO2N SO4
CCB 1	1	05-Jun-2018 15:34		CL NO3N/NO2N SO4
WBLKW1-060518	1	05-Jun-2018 15:49		CL NO3N/NO2N SO4
WLCSW1-060518	1	05-Jun-2018 16:03		CL NO3N/NO2N SO4
WLCSDW1-060518	1	05-Jun-2018 16:18		CL NO3N/NO2N SO4
MW-18	1	05-Jun-2018 16:32		NO3N/NO2N
MW-18MS	1	05-Jun-2018 16:47		NO3N/NO2N
MW-18MSD	1	05-Jun-2018 17:01		NO3N/NO2N
MW-26	1	05-Jun-2018 17:16		NO3N/NO2N
MW-17	1	05-Jun-2018 17:45		NO3N/NO2N
CCB 2	1	05-Jun-2018 18:29		CL NO3N/NO2N SO4
CCV 2	1	05-Jun-2018 19:59		CL NO3N/NO2N SO4
CCB 3	1	05-Jun-2018 20:14		CL NO3N/NO2N SO4
MW-18	1	05-Jun-2018 21:12		CL
MW-18MS	1	05-Jun-2018 21:27		CL NO3N/NO2N SO4
MW-18MSD	1	05-Jun-2018 21:41		CL NO3N/NO2N SO4
MW-18	10	05-Jun-2018 21:56		SO4
MW-26	20	05-Jun-2018 22:10		CL
MW-26	40	05-Jun-2018 22:25		SO4
MW-17	40	05-Jun-2018 22:39		CL SO4
CCB 4	1	05-Jun-2018 23:08		CL NO3N/NO2N SO4
ZZZZZZMS	500	06-Jun-2018 00:50		CL NO3N/NO2N SO4
ZZZZZZMSD	500	06-Jun-2018 01:05		CL NO3N/NO2N SO4
CCV 3	1	06-Jun-2018 01:48		CL NO3N/NO2N SO4
CCB 5	1	06-Jun-2018 02:03		CL NO3N/NO2N SO4
CCB 6	1	06-Jun-2018 03:59		CL NO3N/NO2N SO4
CCV 4	1	06-Jun-2018 06:39		CL NO3N/NO2N SO4
CCB 7	1	06-Jun-2018 06:54		CL NO3N/NO2N SO4
CCV 5	1	06-Jun-2018 11:33		CL NO3N/NO2N SO4
CCB 8	1	06-Jun-2018 11:48		CL NO3N/NO2N SO4
CCB 9	1	06-Jun-2018 13:59		CL NO3N/NO2N SO4

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060151

Run ID:ICS2100_317466
Instrument:ICS2100
Method:E300

CCB 2	Date: 05-Jun-2018 18:29	Seq: 4588819	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	1613	200	500	
Nitrate/Nitrite (as N)	119	30	200	
Sulfate	7613	200	500	

CCB 3	Date: 05-Jun-2018 20:14	Seq: 4588821	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sulfate	323	200	500	

CCB 4	Date: 05-Jun-2018 23:08	Seq: 4588830	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	262	200	500	
Nitrate/Nitrite (as N)	52	30	200	
Sulfate	536	200	500	

CCB 6	Date: 06-Jun-2018 03:59	Seq: 4588845	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	347	200	500	
Nitrate/Nitrite (as N)	54	30	200	
Sulfate	540	200	500	

CCB 7	Date: 06-Jun-2018 06:54	Seq: 4588856	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	519	200	500	
Nitrate/Nitrite (as N)	55	30	200	
Sulfate	293	200	500	

CCB 8	Date: 06-Jun-2018 11:48	Seq: 4589589	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	226	200	500	
Sulfate	281	200	500	

CCB 9	Date: 06-Jun-2018 13:59	Seq: 4589597	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	285	200	500	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060151
Start Date: 06-Jun-2018 End Date: 06-Jun-2018

Run ID:ICPMS04_317479
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	06-Jun-2018 11:40	014_ICV.d	AS CA CD FE MG PB SB SE
LLICV2	1	06-Jun-2018 11:42	015SMPL.d	AS CA CD FE MG PB SB SE
LLICV5	1	06-Jun-2018 11:44	016LICV.d	AS CA CD FE MG PB SB SE
ICB	1	06-Jun-2018 11:46	017_ICB.d	AS CA CD FE MG PB SB SE
ICSA	1	06-Jun-2018 12:00	020ICSA.d	AS CA CD FE MG PB SB SE
ICSAB	1	06-Jun-2018 12:02	021ICSB.d	AS CA CD FE MG PB SB SE
CCV 1	1	06-Jun-2018 12:28	029_CCV.d	AS CA CD FE MG PB SB SE
CCB 1	1	06-Jun-2018 12:31	030_CCB.d	AS CA CD FE MG PB SB SE
CCV 2	1	06-Jun-2018 12:49	038_CCV.d	AS CA CD FE MG PB SB SE
CCB 2	1	06-Jun-2018 12:51	039_CCB.d	AS CA CD FE MG PB SB SE
CCV 3	1	06-Jun-2018 14:24	043_CCV.d	AS CA CD FE MG PB SB SE
CCB 3	1	06-Jun-2018 14:27	044_CCB.d	AS CA CD FE MG PB SB SE
CCV 4	1	06-Jun-2018 14:52	055_CCV.d	AS CA CD FE MG PB SB SE
CCB 4	1	06-Jun-2018 14:54	056_CCB.d	AS CA CD FE MG PB SB SE
CCV 5	1	06-Jun-2018 15:14	064_CCV.d	AS CA CD FE MG PB SB SE
CCB 5	1	06-Jun-2018 15:17	065_CCB.d	AS CA CD FE MG PB SB SE
CCB 6	1	06-Jun-2018 15:50	077_CCB.d	AS CA CD FE MG PB SB SE
CCV 6	1	06-Jun-2018 15:56	079_CCV.d	AS CA CD FE MG PB SB SE
CCV 7	1	06-Jun-2018 16:22	089_CCV.d	AS CA CD FE MG PB SB SE
CCB 7	1	06-Jun-2018 16:24	090_CCB.d	AS CA CD FE MG PB SB SE
CCV 8	1	06-Jun-2018 17:01	101_CCV.d	AS CA CD FE MG PB SB SE
CCB 8	1	06-Jun-2018 17:04	102_CCB.d	AS CA CD FE MG PB SB SE
ICCV 9	1	06-Jun-2018 18:11	115_ICV.d	AS CA CD FE MG PB SB SE
LLCCV2	1	06-Jun-2018 18:13	116SMPL.d	AS CA CD FE MG PB SB SE
LLCCV5	1	06-Jun-2018 18:15	117LICV.d	AS CA CD FE MG PB SB SE
ICB	1	06-Jun-2018 18:17	118_ICB.d	AS CA CD FE MG PB SB SE
CCV 10	1	06-Jun-2018 18:50	130_CCV.d	AS CA CD FE MG PB SB SE
CCB 9	1	06-Jun-2018 18:52	131_CCB.d	AS CA CD FE MG PB SB SE
CCV 11	1	06-Jun-2018 19:17	142_CCV.d	AS CA CD FE MG PB SB SE
CCB 10	1	06-Jun-2018 19:19	143_CCB.d	AS CA CD FE MG PB SB SE
CCV 12	1	06-Jun-2018 19:24	145_CCV.d	AS CA CD FE MG PB SB SE
CCB 11	1	06-Jun-2018 19:26	146_CCB.d	AS CA CD FE MG PB SB SE
CCV 13	1	06-Jun-2018 21:16	148_CCV.d	AS CA CD FE MG PB SB SE
CCB 12	1	06-Jun-2018 21:18	149_CCB.d	AS CA CD FE MG PB SB SE
MBLK-129121	1	06-Jun-2018 21:20	150SMPL.d	AS CA CD FE MG PB SB SE
LCS-129121	1	06-Jun-2018 21:22	151SMPL.d	AS CA CD FE MG PB SB SE
MW-18	1	06-Jun-2018 21:25	152SMPL.d	AS CA CD FE MG PB SB SE
MW-18SD	5	06-Jun-2018 21:27	153SMPL.d	AS CA CD FE MG PB SB SE
MW-18MS	1	06-Jun-2018 21:29	154SMPL.d	AS CA CD FE MG PB SB SE
MW-18MSD	1	06-Jun-2018 21:31	155SMPL.d	AS CA CD FE MG PB SB SE
MW-18PDS	1	06-Jun-2018 21:34	156SMPL.d	AS CA CD FE MG PB SB SE
MW-26	1	06-Jun-2018 21:36	157SMPL.d	AS CD FE PB SB SE
MW-17	1	06-Jun-2018 21:38	158SMPL.d	AS CD FE MG PB SB SE
CCV 14	1	06-Jun-2018 21:40	159_CCV.d	AS CA CD FE MG PB SB SE
CCB 13	1	06-Jun-2018 21:43	160_CCB.d	AS CA CD FE MG PB SB SE
CCV 15	1	06-Jun-2018 22:07	162_CCV.d	AS CA CD FE MG PB SB SE
CCB 14	1	06-Jun-2018 22:10	163_CCB.d	AS CA CD FE MG PB SB SE
LLICV2	1	06-Jun-2018 22:12	164SMPL.d	AS CA CD FE MG PB SB SE
LLICV5	1	06-Jun-2018 22:14	165LICV.d	AS CA CD FE MG PB SB SE
ICSA	1	06-Jun-2018 22:16	166ICSA.d	AS CA CD FE MG PB SB SE
ICSAB	1	06-Jun-2018 22:19	167ICSB.d	AS CA CD FE MG PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060151

Run ID:ICPMS04_317479
Instrument:ICPMS04
Method:SW6020

CCB 5	Date: 06-Jun-2018 15:17	Seq: 4589694	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Arsenic	0.453	0.4	2	

CCB 6	Date: 06-Jun-2018 15:50	Seq: 4589863	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.431	0.4	2	

CCB 13	Date: 06-Jun-2018 21:43	Seq: 4590225	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.644	0.4	2	

Client: Golder Associates
Project: Exide DGW PDI
Work Order: HS18060151

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18060151-01	MW-18	Water		04-Jun-2018 13:00	05-Jun-2018 09:00	☐
HS18060151-02	MW-26	Water		04-Jun-2018 14:25	05-Jun-2018 09:00	☐
HS18060151-03	MW-17	Water		04-Jun-2018 16:25	05-Jun-2018 09:00	☐

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
Sample ID: MW-18
Collection Date: 04-Jun-2018 13:00

ANALYTICAL REPORT
WorkOrder:HS18060151
Lab ID:HS18060151-01
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 06-Jun-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	06-Jun-2018 21:57
Arsenic	**0.00139**	J	**0.000400**	**0.00200**	**mg/L**	1	06-Jun-2018 21:57
Cadmium	U		0.000200	0.00200	mg/L	1	06-Jun-2018 21:57
Calcium	**144**		**0.0340**	**0.500**	**mg/L**	1	06-Jun-2018 21:57
Iron	**0.418**		**0.0120**	**0.200**	**mg/L**	1	06-Jun-2018 21:57
Lead	U		0.000600	0.00200	mg/L	1	06-Jun-2018 21:57
Magnesium	**6.30**		**0.0100**	**0.200**	**mg/L**	1	06-Jun-2018 21:57
Selenium	U		0.00110	0.00200	mg/L	1	06-Jun-2018 21:57
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**			Prep:SW3010A / 06-Jun-2018		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	06-Jun-2018 21:25
Arsenic	**0.000562**	J	**0.000400**	**0.00200**	**mg/L**	1	06-Jun-2018 21:25
Cadmium	U		0.000200	0.00200	mg/L	1	06-Jun-2018 21:25
Calcium	**127**		**0.0340**	**0.500**	**mg/L**	1	06-Jun-2018 21:25
Iron	U		0.0120	0.200	mg/L	1	06-Jun-2018 21:25
Lead	U		0.000600	0.00200	mg/L	1	06-Jun-2018 21:25
Magnesium	**6.30**		**0.0100**	**0.200**	**mg/L**	1	06-Jun-2018 21:25
Selenium	U		0.00110	0.00200	mg/L	1	06-Jun-2018 21:25
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**76.8**		**0.200**	**0.500**	**mg/L**	1	05-Jun-2018 21:12
Nitrate/Nitrite (as N)	**0.0350**	J	**0.0300**	**0.200**	**mg/L**	1	05-Jun-2018 16:32
Sulfate	**180**		**2.00**	**5.00**	**mg/L**	10	05-Jun-2018 21:56
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**289**		**5.00**	**5.00**	**mg/L**	1	05-Jun-2018 13:23
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	05-Jun-2018 13:23
Alkalinity, Hydroxide (As CaCO3)	U		5.00	5.00	mg/L	1	05-Jun-2018 13:23
Alkalinity, Total (As CaCO3)	**289**		**5.00**	**5.00**	**mg/L**	1	05-Jun-2018 13:23
TOC, DISSOLVED - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Dissolved	**1.67**		**0.500**	**1.00**	**mg/L**	1	06-Jun-2018 09:35
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Total	**1.26**		**0.500**	**1.00**	**mg/L**	1	08-Jun-2018 03:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
Sample ID: MW-26
Collection Date: 04-Jun-2018 14:25

ANALYTICAL REPORT
WorkOrder:HS18060151
Lab ID:HS18060151-02
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 06-Jun-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	06-Jun-2018 21:59
Arsenic	**0.000995**	J	**0.000400**	**0.00200**	**mg/L**	1	06-Jun-2018 21:59
Cadmium	U		0.000200	0.00200	mg/L	1	06-Jun-2018 21:59
Calcium	**433**		**0.340**	**5.00**	**mg/L**	10	07-Jun-2018 13:55
Iron	**3.69**		**0.0120**	**0.200**	**mg/L**	1	06-Jun-2018 21:59
Lead	U		0.000600	0.00200	mg/L	1	06-Jun-2018 21:59
Magnesium	**211**		**0.100**	**2.00**	**mg/L**	10	07-Jun-2018 13:55
Selenium	**0.00170**	J	**0.00110**	**0.00200**	**mg/L**	1	06-Jun-2018 21:59
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**			Prep:SW3010A / 06-Jun-2018		Analyst: JCJ
Antimony	**0.00295**		**0.000400**	**0.00200**	**mg/L**	1	06-Jun-2018 21:36
Arsenic	U		0.000400	0.00200	mg/L	1	06-Jun-2018 21:36
Cadmium	U		0.000200	0.00200	mg/L	1	06-Jun-2018 21:36
Calcium	**505**		**0.340**	**5.00**	**mg/L**	10	18-Jun-2018 12:54
Iron	**4.52**		**0.0120**	**0.200**	**mg/L**	1	06-Jun-2018 21:36
Lead	U		0.000600	0.00200	mg/L	1	06-Jun-2018 21:36
Magnesium	**249**		**0.100**	**2.00**	**mg/L**	10	18-Jun-2018 12:54
Selenium	**0.00704**		**0.00110**	**0.00200**	**mg/L**	1	06-Jun-2018 21:36
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**219**		**4.00**	**10.0**	**mg/L**	20	05-Jun-2018 22:10
Nitrate/Nitrite (as N)	U		0.0300	0.200	mg/L	1	05-Jun-2018 17:16
Sulfate	**3,740**		**8.00**	**20.0**	**mg/L**	40	05-Jun-2018 22:25
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**652**		**5.00**	**5.00**	**mg/L**	1	05-Jun-2018 13:30
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	05-Jun-2018 13:30
Alkalinity, Hydroxide (As CaCO3)	U		5.00	5.00	mg/L	1	05-Jun-2018 13:30
Alkalinity, Total (As CaCO3)	**652**		**5.00**	**5.00**	**mg/L**	1	05-Jun-2018 13:30
TOC, DISSOLVED - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Dissolved	**3.66**		**0.500**	**1.00**	**mg/L**	1	06-Jun-2018 09:50
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Total	**3.43**		**0.500**	**1.00**	**mg/L**	1	08-Jun-2018 03:32

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
Sample ID: MW-17
Collection Date: 04-Jun-2018 16:25

ANALYTICAL REPORT
WorkOrder:HS18060151
Lab ID:HS18060151-03
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 06-Jun-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	06-Jun-2018 22:01
Arsenic	U		0.000400	0.00200	mg/L	1	06-Jun-2018 22:01
Cadmium	U		0.000200	0.00200	mg/L	1	06-Jun-2018 22:01
Calcium	**375**		**0.340**	**5.00**	**mg/L**	10	07-Jun-2018 13:57
Iron	**1.83**		**0.0120**	**0.200**	**mg/L**	1	06-Jun-2018 22:01
Lead	U		0.000600	0.00200	mg/L	1	06-Jun-2018 22:01
Magnesium	**32.9**		**0.0100**	**0.200**	**mg/L**	1	06-Jun-2018 22:01
Selenium	**0.00693**		**0.00110**	**0.00200**	**mg/L**	1	06-Jun-2018 22:01
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**			Prep:SW3010A / 06-Jun-2018		Analyst: JCJ
Antimony	**0.00129**	J	**0.000400**	**0.00200**	**mg/L**	1	06-Jun-2018 21:38
Arsenic	U		0.000400	0.00200	mg/L	1	06-Jun-2018 21:38
Cadmium	U		0.000200	0.00200	mg/L	1	06-Jun-2018 21:38
Calcium	**251**		**0.340**	**5.00**	**mg/L**	10	15-Jun-2018 22:03
Iron	**1.78**		**0.0120**	**0.200**	**mg/L**	1	06-Jun-2018 21:38
Lead	U		0.000600	0.00200	mg/L	1	06-Jun-2018 21:38
Magnesium	**34.9**		**0.0100**	**0.200**	**mg/L**	1	06-Jun-2018 21:38
Selenium	**0.0237**		**0.00110**	**0.00200**	**mg/L**	1	06-Jun-2018 21:38
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**382**		**8.00**	**20.0**	**mg/L**	40	05-Jun-2018 22:39
Nitrate/Nitrite (as N)	U		0.0300	0.200	mg/L	1	05-Jun-2018 17:45
Sulfate	**2,070**		**8.00**	**20.0**	**mg/L**	40	05-Jun-2018 22:39
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**445**		**5.00**	**5.00**	**mg/L**	1	05-Jun-2018 13:37
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	05-Jun-2018 13:37
Alkalinity, Hydroxide (As CaCO3)	U		5.00	5.00	mg/L	1	05-Jun-2018 13:37
Alkalinity, Total (As CaCO3)	**445**		**5.00**	**5.00**	**mg/L**	1	05-Jun-2018 13:37
TOC, DISSOLVED - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Dissolved	**4.89**		**0.500**	**1.00**	**mg/L**	1	06-Jun-2018 10:06
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**					Analyst: AJH
Organic Carbon, Total	**4.54**		**0.500**	**1.00**	**mg/L**	1	08-Jun-2018 03:46

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

WEIGHT LOG

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060151

Batch ID: 129121 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18060151-01	1	10	10 (mL)	1
HS18060151-02	1	10	10 (mL)	1
HS18060151-03	1	10	10 (mL)	1

Batch ID: 129131 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18060151-01	1	10	10 (mL)	1
HS18060151-02	1	10	10 (mL)	1
HS18060151-03	1	10	10 (mL)	1

Batch ID: 129455 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18060151-02	1	10	10 (mL)	1
HS18060151-03	1	10	10 (mL)	1

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060151

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 129121	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Water		
HS18060151-01	MW-18	04 Jun 2018 13:00		06 Jun 2018 12:34	06 Jun 2018 21:25	1
HS18060151-02	MW-26	04 Jun 2018 14:25		06 Jun 2018 12:34	06 Jun 2018 21:36	1
HS18060151-03	MW-17	04 Jun 2018 16:25		06 Jun 2018 12:34	06 Jun 2018 21:38	1
Batch ID 129131	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Water		
HS18060151-01	MW-18	04 Jun 2018 13:00		06 Jun 2018 13:30	06 Jun 2018 21:57	1
HS18060151-02	MW-26	04 Jun 2018 14:25		06 Jun 2018 13:30	07 Jun 2018 13:55	10
HS18060151-02	MW-26	04 Jun 2018 14:25		06 Jun 2018 13:30	06 Jun 2018 21:59	1
HS18060151-03	MW-17	04 Jun 2018 16:25		06 Jun 2018 13:30	07 Jun 2018 13:57	10
HS18060151-03	MW-17	04 Jun 2018 16:25		06 Jun 2018 13:30	06 Jun 2018 22:01	1
Batch ID 129455	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Water		
HS18060151-02	MW-26	04 Jun 2018 14:25		15 Jun 2018 14:00	18 Jun 2018 12:54	10
HS18060151-03	MW-17	04 Jun 2018 16:25		15 Jun 2018 14:00	15 Jun 2018 22:03	10
Batch ID R317432	**Test Name :** ALKALINITY BY SM2320B			**Matrix:** Water		
HS18060151-01	MW-18	04 Jun 2018 13:00			05 Jun 2018 13:23	1
HS18060151-02	MW-26	04 Jun 2018 14:25			05 Jun 2018 13:30	1
HS18060151-03	MW-17	04 Jun 2018 16:25			05 Jun 2018 13:37	1
Batch ID R317466	**Test Name :** ANIONS BY E300.0			**Matrix:** Water		
HS18060151-01	MW-18	04 Jun 2018 13:00			05 Jun 2018 21:56	10
HS18060151-01	MW-18	04 Jun 2018 13:00			05 Jun 2018 21:12	1
HS18060151-01	MW-18	04 Jun 2018 13:00			05 Jun 2018 16:32	1
HS18060151-02	MW-26	04 Jun 2018 14:25			05 Jun 2018 22:25	40
HS18060151-02	MW-26	04 Jun 2018 14:25			05 Jun 2018 22:10	20
HS18060151-02	MW-26	04 Jun 2018 14:25			05 Jun 2018 17:16	1
HS18060151-03	MW-17	04 Jun 2018 16:25			05 Jun 2018 22:39	40
HS18060151-03	MW-17	04 Jun 2018 16:25			05 Jun 2018 17:45	1
Batch ID R317489	**Test Name :** TOC, DISSOLVED - SM5310B			**Matrix:** Water		
HS18060151-01	MW-18	04 Jun 2018 13:00			06 Jun 2018 09:35	1
HS18060151-02	MW-26	04 Jun 2018 14:25			06 Jun 2018 09:50	1
HS18060151-03	MW-17	04 Jun 2018 16:25			06 Jun 2018 10:06	1
Batch ID R317654	**Test Name :** TOTAL ORGANIC CARBON - SM5310B			**Matrix:** Water		
HS18060151-01	MW-18	04 Jun 2018 13:00			08 Jun 2018 03:17	1
HS18060151-02	MW-26	04 Jun 2018 14:25			08 Jun 2018 03:32	1
HS18060151-03	MW-17	04 Jun 2018 16:25			08 Jun 2018 03:46	1

Revision:1

WorkOrder: HS18060151
InstrumentID: ICPMS04
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.00100	0.000705	0.000400	0.00200
A	Arsenic	7440-38-2	0.00100	0.000881	0.000400	0.00200
A	Cadmium	7440-43-9	0.00100	0.000987	0.000200	0.00200
A	Calcium	7440-70-2	0.100	0.108	0.0340	0.500
A	Iron	7439-89-6	0.100	0.0909	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000874	0.000600	0.00200
A	Magnesium	7439-95-4	0.100	0.105	0.0100	0.200
A	Selenium	7782-49-2	0.00200	0.00142	0.00110	0.00200

WorkOrder: HS18060151
InstrumentID: ICPMS05
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Calcium	7440-70-2	0.100	0.106	0.0340	0.500
A	Magnesium	7439-95-4	0.100	0.109	0.0100	0.200

Revision:1

WorkOrder: HS18060151
InstrumentID: ICPMS05
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.00100	0.000956	0.000400	0.00200
A	Arsenic	7440-38-2	0.00100	0.000990	0.000400	0.00200
A	Cadmium	7440-43-9	0.00100	0.00101	0.000200	0.00200
A	Calcium	7440-70-2	0.100	0.106	0.0340	0.500
A	Iron	7439-89-6	0.100	0.102	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.00115	0.000600	0.00200
A	Magnesium	7439-95-4	0.100	0.109	0.0100	0.200
A	Selenium	7782-49-2	0.00200	0.000378	0.00110	0.00200

Revision:1

WorkOrder: HS18060151
InstrumentID: ICS2100
Test Code: 300_W
Test Number: E300
Test Name: Anions by E300.0

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Chloride	16887-00-6	0.500	0.707	0.200	0.500
A	Nitrate/Nitrite (as N)	ARC-NO3NO2N	0.200	0.224	0.0300	0.200
A	Sulfate	14808-79-8	0.500	0.509	0.200	0.500

Revision:1

WorkOrder: HS18060151
InstrumentID: ManTech01
Test Code: ALK_W 2320B
Test Number: SM2320B
Test Name: Alkalinity by SM2320B

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Alkalinity, Bicarbonate (As CaCO3)	ALK-Bicarb	5.00	4.55	5.00	5.00
A	Alkalinity, Carbonate (As CaCO3)	ALK-Carb	5.00	4.55	5.00	5.00
A	Alkalinity, Hydroxide (As CaCO3)	ALK-Hyd	5.00	4.55	5.00	5.00
A	Alkalinity, Total (As CaCO3)	ALK	5.00	4.55	5.00	5.00

WorkOrder: HS18060151
InstrumentID: TOC_02
Test Code: TOC_Diss_5310B
Test Number: SM5310B
Test Name: TOC, Dissolved - SM5310B

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Organic Carbon, Dissolved	DOC	0.600	0.585	0.500	1.00

Revision:1

WorkOrder: HS18060151
InstrumentID: TOC_02
Test Code: TOC_W 5310B
Test Number: SM5310B
Test Name: Total Organic Carbon - SM5310B

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Organic Carbon, Total	7440-44-0	0.600	0.585	0.500	1.00

Revision:1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060151

QC BATCH REPORT

Batch ID: 129121 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLK-129121** Units: **mg/L** Analysis Date: **06-Jun-2018 21:20**
Client ID: Run ID: **ICPMS04_317479** SeqNo: **4590215** PrepDate: **06-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01184	0.200								J
Selenium	U	0.00200								

LCS Sample ID: **LCS-129121** Units: **mg/L** Analysis Date: **06-Jun-2018 21:22**
Client ID: Run ID: **ICPMS04_317479** SeqNo: **4590216** PrepDate: **06-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04286	0.00200	0.05	0	85.7	80 - 120				
Arsenic	0.0472	0.00200	0.05	0	94.4	80 - 120				
Cadmium	0.04605	0.00200	0.05	0	92.1	80 - 120				
Calcium	4.619	0.500	5	0	92.4	80 - 120				
Iron	4.718	0.200	5	0	94.4	80 - 120				
Lead	0.04289	0.00200	0.05	0	85.8	80 - 120				
Magnesium	4.946	0.200	5	0	98.9	80 - 120				
Selenium	0.04659	0.00200	0.05	0	93.2	80 - 120				

MS Sample ID: **HS18060151-01MS** Units: **mg/L** Analysis Date: **06-Jun-2018 21:29**
Client ID: **MW-18** Run ID: **ICPMS04_317479** SeqNo: **4590219** PrepDate: **06-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04269	0.00200	0.05	0.000194	85.0	75 - 125				
Arsenic	0.04568	0.00200	0.05	0.000562	90.2	75 - 125				
Cadmium	0.04478	0.00200	0.05	0.000062	89.4	75 - 125				
Calcium	129.6	0.500	5	126.8	56.3	75 - 125				SO
Iron	4.586	0.200	5	0.004853	91.6	75 - 125				
Lead	0.04311	0.00200	0.05	0.000083	86.0	75 - 125				
Magnesium	10.82	0.200	5	6.295	90.4	75 - 125				
Selenium	0.04957	0.00200	0.05	0.000902	97.3	75 - 125				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060151

QC BATCH REPORT

Batch ID: 129121 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

MSD Sample ID: **HS18060151-01MSD** Units: **mg/L** Analysis Date: **06-Jun-2018 21:31**
Client ID: **MW-18** Run ID: **ICPMS04_317479** SeqNo: **4590220** PrepDate: **06-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04375	0.00200	0.05	0.000194	87.1	75 - 125	0.04269	2.46	20	
Arsenic	0.04846	0.00200	0.05	0.000562	95.8	75 - 125	0.04568	5.91	20	
Cadmium	0.04576	0.00200	0.05	0.000062	91.4	75 - 125	0.04478	2.18	20	
Calcium	133.5	0.500	5	126.8	133	75 - 125	129.6	2.91	20	SO
Iron	4.522	0.200	5	0.004853	90.4	75 - 125	4.586	1.41	20	
Lead	0.04347	0.00200	0.05	0.000083	86.8	75 - 125	0.04311	0.843	20	
Magnesium	10.91	0.200	5	6.295	92.4	75 - 125	10.82	0.898	20	
Selenium	0.0425	0.00200	0.05	0.000902	83.2	75 - 125	0.04957	15.4	20	

PDS Sample ID: **HS18060151-01PDS** Units: **mg/L** Analysis Date: **06-Jun-2018 21:34**
Client ID: **MW-18** Run ID: **ICPMS04_317479** SeqNo: **4590221** PrepDate: **06-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.07662	0.00200	0.1	0.000194	76.4	75 - 125				
Arsenic	0.09032	0.00200	0.1	0.000562	89.8	75 - 125				
Cadmium	0.09142	0.00200	0.1	0.000062	91.4	75 - 125				
Calcium	132.6	0.500	10	126.8	57.9	75 - 125				SO
Iron	9.12	0.200	10	0.004853	91.1	75 - 125				
Lead	0.08786	0.00200	0.1	0.000083	87.8	75 - 125				
Magnesium	15.46	0.200	10	6.295	91.7	75 - 125				
Selenium	0.09882	0.00200	0.1	0.000902	97.9	75 - 125				

SD Sample ID: **HS18060151-01SD** Units: **mg/L** Analysis Date: **06-Jun-2018 21:27**
Client ID: **MW-18** Run ID: **ICPMS04_317479** SeqNo: **4590218** PrepDate: **06-Jun-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000194	0	10	
Arsenic	U	0.0100					0.000562	0	10	
Cadmium	U	0.0100					0.000062	0	10	
Calcium	121.1	2.50					126.8	4.52	10	
Iron	U	1.00					0.004853	0	10	
Lead	U	0.0100					0.000083	0	10	
Magnesium	6.418	1.00					6.295	1.96	10	
Selenium	U	0.0100					0.000902	0	10	

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client:	Golder Associates
Project:	Exide DGW PDI
WorkOrder:	HS18060151

QC BATCH REPORT

Batch ID: 129121	**Instrument:** ICPMS04	**Method:** SW6020 (dissolved) (DISSOLVED)

The following samples were analyzed in this batch:	HS18060151-01	HS18060151-02	HS18060151-03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060151

QC BATCH REPORT

Batch ID: 129131 **Instrument: ICPMS05** **Method: SW6020**

MBLK Sample ID: **MBLK-129131** Units: **mg/L** Analysis Date: **06-Jun-2018 21:45**
Client ID: Run ID: **ICPMS05_317492** SeqNo: **4590226** PrepDate: **06-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01322	0.200								J
Selenium	U	0.00200								

LCS Sample ID: **LCS-129131** Units: **mg/L** Analysis Date: **06-Jun-2018 21:47**
Client ID: Run ID: **ICPMS05_317492** SeqNo: **4590227** PrepDate: **06-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04621	0.00200	0.05	0	92.4	80 - 120				
Arsenic	0.04599	0.00200	0.05	0	92.0	80 - 120				
Cadmium	0.04612	0.00200	0.05	0	92.2	80 - 120				
Calcium	4.671	0.500	5	0	93.4	80 - 120				
Iron	4.827	0.200	5	0	96.5	80 - 120				
Lead	0.05009	0.00200	0.05	0	100	80 - 120				
Magnesium	4.576	0.200	5	0	91.5	80 - 120				
Selenium	0.04877	0.00200	0.05	0	97.5	80 - 120				

MS Sample ID: **HS18060198-02MS** Units: **mg/L** Analysis Date: **06-Jun-2018 22:23**
Client ID: Run ID: **ICPMS05_317492** SeqNo: **4590245** PrepDate: **06-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04509	0.00200	0.05	0.000085	90.0	80 - 120				
Arsenic	0.05936	0.00200	0.05	0.01262	93.5	80 - 120				
Cadmium	0.04562	0.00200	0.05	0.000024	91.2	80 - 120				
Calcium	178.3	0.500	5	181.1	-55.6	80 - 120				SO
Iron	4.543	0.200	5	0.01408	90.6	80 - 120				
Lead	0.04181	0.00200	0.05	0.000023	83.6	80 - 120				
Magnesium	64.3	0.200	5	64.15	2.90	80 - 120				SO
Selenium	0.06945	0.00200	0.05	0.02426	90.4	80 - 120				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060151

QC BATCH REPORT

Batch ID: 129131 **Instrument: ICPMS05** **Method: SW6020**

MSD Sample ID: **HS18060198-02MSD** Units: **mg/L** Analysis Date: **06-Jun-2018 22:25**
Client ID: Run ID: **ICPMS05_317492** SeqNo: **4590246** PrepDate: **06-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04536	0.00200	0.05	0.000085	90.6	80 - 120	0.04509	0.612	20	
Arsenic	0.05958	0.00200	0.05	0.01262	93.9	80 - 120	0.05936	0.375	20	
Cadmium	0.04702	0.00200	0.05	0.000024	94.0	80 - 120	0.04562	3.02	20	
Calcium	184	0.500	5	181.1	56.7	80 - 120	178.3	3.1	20	SEO
Iron	4.581	0.200	5	0.01408	91.3	80 - 120	4.543	0.821	20	
Lead	0.04409	0.00200	0.05	0.000023	88.1	80 - 120	0.04181	5.3	20	
Magnesium	64.59	0.200	5	64.15	8.68	80 - 120	64.3	0.449	20	SO
Selenium	0.07016	0.00200	0.05	0.02426	91.8	80 - 120	0.06945	1.02	20	

PDS Sample ID: **HS18060198-02PDS** Units: **mg/L** Analysis Date: **06-Jun-2018 22:27**
Client ID: Run ID: **ICPMS05_317492** SeqNo: **4590247** PrepDate: **06-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.0802	0.00200	0.1	0.000085	80.1	75 - 125				
Arsenic	0.1037	0.00200	0.1	0.01262	91.1	75 - 125				
Cadmium	0.08911	0.00200	0.1	0.000024	89.1	75 - 125				
Iron	8.651	0.200	10	0.01408	86.4	75 - 125				
Lead	0.08294	0.00200	0.1	0.000023	82.9	75 - 125				
Magnesium	68.34	0.200	10	64.15	41.8	75 - 125				SO
Selenium	0.1169	0.00200	0.1	0.02426	92.6	75 - 125				

PDS Sample ID: **HS18060198-02PDS** Units: **mg/L** Analysis Date: **07-Jun-2018 13:45**
Client ID: Run ID: **ICPMS05_317550** SeqNo: **4590901** PrepDate: **06-Jun-2018** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	247.1	5.00	100	167.2	79.9	75 - 125				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060151

QC BATCH REPORT

Batch ID: 129131 **Instrument: ICPMS05** **Method: SW6020**

SD Sample ID: **HS18060198-02SD** Units: **mg/L** Analysis Date: **06-Jun-2018 22:21**
Client ID: Run ID: **ICPMS05_317492** SeqNo: **4590244** PrepDate: **06-Jun-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000085	0	10	
Arsenic	0.0123	0.0100					0.01262	2.53	10	
Cadmium	U	0.0100					0.000024	0	10	
Iron	U	1.00					0.01408	0	10	
Lead	U	0.0100					0.000023	0	10	
Magnesium	66.51	1.00					64.15	3.67	10	

SD Sample ID: **HS18060198-02SD** Units: **mg/L** Analysis Date: **07-Jun-2018 13:41**
Client ID: Run ID: **ICPMS05_317550** SeqNo: **4590899** PrepDate: **06-Jun-2018** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	160.2	25.0					167.2	4.17	10	

The following samples were analyzed in this batch: HS18060151-01 HS18060151-02 HS18060151-03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060151

QC BATCH REPORT

Batch ID: 129455 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLK-129455** Units: **mg/L** Analysis Date: **15-Jun-2018 21:47**
Client ID: Run ID: **ICPMS05_318049** SeqNo: **4612123** PrepDate: **15-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	U	0.500								
Magnesium	0.01349	0.200								J

LCS Sample ID: **LCS-129455** Units: **mg/L** Analysis Date: **15-Jun-2018 21:49**
Client ID: Run ID: **ICPMS05_318049** SeqNo: **4612124** PrepDate: **15-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	4.673	0.500	5	0	93.5	80 - 120				
Magnesium	4.786	0.200	5	0	95.7	80 - 120				

MS Sample ID: **HS18060151-02MS** Units: **mg/L** Analysis Date: **15-Jun-2018 22:11**
Client ID: **MW-26** Run ID: **ICPMS05_318049** SeqNo: **4612135** PrepDate: **15-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	489.8	0.500	5	515.6	-516	75 - 125				SEO
Magnesium	226.6	0.200	5	248.4	-434	75 - 125				SEO

MSD Sample ID: **HS18060151-02MSD** Units: **mg/L** Analysis Date: **15-Jun-2018 22:13**
Client ID: **MW-26** Run ID: **ICPMS05_318049** SeqNo: **4612136** PrepDate: **15-Jun-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	498.7	0.500	5	515.6	-337	75 - 125	489.8	1.81	20	SEO
Magnesium	229.3	0.200	5	248.4	-382	75 - 125	226.6	1.15	20	SEO

PDS Sample ID: **HS18060151-02PDS** Units: **mg/L** Analysis Date: **15-Jun-2018 22:01**
Client ID: **MW-26** Run ID: **ICPMS05_318049** SeqNo: **4612130** PrepDate: **15-Jun-2018** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	430.8	5.00	100	505.1	-74.3	75 - 125				SO
Magnesium	269.5	2.00	100	248.6	20.9	75 - 125				S

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060151

QC BATCH REPORT

Batch ID: 129455 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

SD Sample ID: **HS18060151-02SD** Units: **mg/L** Analysis Date: **18-Jun-2018 12:56**
Client ID: **MW-26** Run ID: **ICPMS05_318132** SeqNo: **4613152** PrepDate: **15-Jun-2018** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	525.8	25.0					505.1	4.09	10	
Magnesium	244.5	10.0					248.6	1.64	10	

The following samples were analyzed in this batch: HS18060151-02 HS18060151-03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060151

QC BATCH REPORT

Batch ID: R317432 **Instrument: ManTech01** **Method: SM2320B**

MBLK Sample ID: **WBLKW1-180602** Units: **mg/L** Analysis Date: **05-Jun-2018 12:46**
Client ID: Run ID: **ManTech01_317432** SeqNo: **4587903** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	U	5.00								
Alkalinity, Carbonate (As CaCO3)	U	5.00								
Alkalinity, Hydroxide (As CaCO3)	U	5.00								
Alkalinity, Total (As CaCO3)	U	5.00								

LCS Sample ID: **WLCS1-180602** Units: **mg/L** Analysis Date: **05-Jun-2018 12:55**
Client ID: Run ID: **ManTech01_317432** SeqNo: **4587904** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1063	5.00	1000	0	106	85 - 115				
Alkalinity, Total (As CaCO3)	1075	5.00	1000	0	107	85 - 115				

LCSD Sample ID: **WLCSD1-180602** Units: **mg/L** Analysis Date: **05-Jun-2018 13:04**
Client ID: Run ID: **ManTech01_317432** SeqNo: **4587905** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1074	5.00	1000	0	107	85 - 115	1063	1.02	20	
Alkalinity, Total (As CaCO3)	1082	5.00	1000	0	108	85 - 115	1075	0.639	20	

DUP Sample ID: **HS18060078-01DUP** Units: **mg/L** Analysis Date: **05-Jun-2018 13:17**
Client ID: Run ID: **ManTech01_317432** SeqNo: **4587907** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	175.1	5.00					177.5	1.34	20	
Alkalinity, Carbonate (As CaCO3)	U	5.00					0	0	20	
Alkalinity, Hydroxide (As CaCO3)	U	5.00					0	0	20	
Alkalinity, Total (As CaCO3)	175.1	5.00					177.5	1.34	20	

The following samples were analyzed in this batch: HS18060151-01 HS18060151-02 HS18060151-03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060151

QC BATCH REPORT

Batch ID: R317466 **Instrument: ICS2100** **Method: E300**

MBLK Sample ID: **WBLKW1-060518** Units: **mg/L** Analysis Date: **05-Jun-2018 15:49**
Client ID: Run ID: **ICS2100_317466** SeqNo: **4588808** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	0.500								
Nitrate/Nitrite (as N)	U	0.200								
Sulfate	U	0.500								

LCS Sample ID: **WLCSW1-060518** Units: **mg/L** Analysis Date: **05-Jun-2018 16:03**
Client ID: Run ID: **ICS2100_317466** SeqNo: **4588809** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.42	0.500	20	0	102	90 - 110				
Nitrate/Nitrite (as N)	8.508	0.200	8	0	106	90 - 110				
Sulfate	20.68	0.500	20	0	103	90 - 110				

LCSD Sample ID: **WLCSDW1-060518** Units: **mg/L** Analysis Date: **05-Jun-2018 16:18**
Client ID: Run ID: **ICS2100_317466** SeqNo: **4588810** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.41	0.500	20	0	102	90 - 110	20.42	0.0686	20	
Nitrate/Nitrite (as N)	8.494	0.200	8	0	106	90 - 110	8.508	0.165	20	
Sulfate	20.67	0.500	20	0	103	90 - 110	20.68	0.00967	20	

MS Sample ID: **HS18060151-01MS** Units: **mg/L** Analysis Date: **05-Jun-2018 16:47**
Client ID: **MW-18** Run ID: **ICS2100_317466** SeqNo: **4588812** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	79.5	0.500	10	76.76	27.4	80 - 120				SO
Nitrate/Nitrite (as N)	4.408	0.200	4	0.079	108	80 - 120				
Sulfate	169	0.500	10	175.8	-68.6	80 - 120				SEO

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060151

QC BATCH REPORT

Batch ID: R317466 **Instrument: ICS2100** **Method: E300**

MS Sample ID: **HS18060151-01MS** Units: **mg/L** Analysis Date: **05-Jun-2018 21:27**
Client ID: **MW-18** Run ID: **ICS2100_317466** SeqNo: **4588823** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	83.82	0.500	10	76.76	70.6	80 - 120				SO
Nitrate/Nitrite (as N)	4.344	0.200	4	0.079	107	80 - 120				
Sulfate	178.1	0.500	10	175.8	22.3	80 - 120				SEO

MS Sample ID: **HS18051525-01MS** Units: **mg/L** Analysis Date: **06-Jun-2018 00:50**
Client ID: Run ID: **ICS2100_317466** SeqNo: **4588832** PrepDate: DF: **500**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	13910	250	5000	8488	108	80 - 120				
Nitrate/Nitrite (as N)	2189	100	2000	0	109	80 - 120				
Sulfate	5439	250	5000	199.4	105	80 - 120				

MSD Sample ID: **HS18060151-01MSD** Units: **mg/L** Analysis Date: **05-Jun-2018 17:01**
Client ID: **MW-18** Run ID: **ICS2100_317466** SeqNo: **4588813** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	73.53	0.500	10	76.76	-32.4	80 - 120	83.82	13.1	20	SO
Nitrate/Nitrite (as N)	4.103	0.200	4	0.079	101	80 - 120	4.344	5.71	20	
Sulfate	156	0.500	10	175.8	-198	80 - 120	178.1	13.2	20	SEO

MSD Sample ID: **HS18060151-01MSD** Units: **mg/L** Analysis Date: **05-Jun-2018 21:41**
Client ID: **MW-18** Run ID: **ICS2100_317466** SeqNo: **4588824** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	73.75	0.500	10	76.76	-30.1	80 - 120	83.82	12.8	20	SO
Nitrate/Nitrite (as N)	4.103	0.200	4	0.079	101	80 - 120	4.344	5.71	20	
Sulfate	157.4	0.500	10	175.8	-184	80 - 120	178.1	12.3	20	SEO

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060151

QC BATCH REPORT

Batch ID: R317466 **Instrument: ICS2100** **Method: E300**

MSD Sample ID: **HS18051525-01MSD** Units: **mg/L** Analysis Date: **06-Jun-2018 01:05**
Client ID: Run ID: **ICS2100_317466** SeqNo: **4588833** PrepDate: DF: **500**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	13600	250	5000	8488	102	80 - 120	13910	2.25	20	
Nitrate/Nitrite (as N)	2160	100	2000	0	108	80 - 120	2189	1.35	20	
Sulfate	5491	250	5000	199.4	106	80 - 120	5439	0.947	20	

The following samples were analyzed in this batch: HS18060151-01 HS18060151-02 HS18060151-03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060151

QC BATCH REPORT

Batch ID: R317489 **Instrument: TOC_02** **Method: SM5310B**

MBLK Sample ID: **WBLKW4-180605** Units: **mg/L** Analysis Date: **06-Jun-2018 07:58**
Client ID: Run ID: **TOC_02_317489** SeqNo: **4589352** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Dissolved	U	1.00								

LCS Sample ID: **WLCSW4-180605** Units: **mg/L** Analysis Date: **06-Jun-2018 08:12**
Client ID: Run ID: **TOC_02_317489** SeqNo: **4589353** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Dissolved	9.909	1.00	10	0	99.1	85 - 115				

LCSD Sample ID: **WLCSDW4-180605** Units: **mg/L** Analysis Date: **06-Jun-2018 08:25**
Client ID: Run ID: **TOC_02_317489** SeqNo: **4589354** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Dissolved	9.546	1.00	10	0	95.5	85 - 115	9.909	3.73	20	

MS Sample ID: **HS18060068-01MS** Units: **mg/L** Analysis Date: **06-Jun-2018 08:51**
Client ID: Run ID: **TOC_02_317489** SeqNo: **4589356** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Dissolved	19.47	1.00	10	9.829	96.4	80 - 120				

The following samples were analyzed in this batch: HS18060151-01 HS18060151-02 HS18060151-03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: HS18060151

QC BATCH REPORT

Batch ID: R317654 **Instrument: TOC_02** **Method: SM5310B**

MBLK Sample ID: **WBLKW2-180606** Units: **mg/L** Analysis Date: **08-Jun-2018 01:58**
Client ID: Run ID: **TOC_02_317654** SeqNo: **4593180** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	U	1.00								

LCS Sample ID: **WLCSW2-180606** Units: **mg/L** Analysis Date: **08-Jun-2018 02:11**
Client ID: Run ID: **TOC_02_317654** SeqNo: **4593181** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.85	1.00	10	0	98.5	85 - 115				

LCSD Sample ID: **WLCSDW2-180606** Units: **mg/L** Analysis Date: **08-Jun-2018 02:24**
Client ID: Run ID: **TOC_02_317654** SeqNo: **4593182** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.795	1.00	10	0	98.0	85 - 115	9.85	0.56	20	

MS Sample ID: **HS18051348-02MS** Units: **mg/L** Analysis Date: **08-Jun-2018 04:56**
Client ID: Run ID: **TOC_02_317654** SeqNo: **4593193** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	26.13	1.00	10	16.76	93.7	80 - 120				

The following samples were analyzed in this batch: HS18060151-01 HS18060151-02 HS18060151-03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

Client: Golder Associates
Project: Exide DGW PDI
WorkOrder: **HS18060151**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
California	2919 2016-2018	31-Jul-2018
Oklahoma	2017-088	31-Aug-2018
North Carolina	624-2018	31-Dec-2018
Louisiana	03087 2017-2018	30-Jun-2018
Arkansas	88-0356	27-Mar-2019
Kansas	E-10352 2017-218	31-Jul-2018
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193	30-Apr-2019

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS18060151

Date/Time Received: **05-Jun-2018 09:00**
Received by: **RPG**

Checklist completed by: *Raegen Giga* eSignature — 5-Jun-2018 Date

Reviewed by: *Dane J. Wacasey* eSignature — 5-Jun-2018 Date

Matrices: **water**

Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	1.3c/0.9c uc/c	IR 30	
Cooler(s)/Kit(s):	43825		
Date/Time sample(s) sent to storage:	06/05/2018 10:25		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070

Chain of Custody Form

Page 1 of 1

COC ID: 180591 med

HS18060151

Golder Associates
Exide DGW PDI

ALS Project Manager:

Customer Information		Project Information	
Purchase Order	1302086	Project Name	Exide DGW PDI
Work Order		Project Number	1302086
Company Name	Golder Associates	Bill To Company	Golder Associates
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021
Phone	(314) 984-8800	Phone	(314) 984-8800
Fax		Fax	
e-Mail Address	ewhite@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com

A	300_W (E300 Cl, SO4, NO3, NO2)-48hr HT
B	ALK_W 2320B (2320B Alkalinity)
C	TOC_W 5310B (5310B TOC)
D	TOC_Diss_5310B (5310B Dissolved Organic Carbon (FdFltr)
E	ICP_TW (Total Sb, As, Ca, Cd, Fe, Pb, Mg, Se)
F	ICP_DISS (6020 Diss Sb, As, Cd, Pb, Se (FdFltr))
G	
H	
I	
J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-18	6/4/18	1300	Water	2,3,8	7	X	X	X	X	X	X					
2	MW-26	"	1425	"	"	7	X	X	X	X	X	X					
3	MW-17	"	1625	"	"	7	X	X	X	X	X	X					
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Jacqueline Engel

Shipment Method: Fed Ex

Required Turnaround Time: (Check Box) [X] 3 [ ] STD 10 Wk Days [ ] 5 Wk Days [ ] 2 Wk Days [ ] 24 Hour

Results Due Date: ASAP, please.

Relinquished by: Date: 6/4/18 Time: 1730 Received by:

Relinquished by: Date: Time: Received by (Laboratory): R Cline 6/5/18 09:00

Logged by (Laboratory): Date: Time: Checked by (Laboratory):

Notes: Golder Exide DGW PDI

Cooler ID	Cooler Temp.
43525	1.3
1230	
CF-04	

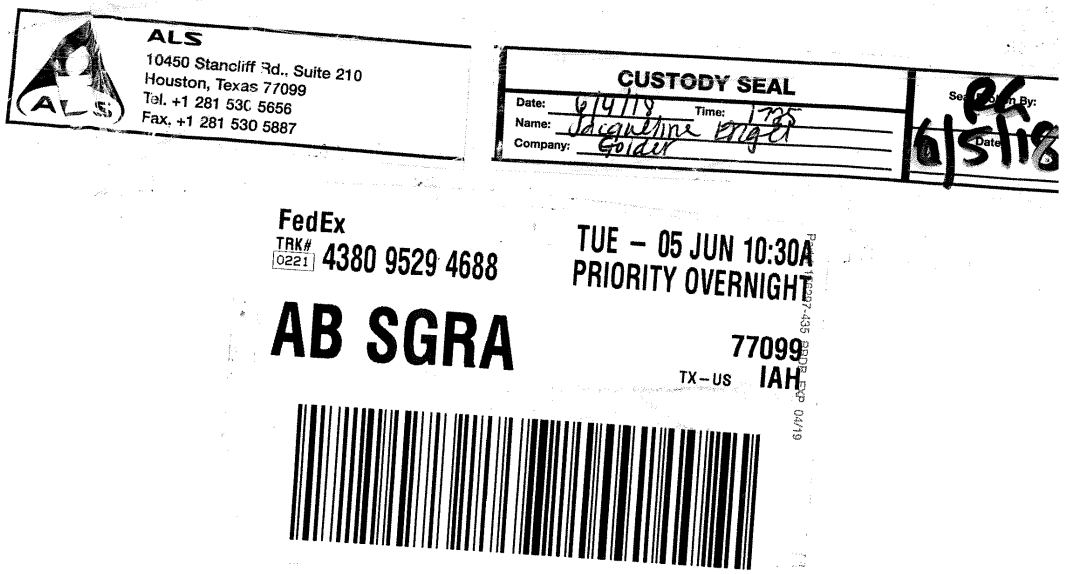
QC Package: (Check One Box Below)

- [ ] Level I Std QC
- [ ] Level II Std QC/Raw Data
- [ ] Level IV SW846/CLP
- [ ] Other
- [X] TRRP Checklist
- [ ] TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note:
1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

Copyright 2011 by ALS Environmental.



ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

CUSTODY SEAL
Date: 6/4/19 Time: 1725
Name: Jacqueline Wright
Company: Golder
Seal Broken By:
Date: 6/5/19

FedEx
TRK# 0221 4380 9529 4688

TUE – 05 JUN 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX–US IAH

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

August 03, 2018

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS18080094**

Laboratory Results for: **Exide DGW PDI MW10**

Dear Emily,

ALS Environmental received 1 sample(s) on Aug 02, 2018 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DAYNA.FISHER
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide DGW PDI MW10	
WorkOrder:	**HS18080094**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide DGW PDI MW10
WorkOrder:	**HS18080094**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 08/03/2018				
Project Name: Exide DGW PDI MW10			Laboratory Job Number: HS18080094				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 131120, 131123				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	X				
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?			X		
		Were analytical duplicates analyzed at the appropriate frequency?			X		
		Were RPDs or relative standard deviations within the laboratory QC limits?			X		
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 08/03/2018				
Project Name: Exide DGW PDI MW10			Laboratory Job Number: HS18080094				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 131120, 131123				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports	
Laboratory Name: ALS Laboratory Group	LRC Date: 08/03/2018
Project Name: Exide DGW PDI MW10	Laboratory Job Number: HS18080094
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 131120, 131123

ER#[5]	Description
	No Exceptions

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Client: Golder Associates
Project: Exide DGW PDI MW10
Work Order: HS18080094

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18080094-01	MW-10	Water		01-Aug-2018 10:05	02-Aug-2018 08:20	☐

Client: Golder Associates
Project: Exide DGW PDI MW10
Sample ID: MW-10
Collection Date: 01-Aug-2018 10:05

ANALYTICAL REPORT
WorkOrder:HS18080094
Lab ID:HS18080094-01
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 02-Aug-2018		Analyst: JDE
Lead	**0.0115**		**0.000600**	**0.00200**	**mg/L**	1	02-Aug-2018 23:02
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 02-Aug-2018		Analyst: JDE
Lead	**0.00143**	J	**0.000600**	**0.00200**	**mg/L**	1	02-Aug-2018 22:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide DGW PDI MW10
WorkOrder: HS18080094

Batch ID: 131120 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18080094-01	1	10	10 (mL)	1

Batch ID: 131123 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18080094-01	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide DGW PDI MW10
WorkOrder: HS18080094

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 131120	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Water		
HS18080094-01	MW-10	01 Aug 2018 10:05		02 Aug 2018 12:24	02 Aug 2018 23:02	1
Batch ID 131123	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Water		
HS18080094-01	MW-10	01 Aug 2018 10:05		02 Aug 2018 12:27	02 Aug 2018 22:42	1

WorkOrder: HS18080094
InstrumentID: ICPMS05
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Lead	7439-92-1	0.00100	0.000964	0.000600	0.00200

WorkOrder: HS18080094
InstrumentID: ICPMS05
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Lead	7439-92-1	0.00100	0.000964	0.000600	0.00200

Client: Golder Associates
Project: Exide DGW PDI MW10
WorkOrder: HS18080094

QC BATCH REPORT

Batch ID: 131120 **Instrument: ICPMS05** **Method: SW6020**

MBLK Sample ID: **MBLK-131120** Units: **mg/L** Analysis Date: **02-Aug-2018 22:58**
Client ID: Run ID: **ICPMS05_321012** SeqNo: **4677778** PrepDate: **02-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	U	0.00200								

LCS Sample ID: **LCS-131120** Units: **mg/L** Analysis Date: **02-Aug-2018 23:00**
Client ID: Run ID: **ICPMS05_321012** SeqNo: **4677779** PrepDate: **02-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.04998	0.00200	0.05	0	100.0	80 - 120				

MS Sample ID: **HS18080080-01MS** Units: **mg/L** Analysis Date: **02-Aug-2018 23:07**
Client ID: Run ID: **ICPMS05_321012** SeqNo: **4677783** PrepDate: **02-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.04868	0.00200	0.05	0.000301	96.8	80 - 120				

MSD Sample ID: **HS18080080-01MSD** Units: **mg/L** Analysis Date: **02-Aug-2018 23:09**
Client ID: Run ID: **ICPMS05_321012** SeqNo: **4677784** PrepDate: **02-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.04923	0.00200	0.05	0.000301	97.9	80 - 120	0.04868	1.11	20	

PDS Sample ID: **HS18080080-01PDS** Units: **mg/L** Analysis Date: **02-Aug-2018 23:11**
Client ID: Run ID: **ICPMS05_321012** SeqNo: **4677785** PrepDate: **02-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.1119	0.00200	0.1	0.000301	112	75 - 125				

SD Sample ID: **HS18080080-01SD** Units: **mg/L** Analysis Date: **02-Aug-2018 23:06**
Client ID: Run ID: **ICPMS05_321012** SeqNo: **4677782** PrepDate: **02-Aug-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Lead	U	0.0100					0.000301	0	10	

The following samples were analyzed in this batch: HS18080094-01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide DGW PDI MW10
WorkOrder: HS18080094

QC BATCH REPORT

Batch ID: 131123 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLK-131123** Units: **mg/L** Analysis Date: **02-Aug-2018 22:36**
Client ID: Run ID: **ICPMS05_321012** SeqNo: **4677767** PrepDate: **02-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	U	0.00200								

LCS Sample ID: **LCS-131123** Units: **mg/L** Analysis Date: **02-Aug-2018 22:38**
Client ID: Run ID: **ICPMS05_321012** SeqNo: **4677768** PrepDate: **02-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.05017	0.00200	0.05	0	100	80 - 120				

MS Sample ID: **HS18080094-01MS** Units: **mg/L** Analysis Date: **02-Aug-2018 22:46**
Client ID: **MW-10** Run ID: **ICPMS05_321012** SeqNo: **4677772** PrepDate: **02-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.05002	0.00200	0.05	0.001433	97.2	75 - 125				

MSD Sample ID: **HS18080094-01MSD** Units: **mg/L** Analysis Date: **02-Aug-2018 22:48**
Client ID: **MW-10** Run ID: **ICPMS05_321012** SeqNo: **4677773** PrepDate: **02-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.04934	0.00200	0.05	0.001433	95.8	75 - 125	0.05002	1.36	20	

PDS Sample ID: **HS18080094-01PDS** Units: **mg/L** Analysis Date: **02-Aug-2018 22:50**
Client ID: **MW-10** Run ID: **ICPMS05_321012** SeqNo: **4677774** PrepDate: **02-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.1022	0.00200	0.1	0.001433	101	75 - 125				

SD Sample ID: **HS18080094-01SD** Units: **mg/L** Analysis Date: **02-Aug-2018 22:44**
Client ID: **MW-10** Run ID: **ICPMS05_321012** SeqNo: **4677771** PrepDate: **02-Aug-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Lead	U	0.0100					0.001433	0	10	

The following samples were analyzed in this batch: HS18080094-01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide DGW PDI MW10
WorkOrder: **HS18080094**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Oklahoma	2017-088	31-Aug-2018
North Carolina	624-2018	31-Dec-2018
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	L2231 Rev 3-30-2018	22-Dec-2018
Kentucky	123043 - 2018	30-Apr-2019

Sample Receipt Checklist

Client Name:	Golder St Louis	Date/Time Received:	**02-Aug-2018 08:20**
Work Order:	HS18080094	Received by:	**JRM**

Checklist completed by: *Pablo Marinez* eSignature — 2-Aug-2018 Date

Reviewed by: *Dane J. Wacasey* eSignature — 2-Aug-2018 Date

Matrices: **WATER**

Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	2.3C/1.9C UC/C	IR # 11	
Cooler(s)/Kit(s):	43445		
Date/Time sample(s) sent to storage:	8/2/2018 10:30		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH
+1 513 733 5336

Everett, WA
+1 425 356 2600

Fort Collins, CO
+1 970 490 1511

Holland, MI
+1 616 399 6070

Chain of Custody Form

Page 1 of 1

COC ID: 191099

HS18080094

Golder Associates
Exide GDW PDI

ALS Project Manager:

Customer Information		Project Information	
Purchase Order	1302086-06	Project Name	Exide DGW PDI
Work Order		Project Number	1302086-06
Company Name	Golder Associates	Bill To Company	Golder Associates
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021
Phone	(314) 984-8800	Phone	(314) 984-8800
Fax		Fax	
e-Mail Address	ewhite@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com

A	ICP_TW (6020 Total Pb)
B	ICP_DISS (6020 Diss Pb (FdFltr))
C	
D	
E	
F	
G	
H	
I	
J	

lo.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-10	8/01/18	1005	Water	2, 8	2	X	X									
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
0																	

ampler(s) Please Print & Sign: Bill Works

Shipment Method: FedEx

Required Turnaround Time: (Check Box) ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☒ Other ASAP

Results Due Date:

elinquished by: [signature] Date: 8/01/18 Time: 1930 Received by:

elinquished by: Date: 8/2/18 Time: 08:20 Received by (Laboratory): J. Waumm

gged by (Laboratory): Date: Time: Checked by (Laboratory):

Notes: Golder Exide DGW PDI

Cooler ID	Cooler Temp.
43445	2.3
	12.11
	0.4

QC Package: (Check One Box Below)

- ☐ Level II Std QC
- ☐ Level III Std QC/Raw Data
- ☐ Level IV SW846/CLP
- ☐ Other
- ☒ TRRP Checklist
- ☐ TRRP Level IV

eservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

e:
1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

43445

CUSTODY SEAL

Date: 8/01/18 Time: 1980
Name: Ed Lowes
Company: Ed Lowes

Seal Broken By:
Date: 08/02/18

43445 AUG 0 2 2018

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656

43445

REF: EXIDE DGW PDI RESAMPLE – DW

RMA:

FedEx Express

TRK# 0221 4380 9531 1938

RETURNS MON-SAT
PRIORITY OVERNIGHT

FedEx
TRK# 0221 4380 9531 1938

THU – 02 AUG 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US IAH

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

May 29, 2018

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS18051061**

Laboratory Results for: **Exide TCLP DGWPDISP**

Dear Emily,

ALS Environmental received 1 sample(s) on May 22, 2018 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide TCLP DGWPDISP	
WorkOrder:	**HS18051061**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide TCLP DGWPDISP
WorkOrder:	**HS18051061**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data								
Laboratory Name: ALS Laboratory Group			LRC Date: 05/29/2018					
Project Name: Exide TCLP DGWPDISP			Laboratory Job Number: HS18051061					
Reviewer Name: ddd			Prep Batch Number(s): 128666,128680,128691,128695,128705					
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]	
R1	OI	**Chain-of-custody (C-O-C)**						
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X					
		Were all departures from standard conditions described in an exception report?	X					
R2	OI	**Sample and quality control (QC) identification**						
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X					
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X					
R3	OI	**Test reports**						
		Were all samples prepared and analyzed within holding times?	X					
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X					
		Were calculations checked by a peer or supervisor?	X					
		Were all analyte identifications checked by a peer or supervisor?	X					
		Were sample detection limits reported for all analytes not detected?	X					
		Were all results for soil and sediment samples reported on a dry weight basis?			X			
		Were % moisture (or solids) reported for all soil and sediment samples?			X			
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X			
		If required for the project, TICs reported?			X			
R4	O	**Surrogate recovery data**						
		Were surrogates added prior to extraction?	X					
		Were surrogate percent recoveries in all samples within the laboratory QC limits?	X					
R5	OI	**Test reports/summary forms for blank samples**						
		Were appropriate type(s) of blanks analyzed?	X					
		Were blanks analyzed at the appropriate frequency?	X					
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X					
		Were blank concentrations < MQL?	X					
R6	OI	**Laboratory control samples (LCS):**						
		Were all COCs included in the LCS?	X					
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X					
		Were LCSs analyzed at the required frequency?	X					
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X					
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X					
		Was the LCSD RPD within QC limits?	X					
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**						
		Were the project/method specified analytes included in the MS and MSD?	X					
		Were MS/MSD analyzed at the appropriate frequency?	X					
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1	
		Were MS/MSD RPDs within laboratory QC limits?	X					
R8	OI	**Analytical duplicate data**						
		Were appropriate analytical duplicates analyzed for each matrix?			X			
		Were analytical duplicates analyzed at the appropriate frequency?			X			
		Were RPDs or relative standard deviations within the laboratory QC limits?			X			
R9	OI	**Method quantitation limits (MQLs):**						
		Are the MQLs for each method analyte included in the laboratory data package?	X					
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X					
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X					
R10	OI	**Other problems/anomalies**						
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X					
		Were all necessary corrective actions performed for the reported data?	X					
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X					
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X					

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 05/29/2018				
Project Name: Exide TCLP DGWPDISP			Laboratory Job Number: HS18051061				
Reviewer Name: ddd			Prep Batch Number(s): 128666,128680,128691,128695,128705				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			2
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Data	
Laboratory Name: ALS Laboratory Group	LRC Date: 05/29/2018
Project Name: Exide TCLP DGWPDISP	Laboratory Job Number: HS18051061
Reviewer Name: ddd	Prep Batch Number(s): 128666,128680,128691,128695,128705

ER#[5]	Description
1	Batch 128680, Texas TPH by TX 1005, sample HS18051053-01, MS and MSD were performed on unrelated sample. Batch 128691, TCLP Semivolatile Organics Method SW8270, sample HS18050920-01, MS was performed on unrelated sample.
2	See Run Log and CCB Exceptions Report.

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide TCLP DGWPDISP
WorkOrder: HS18051061
Start Date: 23-May-2018 End Date: 24-May-2018

Run ID:ICPMS05_316716
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
CCV 18	1	24-May-2018 00:27	242_CCV.d	AG AS BA BE CD CR NI PB SB SE V
CCB 18	1	24-May-2018 00:29	243_CCB.d	AG AS BA BE CD CR NI PB SB SE V
CCV 19	1	24-May-2018 00:51	254_CCV.d	AG AS BA BE CD CR NI PB SB SE V
CCB 19	1	24-May-2018 00:53	255_CCB.d	AG AS BA BE CD CR NI PB SB SE V
DGW-PDI SP-01	1	24-May-2018 00:59	258SMPL.d	AG AS BA BE CD CR NI PB SB SE V
CCV 20	1	24-May-2018 01:05	261_CCV.d	AG AS BA BE CD CR NI PB SB SE V
CCB 20	1	24-May-2018 01:07	262_CCB.d	AG AS BA BE CD CR NI PB SB SE V
LLCCV5	1	24-May-2018 01:09	263LICV.d	AG AS BA BE CD CR NI PB SB SE V
LLCCV2	1	24-May-2018 01:11	264SMPL.d	AG AS BA BE CD CR NI PB SB SE V
ICSA	1	24-May-2018 01:13	265ICSA.d	AG AS BA BE CD CR NI PB SB SE V
ICSAB	1	24-May-2018 01:15	266ICSB.d	AG AS BA BE CD CR NI PB SB SE V

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide TCLP DGWPDISP
WorkOrder: HS18051061

Run ID:ICPMS05_316716
Instrument:ICPMS05
Method:SW6020

ICB	Date: 23-May-2018 10:52	Seq: 4572097		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Vanadium	-0.818	0.6	5	
CCB 4	Date: 23-May-2018 12:51	Seq: 4572585		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Vanadium	-0.655	0.6	5	
ICCB 14	Date: 23-May-2018 23:15	Seq: 4573683		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Nickel	-0.936	0.6	2	
	Vanadium	-0.698	0.6	5	
CCB 15	Date: 23-May-2018 23:31	Seq: 4573790		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Nickel	-0.865	0.6	2	
	Vanadium	-0.764	0.6	5	
CCB 16	Date: 23-May-2018 23:51	Seq: 4573800		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Nickel	-0.848	0.6	2	
CCB 17	Date: 24-May-2018 00:05	Seq: 4573807		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.491	0.4	2	
	Nickel	-0.856	0.6	2	
	Vanadium	-0.66	0.6	5	
CCB 18	Date: 24-May-2018 00:29	Seq: 4573820		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.46	0.4	2	
	Nickel	-0.846	0.6	2	
	Vanadium	-0.782	0.6	5	
CCB 19	Date: 24-May-2018 00:53	Seq: 4573832		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Nickel	-0.858	0.6	2	
	Vanadium	-0.848	0.6	5	
CCB 20	Date: 24-May-2018 01:07	Seq: 4573839		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Nickel	-0.888	0.6	2	
	Vanadium	-0.798	0.6	5	

Client: Golder Associates
Project: Exide TCLP DGWPDISP
Work Order: HS18051061

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18051061-01	DGW-PDI SP-01	Soil		21-May-2018 18:45	22-May-2018 09:00	☐

Client: Golder Associates
Project: Exide TCLP DGWPDISP
Sample ID: DGW-PDI SP-01
Collection Date: 21-May-2018 18:45

ANALYTICAL REPORT
WorkOrder:HS18051061
Lab ID:HS18051061-01
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
TCLP VOLATILES	**Method:SW1311/8260B**		Leache:SW1311 / 22-May-2018	Prep:SW1311 / 22-May-2018			Analyst: PC
1,1-Dichloroethene		U	0.010	0.10	mg/L	20	25-May-2018 18:31
1,2-Dichloroethane		U	0.010	0.10	mg/L	20	25-May-2018 18:31
1,4-Dichlorobenzene		U	0.012	0.10	mg/L	20	25-May-2018 18:31
2-Butanone		U	0.020	0.20	mg/L	20	25-May-2018 18:31
Benzene		U	0.012	0.10	mg/L	20	25-May-2018 18:31
Carbon tetrachloride		U	0.012	0.10	mg/L	20	25-May-2018 18:31
Chlorobenzene		U	0.0080	0.10	mg/L	20	25-May-2018 18:31
Chloroform		U	0.012	0.10	mg/L	20	25-May-2018 18:31
Tetrachloroethene		U	0.012	0.10	mg/L	20	25-May-2018 18:31
Trichloroethene		U	0.010	0.10	mg/L	20	25-May-2018 18:31
Vinyl chloride		U	0.0080	0.040	mg/L	20	25-May-2018 18:31
Surr: 1,2-Dichloroethane-d4	*97.4*			*70-126*	*%REC*	*20*	*25-May-2018 18:31*
Surr: 4-Bromofluorobenzene	*99.0*			*82-124*	*%REC*	*20*	*25-May-2018 18:31*
Surr: Dibromofluoromethane	*97.0*			*77-123*	*%REC*	*20*	*25-May-2018 18:31*
Surr: Toluene-d8	*99.2*			*82-127*	*%REC*	*20*	*25-May-2018 18:31*
TCLP SEMIVOLATILES	**Method:SW1311/8270**		Leache:SW1311 / 23-May-2018	Prep:SW3510 / 23-May-2018			Analyst: SGA
2,4,5-Trichlorophenol		U	0.00091	0.0051	mg/L	1	25-May-2018 16:45
2,4,6-Trichlorophenol		U	0.0014	0.0051	mg/L	1	25-May-2018 16:45
2,4-Dinitrotoluene		U	0.0010	0.0051	mg/L	1	25-May-2018 16:45
Cresols, Total		U	0.0020	0.015	mg/L	1	25-May-2018 16:45
Hexachlorobenzene		U	0.0011	0.0051	mg/L	1	25-May-2018 16:45
Hexachlorobutadiene		U	0.0011	0.0051	mg/L	1	25-May-2018 16:45
Hexachloroethane		U	0.0010	0.0051	mg/L	1	25-May-2018 16:45
Nitrobenzene		U	0.00081	0.0051	mg/L	1	25-May-2018 16:45
Pentachlorophenol		U	0.0016	0.0051	mg/L	1	25-May-2018 16:45
Pyridine		U	0.0020	0.0051	mg/L	1	25-May-2018 16:45
Surr: 2,4,6-Tribromophenol	*73.0*			*39-153*	*%REC*	*1*	*25-May-2018 16:45*
Surr: 2-Fluorobiphenyl	*74.8*			*40-147*	*%REC*	*1*	*25-May-2018 16:45*
Surr: 2-Fluorophenol	*58.6*			*21-110*	*%REC*	*1*	*25-May-2018 16:45*
Surr: 4-Terphenyl-d14	*84.7*			*39-141*	*%REC*	*1*	*25-May-2018 16:45*
Surr: Nitrobenzene-d5	*70.7*			*37-140*	*%REC*	*1*	*25-May-2018 16:45*
Surr: Phenol-d6	*56.4*			*11-110*	*%REC*	*1*	*25-May-2018 16:45*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide TCLP DGWPDISP
Sample ID: DGW-PDI SP-01
Collection Date: 21-May-2018 18:45

ANALYTICAL REPORT
WorkOrder:HS18051061
Lab ID:HS18051061-01
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
TEXAS TPH BY TX1005		**Method:TX1005**		Prep:TX1005PR / 23-May-2018			Analyst: MBG
nC6 to nC12	U		7.2	49	mg/Kg	1	24-May-2018 00:02
>nC12 to nC28	U		9.6	49	mg/Kg	1	24-May-2018 00:02
>nC28 to nC35	U		9.6	49	mg/Kg	1	24-May-2018 00:02
Total Petroleum Hydrocarbon	U		7.2	49	mg/Kg	1	24-May-2018 00:02
Surr: 2-Fluorobiphenyl	*78.6*			*70-130*	*%REC*	*1*	*24-May-2018 00:02*
Surr: Trifluoromethyl benzene	*72.4*			*70-130*	*%REC*	*1*	*24-May-2018 00:02*
TCLP METALS BY SW6020A		**Method:SW1311/6020**		Leache:SW1311 / 23-May-2018	Prep:SW3010A / 23-May-2018		Analyst: JDE
Antimony	**0.0324**	J	**0.00400**	**0.0500**	**mg/L**	1	24-May-2018 00:59
Arsenic	U		0.00400	0.0500	mg/L	1	24-May-2018 00:59
Barium	**0.360**		**0.0190**	**0.200**	**mg/L**	1	24-May-2018 00:59
Beryllium	U		0.00200	0.0200	mg/L	1	24-May-2018 00:59
Cadmium	**0.108**		**0.00200**	**0.0500**	**mg/L**	1	24-May-2018 00:59
Chromium	U		0.00400	0.0500	mg/L	1	24-May-2018 00:59
Lead	**1.02**		**0.00600**	**0.0500**	**mg/L**	1	24-May-2018 00:59
Nickel	**0.0380**	J	**0.00600**	**0.0500**	**mg/L**	1	24-May-2018 00:59
Selenium	U		0.0110	0.0500	mg/L	1	24-May-2018 00:59
Silver	U		0.00200	0.0500	mg/L	1	24-May-2018 00:59
Vanadium	U		0.00600	0.0500	mg/L	1	24-May-2018 00:59
TCLP MERCURY BY SW7470A		**Method:SW7470**		Leache:SW1311 / 23-May-2018	Prep:SW7470 / 23-May-2018		Analyst: JBA
Mercury	U		0.0000300	0.000200	mg/L	1	23-May-2018 16:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide TCLP DGWPDISP
WorkOrder: HS18051061

Batch ID: 128666 **Method:** TCLP VOLATILES **Prep:** 1311ZHE

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18051061-01	1	25	500 (mL)	1

Batch ID: 128680 **Method:** TEXAS TPH BY TX1005 **Prep:** TX 1005_S PR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18051061-01	1	10.24	10 (mL)	0.9766

Batch ID: 128691 **Method:** TCLP SEMIVOLATILES **Prep:** 3510_B

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18051061-01	1	990	1 (mL)	0.00101

Batch ID: 128695 **Method:** TCLP MERCURY BY SW7470A **Prep:** 1311_HGPR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18051061-01	1	40	40 (mL)	1

Batch ID: 128705 **Method:** TCLP METALS BY SW6020A **Prep:** 3010A_TCLP

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18051061-01	1	1	10 (mL)	10

Client: Golder Associates
Project: Exide TCLP DGWPDISP
WorkOrder: HS18051061

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 128666	**Test Name :** TCLP VOLATILES			**Matrix:** Soil		
HS18051061-01	DGW-PDI SP-01	21 May 2018 18:45	22 May 2018 16:00	22 May 2018 16:00	25 May 2018 18:31	20
Batch ID 128680	**Test Name :** TEXAS TPH BY TX1005			**Matrix:** Soil		
HS18051061-01	DGW-PDI SP-01	21 May 2018 18:45		23 May 2018 10:05	24 May 2018 00:02	1
Batch ID 128691	**Test Name :** TCLP SEMIVOLATILES			**Matrix:** Soil		
HS18051061-01	DGW-PDI SP-01	21 May 2018 18:45	23 May 2018 10:07	23 May 2018 11:18	25 May 2018 16:45	1
Batch ID 128695	**Test Name :** TCLP MERCURY BY SW7470A			**Matrix:** Soil		
HS18051061-01	DGW-PDI SP-01	21 May 2018 18:45	23 May 2018 11:48	23 May 2018 11:00	23 May 2018 16:06	1
Batch ID 128705	**Test Name :** TCLP METALS BY SW6020A			**Matrix:** Soil		
HS18051061-01	DGW-PDI SP-01	21 May 2018 18:45	23 May 2018 11:50	23 May 2018 13:10	24 May 2018 00:59	1

WorkOrder: HS18051061
InstrumentID: FID-12
Test Code: TX1005_S_REV3
Test Number: TX1005
Test Name: Texas TPH by TX1005

METHOD DETECTION / REPORTING LIMITS

Matrix: Solid **Units:** mg/Kg

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	nC6 to nC12	TPH-1005-1	25	22	7.4	50
A	>nC12 to nC28	TPH-1005-2	25	30	9.8	50
A	>nC28 to nC35	TPH-1005-4	25	22	9.8	50
A	Total Petroleum Hydrocarbon	TPH	25	22	7.4	50
S	2-Fluorobiphenyl	321-60-8	0	0	0	0
S	Trifluoromethyl benzene	98-08-8	0	0	0	0

WorkOrder: HS18051061
InstrumentID: HG03
Test Code: 1311_HG
Test Number: SW7470
Test Name: TCLP Mercury by SW7470A

METHOD DETECTION / REPORTING LIMITS

Matrix: Leachate **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Mercury	7439-97-6	0.0000500	0.0000540	0.0000300	0.000200

WorkOrder: HS18051061
InstrumentID: ICPMS05
Test Code: 1311_METALS_HS
Test Number: SW1311/6020
Test Name: TCLP Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Leachate **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.00100	0.000956	0.000400	0.00500
A	Arsenic	7440-38-2	0.00100	0.000990	0.000400	0.00500
A	Barium	7440-39-3	0.00250	0.00320	0.00190	0.0200
A	Beryllium	7440-41-7	0.00100	0.000995	0.000200	0.00200
A	Cadmium	7440-43-9	0.00100	0.00101	0.000200	0.00500
A	Chromium	7440-47-3	0.00100	0.000916	0.000400	0.00500
A	Lead	7439-92-1	0.00100	0.00115	0.000600	0.00500
A	Nickel	7440-02-0	0.00100	0.000751	0.000600	0.00500
A	Selenium	7782-49-2	0.00200	0.000378	0.00110	0.00500
A	Silver	7440-22-4	0.00100	0.000976	0.000200	0.00500
A	Vanadium	7440-62-2	0.00100	0.000912	0.000600	0.00500

WorkOrder: HS18051061
InstrumentID: SV-4
Test Code: 1311_SV
Test Number: SW1311/8270
Test Name: TCLP Semivolatiles

METHOD DETECTION / REPORTING LIMITS

Matrix: Leachate **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	2,4,5-Trichlorophenol	95-95-4	0.0012	0.00091	0.00090	0.0050
A	2,4,6-Trichlorophenol	88-06-2	0.0012	0.00096	0.0014	0.0050
A	2,4-Dinitrotoluene	121-14-2	0.0012	0.00099	0.0010	0.0050
A	Cresols, Total	1319-77-3	0.0012	0.00080	0.0020	0.015
A	Hexachlorobenzene	118-74-1	0.0012	0.00091	0.0011	0.0050
A	Hexachlorobutadiene	87-68-3	0.0012	0.0013	0.0011	0.0050
A	Hexachloroethane	67-72-1	0.0012	0.00097	0.0010	0.0050
A	Nitrobenzene	98-95-3	0.0012	0.0014	0.00080	0.0050
A	Pentachlorophenol	87-86-5	0.0012	0.00071	0.0016	0.0050
A	Pyridine	110-86-1	0.0012	0.00077	0.0020	0.0050
S	2,4,6-Tribromophenol	118-79-6	0	0	0	0.0050
S	2-Fluorobiphenyl	321-60-8	0	0	0	0.0050
S	2-Fluorophenol	367-12-4	0	0	0	0.0050
S	4-Terphenyl-d14	1718-51-0	0	0	0	0.0050
S	Nitrobenzene-d5	4165-60-0	0	0	0	0.0050
S	Phenol-d6	13127-88-3	0	0	0	0.0050

WorkOrder: HS18051061
InstrumentID: VOA6
Test Code: 1311_VOC
Test Number: SW1311/8260B
Test Name: TCLP Volatiles

METHOD DETECTION / REPORTING LIMITS

Matrix: Leachate **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	1,1-Dichloroethene	75-35-4	0.0010	0.0011	0.00050	0.0050
A	1,2-Dichloroethane	107-06-2	0.0010	0.0012	0.00050	0.0050
A	1,4-Dichlorobenzene	106-46-7	0.0010	0.0011	0.00060	0.0050
A	2-Butanone	78-93-3	0.0010	0.0013	0.0010	0.010
A	Benzene	71-43-2	0.0010	0.0010	0.00060	0.0050
A	Carbon tetrachloride	56-23-5	0.0010	0.0011	0.00060	0.0050
A	Chlorobenzene	108-90-7	0.0010	0.0010	0.00040	0.0050
A	Chloroform	67-66-3	0.0010	0.00099	0.00060	0.0050
A	Tetrachloroethene	127-18-4	0.0010	0.0011	0.00060	0.0050
A	Trichloroethene	79-01-6	0.0010	0.0010	0.00050	0.0050
A	Vinyl chloride	75-01-4	0.0010	0.00095	0.00040	0.0020
S	1,2-Dichloroethane-d4	17060-07-0	0	0	0	0.0050
S	4-Bromofluorobenzene	460-00-4	0	0	0	0.0050
S	Dibromofluoromethane	1868-53-7	0	0	0	0.0050
S	Toluene-d8	2037-26-5	0	0	0	0.0050

Client: Golder Associates
Project: Exide TCLP DGWPDISP
WorkOrder: HS18051061

QC BATCH REPORT

Batch ID: 128680 **Instrument: FID-12** **Method: TX1005**

MBLK Sample ID: **MBLK-128680** Units: **mg/Kg** Analysis Date: **23-May-2018 17:44**
Client ID: Run ID: **FID-12_316811** SeqNo: **4574377** PrepDate: **23-May-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
nC6 to nC12	U	50								
>nC12 to nC28	U	50								
>nC28 to nC35	U	50								
Total Petroleum Hydrocarbon	U	50								
Surr: 2-Fluorobiphenyl	*19.39*	*0*	*25*	*0*	*77.5*	*70 - 130*				
Surr: Trifluoromethyl benzene	*19.54*	*0*	*25*	*0*	*78.1*	*70 - 130*				

LCS Sample ID: **LCS-128680** Units: **mg/Kg** Analysis Date: **23-May-2018 18:13**
Client ID: Run ID: **FID-12_316811** SeqNo: **4574378** PrepDate: **23-May-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
nC6 to nC12	242.2	50	250	0	96.9	75 - 125				
>nC12 to nC28	293.6	50	250	0	117	75 - 125				
Surr: 2-Fluorobiphenyl	*18.69*	*0*	*25*	*0*	*74.8*	*70 - 130*				
Surr: Trifluoromethyl benzene	*19.12*	*0*	*25*	*0*	*76.5*	*70 - 130*				

LCSD Sample ID: **LCSD-128680** Units: **mg/Kg** Analysis Date: **23-May-2018 18:42**
Client ID: Run ID: **FID-12_316811** SeqNo: **4574379** PrepDate: **23-May-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
nC6 to nC12	256.2	50	250	0	102	75 - 125	242.2	5.62	20	
>nC12 to nC28	297.8	50	250	0	119	75 - 125	293.6	1.41	20	
Surr: 2-Fluorobiphenyl	*22.37*	*0*	*25*	*0*	*89.5*	*70 - 130*	*18.69*	*17.9*	*20*	
Surr: Trifluoromethyl benzene	*21.21*	*0*	*25*	*0*	*84.8*	*70 - 130*	*19.12*	*10.3*	*20*	

MS Sample ID: **HS18051053-01MS** Units: **mg/Kg** Analysis Date: **23-May-2018 19:40**
Client ID: Run ID: **FID-12_316811** SeqNo: **4574381** PrepDate: **23-May-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
nC6 to nC12	218.7	47	234.3	0	93.3	75 - 125				
>nC12 to nC28	532.3	47	234.3	222.1	132	75 - 125				S
Surr: 2-Fluorobiphenyl	*17.9*	*0*	*23.43*	*0*	*76.4*	*70 - 130*				
Surr: Trifluoromethyl benzene	*17.27*	*0*	*23.43*	*0*	*73.7*	*70 - 130*				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide TCLP DGWPDISP
WorkOrder: HS18051061

QC BATCH REPORT

Batch ID: 128680 **Instrument: FID-12** **Method: TX1005**

MSD Sample ID: **HS18051053-01MSD** Units: **mg/Kg** Analysis Date: **23-May-2018 20:09**
Client ID: Run ID: **FID-12_316811** SeqNo: **4574382** PrepDate: **23-May-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
nC6 to nC12	251.7	50	252.3	0	99.8	75 - 125	218.7	14	20	
>nC12 to nC28	592.8	50	252.3	222.1	147	75 - 125	532.3	10.7	20	S
Surr: 2-Fluorobiphenyl	*20.01*	*0*	*25.23*	*0*	*79.3*	*70 - 130*	*17.9*	*11.1*	*20*	
Surr: Trifluoromethyl benzene	*19.31*	*0*	*25.23*	*0*	*76.5*	*70 - 130*	*17.27*	*11.1*	*20*	

The following samples were analyzed in this batch: HS18051061-01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide TCLP DGWPDISP
WorkOrder: HS18051061

QC BATCH REPORT

Batch ID: 128695 **Instrument: HG03** **Method: SW7470**

MBLK Sample ID: **MBLK-128695** Units: **mg/L** Analysis Date: **23-May-2018 15:14**
Client ID: Run ID: **HG03_316722** SeqNo: **4573068** PrepDate: **23-May-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	U	0.000200								

MBLK Sample ID: **GBLKT2-128695** Units: **mg/L** Analysis Date: **23-May-2018 15:13**
Client ID: Run ID: **HG03_316722** SeqNo: **4573067** PrepDate: **23-May-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	U	0.000200								

MBLK Sample ID: **GBLKT1-128695** Units: **mg/L** Analysis Date: **23-May-2018 15:11**
Client ID: Run ID: **HG03_316722** SeqNo: **4573066** PrepDate: **23-May-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	U	0.000200								

LCS Sample ID: **LCS-128695** Units: **mg/L** Analysis Date: **23-May-2018 15:20**
Client ID: Run ID: **HG03_316722** SeqNo: **4573069** PrepDate: **23-May-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00472	0.000200	0.005	0	94.4	80 - 120				

MS Sample ID: **HS18050899-01MS** Units: **mg/L** Analysis Date: **23-May-2018 15:23**
Client ID: Run ID: **HG03_316722** SeqNo: **4573071** PrepDate: **23-May-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00462	0.000200	0.005	-0.000012	92.6	75 - 125				

MSD Sample ID: **HS18050899-01MSD** Units: **mg/L** Analysis Date: **23-May-2018 15:25**
Client ID: Run ID: **HG03_316722** SeqNo: **4573072** PrepDate: **23-May-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00464	0.000200	0.005	-0.000012	93.0	75 - 125	0.00462	0.432	20	

The following samples were analyzed in this batch: HS18051061-01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide TCLP DGWPDISP
WorkOrder: HS18051061

QC BATCH REPORT

Batch ID: 128705 **Instrument: ICPMS05** **Method: SW1311/6020**

MBLK Sample ID: **MBLKT2-128705** Units: **mg/L** Analysis Date: **24-May-2018 00:09**
Client ID: Run ID: **ICPMS05_316716** SeqNo: **4573810** PrepDate: **23-May-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.0500								
Arsenic	U	0.0500								
Barium	U	0.200								
Beryllium	U	0.0200								
Cadmium	U	0.0500								
Chromium	U	0.0500								
Lead	U	0.0500								
Nickel	U	0.0500								
Selenium	U	0.0500								
Silver	U	0.0500								
Vanadium	U	0.0500								

MBLK Sample ID: **MBLKT1-128705** Units: **mg/L** Analysis Date: **24-May-2018 00:07**
Client ID: Run ID: **ICPMS05_316716** SeqNo: **4573809** PrepDate: **23-May-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.0500								
Arsenic	U	0.0500								
Barium	U	0.200								
Beryllium	U	0.0200								
Cadmium	U	0.0500								
Chromium	U	0.0500								
Lead	U	0.0500								
Nickel	U	0.0500								
Selenium	U	0.0500								
Silver	U	0.0500								
Vanadium	U	0.0500								

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide TCLP DGWPDISP
WorkOrder: HS18051061

QC BATCH REPORT

Batch ID: 128705 **Instrument: ICPMS05** **Method: SW1311/6020**

MBLK Sample ID: **MBLK-128705** Units: **mg/L** Analysis Date: **24-May-2018 00:11**
Client ID: Run ID: **ICPMS05_316716** SeqNo: **4573811** PrepDate: **23-May-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00500								
Arsenic	U	0.00500								
Barium	U	0.0200								
Beryllium	U	0.00200								
Cadmium	U	0.00500								
Chromium	U	0.00500								
Lead	U	0.00500								
Nickel	U	0.00500								
Selenium	U	0.00500								
Silver	U	0.00500								
Vanadium	U	0.00500								

LCS Sample ID: **LCS-128705** Units: **mg/L** Analysis Date: **24-May-2018 00:13**
Client ID: Run ID: **ICPMS05_316716** SeqNo: **4573812** PrepDate: **23-May-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04753	0.00500	0.05	0	95.1	80 - 120				
Arsenic	0.04893	0.00500	0.05	0	97.9	80 - 120				
Barium	0.04258	0.0200	0.05	0	85.2	80 - 120				
Beryllium	0.04012	0.00200	0.05	0	80.2	80 - 120				
Cadmium	0.04428	0.00500	0.05	0	88.6	80 - 120				
Chromium	0.04805	0.00500	0.05	0	96.1	80 - 120				
Lead	0.0448	0.00500	0.05	0	89.6	80 - 120				
Nickel	0.04776	0.00500	0.05	0	95.5	80 - 120				
Selenium	0.04655	0.00500	0.05	0	93.1	80 - 120				
Silver	0.04451	0.00500	0.05	0	89.0	80 - 120				
Vanadium	0.04646	0.00500	0.05	0	92.9	80 - 120				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide TCLP DGWPDISP
WorkOrder: HS18051061

QC BATCH REPORT

Batch ID: 128705 **Instrument: ICPMS05** **Method: SW1311/6020**

MS Sample ID: **HS18050846-01MS** Units: **mg/L** Analysis Date: **24-May-2018 00:19**
Client ID: Run ID: **ICPMS05_316716** SeqNo: **4573815** PrepDate: **23-May-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.4875	0.0500	0.5	0.00846	95.8	80 - 120				
Arsenic	0.5184	0.0500	0.5	0.02496	98.7	80 - 120				
Barium	1.803	0.200	0.5	1.271	106	80 - 120				
Beryllium	0.4329	0.0200	0.5	0.00037	86.5	80 - 120				
Cadmium	0.4724	0.0500	0.5	0.0014	94.2	80 - 120				
Chromium	0.4998	0.0500	0.5	0.01214	97.5	80 - 120				
Lead	0.5489	0.0500	0.5	0.06046	97.7	80 - 120				
Nickel	0.5292	0.0500	0.5	0.04607	96.6	80 - 120				
Selenium	0.4452	0.0500	0.5	-0.00063	89.2	80 - 120				
Silver	0.4401	0.0500	0.5	0.00014	88.0	80 - 120				
Vanadium	0.4841	0.0500	0.5	-0.00703	98.2	80 - 120				

MSD Sample ID: **HS18050846-01MSD** Units: **mg/L** Analysis Date: **24-May-2018 00:21**
Client ID: Run ID: **ICPMS05_316716** SeqNo: **4573816** PrepDate: **23-May-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.4906	0.0500	0.5	0.00846	96.4	80 - 120	0.4875	0.644	20	
Arsenic	0.5096	0.0500	0.5	0.02496	96.9	80 - 120	0.5184	1.7	20	
Barium	1.776	0.200	0.5	1.271	101	80 - 120	1.803	1.48	20	
Beryllium	0.4263	0.0200	0.5	0.00037	85.2	80 - 120	0.4329	1.53	20	
Cadmium	0.4666	0.0500	0.5	0.0014	93.0	80 - 120	0.4724	1.25	20	
Chromium	0.4964	0.0500	0.5	0.01214	96.8	80 - 120	0.4998	0.679	20	
Lead	0.5279	0.0500	0.5	0.06046	93.5	80 - 120	0.5489	3.9	20	
Nickel	0.5265	0.0500	0.5	0.04607	96.1	80 - 120	0.5292	0.523	20	
Selenium	0.4617	0.0500	0.5	-0.00063	92.5	80 - 120	0.4452	3.63	20	
Silver	0.4515	0.0500	0.5	0.00014	90.3	80 - 120	0.4401	2.55	20	
Vanadium	0.4795	0.0500	0.5	-0.00703	97.3	80 - 120	0.4841	0.963	20	

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide TCLP DGWPDISP
WorkOrder: HS18051061

QC BATCH REPORT

Batch ID: 128705 **Instrument: ICPMS05** **Method: SW1311/6020**

PDS Sample ID: **HS18050846-01PDS** Units: **mg/L** Analysis Date: **24-May-2018 00:23**
Client ID: Run ID: **ICPMS05_316716** SeqNo: **4573817** PrepDate: **23-May-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.8752	0.0500	1	0.00846	86.7	75 - 125				
Arsenic	0.9939	0.0500	1	0.02496	96.9	75 - 125				
Barium	2.144	0.200	1	1.271	87.4	75 - 125				
Beryllium	0.8259	0.0200	1	0.00037	82.6	75 - 125				
Cadmium	0.8909	0.0500	1	0.0014	89.0	75 - 125				
Chromium	0.9899	0.0500	1	0.01214	97.8	75 - 125				
Lead	0.946	0.0500	1	0.06046	88.6	75 - 125				
Nickel	1.004	0.0500	1	0.04607	95.8	75 - 125				
Selenium	0.8775	0.0500	1	-0.00063	87.8	75 - 125				
Silver	0.8601	0.0500	1	0.00014	86.0	75 - 125				
Vanadium	0.9581	0.0500	1	-0.00703	96.5	75 - 125				

SD Sample ID: **HS18050846-01SD** Units: **mg/L** Analysis Date: **24-May-2018 00:17**
Client ID: Run ID: **ICPMS05_316716** SeqNo: **4573814** PrepDate: **23-May-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.250					0.00846	0	10	
Arsenic	0.02239	0.250					0.02496	0	10	J
Barium	1.274	1.00					1.271	0.222	10	
Beryllium	U	0.100					0.00037	0	10	
Cadmium	U	0.250					0.0014	0	10	
Chromium	U	0.250					0.01214	0	10	
Lead	0.06361	0.250					0.06046	0	10	J
Nickel	U	0.250					0.04607	0	10	
Selenium	U	0.250					-0.00063	0	10	
Silver	U	0.250					0.00014	0	10	
Vanadium	U	0.250					-0.00703	0	10	

The following samples were analyzed in this batch: HS18051061-01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide TCLP DGWPDISP
WorkOrder: HS18051061

QC BATCH REPORT

Batch ID: 128691 **Instrument: SV-4** **Method: SW8270**

MBLK Sample ID: **MBLK-128691** Units: **ug/L** Analysis Date: **23-May-2018 13:23**
Client ID: Run ID: **SV-4_316726** SeqNo: **4572667** PrepDate: **23-May-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2,4,5-Trichlorophenol	U	5.0								
2,4,6-Trichlorophenol	U	5.0								
2,4-Dinitrotoluene	U	5.0								
Hexachlorobenzene	U	5.0								
Hexachlorobutadiene	U	5.0								
Hexachloroethane	U	5.0								
Nitrobenzene	U	5.0								
Pentachlorophenol	U	5.0								
Pyridine	U	5.0								
Cresols, Total	U	5.0								
Surr: 2,4,6-Tribromophenol	*81.59*	*5.0*	*100*	*0*	*81.6*	*39 - 153*				
Surr: 2-Fluorobiphenyl	*91.65*	*5.0*	*100*	*0*	*91.6*	*40 - 147*				
Surr: 2-Fluorophenol	*86.97*	*5.0*	*100*	*0*	*87.0*	*21 - 110*				
Surr: 4-Terphenyl-d14	*81.9*	*5.0*	*100*	*0*	*81.9*	*39 - 141*				
Surr: Nitrobenzene-d5	*88.54*	*5.0*	*100*	*0*	*88.5*	*37 - 140*				
Surr: Phenol-d6	*77.1*	*5.0*	*100*	*0*	*77.1*	*11 - 110*				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide TCLP DGWPDISP
WorkOrder: HS18051061

QC BATCH REPORT

Batch ID: 128691 **Instrument: SV-4** **Method: SW8270**

LCS Sample ID: **LCS-128691** Units: **ug/L** Analysis Date: **23-May-2018 13:01**
Client ID: Run ID: **SV-4_316726** SeqNo: **4572666** PrepDate: **23-May-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2,4,5-Trichlorophenol	99.18	5.0	100	0	99.2	55 - 120				
2,4,6-Trichlorophenol	97	5.0	100	0	97.0	55 - 120				
2,4-Dinitrotoluene	50.11	5.0	50	0	100	55 - 125				
Hexachlorobenzene	51.42	5.0	50	0	103	55 - 120				
Hexachlorobutadiene	47.01	5.0	50	0	94.0	55 - 120				
Hexachloroethane	42.09	5.0	50	0	84.2	55 - 120				
Nitrobenzene	43.23	5.0	50	0	86.5	55 - 120				
Pentachlorophenol	106.8	5.0	100	0	107	50 - 135				
Pyridine	30.23	5.0	50	0	60.5	30 - 120				
Cresols, Total	262.1	5.0	250	0	105	48 - 115				
Surr: 2,4,6-Tribromophenol	*82.21*	*5.0*	*100*	*0*	*82.2*	*39 - 153*				
Surr: 2-Fluorobiphenyl	*88.8*	*5.0*	*100*	*0*	*88.8*	*40 - 147*				
Surr: 2-Fluorophenol	*77.8*	*5.0*	*100*	*0*	*77.8*	*21 - 110*				
Surr: 4-Terphenyl-d14	*100.5*	*5.0*	*100*	*0*	*100*	*39 - 141*				
Surr: Nitrobenzene-d5	*72.2*	*5.0*	*100*	*0*	*72.2*	*37 - 140*				
Surr: Phenol-d6	*75.44*	*5.0*	*100*	*0*	*75.4*	*11 - 110*				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide TCLP DGWPDISP
WorkOrder: HS18051061

QC BATCH REPORT

Batch ID: 128691 **Instrument: SV-4** **Method: SW8270**

LCSD Sample ID: **LCSD-128691** Units: **ug/L** Analysis Date: **23-May-2018 13:44**
Client ID: Run ID: **SV-4_316726** SeqNo: **4572668** PrepDate: **23-May-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
2,4,5-Trichlorophenol	100.2	5.0	100	0	100	55 - 120	99.18	1.05	30	
2,4,6-Trichlorophenol	94.26	5.0	100	0	94.3	55 - 120	97	2.87	30	
2,4-Dinitrotoluene	50.71	5.0	50	0	101	55 - 125	50.11	1.19	30	
Hexachlorobenzene	49.52	5.0	50	0	99.0	55 - 120	51.42	3.77	30	
Hexachlorobutadiene	49.71	5.0	50	0	99.4	55 - 120	47.01	5.59	30	
Hexachloroethane	48.39	5.0	50	0	96.8	55 - 120	42.09	13.9	30	
Nitrobenzene	48.04	5.0	50	0	96.1	55 - 120	43.23	10.5	30	
Pentachlorophenol	106.8	5.0	100	0	107	50 - 135	106.8	0.05	30	
Pyridine	36.66	5.0	50	0	73.3	30 - 120	30.23	19.2	30	
Cresols, Total	252.5	5.0	250	0	101	48 - 115	262.1	3.74	30	
Surr: 2,4,6-Tribromophenol	*82.29*	*5.0*	*100*	*0*	*82.3*	*39 - 153*	*82.21*	*0.0921*	*30*	
Surr: 2-Fluorobiphenyl	*90.42*	*5.0*	*100*	*0*	*90.4*	*40 - 147*	*88.8*	*1.8*	*30*	
Surr: 2-Fluorophenol	*74.47*	*5.0*	*100*	*0*	*74.5*	*21 - 110*	*77.8*	*4.38*	*30*	
Surr: 4-Terphenyl-d14	*114.8*	*5.0*	*100*	*0*	*115*	*39 - 141*	*100.5*	*13.3*	*30*	
Surr: Nitrobenzene-d5	*78.27*	*5.0*	*100*	*0*	*78.3*	*37 - 140*	*72.2*	*8.06*	*30*	
Surr: Phenol-d6	*72.39*	*5.0*	*100*	*0*	*72.4*	*11 - 110*	*75.44*	*4.12*	*30*	

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide TCLP DGWPDISP
WorkOrder: HS18051061

QC BATCH REPORT

Batch ID: 128691 **Instrument: SV-4** **Method: SW8270**

MS Sample ID: **HS18050920-01MS** Units: **ug/L** Analysis Date: **24-May-2018 20:09**
Client ID: Run ID: **SV-4_316726** SeqNo: **4575976** PrepDate: **23-May-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2,4,5-Trichlorophenol	111.7	5.2	103.1	0	108	55 - 120				
2,4,6-Trichlorophenol	115.2	5.2	103.1	0	112	55 - 120				
2,4-Dinitrotoluene	58.07	5.2	51.55	0	113	55 - 125				
Hexachlorobenzene	63.24	5.2	51.55	0	123	55 - 120				S
Hexachlorobutadiene	62.4	5.2	51.55	0	121	55 - 120				S
Hexachloroethane	45.68	5.2	51.55	0	88.6	55 - 120				
Nitrobenzene	72.57	5.2	51.55	0	141	55 - 120				S
Pentachlorophenol	131.8	5.2	103.1	0	128	50 - 135				
Pyridine	35.72	5.2	51.55	0	69.3	30 - 120				
Cresols, Total	247.1	5.2	257.7	0	95.9	48 - 115				
Surr: 2,4,6-Tribromophenol	*114.7*	*5.2*	*103.1*	*0*	*111*	*39 - 153*				
Surr: 2-Fluorobiphenyl	*100.4*	*5.2*	*103.1*	*0*	*97.4*	*40 - 147*				
Surr: 2-Fluorophenol	*85.99*	*5.2*	*103.1*	*0*	*83.4*	*21 - 110*				
Surr: 4-Terphenyl-d14	*118.6*	*5.2*	*103.1*	*0*	*115*	*39 - 141*				
Surr: Nitrobenzene-d5	*115.3*	*5.2*	*103.1*	*0*	*112*	*37 - 140*				
Surr: Phenol-d6	*73.59*	*5.2*	*103.1*	*0*	*71.4*	*11 - 110*				

The following samples were analyzed in this batch: HS18051061-01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide TCLP DGWPDISP
WorkOrder: HS18051061

QC BATCH REPORT

Batch ID: 128666 **Instrument: VOA6** **Method: SW1311/8260B**

MBLK Sample ID: **MBLK-128666 052218** Units: **ug/L** Analysis Date: **25-May-2018 17:42**
Client ID: Run ID: **VOA6_316952** SeqNo: **4577470** PrepDate: **22-May-2018** DF: **20**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	U	100								
1,2-Dichloroethane	U	100								
1,4-Dichlorobenzene	U	100								
2-Butanone	U	200								
Benzene	U	100								
Carbon tetrachloride	U	100								
Chlorobenzene	U	100								
Chloroform	U	100								
Tetrachloroethene	U	100								
Trichloroethene	U	100								
Vinyl chloride	U	40								
Surr: 1,2-Dichloroethane-d4	*1007*	*100*	*1000*	*0*	*101*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*993.4*	*100*	*1000*	*0*	*99.3*	*83 - 122*				
Surr: Dibromofluoromethane	*994.1*	*100*	*1000*	*0*	*99.4*	*73 - 126*				
Surr: Toluene-d8	*1018*	*100*	*1000*	*0*	*102*	*81 - 119*				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide TCLP DGWPDISP
WorkOrder: HS18051061

QC BATCH REPORT

Batch ID: 128666 **Instrument: VOA6** **Method: SW1311/8260B**

LCS Sample ID: **VLCSW-128666 052218** Units: **ug/L** Analysis Date: **25-May-2018 12:22**
Client ID: Run ID: **VOA6_316952** SeqNo: **4577466** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	45.8	5.0	50	0	91.6	70 - 130				
1,2-Dichloroethane	49.25	5.0	50	0	98.5	70 - 124				
1,4-Dichlorobenzene	50.43	5.0	50	0	101	79 - 113				
2-Butanone	108	10	100	0	108	70 - 130				
Benzene	46.9	5.0	50	0	93.8	74 - 120				
Carbon tetrachloride	45.87	5.0	50	0	91.7	71 - 125				
Chlorobenzene	46.62	5.0	50	0	93.2	76 - 113				
Chloroform	47.63	5.0	50	0	95.3	71 - 121				
Tetrachloroethene	45.18	5.0	50	0	90.4	76 - 119				
Trichloroethene	47.3	5.0	50	0	94.6	79 - 120				
Vinyl chloride	46.41	2.0	50	0	92.8	70 - 130				
Surr: 1,2-Dichloroethane-d4	*49.15*	*5.0*	*50*	*0*	*98.3*	*70 - 130*				
Surr: 4-Bromofluorobenzene	*49.33*	*5.0*	*50*	*0*	*98.7*	*83 - 122*				
Surr: Dibromofluoromethane	*49.55*	*5.0*	*50*	*0*	*99.1*	*73 - 126*				
Surr: Toluene-d8	*50.21*	*5.0*	*50*	*0*	*100*	*81 - 119*				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide TCLP DGWPDISP
WorkOrder: HS18051061

QC BATCH REPORT

Batch ID: 128666 **Instrument: VOA6** **Method: SW1311/8260B**

MS Sample ID: **HS18050920-01MS** Units: **ug/L** Analysis Date: **25-May-2018 15:14**
Client ID: Run ID: **VOA6_316952** SeqNo: **4577469** PrepDate: **22-May-2018** DF: **20**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	806.2	100	1000	0	80.6	70 - 130				
1,2-Dichloroethane	989.5	100	1000	0	98.9	70 - 127				
1,4-Dichlorobenzene	878.7	100	1000	0	87.9	70 - 114				
2-Butanone	2268	200	2000	0	113	70 - 130				
Benzene	883.9	100	1000	0	88.4	70 - 127				
Carbon tetrachloride	757.4	100	1000	0	75.7	70 - 130				
Chlorobenzene	889.9	100	1000	0	89.0	70 - 114				
Chloroform	919.8	100	1000	0	92.0	70 - 125				
Tetrachloroethene	719	100	1000	0	71.9	70 - 130				
Trichloroethene	832.6	100	1000	0	83.3	70 - 129				
Vinyl chloride	771.8	40	1000	0	77.2	70 - 130				
Surr: 1,2-Dichloroethane-d4	*979.5*	*100*	*1000*	*0*	*98.0*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*984.3*	*100*	*1000*	*0*	*98.4*	*82 - 124*				
Surr: Dibromofluoromethane	*975.4*	*100*	*1000*	*0*	*97.5*	*77 - 123*				
Surr: Toluene-d8	*997*	*100*	*1000*	*0*	*99.7*	*82 - 127*				

The following samples were analyzed in this batch: HS18051061-01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide TCLP DGWPDISP
WorkOrder: **HS18051061**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
Date	
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
California	2919 2016-2018	31-Jul-2018
Oklahoma	2017-088	31-Aug-2018
North Carolina	624-2018	31-Dec-2018
Louisiana	03087 2017-2018	30-Jun-2018
Arkansas	88-0356	27-Mar-2019
Kansas	E-10352 2017-218	31-Jul-2018
Texas	T10470231	30-Apr-2019
North Dakota	R193	30-Apr-2019

Sample Receipt Checklist

Client Name:	Golder St Louis	Date/Time Received:	**22-May-2018 09:00**
Work Order:	HS18051061	Received by:	**RPG**

Checklist completed by: *Paresh M. Giga* eSignature — 22-May-2018 Date

Reviewed by: *Dane J. Wacasey* eSignature — 22-May-2018 Date

Matrices:

Carrier name: **FedEx International Priority**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☐	No ☑	
Temperature(s)/Thermometer(s):	2.2c/1.6c U/C	IR25	
Cooler(s)/Kit(s):	24171		
Date/Time sample(s) sent to storage:	5/22/18 09:45		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted:	Golder	Date Contacted:	22-May-2018	Person Contacted:	Emily White
Contacted By:	369	Regarding:	Adding Tests		

Comments: Can we please move forward to analyzing TCLP VOCs, SVOCs, and TPH?

Corrective Action: Logged TCLP VOC, TCLP SVOC, TPH and extended metals to TX12 list.

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page 1 of 1

COC ID: 183649

Medium Blue Cooler # 24171

ALS Project Manager:	ALS Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order	1302086-03	Project Name	Exide [redacted] TCLP	A	1311_TCLP RCRA Metals (1311/3010/6020/7470 - RCRA 8)
Work Order		Project Number	1302086-[redacted] 06	B	
Company Name	Golder Associates	Bill To Company	Golder Associates	C	
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P	D	
Address	820 South Main St. Suite 100	Address	820 South Main St. Suite 100	E	
				F	
City/State/Zip	St Charles, MO 63301	City/State/Zip	St Charles MO 63301	G	
Phone	(636) 724-9191	Phone	(636) 724-9191	H	
Fax	(636) 724-9323	Fax	(636) 724-9323	I	
e-Mail Address	ewhite@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	DGW-PDI SP-01	05/21/18	1845	Soil	8	4	X										2 extra jars to hold
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

HS18051061

Golder Associates

Exide TCLP

Sampler(s) Please Print & Sign: Emily White Emily White

Shipment Method: FedEx

Required Turnaround Time: (Check Box) ☒ 2 or 3 ☐ STD 10 Wk Days ☐ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour

Results Due Date:

Relinquished by: Emily White Date: 05/21/18 Time: 1900 Received by:

Notes: [Exide Frisco]

Relinquished by: Date: Time: Received by (Laboratory): RG 05/22/18 09:00

Cooler ID	Cooler Temp.
24171	2-2

QC Package: (Check One Box Below)

☐ Level II Std QC ☐ Level III Std QC/Raw Date ☐ Level IV SW846/CLP ☐ Other ☒ TRRP Checklist ☐ TRRP Level IV

Logged by (Laboratory): Date: Time: Checked by (Laboratory):

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

SR1 25 C1F-0.6

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Dane Wacasey

From: White, Emily <Emily_White@golder.com>
Sent: Tuesday, May 22, 2018 4:42 PM
To: Dane Wacasey
Cc: Faeth-Boyd, Anne
Subject: RE: Exide DGW PDI COC TCLP Rush TAT 05-21-18

Dane,

Can we please move forward to analyzing TCLP VOCs, SVOCs, and TPH? We will want the whole TCLP lists for all analyses.

Please let us know if you have any questions.

Thanks!
Emily

From: White, Emily
Sent: Monday, May 21, 2018 11:04 PM
To: 'Dane Wacasey' <Dane.Wacasey@alsglobal.com>
Cc: Faeth-Boyd, Anne <Anne_Faeth-Boyd@golder.com>
Subject: Exide DGW PDI COC TCLP Rush TAT 05-21-18

Dane,

Please see attached COC for TCLP sample from Exide. For now, let's run TCLP RCRA 8 metals. I sent additional jars to be held for potential additional TCLP analyses. I hope to know more information on these in the morning.

Please use PO 130208606.

Please let me know if you have any questions.

Thanks!
Emily

Emily P. White, EI
Staff Geological Engineer

13515 Barrett Parkway Drive, Suite 260, St. Louis, Missouri, USA 63021
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ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
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Fax. +1 281 530 5887

24171

CUSTODY SEAL

Date: 05/4/18 Time: 1900
Name: James Little
Company: Golder

Seal Broken By: CM
Date: 05/22/18

24171 MAY 22 2018

Must Deliver by
Time and T

RUSH TAT

ORIGIN ID:SGRA (314) 304-1326
~~JACQUELINE ENGEL~~ E. White
GOLDER ASSOCIATES
7471 5TH STREET

FRISCO, TX 75034
UNITED STATES US

SHIP DATE: 03MAY18
ACTWGT: 1.00 LB MAN
CAD: 300130/CAFE3111
DIMS: 19x16x13 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP 24171
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099 #0130-2056-06
(281) 530-6656
REF: EXIDE ~~MMMMM~~-DW DCP GW PDI
RMA:

FedEx Express

FedEx
TRK# 0221 4380 9528 8524

TUE - 22 MAY 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US IAH

ATTACHMENT E

DATA USABILITY SUMMARIES

DATA USABILITY SUMMARY
ALS WORK ORDER: HS18051492

PROJECT NO: 130-2086-06 **CLIENT:** Exide Technologies

SAMPLE DATES: May 30, 2018

LABORATORY: ALS Group

WORK ORDERS: HS18051492

INTENDED USE: Deep Groundwater Pre-Design Investigation Report

SITE: Exide Recycling Center, 7471 5th Street, Frisco, TX

TESTS/METHODS

- SW-846 6020A - Inductively Coupled Plasma-Mass Spectrometry (ICP/MS) (total and dissolved metals)
- EPA 300.0 - Determination of Inorganic Anions by Ion Chromatography (chloride, nitrate/nitrite, and sulfate)
- Standard Methods 2320B - Alkalinity
- Standard Methods 5310B - Total Organic Carbon
- TNRCC 1005 - Total Petroleum Hydrocarbons

SAMPLES

Nine groundwater samples and one duplicate groundwater sample were collected. See Table 1 for a list of samples.

Golder completed a review of the above chemical analysis data for conformance with the requirements of the Texas Risk Reduction Program (TRRP) guidance document, Review and Reporting of COC Concentration Data (RGG-366/TRRP-13 Revised May 2010) and for adherence to project objectives. The results of the review are discussed in this data usability summary (DUS).

Golder completed the review using the following laboratory and project submittals:

- Laboratory reportable data as defined in TRRP-13;
- Laboratory review checklists (LRC) with the associated exception reports;
- Laboratory Electronic Data Deliverable (EDD); and
- Project field notes from the sampling event.

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The review of the reportable data included the quality control (QC) parameters listed below, as required per TRRP-13, using the applicable analytical method and project requirements:

- Data Completeness
- Chain-of-Custody Procedures
- Sample Condition - Holding Time, Preservation, and Containers
- Field Procedures
- Results Reporting Procedures
- Field and Laboratory Blanks
- Surrogate Recoveries
- Laboratory Control Spike/Laboratory Control Spike Duplicate (LCS/LCSD)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries
- Field Duplicate Precision
- Detectabillity Check Sample (DCS)

Additionally, Golder used the LRC to evaluate the following QC parameters:

- Method Quantitation Limits (MQLs)
- Method Detection Limits (MDLs) and Sample Detection Limits (SDLs)
- Instrument Tuning, Calibration, and Performance
- Internal Standards

Criteria used for this data usability review are as follows:

- Precision: ±MQL difference or 30% relative percent difference (RPD) for laboratory duplicates and ± 2x MQL difference (if either result is less than 5x MQL) or 30% RPD for field duplicates as recommended in TRRP-13
- Accuracy: 70-130% spike recovery (and not less than 30% or data is rejected) as recommended in TRRP-13r

If an item was found outside of the review criteria, the reviewer applied a data qualifier and bias code to the results for the affected samples in accordance with TRRP-13. A list of qualified results and definitions of the qualifier and bias codes are given in Table 2.

LABORATORY CERTIFICATION

At the time the laboratory data were generated for this project, the laboratory was NELAC accredited under the Texas Laboratory Accreditation Program (TLAP Certification T104704231) for the matrices, methods and parameters of analysis requested on the chain-of-custody forms.

USABILITY SUMMARY

Data are usable for the intended purpose. Qualified data are listed in Table 2.

Reviewer: Brenda Basile 7/5/2018

QUALITY CONTROL PARAMETERS AND OUTCOMES

Data Completeness

The laboratory data package contains necessary data (i.e., the laboratory reportable data per TRRP-13) and the EDD contains sample results in acceptable format.

Chain-of-Custody

Proper sample custody procedures were used, which confirms that the integrity of the samples was maintained. The information on the custody records is complete and agrees with that in the field notes and laboratory reports.

Sample Condition

Other than dissolved organic carbon for DGW-MW-7, DGW-MW-8, and MW-24, samples were collected in appropriate containers and properly preserved in the field. The dissolved organic carbon for DGW-MW-7, DGW-MW-8, and MW-24 were collected in unpreserved vials. The laboratory transferred the samples to acid-preserved amber vials within 24 hours of sample collection. Dissolved organic carbon data for DGW-MW-7, DGW-MW-8, and MW-24 are qualified as estimated (J).

Samples were prepared and analyzed within the holding times as required in the analytical methods.

Field Procedures

The samples were collected and placed immediately into laboratory supplied containers and then into a cooler with ice for overnight delivery to the laboratory.

According to the Work Plan, groundwater samples with turbidity greater than 10 NTU would be field filtered with a 10 micron filter for analyses of total metals. For dissolved metals, samples would be field filtered with a 0.45 micron filter. According to the Groundwater Sample Collection Forms, samples were filtered appropriately.

The dissolved concentrations were slightly above the total concentrations for antimony, arsenic, calcium, iron, magnesium, selenium and organic carbon. Table 3 lists samples and analytes which have greater than + 2x MQL difference (if either result is less than 5x MQL) or 30% RPD between total and dissolved concentrations. Data are qualified as estimated (J) as shown in Table 2.

Results Reporting Procedures

Results are reported in milligram per liter (mg/L). Non-detects are reported using the SDL as specified per TRRP and detects between the SDL and MQL are reported with a laboratory J-flag. The concentration reported for detects between the SDL and MQL is below the calibration range and thus is considered estimated. Results for the DCS are included in the laboratory data package and are acceptable.

Field and Laboratory Blanks

No field blanks were collected. A peristaltic pump with disposable tubing was used to collect samples.

Analytes detected in laboratory method and continuing calibration blanks are listed in Table 4. Sample concentrations are greater than five times the blank concentrations so no data are qualified.

Laboratory Control Sample

The LCS and LCSD (if analyzed) recoveries (%R) are within the TRRP-13 recommended criteria of 70 -130 %R. LCS/LCSD precision is within the TRRP-13 recommended criteria of 30 RPD.

Matrix Spike Recovery

The laboratory prepared one or more MS/MSD samples with each analytical batch. The MS/MSD and post-digestate spike recoveries outside the TRRP-13 recommended criteria of 70 – 130%R are listed in Table 5. No data are qualified since sample concentrations are greater than four times the spike concentrations. Precision was within the TRRP-13 recommended criteria of 30 RPD. Serial dilution percent differences are within method criteria of 10% difference.

Field Duplicate Precision

One field duplicate was collected with the samples. Results are summarized in Table 5. The RPDs (or the absolute difference between results for concentrations <5x MQL and for non-detects) are within the TRRP-13 recommended criteria of 30 RPD.

Instrument Tuning and Performance

According to the LRC, instrument tuning and interference check sample results met method requirements.

Instrument Calibration

According to the LRC, initial and continuing calibration data met method requirements for all reported results, which indicates the instruments were properly calibrated to measure analyte concentrations.

Internal Standards

According to the LRC, internal standard areas were acceptable.

TABLE 1
CROSS REFERENCE OF FIELD SAMPLE IDENTIFICATIONS AND LABORATORY IDENTIFICATIONS

Lab Sample ID	Field Sample ID	Sample Date	Total / Dissolved Metals	Anions	Total Organic Carbon	Total Petroleum Hydrocarbon	Comments
HS18051492-01	DGW-MW-11	05/30/18	✓	✓	✓		Metals MS/MSD
HS18051492-02	DGW-MW-7	05/30/18	✓	✓	✓		
HS18051492-03	DGW-MW-6	05/30/18	✓	✓	✓		
HS18051492-04	DGW-MW-8	05/30/18	✓	✓	✓		
HS18051492-05	DGW-MW-10	05/30/18	✓	✓	✓	✓	
HS18051492-06	MW-24	05/30/18	✓	✓	✓		
HS18051492-07	DGW-MW-11S	05/30/18	✓	✓			Anion MS/SMD
HS18051492-08	DGW-MW-4	05/30/18	✓	✓	✓	✓	
HS18051492-09	DGW-MW-5	05/30/18	✓	✓	✓		
HS18051492-10	DUP-01	05/30/18	✓	✓	✓	✓	Field duplicate of DGW-MW-10

TABLE 2 - QUALIFIED DATA

Lab Sample ID	Field Sample ID	Analyte	Result	Units	Qualifier	Explanation
DGW-MW-7	HS18051492-02	Dissolved organic carbon	7.07	mg/L	J	Sample not preserved in the field
DGW-MW-6	HS18051492-03	Calcium, dissolved	466	mg/L	J	Difference between total and dissolved concentration greater than 30 RPD
DGW-MW-6	HS18051492-03	Calcium, total	250	mg/L	J	Difference between total and dissolved concentration greater than 30 RPD
DGW-MW-8	HS18051492-04	Dissolved organic carbon	7.61	mg/L	J	Sample not preserved in the field
MW-24	HS18051492-06	Calcium, dissolved	507	mg/L	J	Difference between total and dissolved concentration greater than 30 RPD
MW-24	HS18051492-06	Calcium, total	305	mg/L	J	Difference between total and dissolved concentration greater than 30 RPD
MW-24	HS18051492-06	Dissolved organic carbon	4.85	mg/L	J	Sample not preserved in the field
DGW-MW-11S	HS18051492-07	Iron, dissolved	0.473	mg/L	J	Difference between total and dissolved concentration greater than 30 RPD
DGW-MW-11S	HS18051492-07	Iron, total	0.0631	mg/L	J	Difference between total and dissolved concentration greater than 30 RPD
DGW-MW-11S	HS18051492-07	Lead, dissolved	0.0411	mg/L	J	Difference between total and dissolved concentration greater than 30 RPD
DGW-MW-11S	HS18051492-07	Lead, total	0.0285	mg/L	J	Difference between total and dissolved concentration greater than 30 RPD

Notes:
J - Estimated data; data are qualified do to exceedance of one or more quality control criteria. The reported sample concentration is the approximate concentration of the analyte in the sample.
mg/L - milligrams per liter

TABLE 3 - TOTAL VERSUS DISSOLVED COMPARISON

Sample	Analyte	Total Concentration	Dissolved Concentration	Precision (RPD)	Qualification
DGW-MW-6	Calcium	250	466	60	J
MW-24	Calcium	305	507	50	J
DGW-MW-11S	Iron	0.0631	0.473	153	J
DGW-MW-11S	Lead	0.0285	0.0411	36	J

Notes:
mg/L - milligrams per liter

TABLE 4 - BLANK DETECTIONS

Lab Sample ID	Analyte	Result	Qualified Concentration	Units	Explanation
ICPMS05-317305 CCB11 to CCB22	Magnesium	0.01605 to 0.0355	0.08025 to 0.178	mg/L	No qualification; sample concentrations greater than 5x blank concentrations
ICPMS05-317305 CCB12 1700	Cadmium	0.000226	0.00113	mg/L	No qualification; sample concentrations greater than 5x blank concentrations
ICPMS05-317305 CCB12 1700	Calcium	0.03673	0.18365	mg/L	No qualification; sample concentrations greater than 5x blank concentrations
ICPMS05-317305 CCB15 1812	Cadmium	0.000263	0.001315	mg/L	Analyte not detected
ICPMS05-317305 CCB15 1812	Iron	0.01326	0.0663	mg/L	No qualification; sample concentrations greater than 5x blank concentrations
MBLK-128972	Magnesium, dissolved	0.01329	0.06645	mg/L	No qualification; sample concentrations greater than 5x blank concentrations
MBLK-129015	Magnesium, total	0.01506	0.0753	mg/L	No qualification; sample concentrations greater than 5x blank concentrations
MBLK-129454	Magnesium, dissolved	0.01532	0.0766	mg/L	No qualification; sample concentrations greater than 5x blank concentrations

Notes:
U - Not detected; the analyte was detected <5x the level in an associated blank and is not detected above the level of the associated numerical value (i.e., the reported sample concentration).
mg/L - milligrams per liter

TABLE 5 - PRECISION AND ACCURACY

Sample	Analyte	Spike Recovery (%R)	Spike Duplicate	Precision	Qualification
DGW-MW-11	Calcium, dissolved	209	13	1.83	None; sample concentration greater than 4x spike concentration
DGW-MW-11	Magnesium, dissolved	-37.3	58.7	1.48	None; sample concentration greater than 4x spike concentration
DGW-MW-11	Calcium, dissolved	-383	-322	0.623	None; sample concentration greater than 4x spike concentration
DGW-MW-11	Calcium, dissolved (PDS)	134	NA	NA	None; sample concentration greater than 4x spike concentration
DGW-MW-11	Magnesium, total	-299	-274	0.421	None; sample concentration greater than 4x spike concentration
DGW-MW-11	Calcium, total	-539	-201	3.22	None; sample concentration greater than 4x spike concentration
DGW-MW-6	Calcium, dissolved	-379	251	6.52	None; sample concentration greater than 4x spike concentration
DGW-MW-6	Calcium, dissolved (PDS)	-101	NA	NA	None; sample concentration greater than 4x spike concentration
DGW-MW-11S	Sulfate	18.3	14.9	0.0698	None; sample concentration greater than 4x spike concentration

Notes:
mg/L - milligrams per liter

TABLE 6 - FIELD DUPLICATE PRECISION CALCULATIONS

Duplicate and Parent Sample Field Identification	Analyte	Sample Result	Duplicate Result	RPD[a]	Accept or Reject	Qualifier Added
DUP-01 / DGW-MW-10	Antimony	0.000459 J	< 0.0004	NA	A	NA
	Arsenic	0.0113	0.0118	4.3	A	NA
	Calcium	308	374	19	A	NA
	Iron	9.53	9.69	1.7	A	NA
	Lead	0.000855 J	0.00095 J	11	A	NA
	Magnesium	54	55.4	2.6	A	NA
	Selenium	0.00814	0.00889	8.8	A	NA
	Arsenic, dissolved	0.0112	0.0107	4.6	A	NA
	Calcium, dissolved	291	391	29	A	NA
	Iron, dissolved	9.22	9.13	1.0	A	NA
	Magnesium, dissolved	56.6	53.9	4.9	A	NA
	Selenium, dissolved	0.00848	0.00793	6.7	A	NA
	Chloride	279	285	2.1	A	NA
	Sulfate	1700	1820	6.8	A	NA
	Alkalinity, Total	803	806	0.4	A	NA
	Organic Carbon, dissolved	9.56	9.36	2.1	A	NA
	Organic Carbon, total	10	10	0.0	A	NA

Notes:

[a] Relative Percent Difference (RPD) = ((SR - DR)*200)/(SR + DR), where SR is the sample result and DR is the duplicate result.

A - Acceptable Data

The RPD test (<30%) applies if both results are greater than 5x MQL. Otherwise, the absolute difference test (< 2x MQL) applies.

DATA USABILITY SUMMARY
ALS WORK ORDER: HS18060008

PROJECT NO: 130-2086-06 **CLIENT:** Exide Technologies

SAMPLE DATES: May 31, 2018

LABORATORY: ALS Group

WORK ORDERS: HS18060008

INTENDED USE: Deep Groundwater Pre-Design Investigation Report

SITE: Exide Recycling Center, 7471 5th Street, Frisco, TX

TESTS/METHODS

- SW-846 6020A - Inductively Coupled Plasma-Mass Spectrometry (ICP/MS) (total and dissolved metals)
- EPA 300.0 - Determination of Inorganic Anions by Ion Chromatography (chloride, nitrate/nitrite, and sulfate)
- Standard Methods 2320B - Alkalinity
- Standard Methods 5310B - Total Organic Carbon
- TNRCC 1005 - Total Petroleum Hydrocarbons
- TNRCC 1006 – Characterization of NC6 to NC35 Petroleum Hydrocarbons in Environmental Samples

SAMPLES

Twelve groundwater samples and one duplicate groundwater sample were collected. See Table 1 for a list of samples.

Golder completed a review of the above chemical analysis data for conformance with the requirements of the Texas Risk Reduction Program (TRRP) guidance document, Review and Reporting of COC Concentration Data (RGG-366/TRRP-13 Revised May 2010) and for adherence to project objectives. The results of the review are discussed in this data usability summary (DUS).

Golder completed the review using the following laboratory and project submittals:

- Laboratory reportable data as defined in TRRP-13;
- Laboratory review checklists (LRC) with the associated exception reports;
- Laboratory Electronic Data Deliverable (EDD); and

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- Project field notes from the sampling event.

The review of the reportable data included the quality control (QC) parameters listed below, as required per TRRP-13, using the applicable analytical method and project requirements:

- Data Completeness
- Chain-of-Custody Procedures
- Sample Condition - Holding Time, Preservation, and Containers
- Field Procedures
- Results Reporting Procedures
- Field and Laboratory Blanks
- Surrogate Recoveries
- Laboratory Control Spike (LCS)/Laboratory Control Spike Duplicate (LCSD)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries
- Field Duplicate Precision
- Detectabillity Check Sample (DCS)

Additionally, Golder used the LRC to evaluate the following QC parameters:

- Method Quantitation Limits (MQLs)
- Method Detection Limits (MDLs) and Sample Detection Limits (SDLs)
- Instrument Tuning, Calibration, and Performance
- Internal Standards

Criteria used for this data usability review are as follows:

- Precision: ±MQL difference or 30% relative percent difference (RPD) for laboratory duplicates and ± 2x MQL difference (if either result is less than 5x MQL) or 30% RPD for field duplicates as recommended in TRRP-13
- Accuracy: 70-130% spike recovery (and not less than 30% or data is rejected) as recommended in TRRP-13r

If an item was found outside of the review criteria, the reviewer applied a data qualifier and bias code to the results for the affected samples in accordance with TRRP-13. A list of all qualified results and definitions of the qualifier and bias codes are given in Table 2.

LABORATORY CERTIFICATION

At the time the laboratory data were generated for this project, the laboratory was NELAC accredited under the Texas Laboratory Accreditation Program (TLAP Certification T104704231) for the matrices, methods and parameters of analysis requested on the chain-of-custody forms. Texas does not offer accreditation for TNRCC 1006; no data are qualified since the laboratory provided QC data to support the analytical results.

USABILITY SUMMARY

Data are usable for the intended purpose. Qualified data are listed in Table 2.

Reviewer: Brenda Basile 7/5/2018

QUALITY CONTROL PARAMETERS AND OUTCOMES

Data Completeness

The laboratory data package contains necessary data (i.e., the laboratory reportable data per TRRP-13) and the EDD contains sample results in acceptable format.

Chain-of-Custody

Proper sample custody procedures were used, which confirms that the integrity of the samples was maintained. The information on the custody records is complete and agrees with that in the field notes and laboratory reports.

Sample Condition

Samples were collected in appropriate containers, properly preserved in the field, and prepared and analyzed within the holding times as required in the analytical methods.

Field Procedures

The samples were collected and placed immediately into laboratory supplied containers and then into a cooler with ice for overnight delivery to the laboratory.

According to the Work Plan, groundwater samples with turbidity greater than 10 NTU would be field filtered with a 10 micron filter for analyses of total metals. For dissolved metals, samples would be field filtered with a 0.45 micron filter. According to the Groundwater Sample Collection Forms, samples were filtered appropriately.

The dissolved concentrations were slightly above the total concentrations for arsenic, calcium, iron, magnesium, selenium and organic carbon. Total and dissolved analyte concentrations were less than ± 2x MQL difference (if either result is less than 5x MQL) or 30% RPD. No data are qualified.

Results Reporting Procedures

Results are reported in milligram per liter (mg/L). Non-detects are reported using the SDL as specified per TRRP and detects between the SDL and MQL are reported with a laboratory J-flag. The concentration reported for detects between the SDL and MQL is below the calibration range and thus is considered estimated. Results for the DCS are included in the laboratory data package and are acceptable.

Field and Laboratory Blanks

No field blanks were collected. A peristaltic pump with disposable tubing was used to collect samples.

Chloride and sulfate were detected in continuing calibration blanks (CCBs); no data were qualified since sample concentrations are greater than five times the blank concentrations. Other analytes detected in laboratory method and continuing calibration blanks are listed in Table 3. Data are qualified as shown in Tables 2 and 3.

Laboratory Control Sample

The LCS and LCSD (if analyzed) recoveries (%R) are within the TRRP-13 recommended criteria of 70 -130 %R. LCS/LCSD precision is within the TRRP-13 recommended criteria of 30 RPD.

Matrix Spike Recovery

The laboratory prepared one or more MS/MSD samples with each analytical batch. The MS/MSD and post-digestate spike recoveries outside the TRRP-13 recommended criteria of 70 – 130%R are listed in Table 4. No data are qualified since sample concentrations are greater than four times the spike concentrations. Precision was within the TRRP-13 recommended criteria of 30 RPD. Serial dilution percent differences are within method criteria of 10% difference.

Field Duplicate Precision

One field duplicate was collected with the samples. Results are summarized in Table 6. The RPDs (or the absolute difference between results for concentrations <5x MQL and for non-detects) outside the TRRP-13 recommended criteria of 30 RPD are qualified as shown in Tables 2 and 5.

Instrument Tuning and Performance

According to the LRC, instrument tuning and interference check sample results met method requirements.

Instrument Calibration

According to the LRC, initial and continuing calibration data met method requirements for all reported results, which indicates the instruments were properly calibrated to measure analyte concentrations.

Internal Standards

According to the LRC, internal standard areas were acceptable.

TABLE 1
CROSS REFERENCE OF FIELD SAMPLE IDENTIFICATIONS AND LABORATORY IDENTIFICATIONS

Lab Sample ID	Field Sample ID	Sample Date	Total / Dissolved Metals	Anions	Total Organic Carbon	Total Petroleum Hydrocarbon	Comments
HS1806008-01	MW-16	05/31/18	✓	✓	✓		Dissolved Metals MS/MSD, dissolved organic carbon MS
HS1806008-02	MW-16S	05/31/18	✓	✓	✓		Total Metals MS/MSD, dissolved organic carbon MS
HS1806008-03	DGW-MW-1	05/31/18	✓	✓	✓		Alkalinity laboratory duplicate
HS1806008-04	DGW-MW-3	05/31/18	✓	✓	✓	✓	TNRCC 1006; anion MS/MSD
HS1806008-05	DGW-MW-9	05/31/18	✓	✓	✓		
HS1806008-06	DGW-MW-2	05/31/18	✓	✓	✓	✓	
HS1806008-07	MW-27	05/31/18	✓	✓	✓		
HS1806008-08	MW-29	05/31/18	✓	✓	✓	✓	
HS1806008-09	DGW-MW-10S	05/31/18	✓	✓	✓	✓	
HS1806008-10	DGW-MW-11S	05/31/18			✓		Total organic carbon MS
HS1806008-11	MW-30	05/31/18	✓	✓	✓		
HS1806008-12	MW-10	05/31/18	✓	✓	✓		Dissolved organic carbon MS
HS1806008-13	DUP-02	05/31/18	✓	✓	✓		Field duplicate of MW-30

TABLE 2 - QUALIFIED DATA

Lab Sample ID	Field Sample ID	Analyte	Result	Units	Qualifier	Explanation
MW-16	HS18060008-01	Antimony, total	0.00110	mg/L	U	Analyte detected in quality control blank
DGW-MW-3	HS18060008-04	Nitrate/nitriate	0.0320	mg/L	U	Analyte detected in quality control blank
DGW-MW-10S	HS18060008-09	Nitrate/nitriate	0.164	mg/L	U	Analyte detected in quality control blank
MW-30	HS18060008-11	Calcium, dissolved	194	mg/L	J	Field duplicate precision exceeds criteria
DUP-02	HS18060008-13	Calcium, dissolved	304	mg/L	J	Field duplicate precision exceeds criteria

Notes:
J - Data are qualified due to exceedance of one or more quality control criteria. The reported sample concentration is the approximate concentration of the analyte in the sample.
U - Not detected; the analyte was detected <5x the level in an associated blank and is not detected above the level of the associated numerical value (i.e., the reported sample concentration).
mg/L - milligrams per liter

TABLE 3 - BLANK DETECTIONS

Lab Sample ID	Analyte	Result	Qualified Concentration	Units	Explanation
ICPMS05_317395 CCB12 1655	Antimony, total	0.000642	0.00321	mg/L	Qualify associated detections as non-detect (U)
ICS2100_317340 CCB1 1417	Nitrate/nitrite	0.048	0.24	mg/L	Qualify associated detections as non-detect (U)
ICS2100_317340 CCB2 1809	Nitrate/nitrite	0.053	0.265	mg/L	Qualify associated detections as non-detect (U)
ICS2100_317340 CCB4 2358	Nitrate/nitrite	0.06	0.3	mg/L	Qualify associated detections as non-detect (U)
MBLK-129037	Magnesium, total	0.01518	0.0759	mg/L	None; sample concentrations greater than five times blank concentration
MBLK-129039	Magnesium, dissolved	0.01279	0.06395	mg/L	None; sample concentrations greater than five times blank concentration

Notes:
mg/L - milligrams per liter

TABLE 4 - PRECISION AND ACCURACY

Sample	Analyte	Spike Recovery (%R)	Spike Duplicate	Precision	Qualification
MW-16S	Calcium, total	1010	887	0.737	None; sample concentration greater than 4x spike concentration
MW-16S	Magnesium, total	200	176	1.36	None; sample concentration greater than 4x spike concentration
MW-16S	Calcium, total (PDS)	33.3	NA	NA	None; sample concentration greater than 4x spike concentration
MW-16S	Magnesium, total (PDS)	61.1	NA	NA	None; sample concentration greater than 4x spike concentration
MW-16	Calcium, dissolved	147	442	3.76	None; sample concentration greater than 4x spike concentration
MW-16	Magnesium, dissolved	79.8	131	7.56	None; sample concentration greater than 4x spike concentration
DGW-MW-3	Sulfate	63	83.4	1.55	None; average greater than 70%R

Notes:

mg/L - milligrams per liter

TABLE 5 - FIELD DUPLICATE PRECISION CALCULATIONS

Duplicate and Parent Sample Field Identification	Analyte	Sample Result	Duplicate Result	RPD[a]	Accept or Reject	Qualifier Added
DUP-02 / MW-30	Antimony	0.00868	0.0101	15	A	NA
	Arsenic	0.0657	0.0681	3.6	A	NA
	Calcium	378	392	3.6	A	NA
	Iron	23.1	23.9	3.4	A	NA
	Lead	0.0225	0.0278	21	A	NA
	Magnesium	29.2	30.7	5.0	A	NA
	Selenium	0.00328	0.002	48	A (MQL)	NA
	Antimony, dissolved	0.00885	0.00822	7.4	A	NA
	Arsenic, dissolved	0.0166	0.0154	7.5	A	NA
	Calcium, dissolved	194	304	44	J	NA
	Iron, dissolved	6.35	6.11	3.9	A	NA
	Magnesium, dissolved	32.5	31.1	4.4	A	NA
	Chloride	114	115	0.87	A	NA
	Sulfate	950	963	1.4	A	NA
	Alkalinity, Total	547	551	0.73	A	NA
	Organic Carbon, dissolved	6.40	7.42	15	A	NA
	Organic Carbon, total	8.28	8.29	0.12	A	NA

Notes:

[a] Relative Percent Difference (RPD) = ((SR - DR)*200)/(SR + DR), where SR is the sample result and DR is the duplicate result.

A - Acceptable Data

The RPD test (<30%) applies if both results are greater than 5x MQL. Otherwise, the absolute difference test (< 2x MQL) applies.

DATA USABILITY SUMMARY
ALS WORK ORDER: HS18060068

PROJECT NO: 130-2086-06 **CLIENT:** Exide Technologies

SAMPLE DATES: June 1, 2018

LABORATORY: ALS Group

WORK ORDERS: HS18060068

INTENDED USE: Deep Groundwater Pre-Design Investigation

SITE: Exide Recycling Center, 7471 5th Street, Frisco, TX

TESTS/METHODS

- SW-846 6020A - Inductively Coupled Plasma-Mass Spectrometry (ICP/MS) (total and dissolved metals)
- EPA 300.0 - Determination of Inorganic Anions by Ion Chromatography (chloride, nitrate/nitrite, and sulfate)
- Standard Methods 2320B - Alkalinity
- Standard Methods 5310B - Total Organic Carbon

SAMPLES

Three groundwater samples were collected. See Table 1 for a list of samples.

Golder completed a review of the above chemical analysis data for conformance with the requirements of the Texas Risk Reduction Program (TRRP) guidance document, Review and Reporting of COC Concentration Data (RGG-366/TRRP-13 Revised May 2010) and for adherence to project objectives. The results of the review are discussed in this data usability summary (DUS).

Golder completed the review using the following laboratory and project submittals:

- Laboratory reportable data as defined in TRRP-13;
- Laboratory review checklists (LRC) with the associated exception reports;
- Laboratory Electronic Data Deliverable (EDD); and
- Project field notes from the sampling event.

The review of the reportable data included the quality control (QC) parameters listed below, as required per TRRP-13, using the applicable analytical method and project requirements:

- Data Completeness
- Chain-of-Custody Procedures
- Sample Condition - Holding Time, Preservation, and Containers
- Field Procedures
- Results Reporting Procedures
- Field and Laboratory Blanks
- Surrogate Recoveries
- Laboratory Control Spike (LCS)/Laboratory Control Spike Duplicate (LCSD)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries
- Field Duplicate Precision
- Detectabillity Check Sample (DCS)

Additionally, Golder used the LRC to evaluate the following QC parameters:

- Method Quantitation Limits (MQLs)
- Method Detection Limits (MDLs) and Sample Detection Limits (SDLs)
- Instrument Tuning, Calibration, and Performance
- Internal Standards

Criteria used for this data usability review are as follows:

- Precision: ±MQL difference or 30% relative percent difference (RPD) for laboratory duplicates and ± 2x MQL difference (if either result is less than 5x MQL) or 30% RPD for field duplicates as recommended in TRRP-13
- Accuracy: 70-130% spike recovery (and not less than 30% or data is rejected) as recommended in TRRP-13

If an item was found outside of the review criteria, the reviewer applied a data qualifier and bias code to the results for the affected samples in accordance with TRRP-13. No sample data were qualified.

LABORATORY CERTIFICATION

At the time the laboratory data were generated for this project, the laboratory was NELAC accredited under the Texas Laboratory Accreditation Program (TLAP Certification T104704231) for the matrices, methods and parameters of analysis requested on the chain-of-custody forms.

USABILITY SUMMARY

Data are usable for the intended purpose. No data are qualified.

Reviewer: Brenda Basile 7/5/2018

QUALITY CONTROL PARAMETERS AND OUTCOMES

Data Completeness

The laboratory data package contains necessary data (i.e., the laboratory reportable data per TRRP-13) and the EDD contains sample results in acceptable format.

Chain-of-Custody

Proper sample custody procedures were used, which confirms that the integrity of the samples was maintained. The information on the custody records is complete and agrees with that in the field notes and laboratory reports.

Sample Condition

Samples were collected in appropriate containers, properly preserved in the field, and prepared and analyzed within the holding times as required in the analytical methods.

Field Procedures

The samples were collected and placed immediately into laboratory supplied containers and then into a cooler with ice for overnight delivery to the laboratory.

According to the Work Plan, groundwater samples with turbidity greater than 10 NTU would be field filtered with a 10 micron filter for analyses of total metals. For dissolved metals, samples would be field filtered with a 0.45 micron filter. According to the Groundwater Sample Collection Forms, samples were filtered appropriately.

The dissolved concentrations were slightly above the total concentrations for cadmium, magnesium, and selenium. Total and dissolved analyte concentrations were less than + 2x MQL difference (if either result is less than 5x MQL) or 30% RPD. No data are qualified.

Results Reporting Procedures

Results are reported in milligram/liter (mg/L). Non-detects are reported using the SDL as specified per TRRP and detects between the SDL and MQL are reported with a laboratory J-flag. The concentration reported for detects between the SDL and MQL is below the calibration range and thus is considered estimated. Other than the anions, chloride, nitrate/nitrite, and sulfate, results for the DCS are included in the laboratory data package and are acceptable. DCS data were not provided for chloride, nitrate/nitrite, and sulfate; data are not qualified since DCS data for these analytes were provided in other laboratory data packages associated with this sampling event.

Field and Laboratory Blanks

No field blanks were collected. A peristaltic pump with disposable tubing was used to collect samples.

Analytes detected in laboratory method and continuing calibration blanks are listed in Table 2. No data are qualified.

Laboratory Control Sample

The LCS and LCSD (if analyzed) recoveries (%R) are within the TRRP-13 recommended criteria of 70 -130 %R. LCS/LCSD precision is within the TRRP-13 recommended criteria of 30 RPD.

Matrix Spike Recovery

The laboratory prepared one or more MS/MSD samples with each analytical batch. The MS/MSD recoveries outside the TRRP-13 recommended criteria of 70 – 130%R are listed in Table 3. No data are qualified since sample concentrations are greater than four times the spike concentrations. Precision was within the TRRP-13 recommended criteria of 30 RPD. Serial dilution percent differences are within method criteria of 10% difference.

Field Duplicate Precision

No field duplicates were collected with this sample batch.

Instrument Tuning and Performance

According to the LRC, instrument tuning and interference check sample results met method requirements.

Instrument Calibration

According to the LRC, initial and continuing calibration data met method requirements for all reported results, which indicates the instruments were properly calibrated to measure analyte concentrations.

Internal Standards

According to the LRC, internal standard areas were acceptable.

TABLE 1
CROSS REFERENCE OF FIELD SAMPLE IDENTIFICATIONS AND LABORATORY IDENTIFICATIONS

Lab Sample ID	Field Sample ID	Sample Date	Total / Dissolved Metals	Anions	Total Organic Carbon	Comments
HS18060068-01	MW-31	06/01/18	✓	✓	✓	Dissolved organic carbon MS; anion MS/MSD
HS18060068-02	MW-46	06/01/18	✓	✓	✓	
HS18060068-03	MW-44	06/01/18	✓	✓	✓	

TABLE 2 - BLANK DETECTIONS

Lab Sample ID	Analyte	Result	Qualified Concentration	Units	Explanation
MBLK-129037	Magnesium, total	0.01518	0.0759	mg/L	None; sample concentrations greater than five times blank concentration
MBLK-129039	Magnesium, dissolved	0.01279	0.06395	mg/L	None; sample concentrations greater than five times blank concentration

Notes:
mg/L - milligrams per liter

TABLE 3 - PRECISION AND ACCURACY

Sample	Analyte	Spike Recovery (%R)	Spike Duplicate	Precision	Qualification
MW-31	Sulfate	-181	-122	0.385	None; sample concentration greater than 4x spike concentration

Notes:
mg/L - milligrams per liter

DATA USABILITY SUMMARY
ALS WORK ORDER: HS18060151

PROJECT NO: 130-2086-06 **CLIENT:** Exide Technologies

SAMPLE DATES: June 4, 2018

LABORATORY: ALS Group

WORK ORDERS: HS18060151

INTENDED USE: Deep Groundwater Pre-Design Investigation Report

SITE: Exide Recycling Center, 7471 5th Street, Frisco, TX

TESTS/METHODS

- SW-846 6020A - Inductively Coupled Plasma-Mass Spectrometry (ICP/MS) (total and dissolved metals)
- EPA 300.0 - Determination of Inorganic Anions by Ion Chromatography (chloride, nitrate/nitrite, and sulfate)
- Standard Methods 2320B - Alkalinity
- Standard Methods 5310B - Total Organic Carbon

SAMPLES

Three groundwater samples were collected. See Table 1 for a list of samples.

Golder completed a review of the above chemical analysis data for conformance with the requirements of the Texas Risk Reduction Program (TRRP) guidance document, Review and Reporting of COC Concentration Data (RGG-366/TRRP-13 Revised May 2010) and for adherence to project objectives. The results of the review are discussed in this data usability summary (DUS).

Golder completed the review using the following laboratory and project submittals:

- Laboratory reportable data as defined in TRRP-13;
- Laboratory review checklists (LRC) with the associated exception reports;
- Laboratory Electronic Data Deliverable (EDD); and
- Project field notes from the sampling event.

The review of the reportable data included the quality control (QC) parameters listed below, as required per TRRP-13, using the applicable analytical method and project requirements:

- Data Completeness
- Chain-of-Custody Procedures
- Sample Condition - Holding Time, Preservation, and Containers
- Field Procedures
- Results Reporting Procedures
- Field and Laboratory Blanks
- Surrogate Recoveries
- Laboratory Control Spike (LCS)/Laboratory Control Spike Duplicate (LCSD)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries
- Field Duplicate Precision
- Detectabillity Check Sample (DCS)

Additionally, Golder used the LRC to evaluate the following QC parameters:

- Method Quantitation Limits (MQLs)
- Method Detection Limits (MDLs) and Sample Detection Limits (SDLs)
- Instrument Tuning, Calibration, and Performance
- Internal Standards

Criteria used for this data usability review are as follows:

- Precision: ±MQL difference or 30% relative percent difference (RPD) for laboratory duplicates and ± 2x MQL difference (if either result is less than 5x MQL) or 30% RPD for field duplicates as recommended in TRRP-13
- Accuracy: 70-130% spike recovery (and not less than 30% or data is rejected) as recommended in TRRP-13

If an item was found outside of the review criteria, the reviewer applied a data qualifier and bias code to the results for the affected samples in accordance with TRRP-13. A list of qualified results and definitions of the qualifier and bias codes are given in Table 2.

LABORATORY CERTIFICATION

At the time the laboratory data were generated for this project, the laboratory was NELAC accredited under the Texas Laboratory Accreditation Program (TLAP Certification T104704231) for the matrices, methods and parameters of analysis requested on the chain-of-custody forms.

USABILITY SUMMARY

Data are usable for the intended purpose. Qualified data are listed in Table 2.

Reviewer: Brenda Basile 7/5/2018

QUALITY CONTROL PARAMETERS AND OUTCOMES

Data Completeness

The laboratory data package contains necessary data (i.e., the laboratory reportable data per TRRP-13) and the EDD contains sample results in acceptable format.

Chain-of-Custody

Proper sample custody procedures were used, which confirms that the integrity of the samples was maintained. The information on the custody records is complete and agrees with that in the field notes and laboratory reports.

Sample Condition

Samples were collected in appropriate containers, properly preserved in the field, and prepared and analyzed within the holding times as required in the analytical methods.

Field Procedures

The samples were collected and placed immediately into laboratory supplied containers and then into a cooler with ice for overnight delivery to the laboratory.

According to the Work Plan, groundwater samples with turbidity greater than 10 NTU would be field filtered with a 10 micron filter for analyses of total metals. For dissolved metals, samples would be field filtered with a 0.45 micron filter. According to the Groundwater Sample Collection Forms, samples were filtered appropriately.

The dissolved concentrations were slightly above the total concentrations for antimony, calcium, iron, magnesium, selenium, and organic carbon. Total and dissolved analyte concentrations were less than + 2x MQL difference (if either result is less than 5x MQL) or 30% RPD. No data are qualified.

Results Reporting Procedures

Results are reported in milligrams per liter (mg/L). Non-detects are reported using the SDL as specified per TRRP and detects between the SDL and MQL are reported with a laboratory J-flag. The concentration reported for detects between the SDL and MQL is below the calibration range and thus is considered estimated. Results for the DCS are included in the laboratory data package and are acceptable.

Field and Laboratory Blanks

No field blanks were collected. A peristaltic pump with disposable tubing was used to collect samples.

Chloride and sulfate were detected in continuing calibration blanks (CCBs); no data were qualified since sample concentrations are greater than five times the blank concentrations. Other analytes detected in laboratory method and continuing calibration blanks are listed in Table 3. Data are qualified as shown in Tables 2 and 3.

Laboratory Control Sample

The LCS and LCSD (if analyzed) recoveries (%R) are within the TRRP-13 recommended criteria of 70 -130 %R. LCS/LCSD precision is within the TRRP-13 recommended criteria of 30 RPD.

Matrix Spike Recovery

The laboratory prepared one or more MS/MSD samples with each analytical batch. The MS/MSD and post-digestate spike recoveries outside the TRRP-13 recommended criteria of 70 – 130%R are listed in Table 4. No data are qualified for MS/MSD recoveries since sample concentrations are greater than four times the spike concentrations. The post-digestate spike recovery for dissolved magnesium is less than 30%. Since magnesium is detected in the sample, data are qualified as estimated with a low bias (JL). Precision was within the TRRP-13 recommended criteria of 30 RPD. Serial dilution percent differences are within method criteria of 10% difference.

Field Duplicate Precision

No field duplicates were collected.

Instrument Tuning and Performance

According to the LRC, instrument tuning and interference check sample results met method requirements.

Instrument Calibration

According to the LRC, initial and continuing calibration data met method requirements for all reported results, which indicates the instruments were properly calibrated to measure analyte concentrations.

Internal Standards

According to the LRC, internal standard areas were acceptable.

TABLE 1
CROSS REFERENCE OF FIELD SAMPLE IDENTIFICATIONS AND LABORATORY IDENTIFICATIONS

Lab Sample ID	Field Sample ID	Sample Date	Total / Dissolved Metals	Anions	Total Organic Carbon	Comments
HS18060151-01	MW-18	06/04/18	✓	✓	✓	Anions, dissolved metals MS/MSD
HS18060151-02	MW-26	06/04/18	✓	✓	✓	Dissolved calcium, magnesium MS/MSD
HS18060151-03	MW-17	06/04/18	✓	✓	✓	

TABLE 2 - QUALIFIED DATA

Lab Sample ID	Field Sample ID	Analyte	Result	Units	Qualifier	Explanation
MW-18	HS18060151-01	Nitrate/nitrite	0.0350	mg/L	U	Analyte detected in quality control blank
MW-26	HS18060151-02	Antimony, dissolved	0.00295	mg/L	U	Analyte detected in quality control blank
MW-26	HS18060151-02	Magnesium, dissolved	249	mg/L	JL	Post-digestate spike recovery less than 30%R
MW-26	HS18060151-02	Selenium, dissolved	0.00704	mg/L	J	Dissolved concentration is greater than totals concentration
MW-26	HS18060151-02	Selenium, total	0.00170	mg/L	J	Dissolved concentration is greater than totals concentration
MW-17	HS18060151-03	Antimony, dissolved	0.00129	mg/L	U	Analyte detected in quality control blank
MW-17	HS18060151-03	Selenium, dissolved	0.0237	mg/L	J	Dissolved concentration is greater than totals concentration
MW-17	HS18060151-03	Selenium, total	0.00693	mg/L	J	Dissolved concentration is greater than totals concentration

Notes:
J - Data are qualified due to exceedance of one or more quality control criteria. The reported sample concentration is the approximate concentration of the analyte in the sample.
U - Not detected; the analyte was detected <5x the level in an associated blank and is not detected at the reported sample concentration.
mg/L - milligrams per liter

TABLE 3 - TOTAL VERSUS DISSOLVED COMPARISON

Sample	Analyte	Total Concentration	Dissolved Concentration	Precision (RPD)	Qualification
MW-26	Selenium	0.0017	0.00704	122	J
MW-17	Selenium	0.00693	0.0237	110	J

Notes:
mg/L - milligrams per liter

TABLE 4 - BLANK DETECTIONS

Lab Sample ID	Analyte	Result	Qualified Concentration	Units	Explanation
MBLK-129131	Magnesium, total	0.01322	0.0661	mg/L	None; sample concentrations greater than five times blank concentration
MBLK-129121	Magnesium, dissolved	0.01184	0.0592	mg/L	None; sample concentrations greater than five times blank concentration
MBLK-129455	Magnesium, dissolved	0.01349	0.0675	mg/L	None; sample concentrations greater than five times blank concentration
ICPMS04_317479 2143	Antimony	0.000644	0.0032	mg/L	Qualify associated samples as nondetect (U)
ICSS2100_317466	Nitrate/Nitrite	0.119	0.5950	mg/L	Qualify associated samples as nondetect (U)

Notes:
mg/L - milligrams per liter

TABLE 5 - PRECISION AND ACCURACY

Sample	Analyte	Spike Recovery (%R)	Spike Duplicate	Precision	Qualification
MW-18	Calcium, dissolved	56.3	133	2.91	None; sample concentration greater than 4x spike concentration
MW-18	Calcium, dissolved (PDS)	57.9	NA	NA	None; sample concentration greater than 4x spike concentration
MW-18	Chloride	27.4	-32.4	13.1	None; sample concentration greater than 4x spike concentration
MW-18	Sulfate	-68.6	-198	13.2	None; sample concentration greater than 4x spike concentration
MW-18	Chloride	70.6	-30.1	12.8	None; sample concentration greater than 4x spike concentration
MW-18	Sulfate	-198	-184	12.3	None; sample concentration greater than 4x spike concentration
MW-26	Calcium, dissolved	-516	-337	1.81	None; sample concentration greater than 4x spike concentration
MW-26	Magnesium, dissolved	-434	-382	1.15	None; sample concentration greater than 4x spike concentration
MW-26	Calcium, dissolved (PDS)	-74.3	NA	NA	None; sample concentration greater than 4x spike concentration
MW-26	Magnesium, dissolved (PDS)	20.9	NA	NA	JL

Notes:
mg/L - milligrams per liter

DATA USABILITY SUMMARY
ALS WORK ORDER: HS18080094

PROJECT NO: 130-2086-06 **CLIENT:** Exide Technologies

SAMPLE DATES: August 1, 2018

LABORATORY: ALS Group

WORK ORDERS: HS18080094

INTENDED USE: Deep Groundwater Pre-Design Investigation

SITE: Exide Recycling Center, 7471 5th Street, Frisco, TX

TESTS/METHODS

- SW-846 6020A - Inductively Coupled Plasma-Mass Spectrometry (ICP/MS) (total and dissolved metals)

SAMPLES

One groundwater sample was collected. See Table 1 for the sample list.

Golder completed a review of the above chemical analysis data for conformance with the requirements of the Texas Risk Reduction Program (TRRP) guidance document, Review and Reporting of COC Concentration Data (RGG-366/TRRP-13 Revised May 2010) and for adherence to project objectives. The results of the review are discussed in this data usability summary (DUS). Golder completed the review using the following laboratory and project submittals:

- Laboratory reportable data as defined in TRRP-13;
- Laboratory review checklists (LRC) with the associated exception reports;
- Laboratory Electronic Data Deliverable (EDD); and
- Project field notes from the sampling event.

The review of the reportable data included the quality control (QC) parameters listed below, as required per TRRP-13, using the applicable analytical method and project requirements:

- Data Completeness
- Chain-of-Custody Procedures
- Sample Condition - Holding Time, Preservation, and Containers
- Field Procedures

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- Results Reporting Procedures
- Field and Laboratory Blanks
- Laboratory Control Spike (LCS)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries
- Field Duplicate Precision
- Detectabillity Check Sample (DCS)

Additionally, Golder used the LRC to evaluate the following QC parameters:

- Method Quantitation Limits (MQLs)
- Method Detection Limits (MDLs) and Sample Detection Limits (SDLs)
- Instrument Tuning, Calibration, and Performance
- Internal Standards

Criteria used for this data usability review are as follows:

- Precision: ±MQL difference or 30% relative percent difference (RPD) for laboratory duplicates and ± 2x MQL difference (if either result is less than 5x MQL) or 30% RPD for field duplicates as recommended in TRRP-13
- Accuracy: 70-130% spike recovery (and not less than 30% or data is rejected) as recommended in TRRP-13

If an item was found outside of the review criteria, the reviewer applied a data qualifier and bias code to the results for the affected samples in accordance with TRRP-13.

LABORATORY CERTIFICATION

At the time the laboratory data were generated for this project, the laboratory was NELAC accredited under the Texas Laboratory Accreditation Program (TLAP Certification T104704231) for the matrices, methods and parameters of analysis requested on the chain-of-custody forms.

USABILITY SUMMARY

Data are usable for the intended purpose. No sample data were qualified since quality control results were within review criteria.

Reviewer: Brenda Basile 8/8/2018

QUALITY CONTROL PARAMETERS AND OUTCOMES

Data Completeness

The laboratory data package contains necessary data (i.e., the laboratory reportable data per TRRP-13) and the EDD contains sample results in acceptable format.

Chain-of-Custody

Proper sample custody procedures were used, which confirms that the integrity of the samples was maintained. The information on the custody records is complete and agrees with that in the field notes and laboratory reports.

Sample Condition

Samples were collected in appropriate containers, properly preserved in the field, and prepared and analyzed within the holding times as required in the analytical method.

Field Procedures

The samples were collected and placed immediately into laboratory supplied containers and then into a cooler with ice for overnight delivery to the laboratory.

According to the Work Plan, groundwater samples with turbidity greater than 10 NTU would be field filtered with a 10-micron filter for analyses of total metals. For dissolved metals, samples would be field filtered with a 0.45-micron filter. According to the Groundwater Sample Collection Forms, samples were filtered appropriately.

Results Reporting Procedures

Results are reported in milligram/liter (mg/L). Non-detects are reported using the SDL as specified per TRRP and detects between the SDL and MQL are reported with a laboratory J-flag. The concentration reported for detects between the SDL and MQL is below the calibration range and thus is considered estimated. Results for the DCS are included in the laboratory data package and are acceptable.

Field and Laboratory Blanks

No field blanks were collected. A peristaltic pump with disposable tubing was used to collect samples.

No analytes were detected in laboratory method and continuing calibration blanks.

Laboratory Control Sample

The LCS recoveries (%R) are within the TRRP-13 recommended criteria of 70 -130 %R.

Matrix Spike Recovery

The laboratory prepared one MS/MSD samples with each analytical batch. Non-project data were not evaluated. The MS/MSD recoveries were within the TRRP-13 recommended criteria of 70 – 130%R. Precision was within the TRRP-13 recommended criteria of 30 RPD. The post-digestate spike recovery was within the TRRP-13 recommended criteria of 70 – 130%R. The serial dilution percent difference was within method criteria of 10% difference.

Field Duplicate Precision

No field duplicates were collected with this sample batch.

Instrument Tuning and Performance

According to the LRC, instrument tuning and interference check sample results met method requirements.

Instrument Calibration

According to the LRC, initial and continuing calibration data met method requirements for all reported results, which indicates the instruments were properly calibrated to measure analyte concentrations.

Internal Standards

According to the LRC, internal standard areas were acceptable.

TABLE 1
CROSS REFERENCE OF FIELD SAMPLE IDENTIFICATIONS AND LABORATORY IDENTIFICATIONS

Lab Sample ID	Field Sample ID	Sample Date	Total / Dissolved Metals	Comments
HS18080094-01	MW-10	08/01/18	✓	Dissolved Metals MS/MSD

ATTACHMENT F

STATE WELL REPORTS

STATE OF TEXAS WELL REPORT for Tracking #480556

Owner:	**Exide Technologies**	Owner Well #:	**DGW-MW-1**
Address:	**7471 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**7471 5th Street Frisco, TX 75034**	Latitude:	**33° 08' 23.78" N**
		Longitude:	**096° 49' 36.64" W**
Well County:	**Collin**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **5/15/2018** Drilling End Date: **5/15/2018**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**7.25**	**0**	**30**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Screened**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**2**	**Concrete**
2	**8**	**Bentonite**
8	**30**	**Sand**

Seal Method: **Gravity**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	No Data

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Apprentice Name: **Gus Alejandre** Apprentice Number: **59885**

Comments: **This monitor well was completed with a steel, protective, above-grade casing**

Report Amended on 5/30/2019 by Request #27967

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	5	dark brown, silty clay
5	10	dark brown, sandy clay
10	15	grayish brown clay with gravel
15	20	grayish brown, silty clay
20	30	dark gray shale

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	Riser	New Plastic (PVC)	40	0	10
2	Screen	New Plastic (PVC)	40 0.010	10	30

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #480559

Owner:	**Exide Technologies**	Owner Well #:	**DGW-MW-2**
Address:	**7471 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**7471 5th Street Frisco, TX 75034**	Latitude:	**33° 08' 23.2" N**
		Longitude:	**096° 49' 38.82" W**
Well County:	**Collin**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **5/15/2018** Drilling End Date: **5/15/2018**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**7.25**	**0**	**20**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Screened**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**2**	**Concrete**
2	**8**	**Bentonite**
8	**20**	**Sand**

Seal Method: **Gravity**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Apprentice Name: **Gus Alejandre** Apprentice Number: **59885**

Comments: **No Data**

Report Amended on 5/30/2019 by Request #27968

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**10**	**6" concrete, then brownish black, silty clay**
10	**19**	**grayish brown, sandy, gravelly clay**
19	**20**	**dark gray shale**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	**Riser**	**New Plastic (PVC)**	**40**	**0**	**10**
2	**Screen**	**New Plastic (PVC)**	**40 0.010**	**10**	**20**

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STATE OF TEXAS WELL REPORT for Tracking #480561

Owner:	**Exide Technologies**	Owner Well #:	**DGW-MW-3**
Address:	**7471 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**7471 5th Street Frisco, TX 75034**	Latitude:	**33° 08' 23.4" N**
		Longitude:	**096° 49' 40.31" W**
Well County:	**Collin**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **5/15/2018** Drilling End Date: **5/15/2018**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**7.25**	**0**	**20**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Screened**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**2**	**Concrete**
2	**3**	**Bentonite**
3	**20**	**Sand**

Seal Method: **Gravity**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:	Strata Depth (ft.)	Water Type
	No Data	No Data

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Apprentice Name: **Gus Alejandre** Apprentice Number: **59885**

Comments: **No Data**

Report Amended on 5/30/2019 by Request #27969

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	10	6" concrete, then brownish black, silty clay
10	15	grayish brown clay with gravel
15	19	grayish brown clay
19	20	dark gray shale

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	Riser	New Plastic (PVC)	40	0	5
2	Screen	New Plastic (PVC)	40 0.010	5	20

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STATE OF TEXAS WELL REPORT for Tracking #480564

Owner:	**Exide Technologies**	Owner Well #:	**DGW-MW-4**
Address:	**7471 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**7471 5th Street Frisco, TX 75034**	Latitude:	**33° 08' 23.59" N**
		Longitude:	**096° 49' 42.14" W**
Well County:	**Collin**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **5/15/2018** Drilling End Date: **5/15/2018**

Borehole:

Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
7.25	**0**	**20**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Screened**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**2**	**Concrete**
2	**8**	**Bentonite**
8	**20**	**Sand**

Seal Method: **Gravity**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:	Strata Depth (ft.)	Water Type
	No Data	No Data

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Apprentice Name: **Gus Alejandre** Apprentice Number: **59885**

Comments: **No Data**

Report Amended on 5/30/2019 by Request #27970

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	5	6" concrete, then brownish black, silty clay
5	15	grayish brown, silty clay
15	19	grayish brown clay
19	20	dark gray shale

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	Riser	New Plastic (PVC)	40	0	10
2	Screen	New Plastic (PVC)	40 0.010	10	20

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STATE OF TEXAS WELL REPORT for Tracking #480575

Owner:	**Exide Technologies**	Owner Well #:	**DGW-MW-5**
Address:	**7471 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**7471 5th Street Frisco, TX 75034**	Latitude:	**33° 08' 27.29" N**
		Longitude:	**096° 49' 47.95" W**
Well County:	**Collin**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **5/16/2018** Drilling End Date: **5/16/2018**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**7.25**	**0**	**20**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Screened**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**2**	**Concrete**
2	**3**	**Bentonite**
3	**20**	**Sand**

Seal Method: **Gravity**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Apprentice Name: **Gus Alejandre** Apprentice Number: **59885**

Comments: **This monitor well was completed with a steel, protective, above-grade casing**

Report Amended on 5/30/2019 by Request #27971

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	5	dark brown clay
5	10	grayish brown, silty clay
10	18	pale brown, silty clay with sand and gravel
18	20	dark gray shale

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	Riser	New Plastic (PVC)	40	0	5
2	Screen	New Plastic (PVC)	40 0.010	5	20

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STATE OF TEXAS WELL REPORT for Tracking #480578

Owner:	**Exide Technologies**	Owner Well #:	**DGW-MW-6**
Address:	**7471 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**7471 5th Street Frisco, TX 75034**	Latitude:	**33° 08' 27.29" N**
		Longitude:	**096° 49' 45.03" W**
Well County:	**Collin**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **5/16/2018** Drilling End Date: **5/16/2018**

Borehole:

Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
7.25	**0**	**30**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Screened**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**2**	**Concrete**
2	**13**	**Bentonite**
13	**30**	**Sand**

Seal Method: **Gravity**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	No Data

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Apprentice Name: **Gus Alejandre** Apprentice Number: **59885**

Comments: **This monitor well was completed with a steel, protective, above-grade casing**

Report Amended on 5/30/2019 by Request #27972

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	15	dark brown, silty clay
15	20	grayish brown, silty clay with sand
20	29	grayish brown clay with gravel
29	30	dark gray shale

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	Riser	New Plastic (PVC)	40	0	15
2	Screen	New Plastic (PVC)	40 0.010	15	30

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #480579

Owner:	**Exide Technologies**	Owner Well #:	**DGW-MW-7**
Address:	**7471 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**7471 5th Street Frisco, TX 75034**	Latitude:	**33° 08' 27.54" N**
		Longitude:	**096° 49' 46.18" W**
Well County:	**Collin**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **5/16/2018** Drilling End Date: **5/16/2018**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**7.25**	**0**	**30**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Screened**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**2**	**Concrete**
2	**13**	**Bentonite**
13	**30**	**Sand**

Seal Method: **Gravity**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:	Strata Depth (ft.)	Water Type
	No Data	No Data

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Apprentice Name: **Gus Alejandre** Apprentice Number: **59885**

Comments: **This monitor well was completed with a steel, protective, above-grade casing**

Report Amended on 5/30/2019 by Request #27973

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	5	dark brown clay with gravel
5	20	dark brown, silty clay
20	29	grayish brown, silty clay with gravel
29	30	dark gray shale

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	Riser	New Plastic (PVC)	40	0	15
2	Screen	New Plastic (PVC)	40 0.010	15	30

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Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #480584

Owner:	**Exide Technologies**	Owner Well #:	**DGW-MW-8**
Address:	**7471 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**7471 5th Street Frisco, TX 75034**	Latitude:	**33° 08' 28.62" N**
		Longitude:	**096° 49' 49.35" W**
Well County:	**Collin**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **5/17/2018** Drilling End Date: **5/17/2018**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**7.25**	**0**	**30**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Screened**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**1**	**Concrete**
1	**13**	**Bentonite**
13	**30**	**Sand**

Seal Method: **Gravity**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Comments: **This monitor well was completed with a steel, protective, above-grade casing**

Report Amended on 5/30/2019 by Request #27974

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**20**	**dark brown, silty clay**
20	**30**	**dark brown, silty clay with gravel (and shale at bottom)**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	**Riser**	**New Plastic (PVC)**	**40**	**0**	**15**
2	**Screen**	**New Plastic (PVC)**	**40 0.010**	**15**	**30**

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P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #480573

Owner:	**Exide Technologies**	Owner Well #:	**DGW-MW-9**
Address:	**7471 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**7471 5th Street Frisco, TX 75034**	Latitude:	**33° 08' 24.1" N**
		Longitude:	**096° 49' 35.98" W**
Well County:	**Collin**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **5/16/2018** Drilling End Date: **5/16/2018**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**7.25**	**0**	**25**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Screened**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**2**	**Concrete**
2	**8**	**Bentonite**
8	**25**	**Sand**

Seal Method: **Gravity**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Apprentice Name: **Gus Alejandre** Apprentice Number: **59885**

Comments: **This monitor well was completed with a steel, protective, above-grade casing**

Report Amended on 5/30/2019 by Request #27975

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	10	brown, clayey sand
10	15	dark brown, silty clay with sand
15	24	grayish brown, silty clay with sand and gravel
24	25	dark gray shale

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	Riser	New Plastic (PVC)	40	0	10
2	Screen	New Plastic (PVC)	40 0.010	10	25

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Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #480585

Owner:	**Exide Technologies**	Owner Well #:	**DGW-MW-10**
Address:	**7471 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**7471 5th Street Frisco, TX 75034**	Latitude:	**33° 08' 24.53" N**
		Longitude:	**096° 49' 43.86" W**
Well County:	**Collin**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **5/18/2018** Drilling End Date: **5/18/2018**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**7.25**	**0**	**20**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Screened**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**1**	**Concrete**
1	**13**	**Bentonite**
13	**20**	**Sand**

Seal Method: **Gravity**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	No Data

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Comments: **No Data**

Report Amended on 5/30/2019 by Request #27976

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	5	6" concrete, then dark grayish brown, silty clay
5	10	grayish brown, silty clay with gravel
10	15	grayish brown, silty clay
15	19	grayish brown, silty sand
19	20	dark gray shale

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	Riser	New Plastic (PVC)	40	0	15
2	Screen	New Plastic (PVC)	40 0.010	15	20

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P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #480587

Owner:	**Exide Technologies**	Owner Well #:	**DGW-MW-10S**
Address:	**7471 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**7471 5th Street Frisco, TX 75034**	Latitude:	**33° 08' 24.52" N**
		Longitude:	**096° 49' 43.84" W**
Well County:	**Collin**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **5/18/2018** Drilling End Date: **5/18/2018**

Borehole:

Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
7.25	**0**	**7.5**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Screened**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**0.5**	**Concrete**
0.5	**1**	**Bentonite**
1	**7.5**	**Sand**

Seal Method: **Gravity**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	No Data

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Comments: **No Data**

Report Amended on 5/30/2019 by Request #27977

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	5	6" concrete, then brown, silty clay with gravel
5	7.5	dark brown, silty clay

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	Riser	New Plastic (PVC)	40	0	2.5
2	Screen	New Plastic (PVC)	40 0.010	2.5	7.5

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Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #480589

Owner:	**Exide Technologies**	Owner Well #:	**DGW-MW-11**
Address:	**7471 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**7471 5th Street Frisco, TX 75034**	Latitude:	**33° 08' 25.05" N**
		Longitude:	**096° 49' 44.6" W**
Well County:	**Collin**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **5/18/2018** Drilling End Date: **5/18/2018**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**7.25**	**0**	**17.5**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Screened**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**1**	**Concrete**
1	**8**	**Bentonite**
8	**17.5**	**Sand**

Seal Method: **Gravity**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:	Strata Depth (ft.)	Water Type
	No Data	No Data

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Comments: **No Data**

Report Amended on 5/30/2019 by Request #27978

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	5	6" concrete, then brown, silty sand
5	10	dark brown, silty clay with sand
10	15	grayish brown, silty clay withgravel
15	17.5	grayish brown, silty clay and dark gray shale

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	Riser	New Plastic (PVC)	40	0	10
2	Screen	New Plastic (PVC)	40 0.010	10	17.5

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Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #480590

Owner:	**Exide Technologies**	Owner Well #:	**DGW-MW-11S**
Address:	**7471 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**7471 5th Street Frisco, TX 75034**	Latitude:	**33° 08' 25.04" N**
		Longitude:	**096° 49' 44.58" W**
Well County:	**Collin**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **5/18/2018** Drilling End Date: **5/18/2018**

Borehole:

Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
7.25	**0**	**7**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Screened**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**0.5**	**Concrete**
0.5	**1**	**Bentonite**
1	**7**	**Sand**

Seal Method: **Gravity**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Comments: **No Data**

Report Amended on 5/30/2019 by Request #27979

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**5**	**6" concrete, then brown, silty sand and silty clay**
5	**7**	**pale brown, silty clay with sand and gravel**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	**Riser**	**New Plastic (PVC)**	**40**	**0**	**2**
2	**Screen**	**New Plastic (PVC)**	**40 0.010**	**2**	**7**

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Austin, TX 78711
(512) 334-5540

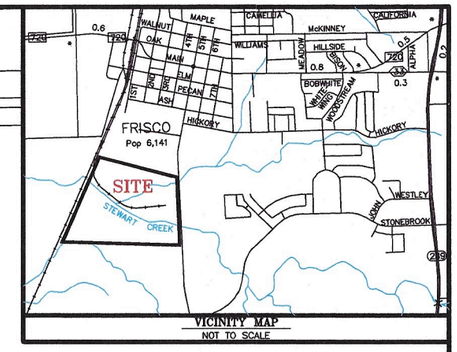
ATTACHMENT G

SURVEY DATA

NOTE: ROADS, BUILDINGS AND CREEKS ON THIS MAP WERE LOCATED BY OTHERS AND NOT A PART OF THIS SURVEY. THESE ITEMS ARE FOR REFERENCE ONLY.

NOTE: ALL COORDINATES ARE GRID COORDINATES BASED ON NAD 83, TEXAS NORTH CENTRAL ZONE No. 4204, NAVD 88 WITH LATITUDE AND LONGITUDE BEING WGS 84

WELL#	NORTHING	EASTING	VAULT RIM	CASING	GROUND	LATITUDE	LOGITUDE
DGW-MW-1	7101737.52	2480599.66	639.27	638.97	635.52	33°08'23.778935"	96°49'36.635192"
DGW-MW-2	7101676.31	2480414.56	634.48	634.05	634.45	33°08'23.202537"	96°49'38.823340"
DGW-MW-3	7101694.14	2480288.02	633.54	633.00	633.68	33°08'23.398852"	96°49'40.308169"
DGW-MW-4	7101711.03	2480132.29	632.53	632.12	632.50	33°08'23.590469"	96°49'42.136388"
DGW-MW-5	7102076.71	2479631.95	630.47	630.12	626.99	33°08'27.287132"	96°49'47.952093"
DGW-MW-6	7102080.86	2479880.14	643.30	642.98	640.42	33°08'27.289197"	96°49'45.032540"
DGW-MW-7	7102104.29	2479782.04	643.31	643.01	639.95	33°08'27.536425"	96°49'46.181829"
DGW-MW-8	7102209.64	2479510.83	644.37	644.13	640.26	33°08'28.621411"	96°49'49.351615"
DGW-MW-9	7101770.76	2480655.11	645.11	644.81	642.22	33°08'24.099092"	96°49'35.976780"
DGW-MW-10	7101803.95	2479984.25	631.91	631.55	631.97	33°08'24.533087"	96°49'43.860007"
DGW-MW-10S	7101802.23	2479985.94	631.89	631.66	631.90	33°08'24.515825"	96°49'43.840410"
DGW-MW-11	7101854.91	2479920.24	631.69	631.28	631.76	33°08'25.047354"	96°49'44.603292"
DGW-MW-11S	7101853.99	2479921.90	631.89	631.54	631.78	33°08'25.038021"	96°49'44.583908"



DGW-MW-8
644.37

EDGE WATER
618.21

EDGE WATER
620.15

DGW-MW-5
630.47

DGW-MW-7
643.31

DGW-MW-6
643.30

CONTROL POINT "T-200"
1/2" IRON ROD STAMPED
"B & C RANDOM"
NORTHING: 7101870.92400
EASTING: 2479343.83400
ELEVATION: 629.18

CONTROL POINT "T-19"
"MAG NAIL SET"
NORTHING: 7101862.01600
EASTING: 2479787.00200
ELEVATION: 631.69

DGW-MW-11
631.69

DGW-MW-11S
631.89

DGW-MW-10
631.91

DGW-MW-10S
631.89

EDGE WATER
625.82

DGW-MW-4
632.53

DGW-MW-3
633.54

DGW-MW-2
634.48

EDGE WATER
627.18

DGW-MW-9
645.11

DGW-MW-1
639.27

EDGE WATER
627.93

CONTROL POINT "T-20"
"MAG NAIL SET"
NORTHING: 7101663.22200
EASTING: 2480049.29000
ELEVATION: 634.39

STATE OF TEXAS
REGISTERED
JAMES L. BRITTAIN
1674
PROFESSIONAL
LAND SURVEYOR

James L. Brittain

NORTH

100 0 100 200 300
GRAPHIC SCALE – 1 INCH=100 FEET

LEGEND
- MONITOR WELL
- CREEKS OR DRAINAGE
- ROADS

PREPARED MAY 22, 2018

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EXHIBIT MAP
OF
MONITOR WELL LOCATIONS EXIDE RECYCLING CENTER

golder.com

APPENDIX 3.2

GROUNDWATER REMEDY EVALUATION

Groundwater Remedy Evaluation

Exide Frisco Recycling Facility
7471 Old 5th Street, Frisco, Texas 75034-5047
TCEQ SWR No. 30516
TCEQ Hazardous Waste Permit No. HW-50206
TCEQ Agreed Order Docket No. 2011-1712-IHW-E
EPA ID No. TXD006451090
Customer No. CN600129779
Regulated Entity No. RN100218643

GOLDER ASSOCIATES INC.
Geoscience Firm Registration
Certificate Number 50369

Submitted to:

Mr. Brad Weaver
Director, Remediation
Exide Technologies
P.O. Box 250
7471 Old 5th Street
Frisco, TX 75034

Submitted by:

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13515 Barrett Parkway Drive, Suite 260, Ballwin, Missouri, USA 63021
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130-2086-06

May 2019

Executive Summary

Golder Associates Inc. (Golder) has prepared this Groundwater Remedy Evaluation (GRE) for the Exide Technologies, Inc. (Exide) Former Operating Plant (FOP or Site) located at 7471 Old 5th Street in Frisco, Texas (Figure 1). This report has been prepared in conjunction with the Deep Groundwater Preliminary Design Investigation (DGWPDI) Report which summarizes the field work completed between May-and August 2018 (as outlined in the DGWPDI Work Plan dated March 1, 2018 and updated on April 10, 2018) to address comments included in the Texas Commission on Environmental Quality (TCEQ) Technical Notice of Deficiency (NOD) dated December 7, 2017 and in support of next steps for Exide's FRC Part B RCRA Permit Renewal Application with a Major Amendment and Compliance Plan (referred to throughout as the "Part B RCRA Permit Renewal Application").

This Report includes an evaluation of remedial measures to address the potential for migration of Site chemicals of concern (COCs) to Stewart Creek from the groundwater to surface water discharge pathway and has been prepared to supplement the information included in the Response Action Plan (RAP) for the Site (which is included as Appendix M to the Part B RCRA Permit Renewal Application).

Based on the detailed evaluation in this GRE, Golder recommends a Funnel & Gate Permeable Reactive Barrier Wall (Alternative 3) for the groundwater protection element at the Site as both a component of the Corrective Action Program at the Site and a component of the CAMU design. In-Situ Chemical Reduction (ISCR) using Zero-Valent Iron (ZVI) is a proven technology for removing arsenic, antimony, cadmium, lead and selenium, the relevant COCs. The application of ISCR using a Permeable Reactive Barrier (PRB) is a proven and accepted remedy. Although PRB technology has been used for approximately 20 years and has been used at over 120 sites (ITRC, 2005), and to the extent it is viewed as a somewhat newer technology, the CAMU criteria specifically encourage the incorporation of innovative technologies into the CAMU design. 40 CFR 264.552(c)(6). The co-deployment of bio-sequestration increases COC metals removal and helps regulate sulfate speciation and the potential for barrier fouling. The PRB offers a proven protection element without the adverse residuals of filter cakes, sludge, or removal of treated condensed leachate. When ZVI is co-applied with low-permeability slurry-wall sections ('funnels'), groundwater is directed towards a permeable reactive barrier segment (gates) where treatment is monitored and maintained. The Funnel and Gate is the most sustainable, low-energy remedy, and it avoids unnecessary waste generation and management. In addition, it maximizes future use of the surface site by avoiding the need for long-term above ground wastewater treatment facilities.

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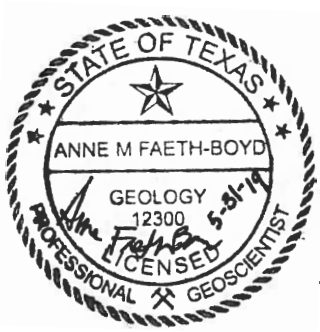

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1.0 INTRODUCTION AND BACKGROUND

1.1 Introduction

Golder Associates Inc. (Golder) has prepared this Groundwater Remedy Evaluation (GRE) for the Exide Technologies, Inc. (Exide) Former Operating Plant (FOP or Site) located at 7471 Old 5th Street in Frisco, Texas (Figure 1). This report has been prepared in conjunction with the Deep Groundwater Preliminary Design Investigation (DGWPDI) Report which summarizes the field work completed between May and August 2018 (as outlined in the DGWPDI Work Plan dated March 1, 2018 and updated on April 10, 2018) to address comments included in the Texas Commission on Environmental Quality (TCEQ) Technical Notice of Deficiency (NOD) dated December 7, 2017 and in support of next steps for Exide's FRC Part B RCRA Permit Renewal Application with a Major Amendment and Compliance Plan (referred to throughout as the "Part B RCRA Permit Renewal Application").

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1.2 Background

As part of overall Site remedial activities, a Corrective Action Management Unit (CAMU), hereafter referred to as the Remediation Consolidation Area (RCA), will be designed, engineered, constructed, and operated within the FOP area of the Frisco Recycling Center. The proposed RCA is in an area of existing soil and groundwater contamination and will be used as a consolidation area for soil and sediment excavated from other areas of the FRC and Stewart Creek. The location of the RCA on the FOP is shown on Figure 2.

To address the potential for contaminant migration from the RCA to groundwater and the potential for discharge of contaminated groundwater to Stewart Creek, TCEQ requested, in addition to the low-permeable engineered capping system for the RCA, that a deep groundwater investigation be performed to identify potential existing contamination pathways and that a groundwater protection element be added to the RCA design. The groundwater protection element will serve as a component of the Corrective Action Program that is being implemented at the Site to address groundwater impacts and will also be incorporated into the design of the RCA as a CAMU.

As described in 40 CFR 264.552(e)(3)(ii), the CAMU regulations afford discretion to the Executive Director of the TCEQ to approve an alternate CAMU design to a composite liner and leachate collection system if:

> "(A) [t]he [Executive Director] finds that alternate design and operating practices, together with location characteristics, will prevent the migration of any hazardous constituents into the ground water or surface water at least as effectively as the liner and leachate collection systems in paragraph (e)(3)(i) of this section; or (B) [t]he CAMU is to be established in an area with existing significant levels of contamination, and the Regional Administrator finds that an alternative design, including a design that does not include a liner, would prevent migration from the unit that would exceed long-term remedial goals."

As the RCA is proposed as a CAMU that will be unlined and located within an area of significant in-place contamination, the groundwater remedy will be incorporated into the CAMU design to work together with other components of the design to prevent migration from the unit that would exceed long-term remedial goals.

As stated in 40 CFR 264.552(c), the CAMU regulations direct the Executive Director to designate CAMUs in accordance with the following criteria:

(1) The CAMU shall facilitate the implementation of reliable, effective, protective, and cost-effective remedies;

(2) Waste management activities associated with the CAMU shall not create unacceptable risks to humans or to the environment resulting from exposure to hazardous wastes or hazardous constituents;

(3) The CAMU shall include uncontaminated areas of the facility, only if including such areas for the purpose of managing CAMU-eligible waste is more protective than management of such wastes at contaminated areas of the facility;

(4) Areas within the CAMU, where wastes remain in place after closure of the CAMU, shall be managed and contained so as to minimize future releases, to the extent practicable;

(5) The CAMU shall expedite the timing of remedial activity implementation, when appropriate and practicable;

(6) The CAMU shall enable the use, when appropriate, of treatment technologies (including innovative technologies) to enhance the long-term effectiveness of remedial actions by reducing the toxicity, mobility, or volume of wastes that will remain in place after closure of the CAMU; and

(7) The CAMU shall, to the extent practicable, minimize the land area of the facility upon which wastes will remain in place after closure of the CAMU.

The objective of this GRE is to present an evaluation of applicable remedial alternatives that can be used for the groundwater protection element for the Site as both a component of the Corrective Action Program for the Site and a component of the CAMU design. As described in the Part B RCRA Permit Renewal Application, the facility must be closed “in a manner that minimizes need for further maintenance and controls, or eliminates, to the extent necessary to protect human health and the environment, the post-closure release of hazardous waste, hazardous constituents, leachate, contaminated rainfall, or waste decomposition products to the groundwater, surface waters, or to the atmosphere.”

This report includes a summary of the Site Chemicals of Concern (COCs) (Section 2), review of potentially applicable treatment technologies for Site COCs (Section 3), presentation of remedial alternatives (Sections 4 and 5), presentation of evaluation criteria (Section 6), a screening of remedial alternatives against appropriate evaluation criteria (Section 7), and recommendations (Section 8).

2.0 CONSTITUENTS OF CONCERN

To evaluate groundwater analytical data, groundwater COCs at the Site were compared to screening criteria set forth in the TCEQ Texas Risk Reduction Program (TRRP) Guidance. Screening criteria used for determination of the Critical Protective Concentration Limit (PCL) included comparison of $^{GW}GW_{Ing}$ PCL (based on groundwater ingestion), $^{Air}GW_{Inh\text{-}V}$ PCL (based on indoor inhalation for volatile COCs only), ^{SW}GW PCL (with dilution factor of 0.15, based on chronic aquatic life criteria for wells along Stewart Creek), and the ^{SW}GW PCL (with dilution factor of 0.15, based on contact recreation criteria for wells along Stewart Creek).

Results of the screening of groundwater analytical data indicated the following metals are considered COCs for the Site based on the exceedance of one or more of the PCLs discussed above:

- Arsenic
- Antimony
- Cadmium, and

- Lead.

In addition, selenium is considered a constituent of concern at the Site although it was not detected in groundwater above applicable PCLs. Selenium may be present in soil remediation waste that is placed in the RCA.

In consideration of the future use of the Site, which will be restricted to commercial-industrial use (subject to TCEQ and site owner agreement on other potential future uses other than dwellings) and will include institutional controls to prohibit groundwater use, the critical PCLs will be based on the potential discharge of groundwater to surface water (^{SW}GW PCL [with dilution factor of 0.15, based on chronic aquatic life criteria for wells along Stewart Creek] and the ^{SW}GW PCL [with dilution factor of 0.15, based on contact recreation criteria for wells along Stewart Creek]).

3.0 SCREENING OF POTENTIALLY APPLICABLE TECHNOLOGIES

During the development of the GRE, numerous treatment and control technologies were preliminarily screened in relation to Site specific considerations such as the types of contaminants treated and the compatibility with hydro-geo-chemical conditions at the Site. Any potentially applicable groundwater remedy selected for implementation at the Site will be paired with a low-permeable engineered cap/cover system that will be placed atop the RCA following final disposition of excavated soils and sediments as well as institutional controls.

Following the preliminary screening, which eliminated several technologies such as chemical oxidation, thermal destruction and vapor extraction found to be incompatible with Site conditions, the following treatment or control technologies are considered the most appropriate for the Site conditions and were selected for a more detailed review:

- Permeable Reactive Barrier (PRB)
  - In-situ chemical reduction (ISCR)
  - In-situ bio-sequestration
- Slurry wall & hydraulic control with ex-situ chemical treatment
- Monitored natural attenuation (MNA)

Descriptions of treatment/control technologies that were evaluated to address the potential for migration of COCs in groundwater are included below.

3.1 Permeable Reactive Barrier (PRB)

As defined by ITRC (ITRC, 2011), a PRB is:

> "…an in situ, permeable treatment zone designed to intercept and remediate a contaminant plume. The term "barrier" is intended to convey the idea that contaminant migration is impeded; however, the PRB is designed to be more permeable than the surrounding aquifer media so that groundwater can easily flow through the structure without significantly altering groundwater hydrology. The treatment zone may be created directly using reactive materials such as zero-valent iron (ZVI), or indirectly using materials designed to stimulate secondary processes (e.g., adding carbon substrate and nutrients to enhance microbial activity). In this way, contaminant treatment may occur through physical, chemical, or biological processes."

Two chemical processes, ISCR and in-situ bio-sequestration, were evaluated in detail for possible use in a PRB at the Site.

3.1.1 In-Situ Chemical Reduction (ISCR)

ISCR using zero-valent iron (ZVI) particles provides an environment for the removal of divalent metallic cations through reductive precipitation, surface adsorption or complexation, or co-precipitation with iron oxyhydroxides (Cundy et al. 2008). The corrosion of the ZVI by water and dissolved oxygen also produces a reducing geochemical environment and increased pH (alkalinity). ISCR could be applied to address metals in groundwater at the Site within a PRB.

Based on discussions between Exide, Golder and the TCEQ, Golder is providing additional supporting information for including an ISCR PRB as a proposed remedy at the Site. In response to this request, literature references for studies and applications and a detailed discussion of chemistry have been included in this GRE for ISCR and in-situ bio-sequestration. The success of ISCR PRBs in relevant applications is well-demonstrated.

3.1.1.1 Applicability of ISCR and In-Situ Bio Sequestration Chemistry for Site COCs

Golder reviewed various literature references regarding the applicability of ISCR for the Site COCs. The following metal COCs were identified and information is summarized below:

- For lead (Pb), the “removal mechanism is believed to be a two-step interaction including both the physical adsorption of Pb(II) on the surface or inner layers of the ZVI particles and the subsequent reduction of Pb(II) to Pb(0) by ZVI” (from USEPA CLU-IN Website). Fiore and Zanetti (2009) researched the ability of ZVI to treat acid mine drainage water that contained among other ions Al, Ba, Cu, Cr, Fe, Mn, Pb, and Zn. All these ions were removed in the ZVI column to levels below local regulatory levels.
- For arsenic (As), research has shown that the removal of the arsenic species by Fe(0) is attributed to electrochemical reduction of As(III) to sparsely soluble As(0) and adsorption of As(III) and As(V) to iron hydroxides formed on the Fe(0) surface under anoxic conditions. Adsorption of both arsenic (III) and arsenic (V) appears to be the key mechanism when ZVI is used (Manning et al. 2002). Arsenic forms inner sphere complexes with ZVI corrosion products, including ferrous hydroxide, mixed valence iron oxides and hydroxides and ferric oxyhydroxides (Manning et al. 2002). Arsenic (III) and arsenic (V) that are adsorbed onto ZVI surfaces are consequently occluded by successive layers of corrosion products (Kanel et al. 2006, as stated in ITRC 2011).
- For antimony (Sb) and selenium (Se), Li et.al. (2017) identified effective removal by ZVI. In samples of the spent ZVI collected iron from the reactor during a 4-month period (with an average retention time of 3-4 days) and analyzed via the methods of acid-digestion, XRF and XPS to characterize compositions of the ZVI after reactions, twelve elements (Fe, As, Cu, Cr, Ni, Co, Zn, Pb, Sb, Se, Au, Tl) were identified in the reacted ZVI. The relative abundance in the solid phase followed a similar order as in the influent wastewater. Iron, copper and arsenic were the major elements along with relatively large amounts of As, Cu, Fe, Na, O and C on the solid surface. Three other elements, Se, Sb and TI were also found in the solids. Further, as reported by Sheng et.al. (2017), “several studies have demonstrated that zero-valent iron (ZVI) was convenient for the effective sequestration of Se(IV)/Se(VI). With ZVI oxidization to Fe2þ and Fe3þ, Se(IV)/Se(VI) can be reduced to Se(0)/Se(-II), followed by precipitation as sparingly soluble Se or FeSe”.
- For cadmium (Cd), enhanced in-situ bioremediation (bio-sequestration) addresses contaminated groundwater by utilizing existing microorganisms in the subsurface to stimulate biological reduction of sulfate

and the addition of carbon sources to the groundwater system subsequently generates solid-phase cadmium sulfide (cadmium immobilization). The introduction of an organic carbon amendment (e.g., lactate, ethanol, or emulsified oil) into the subsurface provides an energy source for indigenous, sulfate-reducing microorganisms to convert existing sulfate in groundwater to sulfide. Cadmium then forms insoluble cadmium sulfide precipitates, or co-precipitates with iron sulfide (DiToro, 1990), which will then precipitate from solution and be bound in the geologic formation. Sequestering the cadmium in a non-mobile form will significantly reduce the concentration and mobility of cadmium in groundwater. Cadmium/iron-cadmium sulfides are relatively stable mineral phases provided that the groundwater system geochemistry (pH and oxidation reduction potential [ORP]) remains relatively constant through time. which is expected to be the case at the Site.

- Though zinc (Zn) is not a Site COC, experiments with ZVI using zinc are relevant because the chemical process documented is also applicable to the Site COCs. In packed column experiments, (Kishimoto et al. 2011) found that the removal of Zn by ZVI occurred with the oxidation of the ZVI to produce ferrous iron ions (Fe+2). The Fe+2 is further oxidized to Fe+3 and precipitated as iron hydroxide onto the surface of the ZVI. The Zn is adsorbed by or co-precipitated with the iron hydroxide. The iron hydroxide is finally transformed into iron oxide. This process of oxidation, precipitation, adsorption, and transformation is applicable to the Site COCs.

3.1.1.2 References for ISCR PRB Applications for Groundwater Remediation

Golder also reviewed references where ISCR and in-situ bio-sequestration PRBs have been applied for projects with the same COCs as the Site. The following table provides references where ISCR in-situ bio-sequestration PRBs have previously been tested or implemented successfully for the remediation of metals in groundwater.

Table 1 – Summary of Literature Review for PRB Use for Metals in Groundwater

Article Reference	Type of Application	Metals Tested/ Treated	PRB Treatment Media	Range of Initial Concentrations	Summary
Beaulieu and Ramirez 2013	Field Implementation	Arsenic	EHC-M® (contains ZVI, organic carbon substrate, and sulfate)	0.005 to 0.500 milligrams per Liter (mg/L)	Field studies demonstrated that a ZVI PRB using sulfate reduction is effective in reducing Arsenic concentrations to below 0.005 mg/L.
Guo 2008	Column Studies	Arsenic and Antimony	Composted leaf mulch, ZVI, limestone, sand, and pea gravel	As: 5 mg/L Sb: 0.5 mg/L	Effluent arsenic and antimony concentrations were approximately 1 ug/L (detection limit) for at least 65 pore volumes.
Kong et al. 2017	Batch and column studies	Cadmium$^{(2+)}$ and Lead$^{(2+)}$	Zeolite-supported microscale ZVI	50 to 100 mg/L	Column studies showed a high removal efficiency under different environmental conditions, including the coexistence of lead (Pb^{2+}) and cadmium (Cd^{2+}), the presence of calcium (Ca^{2+}) and magnesium (Mg^{2+}) up to 1 mmol/L (40.0 mg/L and 24.3 mg/L, respectively), and across pH ranging from 3.0 to 6.8.

Article Reference	Type of Application	Metals Tested/ Treated	PRB Treatment Media	Range of Initial Concentrations	Summary
Ludwig et al. 2008	Field Implementation	Arsenic, Lead, Cadmium	30% leaf/yard compost, 20% ZVI, 5% limestone gravel, 45% pea gravel	Maximum: As: 206 mg/L Pb: 2.02 mg/L Cd: 0.324 mg/L	During the 30-month study, As, Pb, and Cd were reduced to average concentrations of <0.03 mg/L, <0.003 mg/L, and <0.001 mg/L, respectively.
Morrison et al. 2002	Field Implementation	Arsenic Selenium	Cercona foamed ZVI plates	As: 209 micrograms per Liter (ug/L) Se: 202 ug/L	The treatment cell containing foamed ZVI plates effectively treated contaminants, including As and Se, for three years with effluent concentrations of As and Se of 2.3 ug/L and 5.9 ug/L, respectively.
Nikolaidis et al. 2003	Laboratory and Field Studies	Arsenic	ZVI	As: 200-409 ug/L	Complete removal of the arsenic (<1 ug/L) was achieved. Breakthrough (>20 ug/L) did not occur until after 21,600 pore volumes for column A and 17,800 pore volumes for column B.

For comparison purposes, the range of concentrations and frequency of exceedances detected during the DGWPDI are listed below:

Constituent	Fraction	Low (mg/L)	High (mg/L)	Critical PCL (mg/L)	Notes
Lead	Total	<0.000600	0.0390	0.015	
	Dissolved	<0.000600	0.0411	0.015	Exceedances in 5 of 26 wells
Cadmium	Total	<0.000200	0.0254	0.005	
	Dissolved	<0.000200	0.0259	0.0017	Exceedances in 3 of 26 wells
Arsenic	Total	<0.000200	0.100	0.010	
	Dissolved	<0.000200	0.103	0.010	Exceedances in 8 of 26 wells
Antimony	Total	<0.00400	0.0240	0.006	
	Dissolved	<0.00400	0.0245	0.006	Exceedances in 2 of 26 wells
Selenium	Total	<0.00110	0.0325	0.050	
	Dissolved	<0.00110	0.0269	0.050	No exceedances

3.1.2 In-Situ Bio-Sequestration

This technology addresses contaminated groundwater by utilizing microorganisms in the subsurface and adding additional carbon sources to the system to stimulate biologically mediated sequestration of metals. Two primary pathways exist for the bio-sequestration of metals; sulfide and carbonate precipitation via sulfate reducing bacteria, and biological reduction. Though bio-sequestration is not the primary pathway for metals reduction, it can supplement in situ chemical reduction mechanisms, when appropriate.

To incorporate bio-sequestration into a PRB design, treatability testing would be conducted to identify if Site groundwater geochemistry (calcium, sulfate, etc) is conducive to bio-sequestration, to identify COC reduction, to identify the specific organic matter to be used and basis for its selection and its compatibility with the other PRB reactive media (zero-valent iron) over the permanent life of the RCA CAMU.

Remediation of metals using anaerobic bio-sequestration does not generally involve microbial action with the metals directly, but rather some of the products of their respiration can be used for metal stabilization through direct or co-precipitation. Under strong anaerobic reducing conditions, which can be created using an electron

donor and carbon source (e.g., methanol, lactate, molasses), sulfate reduction conditions can be created in an aquifer (or vadose zone). The microbial reduction of sulfate produces H2S, releases HCO3-, and results in an increase in alkalinity and pH (Waybrant et al. 2002). Hydrogen (H2) and hydroxide (OH-) are two of the byproducts of the anaerobic corrosion of ZVI. Hashim (2011) noted "[t]he metal sulfides produced by SRBs are usually very stable. These biochemical processes have long lasting effects on aquifer and are highly sustainable requiring occasional monitoring." These biochemical processes have the advantages of being able to be used in PRBs along with iron-based technologies. The hydrogen can serve as an electron donor for sulfate-reducing bacteria (Guo, 2008). Sulfate reduction is one of the primary reactions that causes the precipitation of metals. The hydroxide can help maintain the neutral pH of the influent.

3.2 Slurry Wall/Hydraulic Control with Ex-Situ Treatment

3.2.1 Slurry Wall

A slurry wall is an engineering control to prevent groundwater migration. Slurry wall construction involves modification or replacement of aquifer materials with low-permeability clay to create a barrier wall. A typical type of slurry wall material is bentonite clay, which expands when wet to create a strong seal in saturated aquifer conditions. Cement may also be added to bentonite to make the slurry wall structurally stronger. There are various technologies for slurry wall construction including trenchless excavation, trench box excavation, slurry trench excavation, vibrating beam or mandrel, and deep soil mixing/cutter soil mixing. A sheet pile wall is also an alternative to a bentonite clay wall.

Although the rate of contaminant transport through a slurry wall is generally assumed to be negligible compared to areas outside of containment, slurry walls are not impermeable and, would be expected to require maintenance to address leaks that develop over time. As part of any Site remedy that incorporates slurry walls in the remedial design, routine monitoring would be conducted. including the use of water elevation maps to identify leakance (outward or inward) across a slurry wall section, and visual inspections for springs or abnormally wet areas.

Slurry walls, when used as a continuous barrier, are used to encompass or surround an area of contamination. Because groundwater inside the slurry wall would mound and create artificially high outward hydraulic gradients that can stress the integrity of the wall, groundwater extraction is required to create inward hydraulic gradients. Groundwater is extracted from upgradient of or within the slurry wall to maintain inward gradients. The extracted water would be treated on-Site, with solids residual transported off-Site for disposal, and treated water discharged to Stewart Creek, or all extracted groundwater would be transported off-Site for treatment and disposal. The engineering design of any remedial element that incorporates hydraulic control would be numerically modeled during the design phase to provide predicted groundwater flow and potentiometric surfaces for the proposed slurry wall and PRB system

3.2.2 Ex-Situ Groundwater Treatment

Ex-situ groundwater treatment can be accomplished in different ways. The two technologies that were determined to be the most applicable to groundwater at the Site were chemical precipitation and reverse osmosis (RO). On-site facilities, operations, and maintenance would be needed as long as hydraulic control is required.

Chemical precipitation addresses contaminated groundwater by converting a soluble substance to an insoluble form by either chemical reaction or by changes in the composition of the solvent to diminish the solubility of the substance in it (Freeman, 1997). Chemical precipitation is applicable to the treatment of Site COCs that may be converted to an insoluble form, including arsenic, cadmium and lead. The process involves adding a chemical precipitant to the aqueous waste in a stirred reaction vessel. The dissolved metals are converted to insoluble form

and the resultant suspended solids are separated out by settling in a clarifier. Flocculation, with or without a chemical coagulant or settling aid, may be used to enhance the removal of suspended sediments. (Freeman, 1997). The two major processes include hydroxide precipitation and sulfide precipitation. For certain metals, like cadmium and lead, carbonate precipitation may produce comparable results.

An alternate treatment technology is RO, which can treat the waste stream in one pass and produces less volumes of residuals than chemical precipitation. The RO system may operate with minimal or no pretreatment making the system simpler and safer to operate than a chemical precipitation system; however, it has a much higher energy requirement. A high recovery may be achievable and so the brine stream requiring offsite disposal may be as low as 10% of the forward flow. A representative treatment system might include a membrane system such a ROCHEM system which is a specialized type of RO membrane for difficult to treat water (i.e., high scaling) and is used mainly to treat landfill leachate. If a conventional RO membrane is used in place of a ROCHEM system it is likely that pretreatment for turbidity, TSS, iron, and TOC is required.

3.3 Monitored Natural Attenuation

MNA addresses groundwater contamination through on-going natural attenuation processes to achieve Site-specific remediation objectives within a time-frame that is reasonable compared to that offered by other more active methods. MNA is accompanied by rigorous verification monitoring. MNA utilizes natural in-situ processes including physical, biological or chemical methods that reduce the mass, toxicity, mobility, and volume of chemicals. In-situ processes include bio-sequestration, dispersion, dilution, sorption and transformation. These natural processes are monitored via regular sampling and analysis of wells, including downgradient “sentinel wells” positioned to assure that the area of contamination is not expanding in size.

4.0 SITE-SPECIFIC PRB DESIGN CONSIDERATIONS

During meetings and through correspondence with the TCEQ (e.g. Exide/Golder/TCEQ meeting of January 12, 2018 and TCEQ's April 10, 2018 Response to the Deep Groundwater Preliminary Design Investigation (DGWPDI) Work Plan, dated March 1, 2018), and subsequent discussions, potential Site conditions that could affect remedy performance were discussed and reviewed. The following is a discussion of these site-specific conditions and Golder's evaluation of associated PRB design considerations.

4.1 Changes in Groundwater Flow Direction

PRBs are effective over the long-term, during which changes in hydraulic gradient and flow direction occur. To account for anticipated fluctuations in gradients, a PRB is designed to have a permeability at least an order of magnitude greater than surrounding porous media. This difference in hydraulic conductivities maintains groundwater flow through the PRB materials even as the groundwater direction may fluctuate.

4.2 Fouling or Failure

ISCR PRBs can experience issues with fouling or failure. Fouling and failure may occur in multiple ways, including precipitation and filtration of suspended and/or dissolved solids. Fouling can occur as a result of mineral precipitation. Sites with high levels of TDS (e.g. alkalinity, carbonate, magnesium, and sulfate) are more susceptible to clogging than sites with low TDS.

Although precipitation in other circumstances can cause performance issues for a PRB, bivalent iron precipitates, such as magnetite (Fe3O4), iron carbonate hydroxide, and green rust, are conductive of electrons and, therefore, allow continued electron activity for contaminant reduction, meaning these precipitates do not impede performance. Both laboratory and field evidence indicate that, at many sites, the bivalent iron precipitates are the dominant species (Kohn et al. 2005, Phillips et al. 2010). Recent studies have shown that some of the corrosion films that form on the iron surface are themselves reactive and degrade certain contaminants (Wilkin, Sewell and Puls 2003). Iron precipitates also provide sorption capacity and offer another mechanism for metals removal from groundwater.

At the Site, the groundwater is characterized with calcium and magnesium average concentrations of 271 mg/L and 46 mg/L, respectively, for recent sampling at PDI wells. The average total alkalinity was 488 mg/L. Nitrate and iron were very low (0.7 mg/L and 2.2 mg/L, respectively), the average chloride concentration was below secondary drinking water standards (189 mg/L vs 250 mg/L), and sulfate concentrations varied but averaged 1,403 mg/L. This groundwater quality can be attributed to the bedrock (and bedrock residuum) at the Site which is comprised of the Eagle Ford shale which contains gypsum (i.e., calcium sulfate or CaSO4).

As with any proposed remedial alternative for the Site, performance monitoring will be used to determine the ongoing effectiveness of the remedy. If and as necessary, the PRB media also can be rejuvenated to address fouling or failure (Zeng, et.al., 2008). Detailed information regarding the rejuvenation process of the PRB can be found in Appendix 3.7 of Attachment M of the Part B Permit Renewal Application.

4.3 Possible Flow Along Preferential Pathways

Several known preferential pathways occur at the Site in form of utility lines and former creek channels of Stewart Creek. While several of these pathways have been identified and documented and their existence (e.g. buried former stream channel) incorporated into the funnel and gate PRB design, additional pathways potentially could exist beneath the proposed RCA. To mitigate potential by-pass or incomplete treatment, the proposed funnel and

gate PRB's alignment would extend from bedrock to nearly ground surface along the entire downgradient side of the RCA and across shallow and deep transmissive layers. Inspection of the bedrock surface during Site drilling activities indicates that the reactive barrier wall can be keyed into a competent low-permeable layer with little weathering.

4.4 Contaminant Flux Through Multiple Transmissive Zones

As shown on Fence Diagrams J-J' and K-K' of the DGWPDI Report (Figures 3B and 3C included in Appendix 3.1 of Attachment M of the Part B Permit Renewal Application), the area beneath and downgradient of the RCA appears to consists primarily of 10 to 30 feet of moist to wet, clay-rich, colluvial soils (silty clay with minor and intermittent sand, silt, and gravel layers). Bedrock is present across the entire FOP at a range of approximately 12 to 30 feet below ground surface. In isolated areas (near creek channels or near building foundations), transmissive zones appear to be present in two separate and distinct transmissive units, one shallow and one deep. These heterogenous soils above the bedrock aquiclude act as an unconfined aquifer, and have been modeled (included in Appendix 3.7 of Attachment M of the Part B Permit Renewal Application) as a single unit for development of the remedial design.

Mass flux of COC metals through these zones is estimated to be 2 to 4 kilograms per year (kg/yr). The funnel and gate PRB wall system proposed would be designed to handle this mass flux (see RAP Appendix 3.7 for additional information on the detailed design). The estimated loading rate to the PRB will be treated effectively in the short-term and long-term with conservatism built in by the excess capacity of the PRB media to treat greater masses than the annual calculated loading of COC metals. The design will provide permanence without the need for frequent maintenance.

4.5 Summary of Applicability of a ZVI PRB for the Exide Frisco FOP

Based on the information described above and information included in the DGWPDI, advantages of a ZVI PRB at the Site include:

- Application of ZVI utilizes common geochemical reactions (precipitation, surface adsorption or complexation, or co-precipitation with iron oxyhydroxides) for the removal of arsenic, antimony, chromium, lead and selenium in aqueous systems, as demonstrated in both laboratory and field applications.
- ISCR and anaerobic biologic processes are already compatible with current Site geochemistry, which is a reducing environment characterized by:
  - Average Oxidation Reduction Potential (ORP): +24 mV (range -79 to +213 mV)
  - Average dissolved oxygen (DO): 0.7 mg/L (range 0.05 to 4.43 mg/L)
  - Neutral pH: (range 5.4 to 7.2)
  - Average sulfate concentration: 1,404 mg/l (range 127 – 5,010 mg/L)
  - Average nitrate concentration: 0.07 mg/L
  - Average alkalinity: 488 mg/L
- ISCR can be co-deployed with bio-sequestration. Sulfate concentrations in groundwater measured during the PDI has the potential to promote the production of arsenic-bearing pyrite, a stable and long-term sink for arsenic for an increased factor of safety

- Fast treatment time (although observable changes downgradient from PRB may take longer)
- Does not require the addition of chemical reagents and/or short-term exchange of process media
- Ability to apply reagent to specifically targeted areas (reactive barrier gate locations at existing plumes)
- Functions without extensive human intervention for long periods
- Minimizes energy and water use, air emissions, waste generation, and environmental footprint of Site remediation

Disadvantages/challenges of ZVI include the following:

- Presence of competing electron acceptors such as sulfate, iron, oxygen, manganese, and nitrate can increase cost and decrease effectiveness (although as mentioned above, these electron acceptors can also provide additional treatment capacity), and
- Potential need for rejuvenation (e.g. acid washing to refresh surface activation sites) of the reactant media in the long-term
- Biological technologies typically require longer time frames.

5.0 REMEDIAL ALTERNATIVES

As described above, the groundwater remedy selected for implementation at the Site will be paired with a low-permeability engineered cap/cover system that will be placed atop the RCA, North Disposal Area (NDA), and Slag Landfill following final disposition of excavated soils and sediments as well as institutional controls. The retained technologies presented in Section 3.0 were assembled into three groundwater remedial action alternatives for further evaluation. These alternatives were also compared to a No Action Alternative. The alternatives compared are as follows:

- Groundwater Alternative 1 – No Action
- Groundwater Alternative 2 – Permeable Reactive Barrier Wall
- Groundwater Alternative 3 – Funnel & Gate Permeable Reactive Barrier Wall
- Groundwater Alternative 4 – Slurry Wall with Pump & Treatment

Below is a brief description of the low-permeability engineered cap/cover system and institutional controls that will be applied for all alternatives followed by a general description of how each groundwater alternative above would be applied at the Site.

5.1 Low-Permeability Engineered Cap/Cover System

The low-permeability engineered cap/cover system that will be placed over the RCA, NDA and Slag Landfill (described in detail in the Closure Plan and Engineering Plan for the RCA, included as Attachments B and F, respectively, of the Part B RCRA Permit Renewal Application) includes the following components:

- GCL barrier layer;
- 40-mil LLDPE Geomembrane to be placed on top of the GCL;

- Geotextile or double-sided geotextile (on areas steeper than 5%) to be placed on top of the geomembrane;
- 30 inches of cover soil to be placed on top of the geotextile; and
- 6 inches of soil suitable for sustaining vegetative growth to then be placed above the general clean fill layer and vegetated.

This system will eliminate or minimize the potential for contact of the underlying consolidated remediation waste with surface water or wind and will eliminate or minimize potential infiltration of storm water.

Although the groundwater remedy will be designed to address both shallow and deeper groundwater migrating between the RCA and Stewart Creek, it is anticipated that the implementation of the cap/cover system will eliminate or reduce the presence of shallow groundwater beneath the footprint of the RCA at the Site over time.

5.2 Institutional Controls

Institutional controls are legal or administrative measures to restrict or prohibit activities that could result in exposure to contaminants that are above acceptable health risk levels or interfere with the integrity of a cleanup action. Institutional controls are commonly used at sites where contaminants are expected to remain at concentrations above cleanup levels for an extended period or where waste will remain in place. As described in Attachment M to the Part B RCRA Permit Renewal Application (the Response Action Plan), the entire Site will be subject to institutional controls consisting of deed restrictions and/or restrictive covenants placed on the property that limit future land use to commercial and/or industrial activities and/or, subject to TCEQ concurrence, recreational use, and restricting the use of groundwater. With respect to areas of the Site with waste remaining in place or where COCs are present above residential standards, maintenance and monitoring requirements will be included in the institutional control documents.

5.3 Groundwater Alternative 1 – No Action

The first remedial alternative evaluated for the Site is the “no action” alternative. A no action alternative may be applicable at sites that can be put under institutional control such that remediation goals are still met in a reasonable time frame. However, for the Site, a no action alternative would not meet the requirement of the TCEQ to address with a physical groundwater remedy the potential for future migration of Site COCs to Stewart Creek from the groundwater to surface water discharge pathway. The Alternative is retained only to provide a baseline to compare other alternatives.

5.4 Groundwater Alternative 2 – Permeable Reactive Barrier Wall

The second remedial alternative evaluated for the Site is a continuous PRB wall or where appropriate, sheet pile (sheet pile is only proposed as a surround to the former battery receiving area). A PRB at the Site would utilize an in-situ technology for the removal of low level metals contamination by allowing the water from beneath the FOP to flow through the reactive media and reduce the concentrations of metals present within the groundwater to achieve long term remedial goals. Implementation of a PRB at the Site would include construction of a barrier using zero valent iron (ZVI) along the downgradient edge of the RCA. The PRB would be installed by biopolymer trenching with reactive materials placed in the trench from bottom up using clam-shell equipment.

For evaluation, a pre-design treatment mixture of 35% by volume, 45% by weight zero-valent iron, with the remainder a mixture of calcitic or dolomitic limestone, sand/gravel ballast and organic matter is assumed. The basic dimensions of the PRB would be: 1650 feet long, 36,000 square feet (vertical face), average depth 22 feet,

average width (2 feet). This would result in 2,688 cubic yards of barrier which is vertically continuous from the Eagle Ford Shale to 4 feet below ground surface where it would be finished with a clay cap.

Further refinement of the specific ZVI mixture that would be used for a PRB will occur through column tests using Site groundwater. The column tests will ensure any site-specific adjustment to the proposed mixture and dosage to achieve optimal performance is identified and implemented. The PRB remedy will effectively remove contaminants to well below their respective PCLs.

With a PRB, there would be no residuals management or adverse byproducts after construction and no full time Site personnel would be required for monitoring purposes. Further, the PRB would not require decommissioning in the future. Following implementation, a PRB would require routine inspections and performance monitoring.

If eventually needed, the PRB reactive material (i.e. zero-valent iron) will be regenerated using an acid-wash process. Acid washing has appeared effective for removing corrosion products on the surface of metal granules, by which a reduction rate could be maintained high for an extended time of reaction (Lee, Rho and Jahng, 2004).

5.5 Groundwater Alternative 3 – Funnel and Gate Permeable Reactive Barrier Wall

The third remedial alternative evaluated is a combined permeable reactive barrier with low-permeability slurry walls or where appropriate, sheet pile (sheet pile is only proposed as a surround to the former battery receiving area and in the segments when the wall transitions inside the flood wall at the Site). This option is often referred to as a funnel and gate alternative where sections of the wall alignment are composed of a low-permeable material such as bentonite having a hydraulic conductivity no greater than $1x10^{-07}$ cm/sec and other segments are composed of a permeable reactive material such as zero-valent iron. The low conductivity sections prevent the transmission of groundwater towards Stewart Creek (the funnels) prior to passing through the reactive barrier, and force groundwater to move through the permeable section comprised of the reactive barrier material (the gate) that are designed to treat the COCs within the wall thickness prior to transmission downgradient and subsequently to Stewart Creek.

For evaluation, a funnel and gate system would be comprised of approximately 3,100 linear feet of slurry-wall funnel sections and 100 feet of PRB ZVI gate reactor. Like Alternative 2, the assumed treatment mixture is 40% by weight zero-valent iron with sand. Basic dimensions of the PRB would be as follows: 100 feet long, average depth 22 feet, average width (3 feet), vertically continuous from shale to 7 feet below ground surface with reactive media, and with clay cap to ground surface. Column tests performed in 2018 and 2018 used Site groundwater and simulated anticipated and accelerated loading of Site COCs. Results showed that a zero-valent iron and sand mix can treat all Site COC metals to below PCLs and that a PRB using ZVI would be appropriate for a funnel and gate system (see RAP Appendix 3.6).

With a funnel and gate there would be no residuals management or adverse byproducts after construction and no full time Site personnel would be needed for monitoring purposes. Further, the funnel and gate would not require decommissioning in the future. Following implementation, a funnel and gate would require routine inspections and performance monitoring.

If eventually needed, the PRB reactive material (i.e. zero-valent iron) for the reactor gate(s) will be rejuvenated using an acid-wash process (Zeng,et. al. 2008). Acid washing has appeared effective for removing corrosion products on the surface of metal granules, by which a reduction rate could be maintained high for an extended time of reaction (Lee, Rho and Jahng, 2004).

5.6 Groundwater Alternative 4 – Slurry Wall with Pump and Treatment System

The fourth remedial alternative evaluated is the installation of a slurry wall between the RCA and Stewart Creek, with a pump and treatment (P&T) system to maintain inward hydraulic gradients along the wall.

As noted in Section 3.2, slurry wall construction involves modification or replacement of aquifer materials with low-permeability clay to create a barrier wall. A typical type of slurry wall material is bentonite clay, which expands when wet to create a strong seal in saturated aquifer conditions. Cement may also be added to bentonite to make the slurry wall structurally stronger. Installation of the slurry wall would consist of trenching and backfilling.

Following implementation, the slurry wall would require constant pump, treat, and disposal of water from the Site as well as ongoing inspection and performance monitoring. The water from the P&T system would be treated on-Site with solids, residual transported off-Site for disposal, and treated water discharged to Stewart Creek, or all extracted groundwater would be transported off-Site for treatment and disposal.

A P&T system at the Site would be expected to consist of a highly distributed system of approximately 20 wells that would need to be operating at approximately 0.5 gallons per minute (cycling on and off) for a combined flow rate of approximately 4-5 gpm. As noted in the Geology Report, there is a wide range of hydraulic conductivities, flow directions, and groundwater gradients due to the varying geology and historical stream channels that cut through the FOP at the site. Effectively selecting locations of extraction wells and pumping rates to produce a sustainable extraction rate and dewatering of the RCA following capping is problematic given Site hydrogeology (e.g. low radius of influence for a given well, extraction cannot be continuous, and pumps must cycle).

Strategic placement of extraction locations would need to be determined along with pumps/conduit/collection, processed in batch with a 20 gallons per minute system treating arsenic at 100 parts per billion (ppb), antimony at 30 ppb, cadmium at 40 ppb, and lead at 40 ppb (and with the capability to treat selenium, if detected).

Groundwater would be directed to an on-Site wastewater treatment system. Both chemical precipitation and RO were evaluated. For the Site, the chemical precipitation process is complicated by the differing precipitation conditions for the various metals:

- The average background water quality matrix has higher levels of calcium, alkalinity and sulfate that would require the addition of large quantities of chemicals to adjust the pH for chemical precipitation.
- The antimony precipitates optimally at a pH near 4.5 (arsenic could be removed with the antimony) while cadmium and lead require increased pH to the range of 9 to 10 for best removal.
- If the low pH step is first, then a large quantity of acid will be required to lower the pH and if the high pH step is first followed by the low pH step then large quantities of calcium carbonate will precipitate.
- This process is timely and produces significant volumes of residuals that must be transported off-Site for disposal.

Based on the factors above, the treatment is assumed to be RO treatment with off-Site concentrate disposal.

6.0 EVALUATION CRITERIA

The three remedial action alternatives and the no action alternative presented above are evaluated using the following criteria:

- Overall Protection of Human Health and the Environment Including Considerations for Sustainability
- Compliance with State and Federal applicable or relevant and appropriate requirements (ARs)
- Long-Term Effectiveness and Permanence
- Short-Term Effectiveness
- Implementability
- Cost
- State and Community Acceptance

The CAMU designation and design criteria for the RCA are also incorporated into the discussion of the criteria listed above.

The results of the evaluation are provided in Section 7 and Table 2.

7.0 ALTERNATIVE ANALYSIS

The following Table presents an evaluation of each of the three remedial alternatives and the no action alternative using the criteria described above.

TABLE 2 - ALTERNATIVE EVALUATION SUMMARY - GROUNDWATER REMEDIATION

PERFORMANCE				
EVALUATION CRITERIA	**NO ACTION (ALTERNATIVE 1)**	**ZERO-VALENT IRON PERMEABLE REACTIVE BARRIER (ALTERNATIVE 2)**	**FUNNEL & GATE ZERO-VALENT IRON PERMEABLE REACTIVE BARRIER (ALTERNATIVE 3)**	**SLURRY WALL AND ON-SITE PUMP & TREATMENT WITH DISCHARGE TO STEWART CREEK (ALTERNATIVE 4)**
1. Overall Protection of Human Health and the Environment	■ Institutional controls prohibiting groundwater use would provide protection until groundwater restoration is achieved. ■ The site currently has no active or passive remediation systems for groundwater other than the French Drain system. ■ Current surface water quality measurements indicate no adverse impacts to Stewart Creek from groundwater recharge. ■ This alternative would potentially be protective of human health and the environment if groundwater quality conditions improve due to the anticipated significant decrease in groundwater infiltration due to the cap/cover system of the RCA[1]	■ No unacceptable risks posed from COCs by controlling exposures. ■ No off-Site migration of groundwater above standards. ■ Institutional controls prohibiting groundwater use would provide protection until groundwater restoration is achieved. ■ Installation of PRB walls would provide protection of groundwater in areas of infrequent lower concentrations of contaminants in high clay strata that render groundwater extraction less efficient. ■ Installation of PRB is protective of Stewart Creek ■ Performance groundwater monitoring and contingency measures will ensure protection. ■ Sustainable solution ■ Low carbon footprint; low energy requirements ■ Treats COCs without generation of significant sludge volumes that will occur with a P&T system. ■ No long-term, increased truck traffic on City of Frisco roadways ■ Reduced future risk of spills, releases.	■ No unacceptable risks posed from COCs by controlling exposures. ■ No off-Site migration of groundwater above standards. ■ Institutional controls prohibiting groundwater use would provide protection until groundwater restoration is achieved. ■ Installation of PRB walls would provide protection of groundwater in areas of lower concentrations of contaminants but in low transmissivity areas that render groundwater extraction less efficient. ■ Installation of PRB is protective of Stewart Creek ■ Performance groundwater monitoring and contingency measures will ensure protection. ■ Sustainable solution ■ Low carbon footprint; low energy requirements ■ Treats COCs without generation of significant sludge volumes that will occur with a P&T system. ■ No long-term, increased truck traffic on City of Frisco roadways ■ Reduced future risk of spills, releases.	■ No unacceptable risks posed from COCs by controlling exposures. ■ No off-Site migration of groundwater above standards. ■ Institutional controls prohibiting groundwater use would provide protection until groundwater restoration is achieved. ■ Groundwater restoration provided by groundwater extraction and treatment using RO technology, and natural attenuation of constituents in groundwater. ■ Isolation of potential source areas through slurry wall encirclement. ■ Does not advance goals of sustainability ■ High energy requirements ■ Highest carbon footprint ■ Generates significant sludge waste stream that requires management and disposal ■ Generates ongoing truck traffic ■ Transportation of waste stream allows for risk of spills, releases
2. Compliance with State and Federal ARs	■ May achieve chemical-specific groundwater quality ARs through from cap/cover system (required of all alternatives) at RCA that significantly reduces infiltration and leaching to groundwater	■ The alternative meets the chemical-specific requirements (amount or concentration of a chemical that may be found in, or discharged to, the ambient environment), the location-specific requirements (protection of Stewart Creek) and the action-specific requirements or the technology-based requirements taken with respect to hazardous substances (on-Site in-situ chemical treatment with PRB). ■ Achieves chemical-specific groundwater quality ARs as significantly reduced infiltration reduces leaching to groundwater. Column testing will be used to determine the optimal treatment media for Site COCs. ■ Maintains surface water quality in Stewart Creek.	■ The alternative meets the chemical-specific requirements (amount or concentration of a chemical that may be found in, or discharged to, the ambient environment), the location-specific requirements (protection of Stewart Creek) and the action-specific requirements or the technology-based requirements taken with respect to hazardous substances (on-Site in-situ chemical treatment with PRB). ■ Achieves chemical-specific groundwater quality ARs as significantly reduced infiltration reduces leaching to groundwater. Column testing will be used to determine the optimal treatment media for Site COCs. ■ Maintains surface water quality in Stewart Creek.	■ The alternative meets the chemical-specific requirements (amount or concentration of a chemical that may be found in, or discharged to, the ambient environment), the location-specific requirements (protection of Stewart Creek) and the action-specific requirements or the technology-based requirements taken with respect to hazardous substances (on-Site chemical treatment with reverse osmosis plant). ■ Achieves chemical-specific groundwater quality ARs through groundwater extraction and treatment using RO technology.

[1] All groundwater remedial alternatives (including no action) include an engineered cap/cover system covering the entire RCA and the implementation of institutional controls.

TABLE 2 - ALTERNATIVE EVALUATION SUMMARY - GROUNDWATER REMEDIATION

PERFORMANCE				
EVALUATION CRITERIA	**NO ACTION (ALTERNATIVE 1)**	**ZERO-VALENT IRON PERMEABLE REACTIVE BARRIER (ALTERNATIVE 2)**	**FUNNEL & GATE ZERO-VALENT IRON PERMEABLE REACTIVE BARRIER (ALTERNATIVE 3)**	**SLURRY WALL AND ON-SITE PUMP & TREATMENT WITH DISCHARGE TO STEWART CREEK (ALTERNATIVE 4)**
3. Long-Term Effectiveness and Permanence	■ Long-term effectiveness may be observed from obtaining chemical-specific groundwater quality ARs through from cap/cover system (required for all alternatives) at RCA that significantly reduces infiltration and leaching to groundwater.	■ ZVI PRB works in conjunction with capping to prevent migration of COCs from RCA. Capping will reduce infiltration and the potential for leaching to groundwater in the long term while the ZVI PRB will treat groundwater in-situ to achieve chemical-specific groundwater quality ARs prior to discharging to Stewart Creek. ■ Effectiveness of PRBs for treating Site COCs (arsenic, antimony, chromium, lead) have been demonstrated and accepted. ■ Effectiveness certainty increased by developing Site-specific reactive barrier materials mixture, determined by bench-scale testing ■ Long-term effectiveness maintained with periodic (if necessary) rejuvenation of ZVI material. ■ Can be co-deployed with bio-sequestration for increased metals treatment and geochemical control of sulfate speciation, reducing loss of porosity and permeability ■ Installation of PRB walls protective of Stewart Creek. ■ Groundwater restoration time dependent upon rate of decreased leaching to groundwater following installation of cap/cover system. ■ The estimated loading rate to the PRB can be treated effectively in the short-term and long-term because the PRB provides treatment capacity in excess of annual loading of COC metals, providing permanence without frequent maintenance.	■ ZVI PRB works in conjunction with capping to prevent migration of COCs from RCA. Capping will reduce infiltration and the potential for leaching to groundwater in the long term while the ZVI PRB will treat groundwater in-situ to achieve chemical-specific groundwater quality ARs prior to discharging to Stewart Creek. ■ Effectiveness of PRBs for treating Site COCs (arsenic, antimony, chromium, lead) have been demonstrated and accepted. ■ Effectiveness certainty increased by developing Site-specific reactive barrier materials mixture, determined by bench-scale testing. ■ Increased certainty in treating groundwater by funneling all groundwater through pre-determined gate locations for treatment. ■ Long-term effectiveness maintained with periodic (if necessary) rejuvenation of ZVI material. ■ Can be co-deployed with bio-sequestration for increased metals treatment and geochemical control of sulfate speciation, reducing loss of porosity and permeability ■ Installation of PRB slurry wall funnel sections protective of Stewart Creek. ■ Groundwater restoration time dependent upon rate of decreased leaching to groundwater following installation of cap/cover system. ■ The estimated loading rate to the PRB can be treated effectively in the short-term and long-term because the PRB reactor gates provide treatment capacity in excess of annual loading of COC metals, providing permanence without frequent maintenance.	■ Slurry wall and Pump & Treat works in conjunction with capping to prevent migration of COCs from RCA. Capping will reduce infiltration and the potential for leaching to groundwater in the long term while the Slurry wall and Pump & Treat will maintain hydraulic control to prevent discharge of impacted groundwater to Stewart Creek. ■ Effectiveness of groundwater extraction and treatment system have been demonstrated and accepted. ■ RO treatment for COCs has been demonstrated (treatment using traditional chemical precipitation is more complex multi-step process due to significant differences geochemistry required to precipitate the different COCs). ■ Effectiveness in protecting Stewart Creek dependent upon maintaining horizontally inward gradients. ■ Effectiveness in maintaining horizontally inward gradients dependent upon maintaining an extraction system in geologic materials of low hydraulic conductivity, which reduces radii of influence of an extraction well. ■ Effectiveness of P&T system dependent upon continuous operation by Site personnel. Low flow extraction and conveyance system prone to periodic and random mechanical failures. ■ Groundwater restoration time still dependent upon rate of decreased leaching to groundwater following installation of cap/cover system.

TABLE 2 - ALTERNATIVE EVALUATION SUMMARY - GROUNDWATER REMEDIATION

PERFORMANCE				
EVALUATION CRITERIA	**NO ACTION (ALTERNATIVE 1)**	**ZERO-VALENT IRON PERMEABLE REACTIVE BARRIER (ALTERNATIVE 2)**	**FUNNEL & GATE ZERO-VALENT IRON PERMEABLE REACTIVE BARRIER (ALTERNATIVE 3)**	**SLURRY WALL AND ON-SITE PUMP & TREATMENT WITH DISCHARGE TO STEWART CREEK (ALTERNATIVE 4)**
4. Short-Term Effectiveness	■ No short-term impact and risk to the community, construction workers, and ecology from construction activities, since no construction activities would be implemented in this alternative. ■ Monitoring the natural attenuation could be effective because the ARs may be achieved from cap/cover system (required of all alternatives) at that RCA that significantly reduces infiltration and reduces leaching to groundwater over time. But chemical-specific gro undwater quality ARs would not be addressed in the short-term by the no action alternative.	■ Minimal short-term impact and risk to the community, construction workers, and ecology from construction activities that use accepted and practice techniques. ■ Effective upon completion in protecting Stewart Creek from potential COC discharge from groundwater to surface water.	■ Minimal short-term impact and risk to the community, construction workers, and ecology from construction activities that use accepted and practice techniques. ■ Effective upon completion in protecting Stewart Creek from potential COC discharge from groundwater to surface water.	■ Minimal short-term impact and risk to the community, construction workers, and ecology from construction activities that use accepted and practice techniques. ■ Effective upon completion in protecting Stewart Creek from potential COC discharge from groundwater to surface water.
5. Implementability	■ Alternative is readily implemented since no actions would be performed.	■ Alternative is readily implemented using experienced contractors. ■ Contractors, vendors, and materials are readily available to supply ZVI for constructing PRB. ■ Alternative can be constructed within 1 year. ■ Performance monitoring associated with ZVI PRB can be implemented. ■ Potential transition to MNA over time when source depletion has occurred to the extent MNA becomes appropriate and feasible. ■ Continuous PRB may be difficult to install at the Site. ■ Continuous PRB more challenging to regenerate during the acid wash process	■ Alternative is readily implemented using experienced contractors. ■ Contractors, vendors, and materials are readily available to supply ZVI and bentonite slurry clays for constructing PRB or slurry wall sections. ■ Alternative can be constructed within 1 year ■ Performance monitoring associated with Funnel and Gate can be readily implemented. ■ Use of gates (as opposed to continuous PRB) provides for more localized treatment zone for rejuvenation process (if necessary). ■ Potential transition to MNA over time when source depletion has occurred to the extent MNA becomes appropriate and feasible. ■ Allows for flexibility for the Site in consideration of installation challenges in some areas.	■ Alternative is readily implemented using experienced contractors. ■ Contractors, vendors, and materials are readily available to supply bentonite slurry clays and to install extraction and treatment components. ■ Alternative can be constructed within 1-2 years ■ Performance monitoring associated with P&T can be readily implemented. ■ Requires obtaining permit to discharge of treated water to Stewart Creek ■ Require a highly inefficient system of approximately 20 distributed wells that would need to be operating at approximately 0.5 gallons per minute (cycling on and off) for a combined flow rate of approximately 4-5 gpm. Effectively selecting locations of extraction wells and pumping rates to produce a sustainable the extraction rate and dewatering of the RCA following capping is problematic.
6. Cost				
Capital	■ N/A	■ $3.6M	■ $3.6M[2]	■ $5M

[2] Though the Alternative 3 cost is comparable to Alternative 2, the slurry wall in the Alternative 3 design offers increased protectiveness to both Stewart Creek and the North Tributary, and Alternative 3 is the proposed groundwater protectiveness remedy for the Site.

TABLE 2 - ALTERNATIVE EVALUATION SUMMARY - GROUNDWATER REMEDIATION

PERFORMANCE				
EVALUATION CRITERIA	**NO ACTION (ALTERNATIVE 1)**	**ZERO-VALENT IRON PERMEABLE REACTIVE BARRIER (ALTERNATIVE 2)**	**FUNNEL & GATE ZERO-VALENT IRON PERMEABLE REACTIVE BARRIER (ALTERNATIVE 3)**	**SLURRY WALL AND ON-SITE PUMP & TREATMENT WITH DISCHARGE TO STEWART CREEK (ALTERNATIVE 4)**
Present Worth of Annual O&M (including all O&M for RCA)	■ N/A	■ $2.5M (assuming rejuvenation twice in 30 years)	■ $2.5M (assuming rejuvenation twice in 30 years)	■ $4.5M (assuming constant flow for 5 years, monitoring only after, 30 years of monitoring total)
Total Present Worth	■ **N/A**	■ **$6.1M**	■ **$6.1M**	■ **$9.5M**
7. State and Community Acceptance	■ Not Acceptable to TCEQ per the 12/07/2017 NOD.	■ Passive remedy with no on-Site buildings, equipment, noise. ■ Sustainable solution ■ Low carbon footprint; low energy requirements ■ Infrequent need for on-Site personnel. ■ Treats COCs without generation of significant sludge volumes that will occur with a P&T system. ■ No truck traffic on City of Frisco roadways ■ Reduced future risk of spills, releases.	■ Passive remedy with no on-Site buildings, equipment, noise. ■ Sustainable solution ■ Low carbon footprint; low energy requirements ■ Infrequent need for on-Site personnel. ■ Treats COCs without generation of significant sludge volumes that will occur with a P&T system. ■ No truck traffic on City of Frisco roadways. ■ Reduced future risk of spills, releases.	■ Alternative requires long-term use of Site for P&T system, including but not limited to presence of office and equipment trailers, freight boxes, tanks. ■ Mechanical remedy requiring continuous on-Site personal ■ RO unit requires significant energy usage ■ Off-Site disposal of treatment residuals requires continuous waste handling on-Site and transportation of waste material off-Site using City of Frisco roadways. ■ Does not advance goals of sustainability ■ High energy requirements ■ Highest carbon footprint ■ Generates ongoing truck traffic ■ Transportation of waste stream allows for risk of spills, releases

8.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the results presented above, Golder recommends Alternative 3 for the groundwater protection element at the Site as both a component of the Corrective Action Program at the Site and a component of the CAMU design.

ISCR using ZVI is a proven technology for removing arsenic, antimony, cadmium, lead and selenium, the relevant COCs. The application of ISCR using a PRB is a proven and accepted remedy. Although PRB technology has been used for approximately 20 years and has been used at over 120 sites (ITRC, 2005), to the extent it is may be viewed as a somewhat newer technology, the CAMU criteria specifically encourage the incorporation of innovative technologies into the CAMU design. 40 CFR 264.552(c)(6). The PRB offers a proven protection element without the adverse residuals of filter cakes, sludge, or removal of treated condensed leachate. When ZVI is co-applied with low-permeability slurry-wall sections ('funnels'), groundwater is directed towards the permeable reactive barrier segment ('gate') where treatment is monitored and maintained. The Funnel and Gate is the most sustainable, low-energy remedy, and it avoids unnecessary waste generation and management. In addition, it maximizes future use of the surface site by avoiding the need for long-term above ground wastewater treatment facilities.

The following summarizes the evaluation as provided in Table 2 for funnel and gate, permeable reactive barrier using zero-valent iron as a preferred remedy for the RCA at the Site:

Overall Protection of Human Health and the Environment

- No unacceptable risks posed from contaminants by controlling exposures.
- Achieves chemical-specific groundwater quality ARs in the short and long term while the cap, over time, significantly reduces infiltration and leaching to groundwater. Column testing will provide site-specific confirmation of the suitability of, and any refining adjustments to, the treatment media for the Site COCs.
- No off-Site migration of groundwater above standards, and is protective of Stewart Creek
- Low carbon footprint; low energy requirements; does not generate ongoing truck traffic to/from Site
- Avoids generation of wastewater treatment residuals requiring management and disposal; avoids future risk of spills or releases

Compliance with Federal and State ARs

- The ZVI PRB alternative meets the chemical-specific requirements (amount or concentration of a chemical that may be found in, or discharged to, the ambient environment), the location-specific requirements (protection of Stewart Creek) and the action-specific requirements or the technology-based requirements taken with respect to hazardous substances (on-Site in-situ chemical treatment with PRB).
- Installation of PRB is protective of Stewart Creek. Installation of slurry wall sections as funnels provide protection of Stewart Creek from groundwater recharge in areas of lower COC metals concentrations and lower transmissivity that render groundwater extraction difficult to accomplish and highly inefficient
- Installation of PRB is protective of Stewart Creek from COC discharge from groundwater to surface water
- Performance groundwater monitoring and contingency measures will ensure protection.

- Institutional controls prohibiting groundwater use would provide protection until groundwater restoration is achieved.
- Meets criteria for CAMU designation and design because it will achieve long term remedial goals.

Long-Term Effectiveness and Permanence

- The ZVI PRB maintains control of sources without off-Site release while chemical-specific groundwater quality ARs are achieved in conjunction with reduced infiltration and reduced leaching to groundwater.
- Maintains surface water quality in Stewart Creek.
- Long-term effectiveness maintained with periodic (if necessary) rejuvenation of ZVI material. Use of gates (as opposed to continuous PRB) provides for more localized treatment zone for rejuvenation process.
- Minimal secondary wastes may be generated on a 10-20-year frequency from rejuvenation of ZVI.
- The estimated loading rate to the PRB can be treated effectively in the short-term and long-term because the PRB provides treatment capacity in excess of annual loading of COC metals, providing permanence without frequent maintenance
- Performance monitoring of ZVI is implemented to demonstrate the effectiveness of the remedy at achieving long term remedial goals

Short-Term Effectiveness

- The ZVI PRB using funnel & gate application takes advantage of slurry wall placement in areas with naturally higher clay content and lower transmissivity, and directing groundwater towards naturally more transmissive areas leading to treatment gates
- Responsive to changes in flow directions and has ability to intercept preferential pathways
- Can be co-deployed with bio-sequestration for increased metals treatment and geochemical control of sulfate speciation, reducing loss of porosity and permeability

Implementability

- The PRB utilizes common geochemical reactions (precipitation, surface adsorption or complexation, or co-precipitation with iron oxyhydroxides)
- The use of ZVI for removal of arsenic, antimony, chromium, lead and selenium in aqueous systems has been demonstrated and accepted in both laboratory and field applications
- The use of ZVI PRBs has been accepted by both federal and state regulatory agencies
- ISCR processes already compatible with current Site geochemistry, as shown by a reducing environment characterized by:
  - Average ORP: +24 mV (range -79 to +213 mV)
  - Average DO: 0.7 mg/l (range 0.05 to 4.43 mg/l)
  - Neutral pH: (range 5.4 to 7.2)

  - Average sulfate concentration: 1,404 mg/l (range 127 – 5,010 mg/l)
  - Average nitrate concentration: 0.07 mg/l
  - Average alkalinity: 488 mg/l
- Funnel and gate is readily implemented using experience contractors
- Funnel and gate can be constructed within 1 year
- Performance monitoring associated with ZVI PRB can be readily implemented

Cost

- The capital and operations and maintenance costs are similar for the funnel and gate ZVI PRB alternative without compromising effectiveness of preventing discharge of COC concentrations to Stewart Creek above the long-term remedial goals.

State and Community Acceptance

- Passive remedy with no on-Site buildings, no on-Site equipment, no noise and dust generation
- No daily and weekly vehicle and truck traffic on City of Frisco roadways. Treats COCs without generation of significant sludge volumes that will occur with a P&T system
- The funnel and gate PRB design has infrequent need for on-Site personnel, functions without extensive human intervention for long periods
- Minimal short-term impact and risk to the community, construction workers, and ecology from construction activities that use accepted and practice techniques
- Reduced risk of future spills, releases
- Low energy footprint, low waste generation, low air emissions, especially compared to pump and treat methods
- Sustainable solution
- Funnel and gate is constructible within 1 year

The final design and recommendation of a Funnel & Gate PRB is further discussed within the Groundwater Remedy Design Report included as Appendix 3.7 to the RAP. Column studies to support the funnel and gate design are further discussed in RAP Appendix 3.6.

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10.0 CLOSING

Please contact the undersigned if you have any questions or would like any additional information about this Report.

Golder Associates Inc.

Todd H. Rees, Ph.D.
Program Leader

Anne M. Faeth-Boyd, P.G.
Associate and Senior Engineer

THR/AMF

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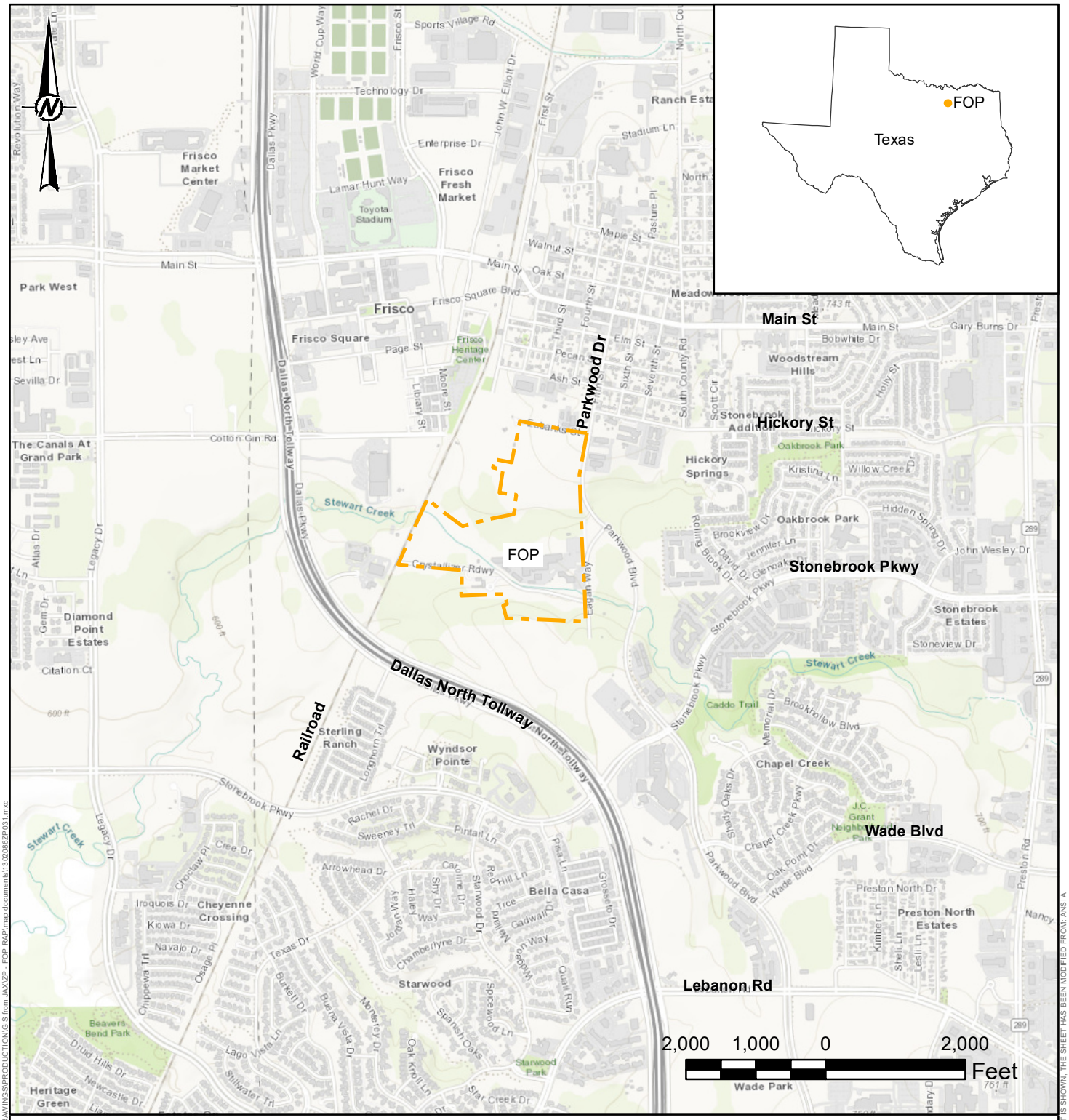
FIGURES



LEGEND

Former Operating Plant Property Boundary

REFERENCE

1.BASE MAP - SOURCES: ESRI, HERE, DELORME, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), SWISSTOPO, MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER

STATE OF TEXAS
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GEOLOGY
12300
5-31-19
LICENSED
PROFESSIONAL GEOSCIENTIST

CLIENT
EXIDE TECHNOLOGIES

PROJECT
GROUNDWATER REMEDY EVALUATION

TITLE
SITE LOCATION MAP

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-03
PREPARED	EPW
DESIGN	EPW
REVIEW	THR
APPROVED	AMF

PROJECT No.	CONTROL	Rev.	FIGURE
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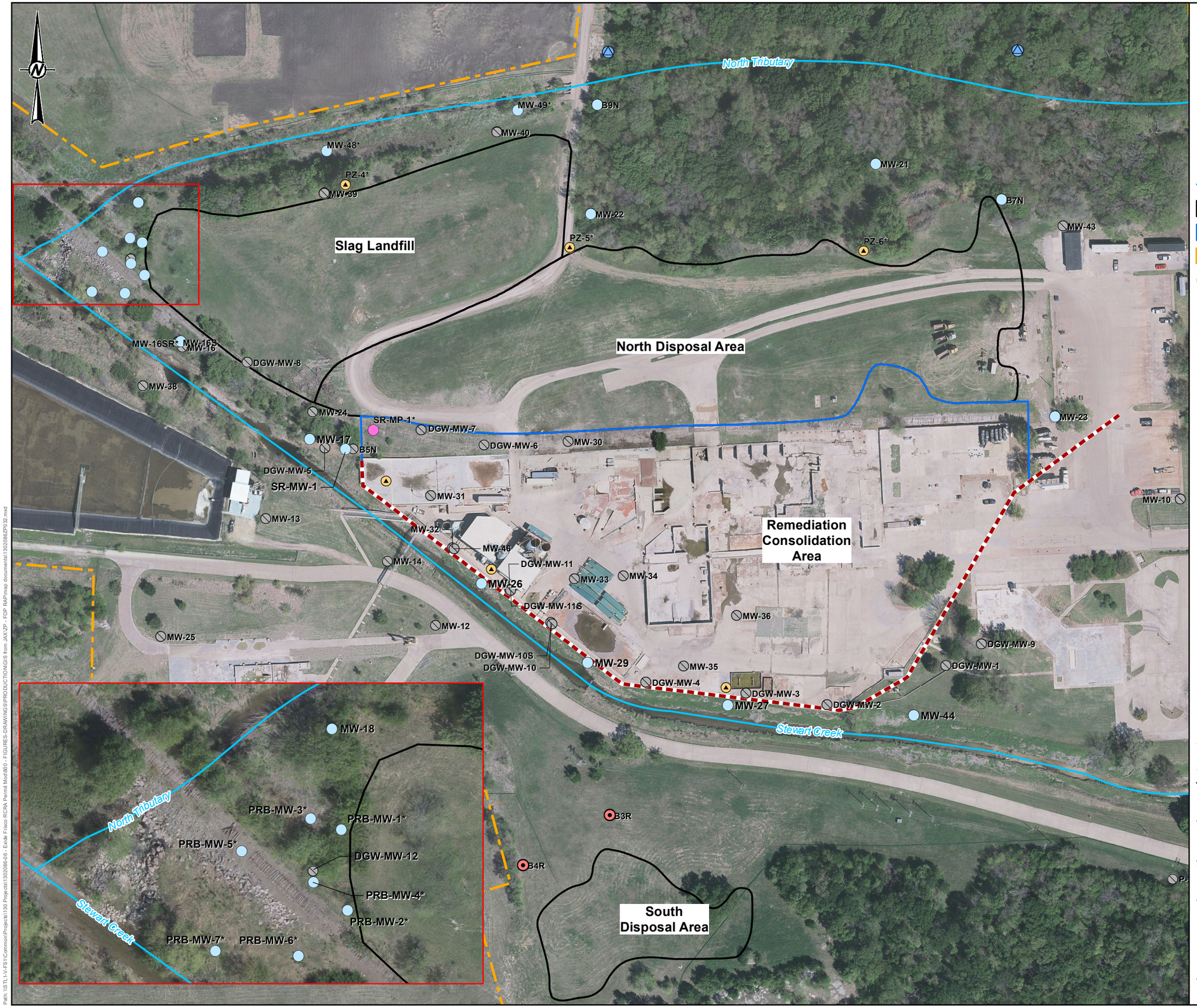

LEGEND

- North CAMU Corrective Action Monitoring Well
- SDA Detection Monitoring Well
- FOP Corrective Action Monitoring Well
- Existing Wells to be Decommissioned
- Piezometer Location
- Sump Reactor Monitoring Point
- Surface Water Centerline
- Disposal Area
- Remediation Consolidation Area
- Former Operating Plant Property Boundary
- Proposed Flood Wall

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PROFESSIONAL GEOSCIENTIST
5-31-19

150 75 0 150
Feet

REFERENCE

1. SITE FEATURES - GOLDER, 2014
2. AERIAL IMAGERY - SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY AND AERIAL IMAGERY PROVIDED BY DALLAS AERIAL SURVEY DATED APRIL, 2017

CLIENT
EXIDE TECHNOLOGIES

PROJECT
GROUNDWATER REMEDY EVALUATION

TITLE
SITE LAYOUT MAP

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-22
PREPARED	EFT
DESIGN	BEF
REVIEW	EPW
APPROVED	AMF

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APPENDIX 3.3

PARKWOOD BOULEVARD PARCEL INVESTIGATION REPORT

PARKWOOD BOULEVARD PARCEL INVESTIGATION REPORT

Exide Frisco Recycling Facility
7471 Old 5th Street, Frisco, Texas 75034-5047
TCEQ SWR No. 30516
TCEQ Hazardous Waste Permit No. HW-50206
TCEQ Agreed Order Docket No. 2011-1712-IHW-E
EPA ID No. TXD006451090
Customer No. CN600129779
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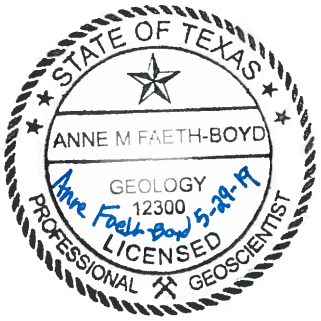

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130208606

May 2019

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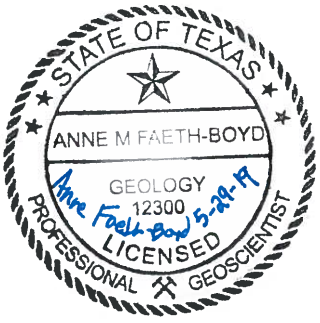

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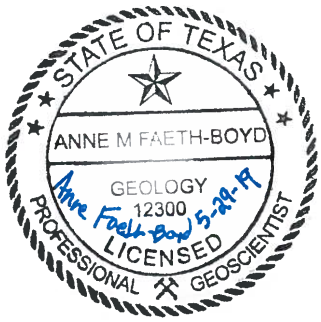


1.0 INTRODUCTION AND BACKGROUND

1.1 Introduction

Golder Associates Inc. (Golder) has prepared this Parkwood Boulevard Parcel (Parkwood) Report to present the results of the July 2018 investigation activities performed on a parcel of land owned at the time of the investigation by Exide Technologies, Inc. (Exide) and since dedicated to the City of Frisco as public right-of-way, which is developed with a portion of Parkwood Boulevard (Parkwood Parcel or "Site"). The Parkwood Parcel is adjacent to the Exide Former Operating Plant (FOP) located within the Frisco Recycling Center (FRC) located at 7471 Old 5th Street in Frisco, Texas (Figure 1) and also located between portions of the former Exide Undeveloped Buffer Property (UBP), now owned by the Frisco Economic Development Corporation and the Frisco Community Development Corporation. The Parkwood Parcel is located to the east of the FOP. Parkwood Boulevard---i.e., the paved road---runs through the Parkwood Parcel.

This report has been prepared in support of next steps for Exide's FRC Resource Conservation and Recovery Act (RCRA) Permit Renewal Application with a Major Amendment and Compliance Plan (referred to throughout as the "Part B RCRA Permit Renewal Application") and addresses item CP10 in the Texas Commission on Environmental Quality (TCEQ) Technical Notice of Deficiency (NOD) on such application dated December 7, 2017. As requested by TCEQ, on February 19, 2018, Golder submitted a Comment Response to address the technical NOD issued in December 2017. This response included a discussion of the Parkwood Parcel. This report includes the rationale and methodology used while performing an investigation of soils (and fill material) adjacent to and beneath Parkwood Boulevard on the Parkwood Parcel.

1.2 Background

A response action was performed by Exide on the Exide UBP under the TCEQ's Voluntary Cleanup Program (VCP). During Exide UBP response action activities, portions of the Parkwood Parcel adjacent to the UBP were excavated and backfilled with clean fill material, consistent with the UBP Response Action Plan (UBP RAP). Due to safety and structural considerations, materials extending to depths greater than two feet below ground surface and adjacent to Parkwood Boulevard and material present beneath Parkwood Boulevard were left in-place. The VCP Co-Applicants and the TCEQ agreed that affected material located adjacent to and outside of the UBP and within the Parkwood Parcel would be addressed within FOP Response Action Plan (FOP RAP).

While some samples were collected along the boundary of the Parkwood Parcel and the UBP during remediation of the UBP in 2017 and 2018, additional data was collected in July 2018 to determine the presence and concentrations of lead and cadmium in the material beneath and adjacent to Parkwood Boulevard (i.e. beneath and adjacent to road base). This report outlines the field procedures used during the investigation and the results of associated laboratory analyses.

2.0 OVERVIEW OF PARKWOOD PARCEL INVESTIGATION

The objective of the investigation for the Parkwood Parcel was to gather additional analytical data for the Parkwood Parcel to be included in the revised FOP RAP.

In general, the Parkwood Boulevard Investigation consisted of the following activities:

- Review of relevant existing Site documents including borehole logs and sampling information.
- Preparation and submittal of a Traffic Control Plan (TCP) to the City of Frisco for partial closure of Parkwood Boulevard during the investigation.
- Field Investigation of the Parkwood Parcel included advancing 19 boreholes including the following activities:
  - Concrete coring of the eleven (11) boreholes within Parkwood Boulevard.
  - Nineteen (19) boreholes were advanced to up to ten (10) feet below ground surface (bgs) and logged by a Golder engineer. Attention was directed to identify the presence of fill materials and inspect for the presence of battery case fragments and/or slag, if any.
  - Four (4) soil samples were collected from each of the nineteen (19) boreholes: three samples were collected from selected intervals and analyzed for total lead and cadmium and one composite sample was analyzed for RCRA 8 metals using the toxicity characteristic leaching procedure (TCLP).
  - Backfilling and restoration of borehole locations.
- Evaluation of new and existing data to update the Site conceptual model to determine appropriate measures and inclusion in the Site RAP.

This Parkwood Report presents a summary of the data obtained during the Parkwood Investigation. Proposed response actions for the Parkwood Parcel are presented in the FOP RAP (which is included as Appendix M to the Part B RCRA Permit Renewal Application).

3.0 FIELD PROCEDURES

3.1 Health and Safety

This work was performed under a Site-Specific Health and Safety Plan (HASP), in accordance with OSHA regulation 29 CFR 1910.120. Each subcontractor was responsible for its own health and safety program. This work was conducted using Level D Protection. All Golder and other subcontracted personnel working on this Site who might be potentially exposed to hazardous materials had successfully completed 40-hour HAZWOPER training.

All contaminated clothing and personal protective equipment was disposed of or cleaned as appropriate before leaving the Site. Contaminated investigation derived waste (IDW) was placed in client-provided containers on-the FOP, sampled, and profiled for disposal.

3.2 Site Access, Utility Locate, and Traffic Control Plan

Prior to mobilization to the field, Golder coordinated with Exide personnel and the City of Frisco regarding access and existing information for utilities. Golder and the drilling subcontractor prepared and submitted the required City of Frisco TCP and Right of Way (ROW) Permit. The TCP outlined diversion of traffic to allow for adequate access for sampling and worker safety.

The drilling subcontractor submitted the state-required public utility locate and Golder also contracted a private utility locate company to clear boring locations using ground penetrating radar (GPR), and surveyed the area prior to initiating drilling activities. Golder also requested an on-Site meeting with all public utility locators for the first day of drilling activities.

3.3 Traffic Diversion

Traffic was first routed around the northbound lane and sampling occurred in the northbound lane. The holes were backfilled and traffic diversion remained in place until the concrete had cured. On the following day, traffic was then diverted from the southbound lane, which was then sampled and backfilled. Traffic diversion lasted a total of two days.

3.4 Drilling Activities

Exact locations of boreholes were determined in the field, allowing for modifications based on access, obstructions, utilities, discussions with the City of Frisco regarding the TCP, and final confirmation sampling results from UBP remediation activities in the Tract H area of the UBP. Figure 2 shows the locations of the borings.

Drilling activities were completed by WEST Drilling, a Texas–licensed drilling subcontractor directly subcontracted to Golder. Nineteen (19) direct-push borings were collected either through or adjacent to Parkwood Boulevard. Prior to drilling, the boreholes through Parkwood Boulevard were cored using a concrete coring machine. All locations were drilled into native materials with the exception of 2018-PB-19 that was limited due to restricted access during the time of drilling. The direct-push drilling method resulted in a continuous soil sample to a maximum depth of 8 feet below grade with the exception of the following:

- 2018-PB-4 which was advanced to approximately 9.5 feet below grade. During drilling of 2018-PB-4, there was initially no recovery for the second drilling interval (4-8 ft bgs) due to wet and loose subsurface

conditions. In order to recover the interval for logging and sampling, the driller re-drilled to a total depth of 9.5 feet bgs and the sample was recovered.

- 2018-PB-18 which was advanced to approximately 10 feet below grade. Due to the restriction noted above for 2018-PB-19, borehole location 2018-PB-18 was extended to a total depth of 10 ft bgs to further evaluate the presence of native materials on the western side of Parkwood Boulevard.

Samples were logged continuously for lithology and classified based on the Unified Soil Classification System (USCS) by a Golder engineer.

Four samples were collected from each borehole based on lithology and presence of fill materials, when encountered. Soil collected from each foot of the boring was composited in a zip top plastic bag and then screened for lead using a Niton XL3t 600 X-Ray Fluorescence Analyzer (XRF). Once composited, the soil was screened directly through the zip top plastic bag. In general, the interval with the highest XRF reading was sampled and submitted for laboratory analysis. In the event that the highest interval consisted primarily of concrete (i.e. soil volume in the interval was insufficient for an analytical sample) the interval immediately below was collected (i.e., 2018-PB-1 [2-3]). The second sample interval submitted for laboratory analysis was determined based on professional judgement or the presence of fill materials. When possible, the third sample interval was taken from native materials below any fill materials encountered. For the purpose of this assessment, native materials were determined based on visual observations of soil type, lack of industrial or road base fill materials, and Golder knowledge of adjacent soils from UBP remediation.

Additionally, one composite sample, representative of the entire length, was collected from each borehole. The composite sample was analyzed for RCRA 8 metals using the toxicity characteristic leaching procedure (TCLP) in order to characterize the materials.

Following sampling, the boreholes were immediately plugged using hydrated bentonite chips. For boreholes through Parkwood, hydrated bentonite chips were placed from the bottom of the borehole until 2 feet below grade with the final two feet plugged with concrete. For boreholes adjacent to Parkwood, hydrated bentonite chips were placed from the bottom of the borehole until grade with a small amount of concrete at the surface. Pertinent data concerning the drilling activities was also recorded on the field boring logs. No slag or battery case fragments were encountered in any of the soil cores during the investigation. Field borings logs are provided as Attachment A to this report. The completed boring locations were field-located and recorded using a GPS handheld receiver. GPS locations of boreholes are provided in Table 3.

3.4.1 Container and Labels

The analytical testing laboratory provided containers and appropriate container lids. The containers were filled, and container lids were tightly closed. The following information were legibly and indelibly written on the label:

- Project identification
- Sample identification
- Location
- Name or initials of collector
- Date and time of collection

- Analysis requested
- Sample preservative, if applicable

3.4.2 Chain-of-Custody Control

After samples were collected, chain-of-custody procedures were followed to establish a written record of sample movement between the sampling site and the testing laboratory.

3.4.3 Sample Shipment

TCLP samples awaiting shipment to the laboratory were stored in a cooler with ice such that the samples maintained a temperature of at most 4 degrees Celsius. Once a set of samples was ready for shipment, the samples were re-packed with ice to maintain appropriate temperature/avoid breaking during shipment.

Total metals samples awaiting shipment to the laboratory were stored in a second cooler with protective material to avoid breakage. Once a set of samples was ready for shipment, the samples were packed to avoid breaking during shipment.

Completed chain-of-custody forms were inserted into a plastic sleeve and placed inside the sample shipment container. The cooler was labeled with the sample collector's name, address, and telephone number; the laboratory's name, address, and telephone number; and the date of shipment. The cooler was sealed with a chain-of-custody seal and signed and dated by the sampler before shipment.

3.5 Laboratory Analytical Program

Following collection, samples were shipped to ALS's Houston, Texas laboratory. Discrete samples were analyzed for lead and cadmium using EPA Method SW6020A. Composite soils were analyzed for TCLP RCRA 8 metals.

3.6 Investigation-Derived Waste

All liquid and soil investigation derived waste (IDW) including decontamination water and soil cuttings were containerized on-Site in 55-gallon steel drums and staged at the FOP pending disposition. Following receipt of analytical data, soil IDW was removed from the Site and disposed of in DFW Landfill in Lewisville, Texas. Decontamination water was disposed of in Turkey Creek Landfill in Alvarado, Texas.

3.7 Decontamination

Decontamination was conducted in general conformance with ASTM Standard D 5088-15. The drill rig was decontaminated prior to arrival on-Site with attention to the working end and downhole equipment (i.e., rods, etc.). Non-dedicated downhole drilling and sampling equipment was decontaminated prior to use at each location. Decontamination consisted of washing the equipment in a potable water and Alconox™ solution, followed by a potable water rinse, and then a distilled water rinse. Decontamination of this equipment, including rods, was performed at a decontamination area or adjacent to the drill rig. Wastewater generated by the decontamination process was containerized as IDW for proper disposal.

3.8 Quality Assurance/Quality Control

The investigation activities were conducted in general accordance with industry standard practices. Field procedures, including soil sampling and collection of quality assurance and quality control (QA/QC) samples were also conducted in accordance with industry standard practices. All pertinent sampling information and other

associated field activities were recorded in a field logbook or on field forms. Samples were handled under appropriate chain-of-custody documentation and procedures.

To confirm the accuracy and reproducibility of the laboratory analytical results, the analytical laboratory implemented a program, including laboratory replicate samples, method blanks and control standards. The laboratory QA/QC data generated during the sample analysis is included in the laboratory analytical reports provided to Golder. Laboratory analytical reports are provided as Attachment B to this report.

Field QA/QC protocols included one field duplicate sample collected for every 20 or less field samples collected. No equipment blanks were warranted as no non-dedicated equipment was used during sampling.

Once the analytical data was received from the laboratory, the laboratory report was reviewed for any narratives or comments indicating qualified data. No data required additional evaluation with the laboratory. Next, the data was reviewed for results in expected ranges. No anomalous results were noted for additional review. The laboratory quality control report was also reviewed to note any qualified data or other indications of anomalous runs. The data was deemed validated as appropriate. Data Usability Summaries (DUS) were prepared in accordance with Texas Risk Reduction Program (TRRP) 13 guidance. DUS's are provided as Attachment C to this report.

4.0 FIELD OBSERVATIONS

Soils encountered as part of the Parkwood Boulevard Investigation were generally similar to borings advanced and recorded at the FOP and UBP during previous investigations. The geology encountered at the Site generally consists of approximately 5 to 6 feet of dry, stiff clay with gravel fill that appeared to be related to road construction. Native soils were encountered at approximately 6 to 8 feet below ground surface and consisted of a hard clay with fine gravels. No fill material was encountered (outside of anticipated road construction materials or what is assumed to be utility corridor backfill [very fine sand observed in 2018-PB-3]) in the soil, with the exception of boreholes 2018-PB-10, 2018-PB-15, 2018-PB-16, 2018-PB-17, and 2018-PB-19. At these five locations, material containing debris was also observed within the fill and is described as follows:

- 2018-PB-10: An approximately 1-inch layer of asphalt was identified at approximately 3.5 ft bgs.
- 2018-PB-15: Some fine pieces of sub-angular asphalt were identified at approximately 3 ft bgs.
- 2018-PB-16: An approximately 2-inch layer of asphalt and concrete was noted at 2 ft bgs.
- 2018-PB-17: Pieces of sub-angular asphalt were identified at approximately 2.5 ft bgs.
- 2018-PB-19: A shard of glass was noted at approximately 7 ft bgs and small pieces of asphalt were identified at approximately 7.9 ft bgs.

2018-PB-1 was cored and sampled to delineate the presence of fine dark yellowish orange sand (similar to material used surrounding utilities observed in UBP excavation activities) encountered in 2018-PB-3. No fine dark yellowish orange sand or fill materials were identified in 2018-PB-1.

Boring location 2018-PB-2 was planned to be advanced in the event that fill materials were present in 2018-PB-4 (location present immediately to the south). 2018-PB-2 was cored with other boring locations within Parkwood Boulevard; however, due to safety considerations regarding nearby utilities, lithology encountered in 2018-PB-4 (no industrial fill present), and information regarding fill materials from the adjacent UBP excavation area, 2018-PB-2 was not advanced.

Boring logs are presented as Attachment A to this report and copies of submitted State Well Reports are included as Attachment D to this report. Debris present in boreholes is depicted with a yellow halo on Figure 3.

5.0 LABORATORY ANALYTICAL RESULTS AND SCREENING CRITERIA

5.1 Derivation of Critical PCLs

The assessment levels for this monitoring report are the same as those described in additional detail in the 2014 Affected Property Assessment Report prepared by Golder in May 2014. Critical PCLs used for this assessment are as follows:

- Cadmium: 30 mg/kg
- Lead: 274.5 mg/kg

5.2 Total Metals Analytical Results

Soil samples were analyzed for lead and cadmium using SW6020A. Total cadmium and lead were compared to their respective critical PCLs: cadmium (30 mg/kg) and lead (274.5 mg/kg).

A summary of detections of lead and cadmium in soil is presented in Table 1. Laboratory analytical reports containing the soil analytical data are included in Attachment B. No samples collected as part of the Parkwood Boulevard Parcel Investigation contained cadmium above the critical PCL (30 mg/kg). Three samples collected as part of the Parkwood Boulevard Parcel Investigation contained lead above the critical PCL (274.5 mg/kg):

- 2018-PB-11 (0-1) (498 mg/kg)
- 2018-PB-19 (6-7) (533 mg/kg)
- 2018-PB-19 (7-8) (454 mg/kg)

In addition, as shown on Figure 3, lead was detected above the critical PCL in UBP remediation confirmation samples D-16N CS-3 (356 mg/kg) (collected directly beneath Parkwood Boulevard) and TP-9 CS-12 (5,520 mg/kg) and D-16 CS-6 (298 mg/kg), both collected at the edge of the Site at adjoining boundary of the UBP. Detailed sampling information and results for UBP remediation was submitted under separate cover to the TCEQ on July 31, 2018 in the UBP Response Action Completion Report (included as Part B, Attachment U to the Part B RCRA Permit Renewal Application).

Additional discussion regarding the critical PCL exceedance is included in the FOP RAP.

5.3 TCLP Analytical Results

The composite samples collected from each boring were analyzed for TCLP RCRA 8 metals. The TCLP results were evaluated using the *TCEQ Guidelines for the Classification and Coding of Industrial and Hazardous Wastes* (RG-022, 2/05). Based on this evaluation, the soils would be classified as non-hazardous Class 2 industrial waste i.e., no metals concentrations were equal to or exceeded the threshold for Class 1 waste or hazardous waste material. TCLP results are presented in Table 2.

6.0 REFERENCES

The following references were used in the preparation of this Report:

Golder Associates Inc. (Golder), 2014. Affected Property Assessment Report (APAR), revised, Exide Technologies Frisco Recycling Center, Frisco, Texas, May 22, 2014.

Golder Associates, Inc. (Golder), 2015. Affected Property Assessment Report (APAR), Exide Technologies Undeveloped Buffer Property, Frisco, Texas, August 13, 2015.

Golder, 2018a. Updated Parkwood Boulevard Parcel Investigation Work Plan, Exide Frisco Recycling Center, 7471 5th Street, Frisco, Texas 75034-5047, TCEQ SWL No. 30516, TCEQ Hazardous Waste Permit No. HW-50206, TCEQ Agreed Order Docket No. 2011-1712-IHW-E, EPA ID No. TX006451090, Customer No. CN600129779, Regulated Entity No. RN100218643, May 30, 2018.

Golder, 2018b. Response Action Completion Report Voluntary Cleanup Program #2541, Exide Technologies Undeveloped Buffer Property. July 31, 2018.

Texas Commission on Environmental Quality (TCEQ), 2018. Comments: Parkwood Boulevard Parcel Investigation Work Plan, Technical Memorandum: Revised RAP Appendix 7 – Statistical Methodology, Stewart Creek Exposure Point Concentration Sampling Work Plan, dated March 29, 2018. April 17, 2018.

Pastor, Behling & Wheeler, LLC (PBW), 2013. Affected Property Assessment Report (APAR), Exide Technologies Frisco Recycling Center, Frisco, Texas, July 8, 2013.

Pastor, Behling & Wheeler, LLC. (PBW), 2015. Undeveloped Buffer Property VCP Investigation Response Action Plan, Exide Technologies Undeveloped Buffer Property, Frisco, Texas. Revised November 30, 2015.

Pastor, Behling & Wheeler, LLC. (PBW), 2015. Affected Property Assessment Report, Undeveloped Buffer Property, Exide Frisco Recycling Center, Frisco, Texas. August 2015.

7.0 CLOSING

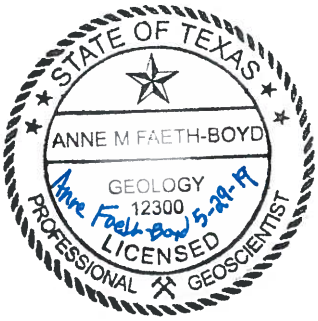
Golder appreciates the opportunity to assist Exide with this project. Please contact the undersigned if you have any questions or would like any additional information about this Report.

Emily White

Emily P. White
Project Geological Engineer

Anne Faeth-Boyd

Anne M. Faeth-Boyd, P.G.
Associate and Senior Engineer



EPW/AMF

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TABLES

Soil Sampling Data Summary - Lead and Cadmium
Appendix 3.3
Parkwood Boulevard Investigation Report

Sample ID	Sample Date	Sample Depth (feet bgs)	Cadmium (mg/kg)	Lead (mg/kg)
Surface Soil Residential Assessment Level (0-15 feet bgs)[1, 7]:			30	274.51
Surface Soil Critical PCL (0-5 feet bgs)[2, 7]:			30	274.51
Subsurface Soil Residential Assessment Level (>15 feet bgs)[1, 7]:			30	274.51
Subsurface Soil Critical PCL (>5 feet bgs)[2, 7]:			30	274.51
Within Parkwood Boulevard				
2018-PB-4 (1-2)	07/30/18	1.0 - 2.0	**0.227 J**	**15.6**
2018-PB-4 (3-4)	07/30/18	3.0 - 4.0	**0.274 J**	**14.6**
2018-PB-4 (4-5)	07/30/18	4.0 - 5.0	**0.0562 J**	**11.4**
2018-PB-6 (1-2)	07/30/18	1.0 - 2.0	**0.466 J**	**13.0**
2018-PB-6 (3-4)	07/30/18	3.0 - 4.0	**0.496 J**	**10.2**
2018-PB-6 (3-4) (DUP-01)	07/30/18	3.0 - 4.0	**0.422 J**	**12.5**
2018-PB-6 (5-6)	07/30/18	5.0 - 6.0	**0.538 J**	**10.9**
2018-PB-8 (2-3)	07/30/18	2.0 - 3.0	**0.433 J**	**10.6**
2018-PB-8 (4-5)	07/30/18	4.0 - 5.0	**0.462 J**	**10.7**
2018-PB-8 (6-7)	07/30/18	6.0 - 7.0	**0.433 J**	**9.68**
2018-PB-14 (2-3)	07/30/18	2.0 - 3.0	**0.738**	**24.0**
2018-PB-14 (4-5)	07/30/18	4.0 - 5.0	**0.496 J**	**11.6**
2018-PB-14 (5-6)	07/30/18	5.0 - 6.0	**0.498 J**	**10.8**
2018-PB-15 (2-3)	07/30/18	2.0 - 3.0	**0.412 J**	**17.6**
2018-PB-15 (3-4)	07/30/18	3.0 - 4.0	**1.05**	**55.2**
2018-PB-15 (5-6)	07/30/18	5.0 - 6.0	**0.858**	**13.7**
2018-PB-1 (2-3)	07/31/18	2.0 - 3.0	**0.372 J**	**69.1**
2018-PB-1 (4-5)	07/31/18	4.0 - 5.0	**0.168 J**	**5.45**
2018-PB-1 (5-6)	07/31/18	5.0 - 6.0	**0.133 J**	**9.21**
2018-PB-3 (2-3)	07/31/18	2.0 - 3.0	**0.244 J**	**34.0**
2018-PB-3 (4-5)	07/31/18	4.0 - 5.0	**0.0712 J**	**6.94**
2018-PB-3 (7-8)	07/31/18	7.0 - 8.0	**0.185 J**	**13.4**
2018-PB-5 (2-3)	07/31/18	2.0 - 3.0	**0.457 J**	**10.0**
2018-PB-5 (4-5)	07/31/18	4.0 - 5.0	**0.471 J**	**9.24**
2018-PB-5 (5-6)	07/31/18	5.0 - 6.0	**0.492 J**	**8.88**
2018-PB-7 (1-2)	07/31/18	1.0 - 2.0	**0.489 J**	**12.1**
2018-PB-7 (3-4)	07/31/18	3.0 - 4.0	**0.472 J**	**12.6**
2018-PB-7 (3-4) (DUP-04)	07/31/18	3.0 - 4.0	**0.383 J**	**11.5**
2018-PB-7 (5-6)	07/31/18	5.0 - 6.0	**0.457 J**	**8.54**
2018-PB-16 (2-3)	07/31/18	2.0 - 3.0	**0.976**	**19.8**
2018-PB-16 (3-4)	07/31/18	3.0 - 4.0	**0.477 J**	**17.5**
2018-PB-16 (7-8)	07/31/18	7.0 - 8.0	**0.430 J**	**8.70**

Soil Sampling Data Summary - Lead and Cadmium
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Parkwood Boulevard Investigation Report

Sample ID	Sample Date	Sample Depth (feet bgs)	Cadmium (mg/kg)	Lead (mg/kg)
Surface Soil Residential Assessment Level (0-15 feet bgs)[1, 7]:			30	274.51
Surface Soil Critical PCL (0-5 feet bgs)[2, 7]:			30	274.51
Subsurface Soil Residential Assessment Level (>15 feet bgs)[1, 7]:			30	274.51
Subsurface Soil Critical PCL (>5 feet bgs)[2, 7]:			30	274.51
Along the East side of Parkwood Boulevard				
2018-PB-9 (0-1)	07/30/18	0.0 - 1.0	**0.541 J**	**28.1**
2018-PB-9 (1-2)	07/30/18	1.0 - 2.0	**0.406 J**	**15.0**
2018-PB-9 (6-7)	07/30/18	6.0 - 7.0	**0.309 J**	**9.04**
2018-PB-10 (3-4)	07/30/18	3.0 - 4.0	**0.367 J**	**213**
2018-PB-10 (4-5)	07/30/18	4.0 - 5.0	**0.454 J**	**24.4**
2018-PB-10 (6-7)	07/30/18	6.0 - 7.0	**0.419 J**	**11.8**
2018-PB-11 (0-1)	07/31/18	0.0 - 1.0	**1.75**	**498**
2018-PB-11 (3-4)	07/31/18	3.0 - 4.0	**0.565**	**26.0**
2018-PB-11 (5-6)	07/31/18	5.0 - 6.0	**0.439 J**	**14.5**
2018-PB-11 (5-6) (DUP-03)	07/31/18	5.0 - 6.0	**0.724**	**13.6**
2018-PB-17 (2-3)	07/30/18	2.0 - 3.0	**0.724**	**168**
2018-PB-17 (3-4)	07/30/18	3.0 - 4.0	**0.979**	**245**
2018-PB-17 (5-6)	07/30/18	5.0 - 6.0	**0.291 J**	**7.97**
Along the West side of Parkwood Boulevard				
2018-PB-12 (0-1)	07/31/18	0.0 - 1.0	**0.478 J**	**30.7**
2018-PB-12 (2-3)	07/31/18	2.0 - 3.0	**0.362 J**	**21.4**
2018-PB-12 (7-8)	07/31/18	7.0 - 8.0	**0.519 J**	**18.1**
2018-PB-13 (0-1)	07/31/18	0.0 - 1.0	**0.853**	**122**
2018-PB-13 (4-5)	07/31/18	4.0 - 5.0	**0.476 J**	**10.9**
2018-PB-13 (5-6)	07/31/18	5.0 - 6.0	**0.502 J**	**9.88**
2018-PB-18 (0-1)	07/31/18	0.0 - 1.0	**0.643**	**113**
2018-PB-18 (5-6)	07/31/18	5.0 - 6.0	**0.321 J**	**105**
2018-PB-18 (8-9)	07/31/18	8.0 - 9.0	**0.630**	**14.1**
2018-PB-19 (0-1)	07/31/18	0.0 - 1.0	**0.814**	**134**
2018-PB-19 (6-7)	07/31/18	6.0 - 7.0	**0.566**	**533**
2018-PB-19 (7-8)	07/31/18	7.0 - 8.0	**0.685**	**454**
2018-PB-20 (0-1)	07/31/18	0.0 - 1.0	**0.865**	**135**
2018-PB-20 (4-5)	07/31/18	4.0 - 5.0	**0.400 J**	**86.6**
2018-PB-20 (7-8)	07/31/18	7.0 - 8.0	**0.448 J**	**17.6**

Soil Sampling Data Summary - Lead and Cadmium
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Notes

Detections are **bolded**.

Exceedance of RAL/Critical PCL.

1. [1] - The Residential Assessment Level (RAL) is the lower of the TRRP residential Tier 1 $^{Tot}Soil_{Comb}$ (applicable to surface soil only) and Tier 2 $^{GW}Soil_{Ing}$ PCLs for a 30-acre source area (TCEQ, 2018). The $^{Air}Soil_{Inh-V}$ pathway is not applicable to lead or cadmium and was therefore not used to develop RALs.

2. [2] - The critical PCL is the lower of the TRRP commercial-industrial Tier 1 $^{Tot}Soil_{Comb}$ (applicable to surface soil only) and Tier 2 $^{GW}Soil_{Ing}$ PCLs for a 30-acre source area (TCEQ, 2018). The $^{Air}Soil_{Inh-V}$ pathway is not applicable to lead or cadmium and was therefore not used to develop critcial PCLs.

3. Surface Soil = 0-15 feet bgs for residential land use and 0-5 feet bgs for commercial-industrial land use; subsurface soil = greater than 15 feet bgs for residential land use and greater than 5 feet bgs for commercial-industrial land use.

4. Data Qualifiers: J - estimated result; U - analyte was not detected at or above the sample detection limit. Value shown is the method quantitation limit.

5. bgs - below ground surface.

6. mg/kg - milligrams per kilogram.

7. Tier 2 $^{GW}Soil_{Ing}$ PCLs per Exide Former Operating Plant 2014 Affected Property Assessment Report prepared by Golder in May 2014.

Prepared by: EPW 08/11/2018
Updated by: EPW 04/17/2019, 05/22/2019
Checked by: AGA 08/13/2018, TJG 04/18/2019
Reviewed by: AMF 08/14/2018, 04/18/2019, 05/21/2019

Table 2
TCLP Waste Characterization Results
Appendix 3.3
Parkwood Boulevard Investigation Report

Sample ID	Sample Date	Arsenic (mg/L)	Barium (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Lead (mg/L)	Mercury (mg/L)	Selenium (mg/L)	Silver (mg/L)
Texas Class 2 Non-Hazardous Waste Criteria Comparison Values		**1.8**	**100**	**0.5**	**5**	**1.5**	**0.2**	**1**	**5**
2018-PB-1	07/31/2018	<0.00400 U	**0.483**	<0.00200 U	<0.00400 U	<0.00600 U	<0.0000300 U	<0.0110 U	<0.00200 U
2018-PB-3	07/31/2018	<0.00400 U	**0.208**	<0.00200 U	<0.00400 U	<0.00600 U	<0.0000300 U	<0.0110 U	<0.00200 U
2018-PB-4	07/30/2018	**0.00516 J**	**0.362 J**	<0.00200 U	<0.00400 U	<0.00600 U	**0.000173 J**	<0.0110 U	<0.00200 U
2018-PB-4 (DUP-02)	07/30/2018	**0.00718 J**	**0.816 J**	<0.00200 U	<0.00400 U	<0.00600 U	**0.000165 J**	<0.0110 U	<0.00200 U
2018-PB-5	07/31/2018	<0.00400 U	**1.20**	<0.00200 U	**0.00479 J**	<0.00600 U	<0.0000300 U	<0.0110 U	<0.00200 U
2018-PB-6	07/30/2018	<0.00400 U	**1.08**	**0.00214 J**	<0.00400 U	<0.00600 U	**0.000173 J**	<0.0110 U	<0.00200 U
2018-PB-7	07/31/2018	**0.00414 J**	**0.960**	<0.00200 U	<0.00400 U	<0.00600 U	<0.0000300 U	<0.0110 U	<0.00200 U
2018-PB-8	07/30/2018	**0.00502 J**	**1.21**	<0.00200 U	<0.00400 U	<0.00600 U	**0.000186 J**	<0.0110 U	<0.00200 U
2018-PB-9	07/30/2018	<0.00400 U	**0.557**	<0.00200 U	<0.00400 U	<0.00600 U	**0.000160 J**	<0.0110 U	<0.00200 U
2018-PB-10	07/30/2018	<0.00400 U	**0.568**	<0.00200 U	<0.00400 U	<0.00600 U	**0.000160 J**	<0.0110 U	<0.00200 U
2018-PB-11	07/31/2018	<0.00400 U	**0.909**	<0.00200 U	<0.00400 U	<0.00600 U	<0.0000300 U	<0.0110 U	<0.00200 U
2018-PB-12	07/31/2018	<0.00400 U	**0.995**	<0.00200 U	<0.00400 U	<0.00600 U	**0.0000560 J**	<0.0110 U	<0.00200 U
2018-PB-13	07/31/2018	<0.00400 U	**0.807**	<0.00200 U	<0.00400 U	<0.00600 U	<0.0000300 U	<0.0110 U	<0.00200 U
2018-PB-14	07/30/2018	**0.00605 J**	**1.30**	<0.00200 U	<0.00400 U	<0.00600 U	**0.000171 J**	<0.0110 U	<0.00200 U
2018-PB-15	07/30/2018	**0.00434 J**	**1.21**	**0.00227 J**	<0.00400 U	<0.00600 U	**0.000171 J**	<0.0110 U	<0.00200 U
2018-PB-16	07/31/2018	**0.00964 J**	**2.15**	<0.00200 U	<0.00400 U	<0.00600 U	<0.0000300 U	<0.0110 U	<0.00200 U
2018-PB-17	07/30/2018	<0.00400 U	**0.738**	<0.00200 U	<0.00400 U	<0.00600 U	**0.000173 J**	<0.0110 U	<0.00200 U
2018-PB-18	07/31/2018	<0.00400 U	**0.768**	<0.00200 U	<0.00400 U	<0.00600 U	**0.0000430 J**	<0.0110 U	<0.00200 U
2018-PB-19	07/31/2018	<0.00400 U	**0.739**	<0.00200 U	<0.00400 U	**0.0136 J**	<0.0000300 U	<0.0110 U	<0.00200 U
2018-PB-20	07/31/2018	<0.00400 U	**0.304**	<0.00200 U	<0.00400 U	<0.00600 U	<0.0000300 U	<0.0110 U	<0.00200 U

NOTES

Detected analytes are **bolded**.

J - Estimated value.

U - Analyzed but not detected above the MDL/SDL.

mg/L - Milligrams per liter.

TCLP - Toxicity Characteristic Leaching Procedure.

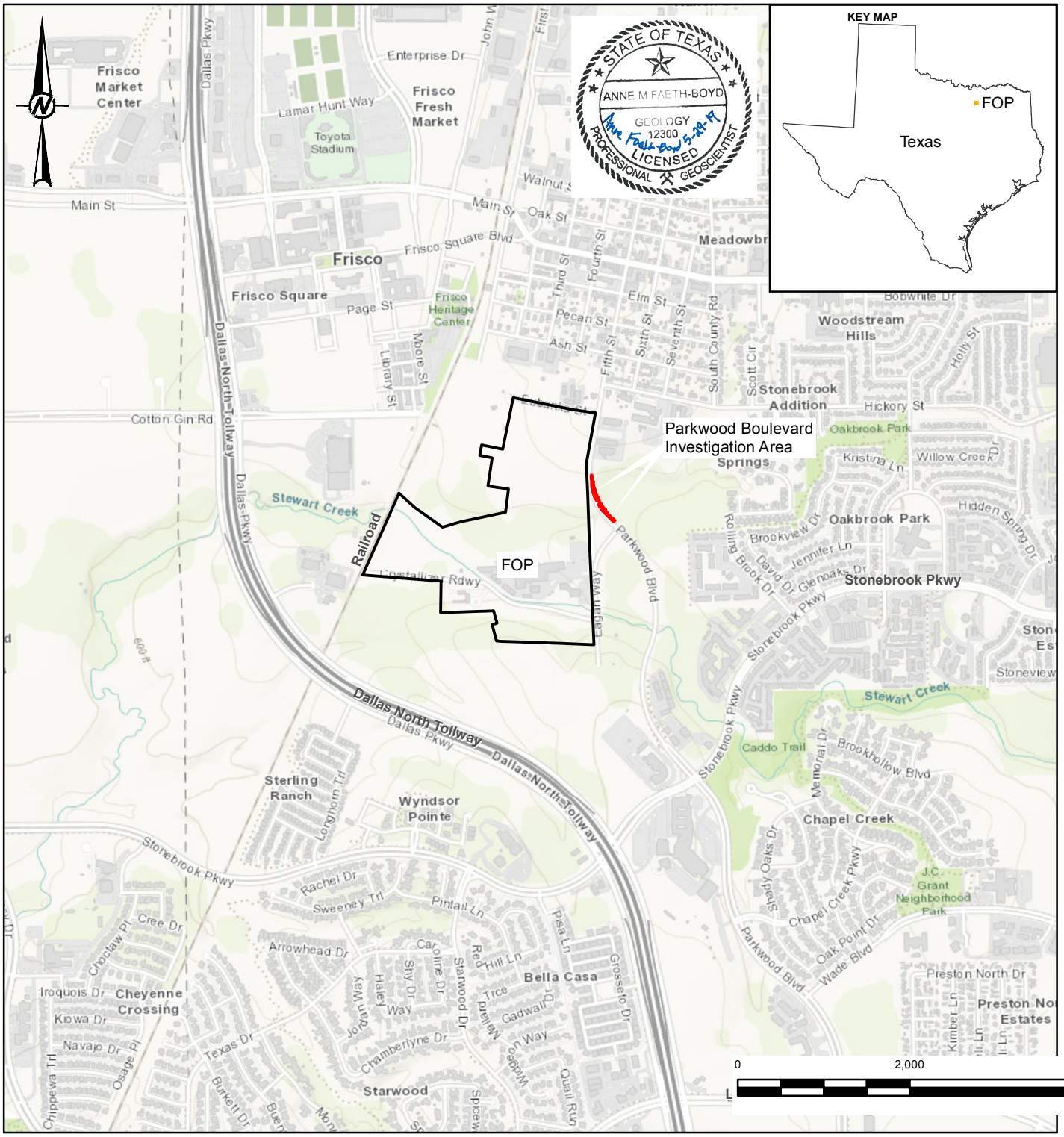
Prepared by: EPW 08/16/2018
Checked by: AGA 08/16/2018
Reviewed by: AMF 08/16/2018

Table 3
Soil Sampling Locations
Appendix 3.3
Parkwood Boulevard Investigation

Sample ID	Description	x_coord	y_coord
2018-PB-1	West side of road, west of Tract H - in road	2480979.98	7103178.15
2018-PB-3	West side of road, west of Tract H - in road	2480966.69	7103134.18
2018-PB-4	East side of road, west of Tract H - in road	2481007.02	7103127.58
2018-PB-5	West side of road, north of Eagan Way Intersection - in road	2481262.10	7102525.12
2018-PB-6	East side of road, north of Eagan Way Intersection - in road	2481285.20	7102555.54
2018-PB-7	West side of road, south of Eagan Way Intersection - in road	2481319.55	7102478.20
2018-PB-8	East side of road, south of Eagan Way Intersection - in road	2481345.04	7102508.12
2018-PB-9	East side of road, adjacent west of Tract H - in grass (previously excavated)	2481031.86	7103000.54
2018-PB-10	East side of road, west of Tract G - in grass along curb (previously exacavated)	2481176.81	7102674.60
2018-PB-11	East side of road, south of Tract G - in grass along curb	2481284.40	7102571.28
2018-PB-12	West side of road, south of North Tributary - in grass	2481145.82	7102626.04
2018-PB-13	West side of road, north of Eagan Way Intersection - in grass	2481225.95	7102536.14
2018-PB-14	East side of road, south of Tract G, south of Air Monitor - in road	2481257.88	7102574.76
2018-PB-15	East side of road, south of Tract G, northwest of Air Monitor - in road	2481203.90	7102634.27
2018-PB-16	West side of road, south of North Tributary - in road	2481168.05	7102617.54
2018-PB-17	East side of road, adjacent west of Tract H - in grass along curb (previously excavated)	2481038.22	7102919.63
2018-PB-18	West side of road, north of North Tributary, West of Guardrail - in grass	2481058.11	7102748.06
2018-PB-19	West side of road, north of North Tributary - in grass along curb	2481033.82	7102817.94
2018-PB-20	West side of road, north of North Tributary - in grass along curb	2481002.65	7102884.17

Prepared by: BCW 08/08/2018
Checked by: EPW/AGA 08/16/2018
Reviewed by: AMF 08/23/2018

FIGURES



LEGEND

- Investigation Area
- Fomer Operating Plant Property Boundary

REFERENCE(S)

1. SITE BOUNDARY - GOLDER, 2019
2. FORMER OPERATING PLANT - FOP PROPERTY BOUNDARY, 2019
3. BACKGROUND IMAGERY - SOURCES: ESRI, HERE, DELORME, TOMTOM, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), SWISSTOPO, MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY

CLIENT
EXIDE TECHNOLOGIES

PROJECT
PARKWOOD BOULEVARD INVESTIGATION REPORT

TITLE
SITE LOCATION MAP

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-29
DESIGNED	JWT
PREPARED	JWT
REVIEWED	EPW/THR
APPROVED	AMF/FMB

PROJECT NO.	CONTROL	REV.	FIGURE
130208606	1302086ZZC001	0	1

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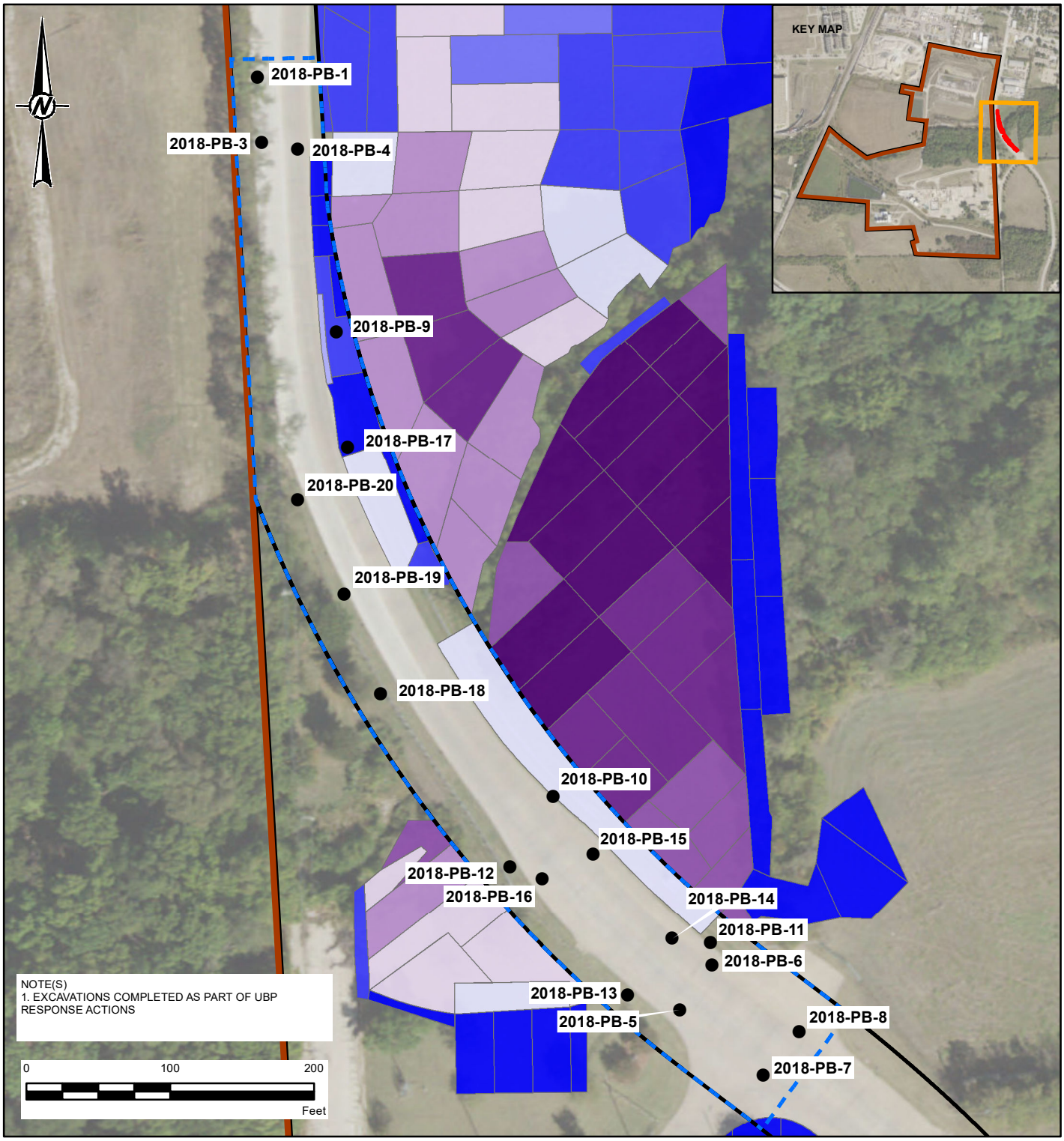

- Sample Location
- Parkwood Parcel Investigation Area
- Former Operating Plant Property Boundary
- Former Undeveloped Buffer Property (UBP)
- Excavation Depth (0-0.5ft)
- Excavation Depth (0-1ft)
- Excavation Depth (0-1.5ft)
- Excavation Depth (0-1.7ft)
- Excavation Depth (1ft intervals to 2ft)
- Excavation Depth (1ft intervals to 3ft)
- Excavation Depth (1ft intervals to 4.5ft)
- Excavation Depth (1ft intervals to 5ft)
- Excavation Depth (1ft intervals to 6ft)
- Excavation Depth (1ft intervals to 7ft)

STATE OF TEXAS
ANNE M FAETH-BOYD
GEOLOGY
12300
LICENSED
PROFESSIONAL GEOSCIENTIST

REFERENCE(S)

1. INVESTIGATION AREA AND LOCATIONS - GOLDER 2018
2. BACKGROUND IMAGERY - SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

CLIENT
EXIDE TECHNOLOGIES

PROJECT
PARKWOOD BOULEVARD INVESTIGATION REPORT

TITLE
BOREHOLE LOCATION MAP

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-29
DESIGNED	JWT
PREPARED	JWT
REVIEWED	EPW/THR
APPROVED	AMF

PROJECT NO.	CONTROL	REV.	FIGURE
130208606	1302086ZZC002	0	2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A

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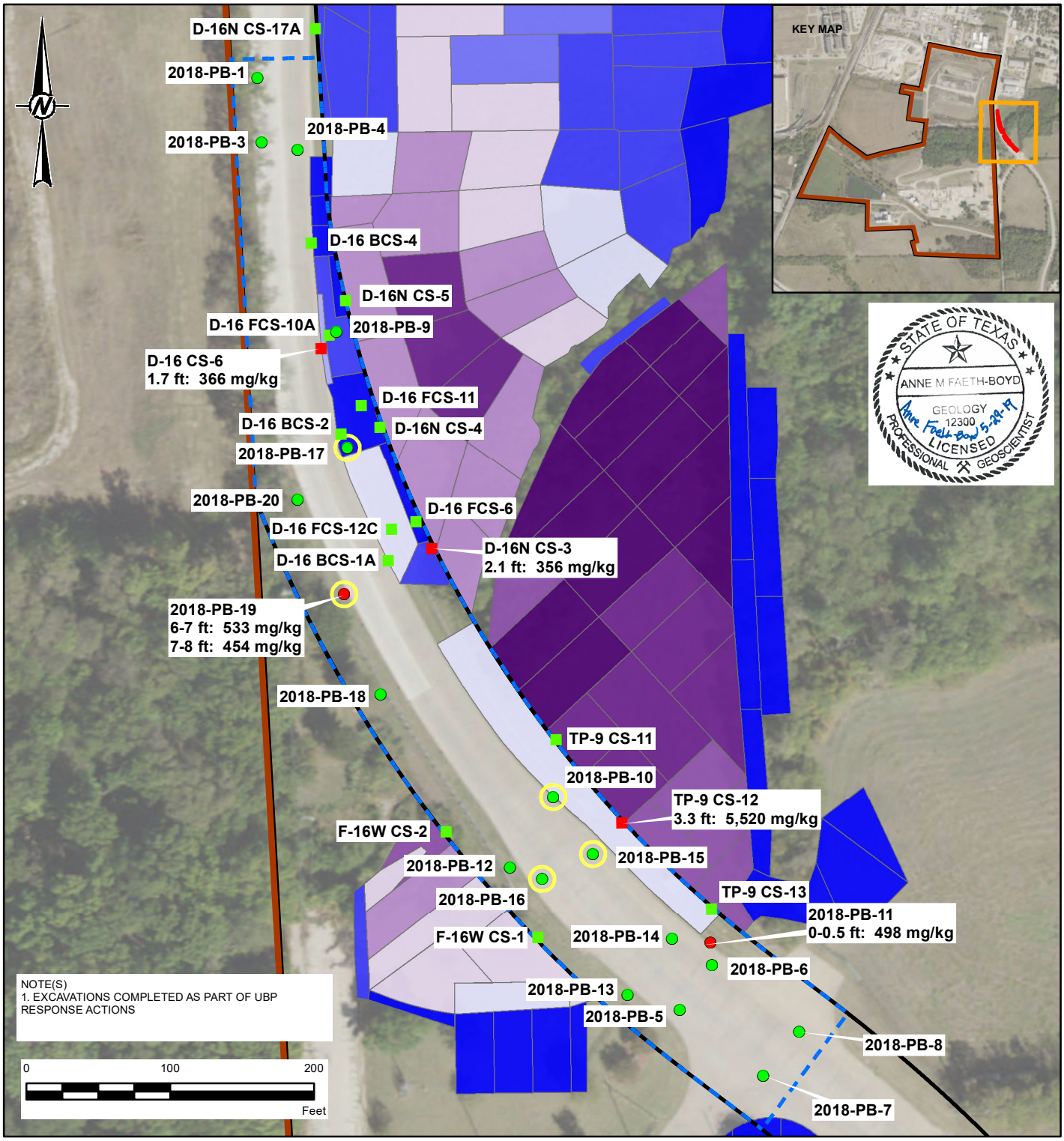

STATE OF TEXAS
ANNE M FAETH-BOYD
GEOLOGY
12300
LICENSED
PROFESSIONAL GEOSCIENTIST

- UBP sample lead concentration greater than 274.5 mg/kg
- UBP sample lead concentration less than 274.5 mg/kg
- Parkwood sample lead concentration greater than 274.5 mg/kg
- Parkwood sample lead concentration less than 274.5 mg/kg
- Parkwood Parcel Investigation area
- Former Operating Plant Property Boundary
- Former Undeveloped Buffer Property (UBP)
- Debris noted in boring log

- Excavation Depth (0-0.5ft)
- Excavation Depth (0-1ft)
- Excavation Depth (0-1.5ft)
- Excavation Depth (0-1.7ft)
- Excavation Depth (1ft intervals to 2ft)
- Excavation Depth (1ft intervals to 3ft)
- Excavation Depth (1ft intervals to 4.5ft)
- Excavation Depth (1ft intervals to 5ft)
- Excavation Depth (1ft intervals to 6ft)
- Excavation Depth (1ft intervals to 7ft)

REFERENCE(S)

1. INVESTIGATION AREA AND LOCATIONS - GOLDER 2018
2. BACKGROUND IMAGERY - SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

CLIENT
EXIDE TECHNOLOGIES

PROJECT
PARKWOOD BOULEVARD INVESTIGATION REPORT

TITLE
PARKWOOD LEAD EXCEEDANCES IN SOIL

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-29
DESIGNED	JWT
PREPARED	JWT
REVIEWED	EPW/THR
APPROVED	AMF

PROJECT NO.	CONTROL	REV.	FIGURE
130208606	1302086ZZC005	0	3

PATH: \\STL-1-FS1\Common\Projects\130\208606-06 - Exide Frisco RCRA Permit Mod\800 - FIGURES-DRAWINGS\PRODUCTION GIS from JAX\ZZC - Parkwood Blvd Report\mxd documents\1302086ZZC005.mxd - LAST SAVED ON: 2019-05-29 AT 2:00:49 PM

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ATTACHMENT A

FIELD BORING LOGS

LOG OF 2018-PB-1

DRILLING METHOD: Direct Push | NORTHING: 7,103,178 FT

DATE/TIME: 07/31/2018, 1353 - 1357 | DRILLER: West Drilling, Robert Williams | EASTING: 2,480,980 FT

TOTAL DEPTH: 8 FT BGS | RIG: Geoprobe 7822DT | SURFACE ELEVATION: 573.123 FT AMSL

DEPTH (Feet)	RUN No.	XRF (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
		40	1.7 / 1.7		CORE		(0.0-1.7) CONCRETE. Fabric on bottom of core.
		17		(2-3) 1424	GM		(1.7-2.0) (GM) SILTY GRAVEL, fine to medium sub-angular gravels, non-plastic fines; white (N9) gravels with dusky yellowish brown (10YR 2/2); non-cohesive, dry, loose.
	1	ND +/- 12	2.0 / 4.0		CL		(2.0-5.0) (CL) gravelly SILTY CLAY, medium-plasticity fines, fine to medium sub-angular to sub-rounded gravels; moderate yellowish brown (10YR 5/4) with light olive gray (5Y 5/2) mottling; cohesive, W<PL, stiff.
5		26		(4-5) 1426			
		ND +/- 12	4.0 / 4.0	(5-6) 1428			
	2	ND +/- 12			CL		(5.0-8.0) (CL) SILTY CLAY, high-plasticity fines, some fine sub-rounded gravels; medium light gray (N6) with dark yellowish orange (10YR 6/6) and light olive gray (5Y 5/2) mottling; cohesive, W<PL, stiff.
		17					
				(TCLP Composite) 1430			END OF BORING AT 8.0 FEET BELOW GROUND SURFACE.
10							
15							
20							
25							
30							
35							

PROJECT No: 130-2086-06 | COMPILED BY: BCW

PROJECT: Exide Frisco | CHECKED BY: EMS

LOCATION: West side of road - West of Tract H (in road) | REVIEWED BY: AMF

LOG OF 2018-PB-3

DRILLING METHOD: Direct Push
NORTHING: 7,103,134 FT
DATE/TIME: 07/31/2018, 1249 - 1253
DRILLER: West Drilling, Robert Williams
EASTING: 2,480,967 FT
TOTAL DEPTH: 8 FT BGS
RIG: Geoprobe 7822DT
SURFACE ELEVATION: 578.466 FT AMSL

DEPTH (Feet)	RUN No.	XRF (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
			1.5 / 1.5		CORE		(0.0-1.5) CONCRETE.
		19		(2-3) 1320	GM		(1.5-3.0) (GM) SILTY GRAVEL, fine to coarse sub-angular gravels, non-plastic fines; very pale orange (10YR 8/2) with dark yellowish brown (10YR 4/2); non-cohesive, dry, loose.
	1	48 ND +/- 7	2.0 / 4.0		SP		(3.0-5.0) (SP) SAND, very fine sand; dark yellowish orange (10YR 6/6); non-cohesive, dry, loose. Sand similar to that used when backfilling utilities.
5		ND +/- 8		(4-5) 1322			
	2	ND+/- 12 25	3.5 / 4.0		CL		(5.0-7.0) (CL) SILTY CLAY, medium-plasticity fines, trace fine sub-angular to sub-rounded gravels; dusky yellowish brown (10YR 2/2); cohesive, W<PL, stiff.
		15		(7-8) 1324 (TCLP Composite) 1326	CL		(7.0-8.0) (CL) SILTY CLAY, high-plasticity fines, trace fine sub-angular to sub-rounded gravels; dark yellowish brown (10YR 4/2) with light olive gray (5Y 5/2) and dark gray (N3) mottling; cohesive, W<PL, very stiff.
10							END OF BORING AT 8.0 FEET BELOW GROUND SURFACE.
15							
20							
25							
30							
35							

PROJECT No: 130-2086-06
COMPILED BY: BCW
PROJECT: Exide Frisco
CHECKED BY: EMS
LOCATION: West side of road - West of Tract H (in road)
REVIEWED BY: AMF

LOG OF 2018-PB-4

DRILLING METHOD: Direct Push | NORTHING: 7,103,128 FT

DATE/TIME: 07/30/2018, 1409 - 1413 | DRILLER: West Drilling, Robert Williams | EASTING: 2,481,007 FT

TOTAL DEPTH: 9.5 FT BGS | RIG: Geoprobe 7822DT | SURFACE ELEVATION: 570.142 FT AMSL

DEPTH (Feet)	RUN No.	XRF (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
			1.2 / 1.2		CORE		(0.0-1.2) CONCRETE.
		24		(1-2) 1445			(1.2-4.0) (CL) SILTY CLAY, high-plasticity fines, trace fine sub-angular gravels; light olive gray (5Y 5/2) with some dark gray (N3) mottling; cohesive, W<PL, firm.
		ND +/- 11	3.0 / 4.0		CL		
		22		(3-4) 1446			
		13		(4-5) 1448			(4.0-9.5) (CL) SILTY CLAY, high-plasticity fines, trace fine sub-rounded gravels, trace fine sand; very light gray (N8) with dark yellowish orange (10YR 6/6) and grayish brown (5Y 8/4); cohesive, W<PL, firm. No recovery on first attempt of second run - driller says too loose/wet. Pushes 5.5 feet and recovers all 5.5 feet.
5		11					
		ND +/- 10	5.5 / 5.5		CL		
		14					
		ND +/- 11					
10				(TCLP Composite) 1450, DUP-02			END OF BORING AT 9.5 FEET BELOW GROUND SURFACE.
15							
20							
25							
30							
35							

PROJECT No: 130-2086-06 | COMPILED BY: BCW

PROJECT: Exide Frisco | CHECKED BY: EMS

LOCATION: East side of Road - West of Tract H (in road) | REVIEWED BY: AMF

LOG OF 2018-PB-5

DRILLING METHOD: Direct Push
NORTHING: 7,102,525 FT
DATE/TIME: 07/31/2018, 1053 - 1057
DRILLER: West Drilling, Robert Williams
EASTING: 2,481,262 FT
TOTAL DEPTH: 8 FT BGS
RIG: Geoprobe 7822DT
SURFACE ELEVATION: 562.937 FT AMSL

DEPTH (Feet)	RUN No.	XRF (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
			1.1 / 1.1		CORE		(0.0-1.1) CONCRETE.
	1	ND +/- 10 ND +/- 14 ND +/- 11	3.3 / 4.0	(2-3) 1138	CL		(1.1-4.0) (CL) SILTY CLAY, high-plasticity fines, trace fine sub-angular gravels; dark yellowish brown (10YR 4/2); cohesive, W<PL, stiff.
5	2	15 ND +/- 12 ND +/- 10 ND +/- 12	4.0 / 4.0	(4-5) 1140 (5-6) 1142	CL		(4.0-8.0) (CL) gravelly SILTY CLAY, high-plasticity fines, fine to medium sub-angular gravels; medium light gray (N6) with dark yellowish orange (10YR 6/6) and dark gray (N3) mottling; cohesive, W<PL, stiff.
				(TCLP Composite) 1144			END OF BORING AT 8.0 FEET BELOW GROUND SURFACE.
10							
15							
20							
25							
30							
35							

PROJECT No: 130-2086-06
COMPILED BY: BCW
PROJECT: Exide Frisco
CHECKED BY: EMS
LOCATION: West side of road - North Eagan Edge (in road)
REVIEWED BY: AMF

LOG OF 2018-PB-6

DRILLING METHOD: Direct Push | NORTHING: 7,102,556 FT

DATE/TIME: 07/30/2018, 1137 - 1140 | DRILLER: West Drilling, Robert Williams | EASTING: 2,481,285 FT

TOTAL DEPTH: 8 FT BGS | RIG: Geoprobe 7822DT | SURFACE ELEVATION: 562.452 FT AMSL

DEPTH (Feet)	RUN No.	XRF (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
			1.5/1.5	(1-2) 1218	CORE		(0.0-1.5) CONCRETE.
		12			CL		(1.5-4.5) (CL) SILTY CLAY, medium-plasticity fines; dark yellowish brown (10YR 4/2); cohesive, W<PL, stiff.
		12					(2.5) SAA (Same As Above), except with trace fine sub-angular gravels.
	1	17	3.4/4.0	(3-4) 1220, DUP-01			
		ND +/- 15					(4.0) SAA, except W>PL.
5		13		(5-6) 1222	CL		(4.5-8.0) (CL) SILTY CLAY, high-plasticity fines, some fine sub-angular to sub-rounded gravels; very light gray (N8) with dark yellowish orange (10YR 6/6) mottling; cohesive, W<PL, stiff.
	2	ND +/- 15	4.0/4.0				
		ND +/- 13					
				(TCLP Composite) 1224			END OF BORING AT 8.0 FEET BELOW GROUND SURFACE.
10							
15							
20							
25							
30							
35							

PROJECT No: 130-2086-06 | COMPILED BY: BCW

PROJECT: Exide Frisco | CHECKED BY: EMS

LOCATION: East Side of Road - North Eagan edge (in road) | REVIEWED BY: AMF

LOG OF 2018-PB-7

DRILLING METHOD: Direct Push | NORTHING: 7,102,478 FT

DATE/TIME: 07/31/2018, 1015 - 1020 | DRILLER: West Drilling, Robert Williams | EASTING: 2,481,320 FT

TOTAL DEPTH: 8 FT BGS | RIG: Geoprobe 7822DT | SURFACE ELEVATION: 563.085 FT AMSL

DEPTH (Feet)	RUN No.	XRF (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
			0.7 / 0.7		CORE		(0.0-0.7) CONCRETE.
	1	13 ND +/- 15 ND +/- 14 ND +/- 12	2.5 / 4.0	(1-2) 1052 (3-4) 1054, DUP-04	CL		(0.7-5.0) (CL) SILTY CLAY, high-plasticity fines, trace fine sub-angular to sub-rounded gravels; dusky yellowish brown (10YR 2/2) with light olive gray (5Y 5/2) mottling; cohesive, W<PL, stiff.
5	2	ND +/- 11 ND +/- 10 ND +/- 11	4.0 / 4.0	(5-6) 1056	CL		(5.0-8.0) (CL) SILTY CLAY, high-plasticity fines, trace fine sub-rounded gravels; light gray (N7) with medium dark gray (N4) and dark yellowish orange (10YR 6/6) mottling; cohesive, W<PL, stiff. (7.0) color change to light gray (N7) with dark yellowish orange mottling.
				(TCLP Composite) 1058			END OF BORING AT 8.0 FEET BELOW GROUND SURFACE.
10							
15							
20							
25							
30							
35							

PROJECT No: 130-2086-06 | COMPILED BY: BCW

PROJECT: Exide Frisco | CHECKED BY: EMS

LOCATION: West Side of Road - South Eagan edge (in road) | REVIEWED BY: AMF

LOG OF 2018-PB-8

DRILLING METHOD: Direct Push | NORTHING: 7,102,508 FT

DATE/TIME: 07/30/2018, 1030 - 1100 | DRILLER: West Drilling, Robert Williams | EASTING: 2,481,345 FT

TOTAL DEPTH: 8 FT BGS | RIG: Geoprobe 7822DT | SURFACE ELEVATION: 562.644 FT AMSL

DEPTH (Feet)	RUN No.	XRF (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
			0.7		CORE		(0.0-0.7) CONCRETE.
		ND +/- 9	0.7				
		ND +/- 11					(0.7-4.5) (CL) SILTY CLAY, high-plasticity fines, trace fine sub-angular gravels; light olive gray (5Y 5/2) with dark gray (N3) mottling and white (N9) gravels; cohesive, W<PL, very stiff.
	1	14	3.8	(2-3) 1130	CL		
		ND +/- 11	4.0				
		ND +/- 12		(4-5) 1132			
5		ND +/- 11					(4.5-8.0) (CL) SILTY CLAY, high-plasticity fines, some fine sub-angular to sub-rounded gravels; very light gray (N8) with dark yellowish orange (10YR 6/6) mottling; cohesive, W<PL, very stiff.
	2	ND +/- 11	2.3	(6-7) 1134	CL		
		ND +/- 11	4.0				
		ND +/- 14					
				(TCLP Composite) 1136			END OF BORING AT 8.0 FEET BELOW GROUND SURFACE.
10							
15							
20							
25							
30							
35							

PROJECT No: 130-2086-06 | COMPILED BY: BCW

PROJECT: Exide Frisco | CHECKED BY: EMS

LOCATION: East Side of Road - South Eagan edge (in road) | REVIEWED BY: AMF

LOG OF 2018-PB-9

DRILLING METHOD: Direct Push
NORTHING: 7,103,001 FT
DATE/TIME: 07/30/2018, 1515 - 1521
DRILLER: West Drilling, Robert Williams
EASTING: 2,481,032 FT
TOTAL DEPTH: 8 FT BGS
RIG: Geoprobe 7822DT
SURFACE ELEVATION: 564.849 FT AMSL

DEPTH (Feet)	RUN No.	XRF (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
	1	25 16 13 13	3.6 4.0	(0-1) 1552 (1-2) 1554	CL		(0.0-4.0) (CL) SILTY CLAY, medium-plasticity fines, trace fine sub-angular gravels; dark gray (N3); cohesive, W<PL, very stiff.
5	2	11 ND +/- 12 ND +/- 12 ND +/- 15	4.0 4.0	(6-7) 1556	CL CL		(4.0-6.0) (CL) SILTY CLAY, high-plasticity fines, trace fine sub-angular gravels; dark yellowish brown (10YR 4/2); cohesive, W<PL, very stiff. (6.0-8.0) (CL) gravelly SILTY CLAY, high-plasticity fines, fine to medium sub-angular gravels; light olive gray (5Y 5/2) with some dark yellowish brown (10YR 4/2) mottling; cohesive, W<PL, very stiff.
10				(TCLP Composite) 1600			END OF BORING AT 8.0 FEET BELOW GROUND SURFACE.
15							
20							
25							
30							
35							

PROJECT No: 130-2086-06
COMPILED BY: BCW
PROJECT: Exide Frisco
CHECKED BY: EMS
LOCATION: East Side of Road - West of Tract H (in grass)
REVIEWED BY: AMF

LOG OF 2018-PB-10

DRILLING METHOD: Direct Push
NORTHING: 7,102,675 FT
DATE/TIME: 07/30/2018, 1643 - 1648
DRILLER: West Drilling, Robert Williams
EASTING: 2,481,177 FT
TOTAL DEPTH: 8 FT BGS
RIG: Geoprobe 7822DT
SURFACE ELEVATION: 561.742 FT AMSL

DEPTH (Feet)	RUN No.	XRF (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
	1	16 20 12 115	3.9 4.0	(3-4) 1714	CL		(0.0-5.5) (CL) gravelly SILTY CLAY, medium-plasticity fines, fine to medium sub-angular to sub-rounded gravels; dark yellowish brown (10YR 4/2) with dark gray (N3) and pale yellowish brown (10YR 6/2) mottling; cohesive, W<PL, stiff. (3.5) 1 - inch layer of medium sub-angular pieces of asphalt.
5	2	ND +/- 14 ND +/- 10 ND +/- 11 ND +/- 10	4.0 4.0	(4-5) 1716 (6-7) 1718	CL		(5.5-8.0) (CL) SILTY CLAY, high-plasticity fines; dark yellowish brown (10YR 4/2) with dusky yellowish brown (10YR 2/2) mottling and trace iron staining; cohesive, W<PL, firm.
				(TCLP Composite) 1720			END OF BORING AT 8.0 FEET BELOW GROUND SURFACE.
10							
15							
20							
25							
30							
35							

PROJECT No: 130-2086-06
COMPILED BY: BCW
PROJECT: Exide Frisco
CHECKED BY: EMS
LOCATION: East Side of Road - West of Tract G (in grass)
REVIEWED BY: AMF

LOG OF 2018-PB-11

DRILLING METHOD: Direct Push | NORTHING: 7,102,571 FT

DATE/TIME: 07/31/2018, 0841 - 0846 | DRILLER: West Drilling, Robert Williams | EASTING: 2,481,284 FT

TOTAL DEPTH: 8 FT BGS | RIG: Geoprobe 7822DT | SURFACE ELEVATION: 562.816 FT AMSL

DEPTH (Feet)	RUN No.	XRF (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
	1	725 250 43 315	3.1 4.0	(0-1) 0922 (3-4) 0924	ML CL		(0.0-1.0) TOPSOIL (ML) SILT, non-plastic fines, trace roots and sub-angular coarse gravels; dusky yellowish brown (10YR 2/2); non-cohesive, dry, loose. (1.0-5.0) (CL) SILTY CLAY, medium-plasticity fines, some fine sub-angular to sub-rounded gravels; medium dark gray (N4) with light olive gray (5Y 5/2) mottling; cohesive, W<PL, stiff.
5	2	ND +/- 18 28 42 51	4.0 4.0	(5-6) 0926, DUP-03	CL		(5.0-8.0) (CL) gravelly SILTY CLAY, high-plasticity fines, fine sub-angular to sub-rounded gravels; medium light gray (N6) with dark yellowish orange (10YR 6/6) mottling; cohesive, W<PL, stiff.
				(TCLP Composite) 0928			END OF BORING AT 8.0 FEET BELOW GROUND SURFACE.
10							
15							
20							
25							
30							
35							

PROJECT No: 130-2086-06 | COMPILED BY: BCW

PROJECT: Exide Frisco | CHECKED BY: EMS

LOCATION: East Side of Road - Southwest Tract G (in grass) | REVIEWED BY: AMF

LOG OF 2018-PB-12

DRILLING METHOD: Direct Push
NORTHING: 7,102,626 FT
DATE/TIME: 07/31/2018, 1600 - 1604
DRILLER: West Drilling, Robert Williams
EASTING: 2,481,146 FT
TOTAL DEPTH: 8 FT BGS
RIG: Geoprobe 7822DT
SURFACE ELEVATION: 563.276 FT AMSL

DEPTH (Feet)	RUN No.	XRF (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
	1	66 45 15 26	3.1 4.0	(0-1) 1640	ML		(0.0-2.0) TOPSOIL (ML) SILT, non-plastic fines, some fine to medium sub-angular gravels, roots; dark yellowish brown (10YR 4/2); non-cohesive, dry, loose.
				(2-3) 1642	ML		(2.0-3.5) (ML) gravelly SILT, non-plastic fines, fine to coarse sub-angular to angular gravels; very pale orange (10YR 8/2); non-cohesive, dry, loose.
5	2	ND +/- 16 24 19 19	2.7 4.0		CL		(3.5-7.5) (CL) SILTY CLAY, medium-plasticity fines, some fine sub-angular to sub-rounded gravels; dusky yellowish brown (10YR 2/2) with dark yellowish brown (10YR 4/2) and dark yellowish orange (10YR 6/6) mottling; cohesive, W<PL, stiff.
				(7-8) 1644	CL		(7.5-8.0) (CL) SILTY CLAY, high-plasticity fines, trace fine sub-angular to sub-rounded gravels; moderate brown (5YR 4/4) with dark gray (N3) and light olive gray (5Y 5/2) mottling; cohesive, W<PL, very stiff
				(TCLP Composite) 1646			END OF BORING AT 8.0 FEET BELOW GROUND SURFACE.
10							
15							
20							
25							
30							
35							

PROJECT No: 130-2086-06
COMPILED BY: BCW
PROJECT: Exide Frisco
CHECKED BY: EMS
LOCATION: West Side of Road - in grass
REVIEWED BY: AMF

LOG OF 2018-PB-13

DRILLING METHOD: Direct Push
NORTHING: 7,102,536 FT
DATE/TIME: 07/31/2018, 0936 - 0940
DRILLER: West Drilling, Robert Williams
EASTING: 2,481,226 FT
TOTAL DEPTH: 8 FT BGS
RIG: Geoprobe 7822DT
SURFACE ELEVATION: 563.256 FT AMSL

DEPTH (Feet)	RUN No.	XRF (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
	1	88 ND +/- 11 13 14	3.2 4.0	(0-1) 1015	ML		(0.0-0.8) TOPSOIL (ML) SILT, non-plastic fines, trace coarse angular gravels; dusky yellowish brown (10YR 2/2); non-cohesive, dry, loose.
					CL		(0.8-4.5) (CL) SILTY CLAY, medium-plasticity fines, some fine sub-angular to sub-rounded gravels; dark yellowish brown (10YR 4/2); cohesive, W<PL, stiff.
5	2	23 ND +/- 18 19 ND +/- 15	4.0 4.0	(4-5) 1016 (5-6) 1018	CL		(4.5-6.0) (CL) SILTY CLAY, high-plasticity fines, trace fine sub-angular gravels; light gray (N7) with dark yellowish orange (10YR 6/6) and light olive gray (5Y 5/2) mottling; cohesive, W<PL, stiff.
					CL		(6.0-8.0) (CL) gravelly SILTY CLAY, high-plasticity fines, fine sub-angular to sub-rounded gravels; light gray (N7) with dark yellowish orange (10YR 6/6) and light olive gray (5Y 5/2) mottling; cohesive, W<PL, stiff.
				(TCLP Composite) 1020			END OF BORING AT 8.0 FEET BELOW GROUND SURFACE.
10							
15							
20							
25							
30							
35							

PROJECT No: 130-2086-06
COMPILED BY: BCW
PROJECT: Exide Frisco
CHECKED BY: EMS
LOCATION: West Side of Road - North Eagan edge (in grass)
REVIEWED BY: AMF

LOG OF 2018-PB-14

DRILLING METHOD: Direct Push | NORTHING: 7,102,575 FT

DATE/TIME: 07/30/2018, 1227 - 1232 | DRILLER: West Drilling, Robert Williams | EASTING: 2,481,258 FT

TOTAL DEPTH: 8 FT BGS | RIG: Geoprobe 7822DT | SURFACE ELEVATION: 562.515 FT AMSL

DEPTH (Feet)	RUN No.	XRF (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
			1.1 / 1.1		CORE		(0.0-1.1) CONCRETE.
	1	ND +/- 11 50 ND +/- 9	3.6 / 4.0	(2-3) 1305	CL		(1.1-4.5) (CL) SILTY CLAY, medium-plasticity fines, some fine sub-angular gravels; light olive gray (5Y 5/2) with trace dark gray (N3) mottling; cohesive, W<PL, very stiff.
		15		(4-5) 1306			(4.0) SAA (Same As Above), except W>PL.
5	2	ND +/- 14 ND +/- 14 ND +/- 12	4.0 / 4.0	(5-6) 1308	CL		(4.5-8.0) (CL) SILTY CLAY, high-plasticity fines, some fine sub-angular to sub-rounded gravels; medium gray (N5) with very light gray (N8) and dark yellowish orange (10YR 6/6) mottling; cohesive, W<PL, stiff.
				(TCLP Composite) 1310			END OF BORING AT 8.0 FEET BELOW GROUND SURFACE.
10							
15							
20							
25							
30							
35							

PROJECT No: 130-2086-06 | COMPILED BY: BCW

PROJECT: Exide Frisco | CHECKED BY: EMS

LOCATION: East Side of Road - Southwest Air Monitor (in road) | REVIEWED BY: AMF

LOG OF 2018-PB-15

DRILLING METHOD: Direct Push
NORTHING: 7,102,634 FT
DATE/TIME: 07/30/2018, 1320 - 1325
DRILLER: West Drilling, Robert Williams
EASTING: 2,481,204 FT
TOTAL DEPTH: 8 FT BGS
RIG: Geoprobe 7822DT
SURFACE ELEVATION: 562.701 FT AMSL

DEPTH (Feet)	RUN No.	XRF (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
			1.3 / 1.3		CORE		(0.0-1.3) CONCRETE.
		12			CL		(1.3-2.5) (CL) gravelly SILTY CLAY, medium-plasticity fines, fine sub-angular to sub-rounded gravels; light olive gray (5Y 5/2); cohesive, W>PL, stiff.
	1	119	2.5 / 4.0	(2-3) 1354	CL		(2.5-4.0) (CL) SILTY CLAY, high-plasticity fines; dark gray (N3); cohesive, W~PL, stiff.
		139		(3-4) 1356	CL		(3.0) some fine pieces of sub-angular asphalt.
5		ND +/- 10					(4.0-4.5) (CL) SILTY CLAY, low-plasticity fines, some fine sub-angular gravels; light olive gray (5Y 5/2); cohesive, W>PL, firm.
	2	ND +/- 12	3.7 / 4.0	(5-6) 1358	CL		(4.5-8.0) (CL) SILTY CLAY, medium-plasticity fines, trace fine sub-rounded gravels; very light gray (N8) with dark yellowish orange (10YR 6/6) mottling; cohesive, W<PL, stiff.
		ND +/- 10					
		14					
				(TCLP Composite) 1400			END OF BORING AT 8.0 FEET BELOW GROUND SURFACE.
10							
15							
20							
25							
30							
35							

PROJECT No: 130-2086-06
COMPILED BY: BCW
PROJECT: Exide Frisco
CHECKED BY: EMS
LOCATION: East Side of Road - West of Tract G (in road)
REVIEWED BY: AMF

LOG OF 2018-PB-16

DRILLING METHOD: Direct Push | NORTHING: 7,102,618 FT

DATE/TIME: 07/31/2018, 1148 - 1153 | DRILLER: West Drilling, Robert Williams | EASTING: 2,481,168 FT

TOTAL DEPTH: 8 FT BGS | RIG: Geoprobe 7822DT | SURFACE ELEVATION: 561.87 FT AMSL

DEPTH (Feet)	RUN No.	XRF (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
			1.0 / 1.0		CORE		(0.0-1.0) CONCRETE.
		21			CL		(1.0-2.0) (CL) SILTY CLAY, medium-plasticity fines; dusky yellowish brown (10YR 2/2); cohesive, W<PL, firm.
	1	42	3.5 / 4.0	(2-3) 1220 (3-4) 1222	CL		(2.0-3.0) (CL) SILTY CLAY, low-plasticity fines; very pale brown (10YR 6/2); cohesive, W<PL, firm. (2.1) 2 - inch seam of medium sub-angular black (N1) asphalt and very pale orange (10YR 8/2) concrete pieces.
		39					
		12					
5		14			CL		(3.0-7.5) (CL) SILTY CLAY, medium-plasticity fines, very trace fine sub-angular gravels; dusky yellowish brown (10YR 2/2) with trace light olive gray (5Y 5/2) mottling; cohesive, W<PL, stiff.
	2	14	3.3 / 4.0				
		ND +/- 12		(7-8) 1224	CL		(7.5-8.0) (CL) SILTY CLAY, high-plasticity fines, trace fine sub-rounded gravels; light olive gray (5Y 5/2) with dark yellowish orange (10YR 6/6) and light gray (N7) mottling; cohesive, W<PL, stiff.
				(TCLP Composite) 1226			END OF BORING AT 8.0 FEET BELOW GROUND SURFACE.
10							
15							
20							
25							
30							
35							

PROJECT No: 130-2086-06 | COMPILED BY: BCW

PROJECT: Exide Frisco | CHECKED BY: EMS

LOCATION: West Side of Road - in road | REVIEWED BY: AMF

LOG OF 2018-PB-17

DRILLING METHOD: Direct Push
NORTHING: 7,102,920 FT
DATE/TIME: 07/30/2018, 1549 - 1553
DRILLER: West Drilling, Robert Williams
EASTING: 2,481,038 FT
TOTAL DEPTH: 8 FT BGS
RIG: Geoprobe 7822DT
SURFACE ELEVATION: 562.856 FT AMSL

DEPTH (Feet)	RUN No.	XRF (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
	1	43 49 115 144	3.1 4.0	(2-3) 1620 (3-4) 1622	CL		(0.0-8.0) (CL) gravelly SILTY CLAY, medium-plasticity fines, sub-angular to sub-rounded fine gravels; dusky yellowish brown (10YR 2/2) with light olive gray (5Y 5/2) mottling; cohesive, W<PL, stiff. (2.5) pieces of angular asphalt.
5	2	16 ND +/- 10 ND +/- 11 ND +/- 11	3.8 4.0	(5-6) 1624			(4.0) color change to pale yellowish brown (10YR 6/2) with dark yellowish orange (10YR 6/6) and moderate yellowish brown (10YR 5/4) mottling.
				(TCLP Composite) 1626			END OF BORING AT 8.0 FEET BELOW GROUND SURFACE.
10							
15							
20							
25							
30							
35							

PROJECT No: 130-2086-06
COMPILED BY: BCW
PROJECT: Exide Frisco
CHECKED BY: EMS
LOCATION: East Side of Road - West of Tract H (in grass)
REVIEWED BY: AMF

LOG OF 2018-PB-18

DRILLING METHOD: Direct Push
NORTHING: 7,102,748 FT
DATE/TIME: 07/31/2018, 1653 - 1659
DRILLER: West Drilling, Robert Williams
EASTING: 2,481,058 FT
TOTAL DEPTH: 10 FT BGS
RIG: Geoprobe 7822DT
SURFACE ELEVATION: 562.043 FT AMSL

DEPTH (Feet)	RUN No.	XRF (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
	1	99 26 ND +/- 11 16	2.2 4.0	(0-1) 1728	ML		(0.0-3.0) TOPSOIL (ML) SILT, non-plastic fines, some fine sub-angular gravels and roots; dusky yellowish brown (10YR 2/2); non-cohesive, dry, loose. (1.0) color change to very pale orange (10YR 8/2).
5	2	97 174 18 ND +/- 16	3.2 4.0	(5-6) 1730	CL		(3.0-6.8) (CL) gravelly SILTY CLAY, high-plasticity fines, fine to medium sub-angular gravels; dark yellowish brown (10YR 4/2) with dark gray (N3) and light olive gray (5Y 5/2) mottling; cohesive, W<PL, stiff.
	3	17 21	1.6 2.0	(8-9) 1732	CL		(6.8-10.0) (CL) SILTY CLAY, high-plasticity fines, trace fine sub-rounded gravels; dark gray (N3) with moderate brown (5YR 4/4) and light olive gray (5Y 5/2) mottling; cohesive, W<PL, very stiff.
10				(TCLP Composite) 1734			END OF BORING AT 10.0 FEET BELOW GROUND SURFACE.
15							
20							
25							
30							
35							

PROJECT No: 130-2086-06
COMPILED BY: BCW
PROJECT: Exide Frisco
CHECKED BY: EMS
LOCATION: West Side of Road - in grass
REVIEWED BY: AMF

LOG OF 2018-PB-19

DRILLING METHOD: Direct Push
NORTHING: 7,102,818 FT
DATE/TIME: 07/31/2018, 1520 - 1525
DRILLER: West Drilling, Robert Williams
EASTING: 2,481,034 FT
TOTAL DEPTH: 8 FT BGS
RIG: Geoprobe 7822DT
SURFACE ELEVATION: 563.778 FT AMSL

DEPTH (Feet)	RUN No.	XRF (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
	1	134 37 16 ND +/- 10	3.5 4.0	(0-1) 1616	ML		(0.0-0.5) TOPSOIL (ML) SILT, non-plastic fines, some fine to medium sub-angular gravels, roots; dark yellowish brown (10YR 4/2); non-cohesive, dry, loose.
					ML		(0.5-3.5) (ML) gravelly SILT, non-plastic fines, fine to medium sub-angular to sub-rounded gravels; very pale orange (10YR 8/2); non-cohesive, dry, loose.
					CL		(3.5-4.0) (CL) SILTY CLAY, high-plasticity fines; dusky yellowish brown (10YR 2/2) with moderate brown (5YR 4/4) mottling and iron staining; cohesive, W<PL, stiff.
5	2	29 308 342 277	3.7 4.0	(6-7) 1605 (7-8) 1606 (TCLP Composite) 1620	CL		(4.0-7.0) (CL) gravelly SILTY CLAY, medium-plasticity fines, fine to medium sub-angular gravels; dark yellowish brown (10YR 4/2) with some dark yellowish orange (10YR 6/6) mottling; cohesive, W<PL, stiff.
					CL		(7.0-8.0) (CL) SILTY CLAY, high-plasticity fines, trace fine sub-rounded gravels; dusky yellowish brown (10YR 2/2) with moderate brown (5YR 4/4) and grayish orange (10YR 7/4) mottling; cohesive, W<PL, very stiff. (7.1) shard of glass. (7.9) small pieces of asphalt.
10							END OF BORING AT 8.0 FEET BELOW GROUND SURFACE.
15							
20							
25							
30							
35							

PROJECT No: 130-2086-06
COMPILED BY: BCW
PROJECT: Exide Frisco
CHECKED BY: EMS
LOCATION: West Side of Road - in grass
REVIEWED BY: AMF

LOG OF 2018-PB-20

DRILLING METHOD: Direct Push | NORTHING: 7,102,884 FT

DATE/TIME: 07/31/2018, 1443 - 1447 | DRILLER: West Drilling, Robert Williams | EASTING: 2,481,003 FT

TOTAL DEPTH: 8 FT BGS | RIG: Geoprobe 7822DT | SURFACE ELEVATION: 564.164 FT AMSL

DEPTH (Feet)	RUN No.	XRF (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
	1	162 42 ND +/- 11 14	2.5 4.0	(0-1) 1514	ML ML		(0.0-0.5) TOPSOIL (ML) SILT, non-plastic fines, some fine sub-angular gravels; dusky yellowish brown (10YR 2/2); non-cohesive, dry, loose. (0.5-4.0) (ML) gravelly SILT, non-plastic fines, fine to coarse sub-angular to sub-rounded gravels; very pale orange (10YR 8/2); non-cohesive, dry, loose.
5	2	58 ND +/- 14 ND +/- 13 ND +/- 11	3.5 4.0	(4-5) 1516 (7-8) 1518	CL		(4.0-8.0) (CL) gravelly SILTY CLAY, high-plasticity fines, fine sub-angular to sub-rounded gravels; dusky yellowish brown (10YR 2/2); cohesive, W<PL, stiff. (7.0) color change to moderate yellowish brown (10YR 5/4) with dark yellowish brown (10YR 4/2) mottling. (7.5) color change to grayish orange (10YR 7/4) with dark yellowish orange (10YR 6/6) mottling.
10				(TCLP Composite) 1520			END OF BORING AT 8.0 FEET BELOW GROUND SURFACE.
15							
20							
25							
30							
35							

PROJECT No: 130-2086-06 | COMPILED BY: BCW

PROJECT: Exide Frisco | CHECKED BY: EMS

LOCATION: West Side of Road - West of Tract G (in grass) | REVIEWED BY: AMF

ATTACHMENT B

LABORATORY ANALYTICAL DATA PACKAGES

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

August 08, 2018

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS18071462**

Laboratory Results for: **Exide Parkwood Blvd 130208606**

Dear Emily,

ALS Environmental received 34 sample(s) on Jul 31, 2018 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DAYNA.FISHER
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Parkwood Blvd 130208606	
WorkOrder:	**HS18071462**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Parkwood Blvd 130208606
WorkOrder:	**HS18071462**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data								
Laboratory Name: ALS Laboratory Group			LRC Date: 08/08/2018					
Project Name: Exide Parkwood Blvd 130208606			Laboratory Job Number: HS18071462					
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 131062, 131070, 131099, 131102, R321053, R321054					
#[1]	A[2]	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?	X				
		Were % moisture (or solids) reported for all soil and sediment samples?	X				
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?	X				
		Were analytical duplicates analyzed at the appropriate frequency?	X				
		Were RPDs or relative standard deviations within the laboratory QC limits?	X				
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 08/08/2018				
Project Name: Exide Parkwood Blvd 130208606			Laboratory Job Number: HS18071462				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 131062, 131070, 131099, 131102, R321053, R321054				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		X			2
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports	
Laboratory Name: ALS Laboratory Group	LRC Date: 08/08/2018
Project Name: Exide Parkwood Blvd 130208606	Laboratory Job Number: HS18071462
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 131062, 131070, 131099, 131102, R321053, R321054

ER#[5]	Description
1	Batch 131099, Metals by Method SW6020, Sample HS18080003-02 MS was performed on an unrelated sample.
2	Batch 131099, Metals by Method SW6020, Sample HS18080003-02 PDS was performed on an unrelated sample.

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
Work Order: HS18071462

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18071462-01	2018-PB-8 (2-3)	Soil		30-Jul-2018 11:30	31-Jul-2018 08:40	☐
HS18071462-02	2018-PB-8 (4-5)	Soil		30-Jul-2018 11:32	31-Jul-2018 08:40	☐
HS18071462-03	2018-PB-8 (6-7)	Soil		30-Jul-2018 11:34	31-Jul-2018 08:40	☐
HS18071462-04	2018-PB-8	Soil		30-Jul-2018 11:36	31-Jul-2018 08:40	☐
HS18071462-05	2018-PB-6 (1-2)	Soil		30-Jul-2018 12:18	31-Jul-2018 08:40	☐
HS18071462-06	2018-PB-6 (3-4)	Soil		30-Jul-2018 12:20	31-Jul-2018 08:40	☐
HS18071462-07	2018-PB-6 (5-6)	Soil		30-Jul-2018 12:22	31-Jul-2018 08:40	☐
HS18071462-08	2018-PB-6	Soil		30-Jul-2018 12:24	31-Jul-2018 08:40	☐
HS18071462-09	2018-PB-14 (2-3)	Soil		30-Jul-2018 13:05	31-Jul-2018 08:40	☐
HS18071462-10	2018-PB-14 (4-5)	Soil		30-Jul-2018 13:06	31-Jul-2018 08:40	☐
HS18071462-11	2018-PB-14 (5-6)	Soil		30-Jul-2018 13:08	31-Jul-2018 08:40	☐
HS18071462-12	2018-PB-14	Soil		30-Jul-2018 13:10	31-Jul-2018 08:40	☐
HS18071462-13	2018-PB-15 (2-3)	Soil		30-Jul-2018 13:54	31-Jul-2018 08:40	☐
HS18071462-14	2018-PB-15 (3-4)	Soil		30-Jul-2018 13:56	31-Jul-2018 08:40	☐
HS18071462-15	2018-PB-15 (5-6)	Soil		30-Jul-2018 13:58	31-Jul-2018 08:40	☐
HS18071462-16	2018-PB-15	Soil		30-Jul-2018 14:00	31-Jul-2018 08:40	☐
HS18071462-17	2018-PB-4 (1-2)	Soil		30-Jul-2018 14:45	31-Jul-2018 08:40	☐
HS18071462-18	2018-PB-4 (3-4)	Soil		30-Jul-2018 14:46	31-Jul-2018 08:40	☐
HS18071462-19	2018-PB-4 (4-5)	Soil		30-Jul-2018 14:48	31-Jul-2018 08:40	☐
HS18071462-20	2018-PB-4	Soil		30-Jul-2018 14:50	31-Jul-2018 08:40	☐
HS18071462-21	2018-PB-9 (0-1)	Soil		30-Jul-2018 15:52	31-Jul-2018 08:40	☐
HS18071462-22	2018-PB-9 (1-2)	Soil		30-Jul-2018 15:54	31-Jul-2018 08:40	☐
HS18071462-23	2018-PB-9 (6-7)	Soil		30-Jul-2018 15:56	31-Jul-2018 08:40	☐
HS18071462-24	2018-PB-9	Soil		30-Jul-2018 16:00	31-Jul-2018 08:40	☐
HS18071462-25	2018-PB-17 (2-3)	Soil		30-Jul-2018 16:20	31-Jul-2018 08:40	☐
HS18071462-26	2018-PB-17 (3-4)	Soil		30-Jul-2018 16:22	31-Jul-2018 08:40	☐
HS18071462-27	2018-PB-17 (5-6)	Soil		30-Jul-2018 16:24	31-Jul-2018 08:40	☐

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
Work Order: HS18071462

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18071462-28	2018-PB-17	Soil		30-Jul-2018 16:26	31-Jul-2018 08:40	☐
HS18071462-29	2018-PB-10 (3-4)	Soil		30-Jul-2018 17:14	31-Jul-2018 08:40	☐
HS18071462-30	2018-PB-10 (4-5)	Soil		30-Jul-2018 17:16	31-Jul-2018 08:40	☐
HS18071462-31	2018-PB-10 (6-7)	Soil		30-Jul-2018 17:18	31-Jul-2018 08:40	☐
HS18071462-32	2018-PB-10	Soil		30-Jul-2018 17:20	31-Jul-2018 08:40	☐
HS18071462-33	DUP-01	Soil		30-Jul-2018 00:00	31-Jul-2018 08:40	☐
HS18071462-34	DUP-02	Soil		30-Jul-2018 00:00	31-Jul-2018 08:40	☐

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
Sample ID: 2018-PB-8 (2-3)
Collection Date: 30-Jul-2018 11:30

ANALYTICAL REPORT
WorkOrder:HS18071462
Lab ID:HS18071462-01
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 01-Aug-2018		Analyst: JCJ
Cadmium	**0.433**	J	**0.0305**	**0.565**	**mg/Kg-dry**	1	07-Aug-2018 23:26
Lead	**10.6**		**0.0147**	**0.565**	**mg/Kg-dry**	1	07-Aug-2018 23:26
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**17.6**		**0.0100**	**0.0100**	**wt%**	1	02-Aug-2018 09:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
Sample ID: 2018-PB-8 (4-5)
Collection Date: 30-Jul-2018 11:32

ANALYTICAL REPORT
WorkOrder:HS18071462
Lab ID:HS18071462-02
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 01-Aug-2018		Analyst: JCJ
Cadmium	**0.462**	J	**0.0319**	**0.592**	**mg/Kg-dry**	1	07-Aug-2018 23:28
Lead	**10.7**		**0.0154**	**0.592**	**mg/Kg-dry**	1	07-Aug-2018 23:28
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**22.1**		**0.0100**	**0.0100**	**wt%**	1	02-Aug-2018 09:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
Sample ID: 2018-PB-8 (6-7)
Collection Date: 30-Jul-2018 11:34

ANALYTICAL REPORT
WorkOrder:HS18071462
Lab ID:HS18071462-03
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 01-Aug-2018		Analyst: JCJ
Cadmium	**0.433**	J	**0.0295**	**0.546**	**mg/Kg-dry**	1	07-Aug-2018 23:40
Lead	**9.68**		**0.0142**	**0.546**	**mg/Kg-dry**	1	07-Aug-2018 23:40
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**14.6**		**0.0100**	**0.0100**	**wt%**	1	02-Aug-2018 09:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
Sample ID: 2018-PB-8
Collection Date: 30-Jul-2018 11:36

ANALYTICAL REPORT
WorkOrder:HS18071462
Lab ID:HS18071462-04
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
TCLP METALS BY SW6020A	**Method:SW1311/6020**		Leache:SW1311 / 01-Aug-2018	Prep:SW3010A / 01-Aug-2018			Analyst: JDE
Arsenic	**0.00502**	J	**0.00400**	**0.0500**	**mg/L**	1	03-Aug-2018 13:46
Barium	**1.21**		**0.0190**	**0.200**	**mg/L**	1	03-Aug-2018 13:46
Cadmium	U		0.00200	0.0500	mg/L	1	03-Aug-2018 13:46
Chromium	U		0.00400	0.0500	mg/L	1	03-Aug-2018 13:46
Lead	U		0.00600	0.0500	mg/L	1	03-Aug-2018 13:46
Selenium	U		0.0110	0.0500	mg/L	1	03-Aug-2018 13:46
Silver	U		0.00200	0.0500	mg/L	1	03-Aug-2018 13:46
TCLP MERCURY BY SW7470A	**Method:SW7470**		Leache:SW1311 / 01-Aug-2018	Prep:SW7470 / 01-Aug-2018			Analyst: JBA
Mercury	**0.000186**	J	**0.0000300**	**0.000200**	**mg/L**	1	02-Aug-2018 12:50

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
Sample ID: 2018-PB-6 (1-2)
Collection Date: 30-Jul-2018 12:18

ANALYTICAL REPORT
WorkOrder:HS18071462
Lab ID:HS18071462-05
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 01-Aug-2018		Analyst: JCJ
Cadmium	**0.466**	J	**0.0324**	**0.600**	**mg/Kg-dry**	1	07-Aug-2018 23:42
Lead	**13.0**		**0.0156**	**0.600**	**mg/Kg-dry**	1	07-Aug-2018 23:42
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**20.5**		**0.0100**	**0.0100**	**wt%**	1	02-Aug-2018 09:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
Sample ID: 2018-PB-6 (3-4)
Collection Date: 30-Jul-2018 12:20

ANALYTICAL REPORT
WorkOrder:HS18071462
Lab ID:HS18071462-06
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 01-Aug-2018		Analyst: JCJ
Cadmium	**0.496**	J	**0.0302**	**0.559**	**mg/Kg-dry**	1	07-Aug-2018 23:44
Lead	**10.2**		**0.0145**	**0.559**	**mg/Kg-dry**	1	07-Aug-2018 23:44
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**16.1**		**0.0100**	**0.0100**	**wt%**	1	02-Aug-2018 09:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
Sample ID: 2018-PB-6 (5-6)
Collection Date: 30-Jul-2018 12:22

ANALYTICAL REPORT
WorkOrder:HS18071462
Lab ID:HS18071462-07
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A	**Method:SW6020**				Prep:SW3050A / 01-Aug-2018		Analyst: JCJ
Cadmium	**0.538**	J	**0.0295**	**0.546**	**mg/Kg-dry**	1	07-Aug-2018 23:51
Lead	**10.9**		**0.0142**	**0.546**	**mg/Kg-dry**	1	07-Aug-2018 23:51
MOISTURE	**Method:SW3550**						Analyst: DFF
Percent Moisture	**15.9**		**0.0100**	**0.0100**	**wt%**	1	02-Aug-2018 09:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
Sample ID: 2018-PB-6
Collection Date: 30-Jul-2018 12:24

ANALYTICAL REPORT
WorkOrder:HS18071462
Lab ID:HS18071462-08
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
TCLP METALS BY SW6020A	**Method:SW1311/6020**			Leache:SW1311 / 01-Aug-2018	Prep:SW3010A / 01-Aug-2018		Analyst: JDE
Arsenic	U		0.00400	0.0500	mg/L	1	03-Aug-2018 14:00
Barium	**1.08**		**0.0190**	**0.200**	**mg/L**	1	03-Aug-2018 14:00
Cadmium	**0.00214**	J	**0.00200**	**0.0500**	**mg/L**	1	03-Aug-2018 14:00
Chromium	U		0.00400	0.0500	mg/L	1	03-Aug-2018 14:00
Lead	U		0.00600	0.0500	mg/L	1	03-Aug-2018 14:00
Selenium	U		0.0110	0.0500	mg/L	1	03-Aug-2018 14:00
Silver	U		0.00200	0.0500	mg/L	1	03-Aug-2018 14:00
TCLP MERCURY BY SW7470A	**Method:SW7470**			Leache:SW1311 / 01-Aug-2018	Prep:SW7470 / 01-Aug-2018		Analyst: JBA
Mercury	**0.000173**	J	**0.0000300**	**0.000200**	**mg/L**	1	02-Aug-2018 12:52

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
Sample ID: 2018-PB-14 (2-3)
Collection Date: 30-Jul-2018 13:05

ANALYTICAL REPORT
WorkOrder:HS18071462
Lab ID:HS18071462-09
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 01-Aug-2018		Analyst: JCJ
Cadmium	**0.738**		**0.0307**	**0.568**	**mg/Kg-dry**	1	07-Aug-2018 23:53
Lead	**24.0**		**0.0148**	**0.568**	**mg/Kg-dry**	1	07-Aug-2018 23:53
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**15.9**		**0.0100**	**0.0100**	**wt%**	1	02-Aug-2018 09:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
Sample ID: 2018-PB-14 (4-5)
Collection Date: 30-Jul-2018 13:06

ANALYTICAL REPORT
WorkOrder:HS18071462
Lab ID:HS18071462-10
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 01-Aug-2018		Analyst: JCJ
Cadmium	**0.496**	J	**0.0312**	**0.577**	**mg/Kg-dry**	1	07-Aug-2018 23:55
Lead	**11.6**		**0.0150**	**0.577**	**mg/Kg-dry**	1	07-Aug-2018 23:55
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**18.7**		**0.0100**	**0.0100**	**wt%**	1	02-Aug-2018 09:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
Sample ID: 2018-PB-14 (5-6)
Collection Date: 30-Jul-2018 13:08

ANALYTICAL REPORT
WorkOrder:HS18071462
Lab ID:HS18071462-11
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 01-Aug-2018		Analyst: JCJ
Cadmium	**0.489**	J	**0.0299**	**0.554**	**mg/Kg-dry**	1	07-Aug-2018 23:58
Lead	**10.8**		**0.0144**	**0.554**	**mg/Kg-dry**	1	07-Aug-2018 23:58
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**16.2**		**0.0100**	**0.0100**	**wt%**	1	02-Aug-2018 09:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
Sample ID: 2018-PB-14
Collection Date: 30-Jul-2018 13:10

ANALYTICAL REPORT
WorkOrder:HS18071462
Lab ID:HS18071462-12
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
TCLP METALS BY SW6020A	**Method:SW1311/6020**		Leache:SW1311 / 01-Aug-2018	Prep:SW3010A / 01-Aug-2018			Analyst: JDE
Arsenic	**0.00605**	J	**0.00400**	**0.0500**	**mg/L**	1	03-Aug-2018 14:02
Barium	**1.30**		**0.0190**	**0.200**	**mg/L**	1	03-Aug-2018 14:02
Cadmium	U		0.00200	0.0500	mg/L	1	03-Aug-2018 14:02
Chromium	U		0.00400	0.0500	mg/L	1	03-Aug-2018 14:02
Lead	U		0.00600	0.0500	mg/L	1	03-Aug-2018 14:02
Selenium	U		0.0110	0.0500	mg/L	1	03-Aug-2018 14:02
Silver	U		0.00200	0.0500	mg/L	1	03-Aug-2018 14:02
TCLP MERCURY BY SW7470A	**Method:SW7470**		Leache:SW1311 / 01-Aug-2018	Prep:SW7470 / 01-Aug-2018			Analyst: JBA
Mercury	**0.000171**	J	**0.0000300**	**0.000200**	**mg/L**	1	02-Aug-2018 12:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
Sample ID: 2018-PB-15 (2-3)
Collection Date: 30-Jul-2018 13:54

ANALYTICAL REPORT
WorkOrder:HS18071462
Lab ID:HS18071462-13
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 01-Aug-2018		Analyst: JCJ
Cadmium	**0.412**	J	**0.0314**	**0.582**	**mg/Kg-dry**	1	08-Aug-2018 00:00
Lead	**17.6**		**0.0151**	**0.582**	**mg/Kg-dry**	1	08-Aug-2018 00:00
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**18.2**		**0.0100**	**0.0100**	**wt%**	1	02-Aug-2018 09:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
Sample ID: 2018-PB-15 (3-4)
Collection Date: 30-Jul-2018 13:56

ANALYTICAL REPORT
WorkOrder:HS18071462
Lab ID:HS18071462-14
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 01-Aug-2018		Analyst: JCJ
Cadmium	**1.05**		**0.0326**	**0.604**	**mg/Kg-dry**	1	08-Aug-2018 00:02
Lead	**55.2**		**0.0157**	**0.604**	**mg/Kg-dry**	1	08-Aug-2018 00:02
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**20.8**		**0.0100**	**0.0100**	**wt%**	1	02-Aug-2018 09:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
Sample ID: 2018-PB-15 (5-6)
Collection Date: 30-Jul-2018 13:58

ANALYTICAL REPORT
WorkOrder:HS18071462
Lab ID:HS18071462-15
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 01-Aug-2018		Analyst: JCJ
Cadmium	**0.858**		**0.0307**	**0.568**	**mg/Kg-dry**	1	08-Aug-2018 00:04
Lead	**13.7**		**0.0148**	**0.568**	**mg/Kg-dry**	1	08-Aug-2018 00:04
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**19.3**		**0.0100**	**0.0100**	**wt%**	1	02-Aug-2018 09:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
Sample ID: 2018-PB-15
Collection Date: 30-Jul-2018 14:00

ANALYTICAL REPORT
WorkOrder:HS18071462
Lab ID:HS18071462-16
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
TCLP METALS BY SW6020A	**Method:SW1311/6020**		Leache:SW1311 / 01-Aug-2018	Prep:SW3010A / 01-Aug-2018			Analyst: JDE
Arsenic	**0.00434**	J	**0.00400**	**0.0500**	**mg/L**	1	03-Aug-2018 14:03
Barium	**1.21**		**0.0190**	**0.200**	**mg/L**	1	03-Aug-2018 14:03
Cadmium	**0.00227**	J	**0.00200**	**0.0500**	**mg/L**	1	03-Aug-2018 14:03
Chromium	U		0.00400	0.0500	mg/L	1	03-Aug-2018 14:03
Lead	U		0.00600	0.0500	mg/L	1	03-Aug-2018 14:03
Selenium	U		0.0110	0.0500	mg/L	1	03-Aug-2018 14:03
Silver	U		0.00200	0.0500	mg/L	1	03-Aug-2018 14:03
TCLP MERCURY BY SW7470A	**Method:SW7470**		Leache:SW1311 / 01-Aug-2018	Prep:SW7470 / 01-Aug-2018			Analyst: JBA
Mercury	**0.000171**	J	**0.0000300**	**0.000200**	**mg/L**	1	02-Aug-2018 12:55

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
Sample ID: 2018-PB-4 (1-2)
Collection Date: 30-Jul-2018 14:45

ANALYTICAL REPORT
WorkOrder:HS18071462
Lab ID:HS18071462-17
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 01-Aug-2018		Analyst: JCJ
Cadmium	**0.227**	J	**0.0331**	**0.613**	**mg/Kg-dry**	1	08-Aug-2018 00:07
Lead	**15.6**		**0.0159**	**0.613**	**mg/Kg-dry**	1	08-Aug-2018 00:07
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**24.0**		**0.0100**	**0.0100**	**wt%**	1	02-Aug-2018 09:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
Sample ID: 2018-PB-4 (3-4)
Collection Date: 30-Jul-2018 14:46

ANALYTICAL REPORT
WorkOrder:HS18071462
Lab ID:HS18071462-18
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A	**Method:SW6020**				Prep:SW3050A / 01-Aug-2018		Analyst: JCJ
Cadmium	**0.274**	J	**0.0318**	**0.589**	**mg/Kg-dry**	1	08-Aug-2018 00:09
Lead	**14.6**		**0.0153**	**0.589**	**mg/Kg-dry**	1	08-Aug-2018 00:09
MOISTURE	**Method:SW3550**						Analyst: DFF
Percent Moisture	**19.6**		**0.0100**	**0.0100**	**wt%**	1	02-Aug-2018 09:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
Sample ID: 2018-PB-4 (4-5)
Collection Date: 30-Jul-2018 14:48

ANALYTICAL REPORT
WorkOrder:HS18071462
Lab ID:HS18071462-19
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 01-Aug-2018		Analyst: JCJ
Cadmium	**0.0562**	J	**0.0306**	**0.567**	**mg/Kg-dry**	1	08-Aug-2018 00:11
Lead	**11.4**		**0.0147**	**0.567**	**mg/Kg-dry**	1	08-Aug-2018 00:11
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**19.2**		**0.0100**	**0.0100**	**wt%**	1	02-Aug-2018 09:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
Sample ID: 2018-PB-4
Collection Date: 30-Jul-2018 14:50

ANALYTICAL REPORT
WorkOrder:HS18071462
Lab ID:HS18071462-20
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
TCLP METALS BY SW6020A	**Method:SW1311/6020**		Leache:SW1311 / 01-Aug-2018	Prep:SW3010A / 01-Aug-2018			Analyst: JDE
Arsenic	**0.00516**	J	**0.00400**	**0.0500**	**mg/L**	1	03-Aug-2018 14:05
Barium	**0.362**		**0.0190**	**0.200**	**mg/L**	1	03-Aug-2018 14:05
Cadmium	U		0.00200	0.0500	mg/L	1	03-Aug-2018 14:05
Chromium	U		0.00400	0.0500	mg/L	1	03-Aug-2018 14:05
Lead	U		0.00600	0.0500	mg/L	1	03-Aug-2018 14:05
Selenium	U		0.0110	0.0500	mg/L	1	03-Aug-2018 14:05
Silver	U		0.00200	0.0500	mg/L	1	03-Aug-2018 14:05
TCLP MERCURY BY SW7470A	**Method:SW7470**		Leache:SW1311 / 01-Aug-2018	Prep:SW7470 / 01-Aug-2018			Analyst: JBA
Mercury	**0.000173**	J	**0.0000300**	**0.000200**	**mg/L**	1	02-Aug-2018 12:57

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
Sample ID: 2018-PB-9 (0-1)
Collection Date: 30-Jul-2018 15:52

ANALYTICAL REPORT
WorkOrder:HS18071462
Lab ID:HS18071462-21
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A	**Method:SW6020**			Prep:SW3050A / 02-Aug-2018			Analyst: JCJ
Cadmium	**0.541**	J	**0.0301**	**0.558**	**mg/Kg-dry**	1	07-Aug-2018 15:03
Lead	**28.1**		**0.0145**	**0.558**	**mg/Kg-dry**	1	07-Aug-2018 15:03
MOISTURE	**Method:SW3550**						Analyst: DFF
Percent Moisture	**16.4**		**0.0100**	**0.0100**	**wt%**	1	02-Aug-2018 09:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
Sample ID: 2018-PB-9 (1-2)
Collection Date: 30-Jul-2018 15:54

ANALYTICAL REPORT
WorkOrder:HS18071462
Lab ID:HS18071462-22
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 02-Aug-2018		Analyst: JCJ
Cadmium	**0.406**	J	**0.0321**	**0.594**	**mg/Kg-dry**	1	07-Aug-2018 15:05
Lead	**15.0**		**0.0154**	**0.594**	**mg/Kg-dry**	1	07-Aug-2018 15:05
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**18.3**		**0.0100**	**0.0100**	**wt%**	1	02-Aug-2018 09:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
Sample ID: 2018-PB-9 (6-7)
Collection Date: 30-Jul-2018 15:56

ANALYTICAL REPORT
WorkOrder:HS18071462
Lab ID:HS18071462-23
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 02-Aug-2018		Analyst: JCJ
Cadmium	**0.309**	J	**0.0298**	**0.551**	**mg/Kg-dry**	1	07-Aug-2018 15:07
Lead	**9.04**		**0.0143**	**0.551**	**mg/Kg-dry**	1	07-Aug-2018 15:07
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**13.9**		**0.0100**	**0.0100**	**wt%**	1	02-Aug-2018 09:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
Sample ID: 2018-PB-9
Collection Date: 30-Jul-2018 16:00

ANALYTICAL REPORT
WorkOrder:HS18071462
Lab ID:HS18071462-24
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
TCLP METALS BY SW6020A		**Method:SW1311/6020**	Leache:SW1311 / 01-Aug-2018	Prep:SW3010A / 01-Aug-2018			Analyst: JDE
Arsenic	U		0.00400	0.0500	mg/L	1	03-Aug-2018 14:07
Barium	**0.557**		**0.0190**	**0.200**	**mg/L**	1	03-Aug-2018 14:07
Cadmium	U		0.00200	0.0500	mg/L	1	03-Aug-2018 14:07
Chromium	U		0.00400	0.0500	mg/L	1	03-Aug-2018 14:07
Lead	U		0.00600	0.0500	mg/L	1	03-Aug-2018 14:07
Selenium	U		0.0110	0.0500	mg/L	1	03-Aug-2018 14:07
Silver	U		0.00200	0.0500	mg/L	1	03-Aug-2018 14:07
TCLP MERCURY BY SW7470A		**Method:SW7470**	Leache:SW1311 / 01-Aug-2018	Prep:SW7470 / 01-Aug-2018			Analyst: JBA
Mercury	**0.000160**	J	**0.0000300**	**0.000200**	**mg/L**	1	02-Aug-2018 12:59

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
Sample ID: 2018-PB-17 (2-3)
Collection Date: 30-Jul-2018 16:20

ANALYTICAL REPORT
WorkOrder:HS18071462
Lab ID:HS18071462-25
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 02-Aug-2018		Analyst: JCJ
Cadmium	**0.724**		**0.0298**	**0.552**	**mg/Kg-dry**	1	07-Aug-2018 15:10
Lead	**168**		**0.0144**	**0.552**	**mg/Kg-dry**	1	07-Aug-2018 15:10
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**15.3**		**0.0100**	**0.0100**	**wt%**	1	02-Aug-2018 09:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
Sample ID: 2018-PB-17 (3-4)
Collection Date: 30-Jul-2018 16:22

ANALYTICAL REPORT
WorkOrder:HS18071462
Lab ID:HS18071462-26
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 02-Aug-2018		Analyst: JCJ
Cadmium	**0.979**		**0.0292**	**0.541**	**mg/Kg-dry**	1	07-Aug-2018 15:12
Lead	**245**		**0.281**	**10.8**	**mg/Kg-dry**	20	07-Aug-2018 16:11
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**14.6**		**0.0100**	**0.0100**	**wt%**	1	02-Aug-2018 09:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
Sample ID: 2018-PB-17 (5-6)
Collection Date: 30-Jul-2018 16:24

ANALYTICAL REPORT
WorkOrder:HS18071462
Lab ID:HS18071462-27
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 02-Aug-2018		Analyst: JCJ
Cadmium	**0.291**	J	**0.0300**	**0.556**	**mg/Kg-dry**	1	07-Aug-2018 15:14
Lead	**7.97**		**0.0145**	**0.556**	**mg/Kg-dry**	1	07-Aug-2018 15:14
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**15.4**		**0.0100**	**0.0100**	**wt%**	1	02-Aug-2018 09:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
Sample ID: 2018-PB-17
Collection Date: 30-Jul-2018 16:26

ANALYTICAL REPORT
WorkOrder:HS18071462
Lab ID:HS18071462-28
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
TCLP METALS BY SW6020A	**Method:SW1311/6020**			Leache:SW1311 / 01-Aug-2018	Prep:SW3010A / 01-Aug-2018		Analyst: JDE
Arsenic	U		0.00400	0.0500	mg/L	1	03-Aug-2018 14:09
Barium	**0.738**		**0.0190**	**0.200**	**mg/L**	1	03-Aug-2018 14:09
Cadmium	U		0.00200	0.0500	mg/L	1	03-Aug-2018 14:09
Chromium	U		0.00400	0.0500	mg/L	1	03-Aug-2018 14:09
Lead	U		0.00600	0.0500	mg/L	1	03-Aug-2018 14:09
Selenium	U		0.0110	0.0500	mg/L	1	03-Aug-2018 14:09
Silver	U		0.00200	0.0500	mg/L	1	03-Aug-2018 14:09
TCLP MERCURY BY SW7470A	**Method:SW7470**			Leache:SW1311 / 01-Aug-2018	Prep:SW7470 / 01-Aug-2018		Analyst: JBA
Mercury	**0.000173**	J	**0.0000300**	**0.000200**	**mg/L**	1	02-Aug-2018 13:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
Sample ID: 2018-PB-10 (3-4)
Collection Date: 30-Jul-2018 17:14

ANALYTICAL REPORT
WorkOrder:HS18071462
Lab ID:HS18071462-29
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A	**Method:SW6020**				Prep:SW3050A / 02-Aug-2018		Analyst: JCJ
Cadmium	**0.367**	J	**0.0300**	**0.556**	**mg/Kg-dry**	1	07-Aug-2018 15:33
Lead	**213**		**0.144**	**5.56**	**mg/Kg-dry**	10	07-Aug-2018 16:13
MOISTURE	**Method:SW3550**						Analyst: DFF
Percent Moisture	**15.4**		**0.0100**	**0.0100**	**wt%**	1	02-Aug-2018 09:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
Sample ID: 2018-PB-10 (4-5)
Collection Date: 30-Jul-2018 17:16

ANALYTICAL REPORT
WorkOrder:HS18071462
Lab ID:HS18071462-30
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 02-Aug-2018		Analyst: JCJ
Cadmium	**0.454**	J	**0.0302**	**0.560**	**mg/Kg-dry**	1	07-Aug-2018 15:36
Lead	**24.4**		**0.0146**	**0.560**	**mg/Kg-dry**	1	07-Aug-2018 15:36
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**16.8**		**0.0100**	**0.0100**	**wt%**	1	02-Aug-2018 09:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
Sample ID: 2018-PB-10 (6-7)
Collection Date: 30-Jul-2018 17:18

ANALYTICAL REPORT
WorkOrder:HS18071462
Lab ID:HS18071462-31
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 02-Aug-2018		Analyst: JCJ
Cadmium	**0.419**	J	**0.0316**	**0.586**	**mg/Kg-dry**	1	07-Aug-2018 15:38
Lead	**11.8**		**0.0152**	**0.586**	**mg/Kg-dry**	1	07-Aug-2018 15:38
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**18.1**		**0.0100**	**0.0100**	**wt%**	1	02-Aug-2018 09:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
Sample ID: 2018-PB-10
Collection Date: 30-Jul-2018 17:20

ANALYTICAL REPORT
WorkOrder:HS18071462
Lab ID:HS18071462-32
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
TCLP METALS BY SW6020A	**Method:SW1311/6020**			Leache:SW1311 / 01-Aug-2018	Prep:SW3010A / 01-Aug-2018		Analyst: JDE
Arsenic	U		0.00400	0.0500	mg/L	1	03-Aug-2018 14:15
Barium	**0.568**		**0.0190**	**0.200**	**mg/L**	1	03-Aug-2018 14:15
Cadmium	U		0.00200	0.0500	mg/L	1	03-Aug-2018 14:15
Chromium	U		0.00400	0.0500	mg/L	1	03-Aug-2018 14:15
Lead	U		0.00600	0.0500	mg/L	1	03-Aug-2018 14:15
Selenium	U		0.0110	0.0500	mg/L	1	03-Aug-2018 14:15
Silver	U		0.00200	0.0500	mg/L	1	03-Aug-2018 14:15
TCLP MERCURY BY SW7470A	**Method:SW7470**			Leache:SW1311 / 01-Aug-2018	Prep:SW7470 / 01-Aug-2018		Analyst: JBA
Mercury	**0.000160**	J	**0.0000300**	**0.000200**	**mg/L**	1	02-Aug-2018 13:02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
Sample ID: DUP-01
Collection Date: 30-Jul-2018 00:00

ANALYTICAL REPORT
WorkOrder:HS18071462
Lab ID:HS18071462-33
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 02-Aug-2018		Analyst: JCJ
Cadmium	**0.422**	J	**0.0303**	**0.562**	**mg/Kg-dry**	1	07-Aug-2018 15:40
Lead	**12.5**		**0.0146**	**0.562**	**mg/Kg-dry**	1	07-Aug-2018 15:40
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**17.1**		**0.0100**	**0.0100**	**wt%**	1	02-Aug-2018 09:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
Sample ID: DUP-02
Collection Date: 30-Jul-2018 00:00

ANALYTICAL REPORT
WorkOrder:HS18071462
Lab ID:HS18071462-34
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
TCLP METALS BY SW6020A	**Method:SW1311/6020**		Leache:SW1311 / 01-Aug-2018	Prep:SW3010A / 01-Aug-2018			Analyst: JDE
Arsenic	**0.00718**	J	**0.00400**	**0.0500**	**mg/L**	1	03-Aug-2018 14:17
Barium	**0.816**		**0.0190**	**0.200**	**mg/L**	1	03-Aug-2018 14:17
Cadmium	U		0.00200	0.0500	mg/L	1	03-Aug-2018 14:17
Chromium	U		0.00400	0.0500	mg/L	1	03-Aug-2018 14:17
Lead	U		0.00600	0.0500	mg/L	1	03-Aug-2018 14:17
Selenium	U		0.0110	0.0500	mg/L	1	03-Aug-2018 14:17
Silver	U		0.00200	0.0500	mg/L	1	03-Aug-2018 14:17
TCLP MERCURY BY SW7470A	**Method:SW7470**		Leache:SW1311 / 01-Aug-2018	Prep:SW7470 / 01-Aug-2018			Analyst: JBA
Mercury	**0.000165**	J	**0.0000300**	**0.000200**	**mg/L**	1	02-Aug-2018 13:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
WorkOrder: HS18071462

Batch ID: 131062 **Method:** METALS BY SW6020A **Prep:** 3050_I_LOW

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18071462-01	1	0.5367	50 (mL)	93.16
HS18071462-02	1	0.5425	50 (mL)	92.17
HS18071462-03	1	0.5364	50 (mL)	93.21
HS18071462-05	1	0.5245	50 (mL)	95.33
HS18071462-06	1	0.5333	50 (mL)	93.76
HS18071462-07	1	0.5442	50 (mL)	91.88
HS18071462-09	1	0.5237	50 (mL)	95.47
HS18071462-10	1	0.5329	50 (mL)	93.83
HS18071462-11	1	0.5386	50 (mL)	92.83
HS18071462-13	1	0.5252	50 (mL)	95.2
HS18071462-14	1	0.5225	50 (mL)	95.69
HS18071462-15	1	0.5457	50 (mL)	91.63
HS18071462-17	1	0.5365	50 (mL)	93.2
HS18071462-18	1	0.5281	50 (mL)	94.68
HS18071462-19	1	0.5457	50 (mL)	91.63

Batch ID: 131070 **Method:** TCLP METALS BY SW6020A **Prep:** 3010A_TCLP

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18071462-04	1	1	10 (mL)	10
HS18071462-08	1	1	10 (mL)	10
HS18071462-12	1	1	10 (mL)	10
HS18071462-16	1	1	10 (mL)	10
HS18071462-20	1	1	10 (mL)	10
HS18071462-24	1	1	10 (mL)	10
HS18071462-28	1	1	10 (mL)	10
HS18071462-32	1	1	10 (mL)	10
HS18071462-34	1	1	10 (mL)	10

Batch ID: 131099 **Method:** METALS BY SW6020A **Prep:** 3050_I_LOW

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18071462-21	1	0.5359	50 (mL)	93.3
HS18071462-22	1	0.515	50 (mL)	97.09
HS18071462-23	1	0.527	50 (mL)	94.88
HS18071462-25	1	0.5346	50 (mL)	93.53
HS18071462-26	1	0.5412	50 (mL)	92.39
HS18071462-27	1	0.5315	50 (mL)	94.07
HS18071462-29	1	0.5318	50 (mL)	94.02
HS18071462-30	1	0.5367	50 (mL)	93.16
HS18071462-31	1	0.5211	50 (mL)	95.95
HS18071462-33	1	0.5368	50 (mL)	93.14

WEIGHT LOG

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
WorkOrder: HS18071462

Batch ID: 131102 **Method:** TCLP MERCURY BY SW7470A **Prep:** 1311_HGPR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18071462-04	1	10 (mL)	10 (mL)	1
HS18071462-08	1	10 (mL)	10 (mL)	1
HS18071462-12	1	10 (mL)	10 (mL)	1
HS18071462-16	1	10 (mL)	10 (mL)	1
HS18071462-20	1	10 (mL)	10 (mL)	1
HS18071462-24	1	10 (mL)	10 (mL)	1
HS18071462-28	1	10 (mL)	10 (mL)	1
HS18071462-32	1	10 (mL)	10 (mL)	1
HS18071462-34	1	10 (mL)	10 (mL)	1

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
WorkOrder: HS18071462

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 131062	**Test Name :** METALS BY SW6020A			**Matrix:** Soil		
HS18071462-01	2018-PB-8 (2-3)	30 Jul 2018 11:30		01 Aug 2018 10:06	07 Aug 2018 23:26	1
HS18071462-02	2018-PB-8 (4-5)	30 Jul 2018 11:32		01 Aug 2018 10:06	07 Aug 2018 23:28	1
HS18071462-03	2018-PB-8 (6-7)	30 Jul 2018 11:34		01 Aug 2018 10:06	07 Aug 2018 23:40	1
HS18071462-05	2018-PB-6 (1-2)	30 Jul 2018 12:18		01 Aug 2018 10:06	07 Aug 2018 23:42	1
HS18071462-06	2018-PB-6 (3-4)	30 Jul 2018 12:20		01 Aug 2018 10:06	07 Aug 2018 23:44	1
HS18071462-07	2018-PB-6 (5-6)	30 Jul 2018 12:22		01 Aug 2018 10:06	07 Aug 2018 23:51	1
HS18071462-09	2018-PB-14 (2-3)	30 Jul 2018 13:05		01 Aug 2018 10:06	07 Aug 2018 23:53	1
HS18071462-10	2018-PB-14 (4-5)	30 Jul 2018 13:06		01 Aug 2018 10:06	07 Aug 2018 23:55	1
HS18071462-11	2018-PB-14 (5-6)	30 Jul 2018 13:08		01 Aug 2018 10:06	07 Aug 2018 23:58	1
HS18071462-13	2018-PB-15 (2-3)	30 Jul 2018 13:54		01 Aug 2018 10:06	08 Aug 2018 00:00	1
HS18071462-14	2018-PB-15 (3-4)	30 Jul 2018 13:56		01 Aug 2018 10:06	08 Aug 2018 00:02	1
HS18071462-15	2018-PB-15 (5-6)	30 Jul 2018 13:58		01 Aug 2018 10:06	08 Aug 2018 00:04	1
HS18071462-17	2018-PB-4 (1-2)	30 Jul 2018 14:45		01 Aug 2018 10:06	08 Aug 2018 00:07	1
HS18071462-18	2018-PB-4 (3-4)	30 Jul 2018 14:46		01 Aug 2018 10:06	08 Aug 2018 00:09	1
HS18071462-19	2018-PB-4 (4-5)	30 Jul 2018 14:48		01 Aug 2018 10:06	08 Aug 2018 00:11	1
Batch ID 131070	**Test Name :** TCLP METALS BY SW6020A			**Matrix:** Soil		
HS18071462-04	2018-PB-8	30 Jul 2018 11:36	01 Aug 2018 08:00	01 Aug 2018 12:41	03 Aug 2018 13:46	1
HS18071462-08	2018-PB-6	30 Jul 2018 12:24	01 Aug 2018 08:00	01 Aug 2018 12:41	03 Aug 2018 14:00	1
HS18071462-12	2018-PB-14	30 Jul 2018 13:10	01 Aug 2018 08:00	01 Aug 2018 12:41	03 Aug 2018 14:02	1
HS18071462-16	2018-PB-15	30 Jul 2018 14:00	01 Aug 2018 08:00	01 Aug 2018 12:41	03 Aug 2018 14:03	1
HS18071462-20	2018-PB-4	30 Jul 2018 14:50	01 Aug 2018 08:00	01 Aug 2018 12:41	03 Aug 2018 14:05	1
HS18071462-24	2018-PB-9	30 Jul 2018 16:00	01 Aug 2018 08:00	01 Aug 2018 12:41	03 Aug 2018 14:07	1
HS18071462-28	2018-PB-17	30 Jul 2018 16:26	01 Aug 2018 08:00	01 Aug 2018 12:41	03 Aug 2018 14:09	1
HS18071462-32	2018-PB-10	30 Jul 2018 17:20	01 Aug 2018 08:00	01 Aug 2018 12:41	03 Aug 2018 14:15	1
HS18071462-34	DUP-02	30 Jul 2018 00:00	01 Aug 2018 08:00	01 Aug 2018 12:41	03 Aug 2018 14:17	1
Batch ID 131099	**Test Name :** METALS BY SW6020A			**Matrix:** Soil		
HS18071462-21	2018-PB-9 (0-1)	30 Jul 2018 15:52		02 Aug 2018 07:50	07 Aug 2018 15:03	1
HS18071462-22	2018-PB-9 (1-2)	30 Jul 2018 15:54		02 Aug 2018 07:50	07 Aug 2018 15:05	1
HS18071462-23	2018-PB-9 (6-7)	30 Jul 2018 15:56		02 Aug 2018 07:50	07 Aug 2018 15:07	1
HS18071462-25	2018-PB-17 (2-3)	30 Jul 2018 16:20		02 Aug 2018 07:50	07 Aug 2018 15:10	1
HS18071462-26	2018-PB-17 (3-4)	30 Jul 2018 16:22		02 Aug 2018 07:50	07 Aug 2018 16:11	20
HS18071462-26	2018-PB-17 (3-4)	30 Jul 2018 16:22		02 Aug 2018 07:50	07 Aug 2018 15:12	1
HS18071462-27	2018-PB-17 (5-6)	30 Jul 2018 16:24		02 Aug 2018 07:50	07 Aug 2018 15:14	1
HS18071462-29	2018-PB-10 (3-4)	30 Jul 2018 17:14		02 Aug 2018 07:50	07 Aug 2018 16:13	10
HS18071462-29	2018-PB-10 (3-4)	30 Jul 2018 17:14		02 Aug 2018 07:50	07 Aug 2018 15:33	1
HS18071462-30	2018-PB-10 (4-5)	30 Jul 2018 17:16		02 Aug 2018 07:50	07 Aug 2018 15:36	1
HS18071462-31	2018-PB-10 (6-7)	30 Jul 2018 17:18		02 Aug 2018 07:50	07 Aug 2018 15:38	1
HS18071462-33	DUP-01	30 Jul 2018 00:00		02 Aug 2018 07:50	07 Aug 2018 15:40	1

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
WorkOrder: HS18071462

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 131102	**Test Name :** TCLP MERCURY BY SW7470A			**Matrix:** Soil		
HS18071462-04	2018-PB-8	30 Jul 2018 11:36	01 Aug 2018 08:00	01 Aug 2018 12:57	02 Aug 2018 12:50	1
HS18071462-08	2018-PB-6	30 Jul 2018 12:24	01 Aug 2018 08:00	01 Aug 2018 12:57	02 Aug 2018 12:52	1
HS18071462-12	2018-PB-14	30 Jul 2018 13:10	01 Aug 2018 08:00	01 Aug 2018 12:57	02 Aug 2018 12:53	1
HS18071462-16	2018-PB-15	30 Jul 2018 14:00	01 Aug 2018 08:00	01 Aug 2018 12:57	02 Aug 2018 12:55	1
HS18071462-20	2018-PB-4	30 Jul 2018 14:50	01 Aug 2018 08:00	01 Aug 2018 12:57	02 Aug 2018 12:57	1
HS18071462-24	2018-PB-9	30 Jul 2018 16:00	01 Aug 2018 08:00	01 Aug 2018 12:57	02 Aug 2018 12:59	1
HS18071462-28	2018-PB-17	30 Jul 2018 16:26	01 Aug 2018 08:00	01 Aug 2018 12:57	02 Aug 2018 13:00	1
HS18071462-32	2018-PB-10	30 Jul 2018 17:20	01 Aug 2018 08:00	01 Aug 2018 12:57	02 Aug 2018 13:02	1
HS18071462-34	DUP-02	30 Jul 2018 00:00	01 Aug 2018 08:00	01 Aug 2018 12:57	02 Aug 2018 13:04	1
Batch ID R321053	**Test Name :** MOISTURE			**Matrix:** Soil		
HS18071462-01	2018-PB-8 (2-3)	30 Jul 2018 11:30			02 Aug 2018 09:37	1
HS18071462-02	2018-PB-8 (4-5)	30 Jul 2018 11:32			02 Aug 2018 09:37	1
HS18071462-03	2018-PB-8 (6-7)	30 Jul 2018 11:34			02 Aug 2018 09:37	1
HS18071462-05	2018-PB-6 (1-2)	30 Jul 2018 12:18			02 Aug 2018 09:37	1
HS18071462-06	2018-PB-6 (3-4)	30 Jul 2018 12:20			02 Aug 2018 09:37	1
HS18071462-07	2018-PB-6 (5-6)	30 Jul 2018 12:22			02 Aug 2018 09:37	1
HS18071462-09	2018-PB-14 (2-3)	30 Jul 2018 13:05			02 Aug 2018 09:37	1
HS18071462-10	2018-PB-14 (4-5)	30 Jul 2018 13:06			02 Aug 2018 09:37	1
HS18071462-11	2018-PB-14 (5-6)	30 Jul 2018 13:08			02 Aug 2018 09:37	1
HS18071462-13	2018-PB-15 (2-3)	30 Jul 2018 13:54			02 Aug 2018 09:37	1
HS18071462-14	2018-PB-15 (3-4)	30 Jul 2018 13:56			02 Aug 2018 09:37	1
HS18071462-15	2018-PB-15 (5-6)	30 Jul 2018 13:58			02 Aug 2018 09:37	1
HS18071462-17	2018-PB-4 (1-2)	30 Jul 2018 14:45			02 Aug 2018 09:37	1
HS18071462-18	2018-PB-4 (3-4)	30 Jul 2018 14:46			02 Aug 2018 09:37	1
Batch ID R321054	**Test Name :** MOISTURE			**Matrix:** Soil		
HS18071462-19	2018-PB-4 (4-5)	30 Jul 2018 14:48			02 Aug 2018 09:40	1
HS18071462-21	2018-PB-9 (0-1)	30 Jul 2018 15:52			02 Aug 2018 09:40	1
HS18071462-22	2018-PB-9 (1-2)	30 Jul 2018 15:54			02 Aug 2018 09:40	1
HS18071462-23	2018-PB-9 (6-7)	30 Jul 2018 15:56			02 Aug 2018 09:40	1
HS18071462-25	2018-PB-17 (2-3)	30 Jul 2018 16:20			02 Aug 2018 09:40	1
HS18071462-26	2018-PB-17 (3-4)	30 Jul 2018 16:22			02 Aug 2018 09:40	1
HS18071462-27	2018-PB-17 (5-6)	30 Jul 2018 16:24			02 Aug 2018 09:40	1
HS18071462-29	2018-PB-10 (3-4)	30 Jul 2018 17:14			02 Aug 2018 09:40	1
HS18071462-30	2018-PB-10 (4-5)	30 Jul 2018 17:16			02 Aug 2018 09:40	1
HS18071462-31	2018-PB-10 (6-7)	30 Jul 2018 17:18			02 Aug 2018 09:40	1
HS18071462-33	DUP-01	30 Jul 2018 00:00			02 Aug 2018 09:40	1

WorkOrder: HS18071462
InstrumentID: HG03
Test Code: 1311_HG
Test Number: SW7470
Test Name: TCLP Mercury by SW7470A

METHOD DETECTION / REPORTING LIMITS

Matrix: Leachate **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Mercury	7439-97-6	0.000100	0.0000940	0.0000300	0.000200

WorkOrder: HS18071462
InstrumentID: ICPMS05
Test Code: 1311_METALS_HS
Test Number: SW1311/6020
Test Name: TCLP Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Leachate **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Arsenic	7440-38-2	0.00100	0.00103	0.000400	0.00500
A	Barium	7440-39-3	0.00250	0.00287	0.00190	0.0200
A	Cadmium	7440-43-9	0.00100	0.000999	0.000200	0.00500
A	Chromium	7440-47-3	0.00100	0.000863	0.000400	0.00500
A	Lead	7439-92-1	0.00100	0.000964	0.000600	0.00500
A	Selenium	7782-49-2	0.00100	0.000936	0.00110	0.00500
A	Selenium	7782-49-2	0.00200	0.00203	0.00110	0.00500
A	Silver	7440-22-4	0.00100	0.000984	0.000200	0.00500

WorkOrder: HS18071462
InstrumentID: ICPMS04
Test Code: ICP_S_Low
Test Number: SW6020
Test Name: Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Solid **Units:** mg/Kg

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Cadmium	7440-43-9	0.100	0.0982	0.0270	0.500
A	Lead	7439-92-1	0.100	0.0922	0.0130	0.500

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
WorkOrder: HS18071462

QC BATCH REPORT

Batch ID: 131062 **Instrument: ICPMS04** **Method: SW6020**

MBLK Sample ID: **MBLK-131062** Units: **mg/Kg** Analysis Date: **07-Aug-2018 23:06**
Client ID: Run ID: **ICPMS04_321246** SeqNo: **4683538** PrepDate: **01-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cadmium	U	0.500								
Lead	U	0.500								

LCS Sample ID: **LCS-131062** Units: **mg/Kg** Analysis Date: **07-Aug-2018 23:08**
Client ID: Run ID: **ICPMS04_321246** SeqNo: **4683539** PrepDate: **01-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cadmium	9.857	0.500	10	0	98.6	80 - 120				
Lead	10.03	0.500	10	0	100	80 - 120				

MS Sample ID: **HS18071462-02MS** Units: **mg/Kg** Analysis Date: **07-Aug-2018 23:33**
Client ID: **2018-PB-8 (4-5)** Run ID: **ICPMS04_321246** SeqNo: **4683550** PrepDate: **01-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cadmium	9.018	0.464	9.283	0.3598	93.3	75 - 125				
Lead	17.4	0.464	9.283	8.298	98.1	75 - 125				

MSD Sample ID: **HS18071462-02MSD** Units: **mg/Kg** Analysis Date: **07-Aug-2018 23:35**
Client ID: **2018-PB-8 (4-5)** Run ID: **ICPMS04_321246** SeqNo: **4683551** PrepDate: **01-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cadmium	8.784	0.459	9.178	0.3598	91.8	75 - 125	9.018	2.63	20	
Lead	17.84	0.459	9.178	8.298	104	75 - 125	17.4	2.46	20	

PDS Sample ID: **HS18071462-02PDS** Units: **mg/Kg** Analysis Date: **07-Aug-2018 23:37**
Client ID: **2018-PB-8 (4-5)** Run ID: **ICPMS04_321246** SeqNo: **4683552** PrepDate: **01-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cadmium	9.315	0.461	9.217	0.3598	97.2	75 - 125				
Lead	17.11	0.461	9.217	8.298	95.6	75 - 125				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
WorkOrder: HS18071462

QC BATCH REPORT

Batch ID: 131062 **Instrument: ICPMS04** **Method: SW6020**

SD Sample ID: **HS18071462-02SD** Units: **mg/Kg** Analysis Date: **07-Aug-2018 23:31**
Client ID: **2018-PB-8 (4-5)** Run ID: **ICPMS04_321246** SeqNo: **4683549** PrepDate: **01-Aug-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Cadmium	0.3408	2.30					0.3598	0	10	J
Lead	8.046	2.30					8.298	3.04	10	

The following samples were analyzed in this batch:

HS18071462-01	HS18071462-02	HS18071462-03	HS18071462-05
HS18071462-06	HS18071462-07	HS18071462-09	HS18071462-10
HS18071462-11	HS18071462-13	HS18071462-14	HS18071462-15
HS18071462-17	HS18071462-18	HS18071462-19	

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
WorkOrder: HS18071462

QC BATCH REPORT

Batch ID: 131070 **Instrument: ICPMS05** **Method: SW1311/6020**

MBLK Sample ID: **MBLKT1-131070** Units: **mg/L** Analysis Date: **03-Aug-2018 13:38**
Client ID: Run ID: **ICPMS05_321071** SeqNo: **4678793** PrepDate: **01-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	U	0.0500								
Barium	U	0.200								
Cadmium	U	0.0500								
Chromium	U	0.0500								
Lead	U	0.0500								
Selenium	U	0.0500								
Silver	U	0.0500								

MBLK Sample ID: **MBLK-131070** Units: **mg/L** Analysis Date: **03-Aug-2018 13:40**
Client ID: Run ID: **ICPMS05_321071** SeqNo: **4678794** PrepDate: **01-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	U	0.00500								
Barium	U	0.0200								
Cadmium	U	0.00500								
Chromium	U	0.00500								
Lead	U	0.00500								
Selenium	U	0.00500								
Silver	U	0.00500								

LCS Sample ID: **LCS-131070** Units: **mg/L** Analysis Date: **03-Aug-2018 13:42**
Client ID: Run ID: **ICPMS05_321071** SeqNo: **4678795** PrepDate: **01-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05085	0.00500	0.05	0	102	80 - 120				
Barium	0.04946	0.0200	0.05	0	98.9	80 - 120				
Cadmium	0.05157	0.00500	0.05	0	103	80 - 120				
Chromium	0.05344	0.00500	0.05	0	107	80 - 120				
Lead	0.05313	0.00500	0.05	0	106	80 - 120				
Selenium	0.05045	0.00500	0.05	0	101	80 - 120				
Silver	0.04815	0.00500	0.05	0	96.3	80 - 120				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
WorkOrder: HS18071462

QC BATCH REPORT

Batch ID: 131070 **Instrument: ICPMS05** **Method: SW1311/6020**

MS Sample ID: **HS18071462-04MS** Units: **mg/L** Analysis Date: **03-Aug-2018 13:54**
Client ID: **2018-PB-8** Run ID: **ICPMS05_321071** SeqNo: **4678801** PrepDate: **01-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.4867	0.0500	0.5	0.00502	96.3	80 - 120				
Barium	1.69	0.200	0.5	1.206	96.8	80 - 120				
Cadmium	0.4783	0.0500	0.5	0.00136	95.4	80 - 120				
Chromium	0.4901	0.0500	0.5	-0.00053	98.1	80 - 120				
Lead	0.4921	0.0500	0.5	0.00041	98.3	80 - 120				
Selenium	0.4689	0.0500	0.5	-0.0015	94.1	80 - 120				
Silver	0.4551	0.0500	0.5	0.00009	91.0	80 - 120				

MSD Sample ID: **HS18071462-04MSD** Units: **mg/L** Analysis Date: **03-Aug-2018 13:56**
Client ID: **2018-PB-8** Run ID: **ICPMS05_321071** SeqNo: **4678802** PrepDate: **01-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.4819	0.0500	0.5	0.00502	95.4	80 - 120	0.4867	0.997	20	
Barium	1.67	0.200	0.5	1.206	92.8	80 - 120	1.69	1.19	20	
Cadmium	0.467	0.0500	0.5	0.00136	93.1	80 - 120	0.4783	2.37	20	
Chromium	0.4814	0.0500	0.5	-0.00053	96.4	80 - 120	0.4901	1.79	20	
Lead	0.4827	0.0500	0.5	0.00041	96.5	80 - 120	0.4921	1.93	20	
Selenium	0.472	0.0500	0.5	-0.0015	94.7	80 - 120	0.4689	0.657	20	
Silver	0.4475	0.0500	0.5	0.00009	89.5	80 - 120	0.4551	1.68	20	

PDS Sample ID: **HS18071462-04PDS** Units: **mg/L** Analysis Date: **03-Aug-2018 13:58**
Client ID: **2018-PB-8** Run ID: **ICPMS05_321071** SeqNo: **4678803** PrepDate: **01-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	1.05	0.0500	1	0.00502	104	75 - 125				
Barium	2.165	0.200	1	1.206	95.9	75 - 125				
Cadmium	1.001	0.0500	1	0.00136	100.0	75 - 125				
Chromium	1.075	0.0500	1	-0.00053	108	75 - 125				
Lead	1.083	0.0500	1	0.00041	108	75 - 125				
Selenium	1.035	0.0500	1	-0.0015	104	75 - 125				
Silver	1.069	0.0500	1	0.00009	107	75 - 125				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
WorkOrder: HS18071462

QC BATCH REPORT

Batch ID: 131070 **Instrument: ICPMS05** **Method: SW1311/6020**

SD Sample ID: **HS18071462-04SD** Units: **mg/L** Analysis Date: **03-Aug-2018 13:52**
Client ID: **2018-PB-8** Run ID: **ICPMS05_321071** SeqNo: **4678800** PrepDate: **01-Aug-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Arsenic	U	0.250					0.00502	0	10	
Barium	1.241	1.00					1.206	2.86	10	
Cadmium	U	0.250					0.00136	0	10	
Chromium	U	0.250					-0.00053	0	10	
Lead	U	0.250					0.00041	0	10	
Selenium	U	0.250					-0.0015	0	10	
Silver	U	0.250					0.00009	0	10	

The following samples were analyzed in this batch:

HS18071462-04	HS18071462-08	HS18071462-12	HS18071462-16
HS18071462-20	HS18071462-24	HS18071462-28	HS18071462-32
HS18071462-34			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
WorkOrder: HS18071462

QC BATCH REPORT

Batch ID: 131099 **Instrument: ICPMS05** **Method: SW6020**

MBLK Sample ID: **MBLK-131099** Units: **mg/Kg** Analysis Date: **03-Aug-2018 14:55**
Client ID: Run ID: **ICPMS05_321071** SeqNo: **4678975** PrepDate: **02-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cadmium	U	0.500								
Lead	U	0.500								

LCS Sample ID: **LCS-131099** Units: **mg/Kg** Analysis Date: **03-Aug-2018 14:57**
Client ID: Run ID: **ICPMS05_321071** SeqNo: **4678976** PrepDate: **02-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cadmium	10.15	0.500	10	0	101	80 - 120				
Lead	10.31	0.500	10	0	103	80 - 120				

MS Sample ID: **HS18080003-02MS** Units: **mg/Kg** Analysis Date: **03-Aug-2018 15:20**
Client ID: Run ID: **ICPMS05_321071** SeqNo: **4678987** PrepDate: **02-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cadmium	8.865	0.460	9.191	0.1486	94.8	75 - 125				

MS Sample ID: **HS18080003-02MS** Units: **mg/Kg** Analysis Date: **03-Aug-2018 23:38**
Client ID: Run ID: **ICPMS05_321071** SeqNo: **4679408** PrepDate: **02-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	146.4	0.460	9.191	154.7	-90.5	75 - 125				SO

MSD Sample ID: **HS18080003-02MSD** Units: **mg/Kg** Analysis Date: **03-Aug-2018 15:22**
Client ID: Run ID: **ICPMS05_321071** SeqNo: **4678988** PrepDate: **02-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cadmium	9.123	0.473	9.457	0.1486	94.9	75 - 125	8.865	2.87	20	

MSD Sample ID: **HS18080003-02MSD** Units: **mg/Kg** Analysis Date: **03-Aug-2018 23:40**
Client ID: Run ID: **ICPMS05_321071** SeqNo: **4679409** PrepDate: **02-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	163.3	0.473	9.457	154.7	90.4	75 - 125	146.4	10.9	20	O

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
WorkOrder: HS18071462

QC BATCH REPORT

Batch ID: 131099 **Instrument: ICPMS05** **Method: SW6020**

PDS Sample ID: **HS18080003-02PDS** Units: **mg/Kg** Analysis Date: **03-Aug-2018 15:24**
Client ID: Run ID: **ICPMS05_321071** SeqNo: **4678989** PrepDate: **02-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cadmium	8.997	0.473	9.455	0.1486	93.6	75 - 125				

PDS Sample ID: **HS18080003-02PDS** Units: **mg/Kg** Analysis Date: **03-Aug-2018 23:42**
Client ID: Run ID: **ICPMS05_321071** SeqNo: **4679410** PrepDate: **02-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	159.8	0.473	9.455	154.7	53.3	75 - 125				SO

SD Sample ID: **HS18080003-02SD** Units: **mg/Kg** Analysis Date: **03-Aug-2018 15:14**
Client ID: Run ID: **ICPMS05_321071** SeqNo: **4678984** PrepDate: **02-Aug-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Cadmium	0.1609	2.36					0.1486	0	10	J
Lead	168	2.36					154.7	8.59	10	

The following samples were analyzed in this batch:

HS18071462-21	HS18071462-22	HS18071462-23	HS18071462-25
HS18071462-26	HS18071462-27	HS18071462-29	HS18071462-30
HS18071462-31	HS18071462-33		

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
WorkOrder: HS18071462

QC BATCH REPORT

Batch ID: 131102 **Instrument: HG03** **Method: SW7470**

MBLK Sample ID: **GBLKT3-131102** Units: **mg/L** Analysis Date: **02-Aug-2018 12:23**
Client ID: Run ID: **HG03_321014** SeqNo: **4676964** PrepDate: **01-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	U	0.000200								

MBLK Sample ID: **MBLK-131102** Units: **mg/L** Analysis Date: **02-Aug-2018 12:24**
Client ID: Run ID: **HG03_321014** SeqNo: **4676965** PrepDate: **01-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	U	0.000200								

MBLK Sample ID: **GBLKT2-131102** Units: **mg/L** Analysis Date: **02-Aug-2018 12:21**
Client ID: Run ID: **HG03_321014** SeqNo: **4676963** PrepDate: **01-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	U	0.000200								

MBLK Sample ID: **GBLKT1-131102** Units: **mg/L** Analysis Date: **02-Aug-2018 12:19**
Client ID: Run ID: **HG03_321014** SeqNo: **4676962** PrepDate: **01-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	U	0.000200								

LCS Sample ID: **LCS-131102** Units: **mg/L** Analysis Date: **02-Aug-2018 12:36**
Client ID: Run ID: **HG03_321014** SeqNo: **4676966** PrepDate: **01-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00446	0.000200	0.005	0	89.2	80 - 120				

MS Sample ID: **HS18071326-01MS** Units: **mg/L** Analysis Date: **02-Aug-2018 12:42**
Client ID: Run ID: **HG03_321014** SeqNo: **4676969** PrepDate: **01-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00516	0.000200	0.005	0.00015	100	75 - 125				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
WorkOrder: HS18071462

QC BATCH REPORT

Batch ID: 131102 **Instrument: HG03** **Method: SW7470**

MSD Sample ID: **HS18071326-01MSD** Units: **mg/L** Analysis Date: **02-Aug-2018 12:43**
Client ID: Run ID: **HG03_321014** SeqNo: **4676970** PrepDate: **01-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00571	0.000200	0.005	0.00015	111	75 - 125	0.00516	10.1	20	

The following samples were analyzed in this batch:

HS18071462-04	HS18071462-08	HS18071462-12	HS18071462-16
HS18071462-20	HS18071462-24	HS18071462-28	HS18071462-32
HS18071462-34			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
WorkOrder: HS18071462

QC BATCH REPORT

Batch ID: R321053 **Instrument: Balance1** **Method: SW3550**

DUP Sample ID: **HS18071462-18DUP** Units: **wt%** Analysis Date: **02-Aug-2018 09:37**
Client ID: **2018-PB-4 (3-4)** Run ID: **Balance1_321053** SeqNo: **4678049** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Percent Moisture	19.7	0.0100					19.6	0.509	20	

The following samples were analyzed in this batch:

HS18071462-01	HS18071462-02	HS18071462-03	HS18071462-05
HS18071462-06	HS18071462-07	HS18071462-09	HS18071462-10
HS18071462-11	HS18071462-13	HS18071462-14	HS18071462-15
HS18071462-17	HS18071462-18		

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
WorkOrder: HS18071462

QC BATCH REPORT

Batch ID: R321054 **Instrument: Balance1** **Method: SW3550**

DUP Sample ID: **HS18080003-05DUP** Units: **wt%** Analysis Date: **02-Aug-2018 09:40**
Client ID: Run ID: **Balance1_321054** SeqNo: **4678067** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Percent Moisture	9.73	0.0100					9.63	1.03	20	

The following samples were analyzed in this batch:

HS18071462-19	HS18071462-21	HS18071462-22	HS18071462-23
HS18071462-25	HS18071462-26	HS18071462-27	HS18071462-29
HS18071462-30	HS18071462-31	HS18071462-33	

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd 130208606
WorkOrder: **HS18071462**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
Date	
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Oklahoma	2017-088	31-Aug-2018
North Carolina	624-2018	31-Dec-2018
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	L2231 Rev 3-30-2018	22-Dec-2018
Kentucky	123043 - 2018	30-Apr-2019

Sample Receipt Checklist

Client Name:	Golder St Louis	Date/Time Received:	**31-Jul-2018 08:40**
Work Order:	HS18071462	Received by:	**RPG**

Checklist completed by: *Nilesh D. Ranchod* eSignature — 31-Jul-2018 Date

Reviewed by: *Dane J. Wacasey* eSignature — 2-Aug-2018 Date

Matrices: **Soil**

Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	24.1C / 23.7C , 0.9C/0.5C UC/C	IR # 11	
Cooler(s)/Kit(s):	43984, 44097 (TCLP)		
Date/Time sample(s) sent to storage:	07/31/2018 1:00pm		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

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Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070

Chain of Custody Form

Page 1 of 4

COC ID: 191198

HS18071462

Golder Associates
Exide Parkwood Blvd

Customer Information		Project Information		ALS Project Manager:	
Purchase Order	130208606	Project Name	130208606 Exide Parkwood Blvd	A	ICP_S_Low (6020 - Total Cd, Pb)
Work Order		Project Number	130208606	B	MOIST_SW3550 (Moisture%)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ICP_TW (6020 - Total Cd, Pb (EB))
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P	D	1311_TCLP RCRA Metals (1311/3010/6020/7470 - TCLP RCRA
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit	E	
				F	
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021	G	
Phone	(314) 984-8800	Phone	(314) 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	2018-PB-8 (2-3)	07/30/18	1130	Soil	None	1	X	X									
2	2018-PB-8 (4-5)		1132			1	X	X									
3	2018-PB-8 (6-7)		1134			1	X	X									
4	2018-PB-8		1136		8	2				X							
5	2018-PB-6 (1-2)		1218		None	1	X	X									
6	2018-PB-6 (3-4)		1220			1	X	X									
7	2018-PB-6 (5-6)		1222			1	X	X									
8	2018-PB-6		1224		8	2				X							
9	2018-PB-14 (2-3)		1305		None	1	X	X									
10	2018-PB-14 (4-5)		1306			1	X	X									

Sampler(s) Please Print & Sign: Emily White Emily White

Shipment Method: FedEx

Required Turnaround Time: (Check Box) ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other

Results Due Date:

Relinquished by: Emily White — Date: 07/30/18 — Time: 1800 — Received by:

Relinquished by: — Date: — Time: — Received by (Laboratory): R Cisa 7/31/18 08:40

Logged by (Laboratory): — Date: — Time: — Checked by (Laboratory):

Notes: Exide Parkwood

Cooler ID	Cooler Temp.
44097	24.1c
43984	0.9c
IR 11	

cf -0-4c

QC Package: (Check One Box Below)
☐ Level II Std QC
☐ Level III Std QC/Raw Date
☐ Level IV SW846/CLP
☐ Other
☒ TRRP Checklist
☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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Chain of Custody Form

Page 2 of 4

COC ID: 191197

HS18071462

Golder Associates
Exide Parkwood Blvd

ALS Project Manager:

Customer Information		Project Information	
Purchase Order	130208606	Project Name	130208606 Exide Parkwood Blvd
Work Order		Project Number	130208606
Company Name	Golder Associates	Bill To Company	Golder Associates
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021
Phone	(314) 984-8800	Phone	(314) 984-8800
Fax		Fax	
e-Mail Address	ewhite@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com

A	ICP_S_Low (6020 - Total Cd, Pb)
B	MOIST_SW3550 (Moisture%)
C	ICP_TW (6020 - Total Cd, Pb (EB))
D	1311_TCLP RCRA Metals (1311/3010/6020/7470 - TCLP RCRA
E	
F	
G	
H	
I	
J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	2018-PB-14 (5-6)	07/30/18	1308	Soil	None	1	X	X									
2	2018-PB-14	"	1310	"	8	2				X							
3	2018-PB-15 (2-3)	"	1324	"	None	1	X	X									
4	2018-PB-15 (3-4)	"	1356	"	"	1	X	X									
5	2018-PB-15 (5-6)	"	1358	"	"	1	X	X									
6	208-PB-15	"	1400	"	8	2				X							
7	2018-PB-4 (1-2)	"	1445	"	None	1	X	X									
8	2018-PB-4 (3-4)	"	1446	"	"	1	X	X									
9	2018-PB-4 (4-5)	"	1448	"	"	1	X	X									
10	2018-PB-4	"	1450	"	8	2				X							

Sampler(s) Please Print & Sign: Emily White Emily White

Shipment Method: FedEx

Required Turnaround Time: (Check Box) ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by: Emily White — Date: 07/30/18 — Time: 1800

Relinquished by: — Date: — Time:

Received by:

Received by (Laboratory): R Cisco 7/31/18 08:40

Logged by (Laboratory): — Date: — Time:

Checked by (Laboratory):

Notes: Exide Parkwood

Cooler ID	Cooler Temp.
44097	24.1c
43984	0.9c
IR 11	cf-0.4c.

QC Package: (Check One Box Below)

☐ Level II Std QC
☐ Level III Std QC/Raw Data
☐ Level IV SW846/CLP
☐ Other _____
☒ TRRP Checklist
☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note:
1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070

Chain of Custody Form

COC ID: 191196

HS18071462

Golder Associates
Exide Parkwood Blvd

, WV

Customer Information		Project Information		ALS Project Manager:	
Purchase Order	130208606	Project Name	130208606 Exide Parkwood Blvd	A	ICP_S_Low (6020 - Total Cd, Pb)
Work Order		Project Number	130208606	B	MOIST_SW3550 (Moisture%)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ICP_TW (6020 - Total Cd, Pb (EB))
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P	D	1311_TCLP RCRA Metals (1311/3010/6020/7470 - TCLP RCRA
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit	E	
				F	
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021	G	
Phone	(314) 984-8800	Phone	(314) 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	2018-PB-9 (0-1)	07/30/18	1552	Soil	None	1	X	X									
2	2018-PB-9 (1-2)		1554			1	X	X									
3	2018-PB-9 (6-7)		1556			1	X	X									
4	2018-PB-9		1600		8	2				X							
5	2018-PB-17 (2-3)		1620		None	1	X	X									
6	2018-PB-17 (3-4)		1622			1	X	X									
7	2018-PB-17 (5-6)		1624			1	X	X									
8	2018-PB-17		1626		8	2				X							
9	2018-PB-10 (3-4)		1714		None	1	X	X									
10	2018-PB-10 (4-5)		1716			1	X	X									

Sampler(s) Please Print & Sign: Emily White

Shipment Method: FedEx

Required Turnaround Time: (Check Box) ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other

Results Due Date:

Relinquished by: Emily White — Date: 07/30/18 — Time: 1800 — Received by:

Relinquished by: — Date: — Time: — Received by (Laboratory): R Cruz 7/31/18 08:40

Logged by (Laboratory): — Date: — Time: — Checked by (Laboratory):

Notes: Exide Parkwood

Cooler ID	Cooler Temp.
44097	24.1c
43984	0-9c
1R11	0-9c

cf -0.4c

QC Package: (Check One Box Below)
☐ Level II Std QC
☐ Level III Std QC/Raw Date
☐ Level IV SW846/CLP
☐ Other
☒ TRRP Checklist
☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

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Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070

Chain of Custody Form

Page 4 of 4

COC ID: 191195

HS18071462

Golder Associates
Exide Parkwood Blvd

Customer Information		Project Information		ALS Project Manager:	
Purchase Order	130208606	Project Name	130208606 Exide Parkwood Blvd	A	ICP_S_Low (6020 - Total Cd, Pb)
Work Order		Project Number	130208606	B	MOIST_SW3550 (Moisture%)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ICP_TW (6020 - Total Cd, Pb (EB))
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P	D	1311_TCLP RCRA Metals (1311/3010/6020/7470 - TCLP RCRA
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit	E	
				F	
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021	G	
Phone	(314) 984-8800	Phone	(314) 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	2018-PB-10 (6-7)	07/30/18	1718	Soil	None	1	X	X									
2	2018-PB-10	"	1720	"	8	2				X							
3	DUP-01	"	"	"	None	1	X	X									
4	DUP-02	"	"	"	8	2				X							
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Emily White Emily White

Shipment Method: FedEx

Required Turnaround Time: (Check Box) ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other

Results Due Date:

Relinquished by: Emily White — Date: 07/30/18 — Time: 1800 — Received by:

Relinquished by: — Date: — Time: — Received by (Laboratory): R Cisco 7/31/18 08-40

Logged by (Laboratory): — Date: — Time: — Checked by (Laboratory):

Notes: Exide Parkwood

Cooler ID	Cooler Temp.
44097	24.1c
43984	0.9c
IR 11	CF -0.4c

QC Package: (Check One Box Below)
☐ Level II Std QC
☐ Level III Std QC/Raw Date
☐ Level IV SW846/CLP
☐ Other
☒ TRRP Checklist
☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

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ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CUSTODY SEAL
Date: 7/30/18
Time: 1800
Name: Ba. Workes
Company: Golder
Seal Broken By:
Date:
FedEx
TRK# 0221 4380 9530 5417
TUE – 31 JUL 10:30A
PRIORITY OVERNIGHT
AB SGRA
77099
TX–US IAH
ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CUSTODY SEAL
Date: 7/30/18
Time: 1800
Name: Ba. Workes
Company: Golder
Seal Broken By:
Date:
FedEx
TRK# 0221 4380 9530 5440
TUE – 31 JUL 10:30A
PRIORITY OVERNIGHT
AB SGRA
77099
TX–US IAH

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

August 09, 2018

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS18080024**

Laboratory Results for: **Exide Parkwood Blvd**

Dear Emily,

ALS Environmental received 46 sample(s) on Aug 01, 2018 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Parkwood Blvd	
WorkOrder:	**HS18080024**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Parkwood Blvd
WorkOrder:	**HS18080024**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data								
Laboratory Name: ALS Laboratory Group			LRC Date: 08/09/2018					
Project Name: Exide Parkwood Blvd			Laboratory Job Number: HS18080024					
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 131100,131131,131175,131201,R321229,R321230					
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]	
R1	OI	**Chain-of-custody (C-O-C)**						
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X					
		Were all departures from standard conditions described in an exception report?	X					
R2	OI	**Sample and quality control (QC) identification**						
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X					
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X					
R3	OI	**Test reports**						
		Were all samples prepared and analyzed within holding times?	X					
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X					
		Were calculations checked by a peer or supervisor?	X					
		Were all analyte identifications checked by a peer or supervisor?	X					
		Were sample detection limits reported for all analytes not detected?	X					
		Were all results for soil and sediment samples reported on a dry weight basis?	X					
		Were % moisture (or solids) reported for all soil and sediment samples?	X					
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X			
		If required for the project, TICs reported?			X			
R4	O	**Surrogate recovery data**						
		Were surrogates added prior to extraction?			X			
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X			
R5	OI	**Test reports/summary forms for blank samples**						
		Were appropriate type(s) of blanks analyzed?	X					
		Were blanks analyzed at the appropriate frequency?	X					
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X					
		Were blank concentrations < MQL?	X					
R6	OI	**Laboratory control samples (LCS):**						
		Were all COCs included in the LCS?	X					
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X					
		Were LCSs analyzed at the required frequency?	X					
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X					
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X					
		Was the LCSD RPD within QC limits?	X					
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**						
		Were the project/method specified analytes included in the MS and MSD?	X					
		Were MS/MSD analyzed at the appropriate frequency?	X					
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1	
		Were MS/MSD RPDs within laboratory QC limits?	X					
R8	OI	**Analytical duplicate data**						
		Were appropriate analytical duplicates analyzed for each matrix?	X					
		Were analytical duplicates analyzed at the appropriate frequency?	X					
		Were RPDs or relative standard deviations within the laboratory QC limits?	X					
R9	OI	**Method quantitation limits (MQLs):**						
		Are the MQLs for each method analyte included in the laboratory data package?	X					
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X					
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X					
R10	OI	**Other problems/anomalies**						
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X					
		Were all necessary corrective actions performed for the reported data?	X					
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X					
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X					

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 08/09/2018				
Project Name: Exide Parkwood Blvd			Laboratory Job Number: HS18080024				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 131100,131131,131175,131201,R321229,R321230				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
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NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Data	
Laboratory Name: ALS Laboratory Group	LRC Date: 08/09/2018
Project Name: Exide Parkwood Blvd	Laboratory Job Number: HS18080024
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 131100,131131,131175,131201,R321229,R321230

ER#[5]	Description
1	Batch 131131, Metals Method SW6020, sample HS18080071-01, MS and MSD were performed on unrelated sample.

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
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NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Client: Golder Associates
Project: Exide Parkwood Blvd
Work Order: HS18080024

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18080024-01	2018-PB-11 (0-1)	Soil		31-Jul-2018 09:22	01-Aug-2018 08:35	
HS18080024-02	2018-PB-11 (3-4)	Soil		31-Jul-2018 09:24	01-Aug-2018 08:35	
HS18080024-03	2018-PB-11 (5-6)	Soil		31-Jul-2018 09:26	01-Aug-2018 08:35	
HS18080024-04	2018-PB-11	Soil		31-Jul-2018 09:28	01-Aug-2018 08:35	
HS18080024-05	2018-PB-13 (0-1)	Soil		31-Jul-2018 10:15	01-Aug-2018 08:35	
HS18080024-06	2018-PB-13 (4-5)	Soil		31-Jul-2018 10:16	01-Aug-2018 08:35	
HS18080024-07	2018-PB-13 (5-6)	Soil		31-Jul-2018 10:18	01-Aug-2018 08:35	
HS18080024-08	2018-PB-13	Soil		31-Jul-2018 10:20	01-Aug-2018 08:35	
HS18080024-09	2018-PB-7 (1-2)	Soil		31-Jul-2018 10:52	01-Aug-2018 08:35	
HS18080024-10	2018-PB-7 (3-4)	Soil		31-Jul-2018 10:54	01-Aug-2018 08:35	
HS18080024-11	2018-PB-7 (5-6)	Soil		31-Jul-2018 10:56	01-Aug-2018 08:35	
HS18080024-12	2018-PB-7	Soil		31-Jul-2018 10:58	01-Aug-2018 08:35	
HS18080024-13	2018-PB-5	Soil		31-Jul-2018 11:44	01-Aug-2018 08:35	
HS18080024-14	2018-PB-5 (2-3)	Soil		31-Jul-2018 11:38	01-Aug-2018 08:35	
HS18080024-15	2018-PB-5 (4-5)	Soil		31-Jul-2018 11:40	01-Aug-2018 08:35	
HS18080024-16	2018-PB-5 (5-6)	Soil		31-Jul-2018 11:42	01-Aug-2018 08:35	
HS18080024-17	2018-PB-16 (2-3)	Soil		31-Jul-2018 12:20	01-Aug-2018 08:35	
HS18080024-18	2018-PB-16 (3-4)	Soil		31-Jul-2018 12:22	01-Aug-2018 08:35	
HS18080024-19	2018-PB-16 (7-8)	Soil		31-Jul-2018 12:24	01-Aug-2018 08:35	
HS18080024-20	2018-PB-16	Soil		31-Jul-2018 12:26	01-Aug-2018 08:35	
HS18080024-21	2018-PB-3 (2-3)	Soil		31-Jul-2018 13:20	01-Aug-2018 08:35	
HS18080024-22	2018-PB-3 (4-5)	Soil		31-Jul-2018 13:22	01-Aug-2018 08:35	
HS18080024-23	2018-PB-3 (7-8)	Soil		31-Jul-2018 13:24	01-Aug-2018 08:35	
HS18080024-24	2018-PB-3	Soil		31-Jul-2018 13:26	01-Aug-2018 08:35	
HS18080024-25	2018-PB-1 (2-3)	Soil		31-Jul-2018 14:24	01-Aug-2018 08:35	
HS18080024-26	2018-PB-1 (4-5)	Soil		31-Jul-2018 14:26	01-Aug-2018 08:35	
HS18080024-27	2018-PB-1 (5-6)	Soil		31-Jul-2018 14:28	01-Aug-2018 08:35	

Client: Golder Associates
Project: Exide Parkwood Blvd
Work Order: HS18080024

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18080024-28	2018-PB-1	Soil		31-Jul-2018 14:30	01-Aug-2018 08:35	☐
HS18080024-29	2018-PB-20 (0-1)	Soil		31-Jul-2018 15:14	01-Aug-2018 08:35	☐
HS18080024-30	2018-PB-20 (4-5)	Soil		31-Jul-2018 15:16	01-Aug-2018 08:35	☐
HS18080024-31	2018-PB-20 (7-8)	Soil		31-Jul-2018 15:18	01-Aug-2018 08:35	☐
HS18080024-32	2018-PB-20	Soil		31-Jul-2018 15:20	01-Aug-2018 08:35	☐
HS18080024-33	2018-PB-19 (0-1)	Soil		31-Jul-2018 16:16	01-Aug-2018 08:35	☐
HS18080024-34	2018-PB-19 (6-7)	Soil		31-Jul-2018 16:05	01-Aug-2018 08:35	☐
HS18080024-35	2018-PB-19 (7-8)	Soil		31-Jul-2018 16:06	01-Aug-2018 08:35	☐
HS18080024-36	2018-PB-19	Soil		31-Jul-2018 16:20	01-Aug-2018 08:35	☐
HS18080024-37	2018-PB-12 (0-1)	Soil		31-Jul-2018 16:40	01-Aug-2018 08:35	☐
HS18080024-38	2018-PB-12 (2-3)	Soil		31-Jul-2018 16:42	01-Aug-2018 08:35	☐
HS18080024-39	2018-PB-12 (7-8)	Soil		31-Jul-2018 16:44	01-Aug-2018 08:35	☐
HS18080024-40	2018-PB-12	Soil		31-Jul-2018 16:46	01-Aug-2018 08:35	☐
HS18080024-41	2018-PB-18 (0-1)	Soil		31-Jul-2018 17:28	01-Aug-2018 08:35	☐
HS18080024-42	2018-PB-18 (5-6)	Soil		31-Jul-2018 17:30	01-Aug-2018 08:35	☐
HS18080024-43	2018-PB-18 (8-9)	Soil		31-Jul-2018 17:32	01-Aug-2018 08:35	☐
HS18080024-44	2018-PB-18	Soil		31-Jul-2018 17:34	01-Aug-2018 08:35	☐
HS18080024-45	DUP-03	Soil		31-Jul-2018 00:00	01-Aug-2018 08:35	☐
HS18080024-46	DUP-04	Soil		31-Jul-2018 00:00	01-Aug-2018 08:35	☐

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-11 (0-1)
Collection Date: 31-Jul-2018 09:22

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-01
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 02-Aug-2018		Analyst: JCJ
Cadmium	**1.75**		**0.0287**	**0.531**	**mg/Kg-dry**	1	08-Aug-2018 17:59
Lead	**498**		**0.690**	**26.6**	**mg/Kg-dry**	50	09-Aug-2018 13:37
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**9.59**		**0.0100**	**0.0100**	**wt%**	1	06-Aug-2018 11:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-11 (3-4)
Collection Date: 31-Jul-2018 09:24

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-02
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 02-Aug-2018		Analyst: JCJ
Cadmium	**0.565**		**0.0281**	**0.520**	**mg/Kg-dry**	1	08-Aug-2018 18:02
Lead	**26.0**		**0.0135**	**0.520**	**mg/Kg-dry**	1	08-Aug-2018 18:02
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**11.8**		**0.0100**	**0.0100**	**wt%**	1	06-Aug-2018 11:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-11 (5-6)
Collection Date: 31-Jul-2018 09:26

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-03
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 02-Aug-2018		Analyst: JCJ
Cadmium	**0.439**	J	**0.0294**	**0.544**	**mg/Kg-dry**	1	08-Aug-2018 18:04
Lead	**14.5**		**0.0141**	**0.544**	**mg/Kg-dry**	1	08-Aug-2018 18:04
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**13.0**		**0.0100**	**0.0100**	**wt%**	1	06-Aug-2018 11:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-11
Collection Date: 31-Jul-2018 09:28

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-04
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
TCLP METALS BY SW6020A		**Method:SW1311/6020**	Leache:SW1311 / 03-Aug-2018	Prep:SW3010A / 06-Aug-2018			Analyst: JDE
Arsenic	U		0.00400	0.0500	mg/L	1	08-Aug-2018 20:23
Barium	**0.909**		**0.0190**	**0.200**	**mg/L**	1	08-Aug-2018 20:23
Cadmium	U		0.00200	0.0500	mg/L	1	08-Aug-2018 20:23
Chromium	U		0.00400	0.0500	mg/L	1	08-Aug-2018 20:23
Lead	U		0.00600	0.0500	mg/L	1	08-Aug-2018 20:23
Selenium	U		0.0110	0.0500	mg/L	1	08-Aug-2018 20:23
Silver	U		0.00200	0.0500	mg/L	1	08-Aug-2018 20:23
TCLP MERCURY BY SW7470A		**Method:SW7470**	Leache:SW1311 / 03-Aug-2018	Prep:SW7470 / 03-Aug-2018			Analyst: JBA
Mercury	U		0.0000300	0.000200	mg/L	1	03-Aug-2018 13:58

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-13 (0-1)
Collection Date: 31-Jul-2018 10:15

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-05
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 02-Aug-2018		Analyst: JCJ
Cadmium	**0.853**		**0.0295**	**0.547**	**mg/Kg-dry**	1	08-Aug-2018 18:06
Lead	**122**		**0.0142**	**0.547**	**mg/Kg-dry**	1	08-Aug-2018 18:06
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**11.3**		**0.0100**	**0.0100**	**wt%**	1	06-Aug-2018 11:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-13 (4-5)
Collection Date: 31-Jul-2018 10:16

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-06
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 02-Aug-2018		Analyst: JCJ
Cadmium	**0.476**	J	**0.0286**	**0.529**	**mg/Kg-dry**	1	08-Aug-2018 18:08
Lead	**10.9**		**0.0138**	**0.529**	**mg/Kg-dry**	1	08-Aug-2018 18:08
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**11.4**		**0.0100**	**0.0100**	**wt%**	1	06-Aug-2018 11:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-13 (5-6)
Collection Date: 31-Jul-2018 10:18

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-07
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 02-Aug-2018		Analyst: JC
Cadmium	**0.502**	J	**0.0306**	**0.568**	**mg/Kg-dry**	1	08-Aug-2018 23:49
Lead	**9.88**		**0.0148**	**0.568**	**mg/Kg-dry**	1	08-Aug-2018 18:23
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**15.3**		**0.0100**	**0.0100**	**wt%**	1	06-Aug-2018 11:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-13
Collection Date: 31-Jul-2018 10:20

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-08
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
TCLP METALS BY SW6020A		**Method:SW1311/6020**	Leache:SW1311 / 03-Aug-2018	Prep:SW3010A / 06-Aug-2018			Analyst: JDE
Arsenic	U		0.00400	0.0500	mg/L	1	08-Aug-2018 22:33
Barium	**0.807**		**0.0190**	**0.200**	**mg/L**	1	08-Aug-2018 22:33
Cadmium	U		0.00200	0.0500	mg/L	1	08-Aug-2018 22:33
Chromium	U		0.00400	0.0500	mg/L	1	08-Aug-2018 22:33
Lead	U		0.00600	0.0500	mg/L	1	08-Aug-2018 22:33
Selenium	U		0.0110	0.0500	mg/L	1	08-Aug-2018 22:33
Silver	U		0.00200	0.0500	mg/L	1	08-Aug-2018 22:33
TCLP MERCURY BY SW7470A		**Method:SW7470**	Leache:SW1311 / 03-Aug-2018	Prep:SW7470 / 03-Aug-2018			Analyst: JBA
Mercury	U		0.0000300	0.000200	mg/L	1	03-Aug-2018 14:03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-7 (1-2)
Collection Date: 31-Jul-2018 10:52

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-09
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 02-Aug-2018		Analyst: JC
Cadmium	**0.489**	J	**0.0320**	**0.592**	**mg/Kg-dry**	1	08-Aug-2018 23:51
Lead	**12.1**		**0.0154**	**0.592**	**mg/Kg-dry**	1	08-Aug-2018 18:25
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**20.5**		**0.0100**	**0.0100**	**wt%**	1	06-Aug-2018 11:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-7 (3-4)
Collection Date: 31-Jul-2018 10:54

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-10
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 02-Aug-2018		Analyst: JC
Cadmium	**0.472**	J	**0.0298**	**0.551**	**mg/Kg-dry**	1	08-Aug-2018 23:53
Lead	**12.6**		**0.0143**	**0.551**	**mg/Kg-dry**	1	08-Aug-2018 18:28
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**17.3**		**0.0100**	**0.0100**	**wt%**	1	06-Aug-2018 11:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-7 (5-6)
Collection Date: 31-Jul-2018 10:56

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-11
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A	**Method:SW6020**				Prep:SW3050A / 02-Aug-2018		Analyst: JC
Cadmium	**0.457**	J	**0.0307**	**0.568**	**mg/Kg-dry**	1	08-Aug-2018 23:56
Lead	**8.54**		**0.0148**	**0.568**	**mg/Kg-dry**	1	08-Aug-2018 18:30
MOISTURE	**Method:SW3550**						Analyst: DFF
Percent Moisture	**17.4**		**0.0100**	**0.0100**	**wt%**	1	06-Aug-2018 11:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-7
Collection Date: 31-Jul-2018 10:58

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-12
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
TCLP METALS BY SW6020A	**Method:SW1311/6020**		Leache:SW1311 / 03-Aug-2018	Prep:SW3010A / 06-Aug-2018			Analyst: JDE
Arsenic	**0.00414**	J	**0.00400**	**0.0500**	**mg/L**	1	08-Aug-2018 22:35
Barium	**0.960**		**0.0190**	**0.200**	**mg/L**	1	08-Aug-2018 22:35
Cadmium	U		0.00200	0.0500	mg/L	1	08-Aug-2018 22:35
Chromium	U		0.00400	0.0500	mg/L	1	08-Aug-2018 22:35
Lead	U		0.00600	0.0500	mg/L	1	08-Aug-2018 22:35
Selenium	U		0.0110	0.0500	mg/L	1	08-Aug-2018 22:35
Silver	U		0.00200	0.0500	mg/L	1	08-Aug-2018 22:35
TCLP MERCURY BY SW7470A	**Method:SW7470**		Leache:SW1311 / 03-Aug-2018	Prep:SW7470 / 03-Aug-2018			Analyst: JBA
Mercury	U		0.0000300	0.000200	mg/L	1	03-Aug-2018 14:09

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-5
Collection Date: 31-Jul-2018 11:44

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-13
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
TCLP METALS BY SW6020A	**Method:SW1311/6020**		Leache:SW1311 / 03-Aug-2018	Prep:SW3010A / 06-Aug-2018			Analyst: JDE
Arsenic	U		0.00400	0.0500	mg/L	1	08-Aug-2018 22:37
Barium	**1.20**		**0.0190**	**0.200**	**mg/L**	1	08-Aug-2018 22:37
Cadmium	U		0.00200	0.0500	mg/L	1	08-Aug-2018 22:37
Chromium	**0.00479**	J	**0.00400**	**0.0500**	**mg/L**	1	08-Aug-2018 22:37
Lead	U		0.00600	0.0500	mg/L	1	08-Aug-2018 22:37
Selenium	U		0.0110	0.0500	mg/L	1	08-Aug-2018 22:37
Silver	U		0.00200	0.0500	mg/L	1	08-Aug-2018 22:37
TCLP MERCURY BY SW7470A	**Method:SW7470**		Leache:SW1311 / 03-Aug-2018	Prep:SW7470 / 03-Aug-2018			Analyst: JBA
Mercury	U		0.0000300	0.000200	mg/L	1	03-Aug-2018 14:10

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-5 (2-3)
Collection Date: 31-Jul-2018 11:38

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-14
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 02-Aug-2018		Analyst: JC
Cadmium	**0.457**	J	**0.0303**	**0.560**	**mg/Kg-dry**	1	09-Aug-2018 00:03
Lead	**10.0**		**0.0146**	**0.560**	**mg/Kg-dry**	1	08-Aug-2018 19:07
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**16.6**		**0.0100**	**0.0100**	**wt%**	1	06-Aug-2018 11:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-5 (4-5)
Collection Date: 31-Jul-2018 11:40

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-15
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A	**Method:SW6020**				Prep:SW3050A / 02-Aug-2018		Analyst: JC
Cadmium	**0.471**	J	**0.0303**	**0.562**	**mg/Kg-dry**	1	09-Aug-2018 00:05
Lead	**9.24**		**0.0146**	**0.562**	**mg/Kg-dry**	1	08-Aug-2018 19:09
MOISTURE	**Method:SW3550**						Analyst: DFF
Percent Moisture	**14.4**		**0.0100**	**0.0100**	**wt%**	1	06-Aug-2018 11:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-5 (5-6)
Collection Date: 31-Jul-2018 11:42

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-16
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 02-Aug-2018		Analyst: JC
Cadmium	**0.492**	J	**0.0306**	**0.567**	**mg/Kg-dry**	1	09-Aug-2018 00:07
Lead	**8.88**		**0.0147**	**0.567**	**mg/Kg-dry**	1	08-Aug-2018 19:12
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**14.6**		**0.0100**	**0.0100**	**wt%**	1	06-Aug-2018 11:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-16 (2-3)
Collection Date: 31-Jul-2018 12:20

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-17
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 02-Aug-2018		Analyst: JC
Cadmium	**0.976**		**0.0298**	**0.552**	**mg/Kg-dry**	1	09-Aug-2018 00:09
Lead	**19.8**		**0.0143**	**0.552**	**mg/Kg-dry**	1	08-Aug-2018 19:14
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**12.7**		**0.0100**	**0.0100**	**wt%**	1	06-Aug-2018 11:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-16 (3-4)
Collection Date: 31-Jul-2018 12:22

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-18
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 02-Aug-2018		Analyst: JC
Cadmium	**0.477**	J	**0.0340**	**0.629**	**mg/Kg-dry**	1	09-Aug-2018 00:12
Lead	**17.5**		**0.0164**	**0.629**	**mg/Kg-dry**	1	09-Aug-2018 00:12
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**22.2**		**0.0100**	**0.0100**	**wt%**	1	06-Aug-2018 11:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-16 (7-8)
Collection Date: 31-Jul-2018 12:24

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-19
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 02-Aug-2018		Analyst: JC
Cadmium	**0.430**	J	**0.0296**	**0.547**	**mg/Kg-dry**	1	09-Aug-2018 00:16
Lead	**8.70**		**0.0142**	**0.547**	**mg/Kg-dry**	1	09-Aug-2018 00:16
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**16.8**		**0.0100**	**0.0100**	**wt%**	1	06-Aug-2018 11:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-16
Collection Date: 31-Jul-2018 12:26

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-20
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
TCLP METALS BY SW6020A	**Method:SW1311/6020**		Leache:SW1311 / 03-Aug-2018	Prep:SW3010A / 06-Aug-2018			Analyst: JDE
Arsenic	**0.00964**	J	**0.00400**	**0.0500**	**mg/L**	1	08-Aug-2018 22:39
Barium	**2.15**		**0.0190**	**0.200**	**mg/L**	1	08-Aug-2018 22:39
Cadmium	U		0.00200	0.0500	mg/L	1	08-Aug-2018 22:39
Chromium	U		0.00400	0.0500	mg/L	1	08-Aug-2018 22:39
Lead	U		0.00600	0.0500	mg/L	1	08-Aug-2018 22:39
Selenium	U		0.0110	0.0500	mg/L	1	08-Aug-2018 22:39
Silver	U		0.00200	0.0500	mg/L	1	08-Aug-2018 22:39
TCLP MERCURY BY SW7470A	**Method:SW7470**		Leache:SW1311 / 03-Aug-2018	Prep:SW7470 / 03-Aug-2018			Analyst: JBA
Mercury	U		0.0000300	0.000200	mg/L	1	03-Aug-2018 14:12

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-3 (2-3)
Collection Date: 31-Jul-2018 13:20

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-21
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 02-Aug-2018		Analyst: JC
Cadmium	**0.244**	J	**0.0260**	**0.482**	**mg/Kg-dry**	1	09-Aug-2018 00:18
Lead	**34.0**		**0.0125**	**0.482**	**mg/Kg-dry**	1	09-Aug-2018 00:18
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**5.37**		**0.0100**	**0.0100**	**wt%**	1	06-Aug-2018 11:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-3 (4-5)
Collection Date: 31-Jul-2018 13:22

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-22
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 02-Aug-2018		Analyst: JC
Cadmium	**0.0712**	J	**0.0258**	**0.479**	**mg/Kg-dry**	1	09-Aug-2018 00:25
Lead	**6.94**		**0.0124**	**0.479**	**mg/Kg-dry**	1	09-Aug-2018 00:25
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**1.63**		**0.0100**	**0.0100**	**wt%**	1	06-Aug-2018 11:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-3 (7-8)
Collection Date: 31-Jul-2018 13:24

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-23
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 02-Aug-2018		Analyst: JC
Cadmium	**0.185**	J	**0.0301**	**0.557**	**mg/Kg-dry**	1	09-Aug-2018 00:36
Lead	**13.4**		**0.0145**	**0.557**	**mg/Kg-dry**	1	09-Aug-2018 00:36
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**14.4**		**0.0100**	**0.0100**	**wt%**	1	06-Aug-2018 11:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-3
Collection Date: 31-Jul-2018 13:26

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-24
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
TCLP METALS BY SW6020A		**Method:SW1311/6020**	Leache:SW1311 / 03-Aug-2018	Prep:SW3010A / 06-Aug-2018			Analyst: JDE
Arsenic	U		0.00400	0.0500	mg/L	1	08-Aug-2018 22:41
Barium	**0.208**		**0.0190**	**0.200**	**mg/L**	1	08-Aug-2018 22:41
Cadmium	U		0.00200	0.0500	mg/L	1	08-Aug-2018 22:41
Chromium	U		0.00400	0.0500	mg/L	1	08-Aug-2018 22:41
Lead	U		0.00600	0.0500	mg/L	1	08-Aug-2018 22:41
Selenium	U		0.0110	0.0500	mg/L	1	08-Aug-2018 22:41
Silver	U		0.00200	0.0500	mg/L	1	08-Aug-2018 22:41
TCLP MERCURY BY SW7470A		**Method:SW7470**	Leache:SW1311 / 03-Aug-2018	Prep:SW7470 / 03-Aug-2018			Analyst: JBA
Mercury	U		0.0000300	0.000200	mg/L	1	03-Aug-2018 14:14

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-1 (2-3)
Collection Date: 31-Jul-2018 14:24

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-25
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 02-Aug-2018		Analyst: JC
Cadmium	**0.372**	J	**0.0283**	**0.523**	**mg/Kg-dry**	1	09-Aug-2018 00:39
Lead	**69.1**		**0.0136**	**0.523**	**mg/Kg-dry**	1	09-Aug-2018 00:39
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**11.8**		**0.0100**	**0.0100**	**wt%**	1	06-Aug-2018 11:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-1 (4-5)
Collection Date: 31-Jul-2018 14:26

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-26
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 02-Aug-2018		Analyst: JC
Cadmium	**0.168**	J	**0.0280**	**0.519**	**mg/Kg-dry**	1	09-Aug-2018 00:50
Lead	**5.45**		**0.0135**	**0.519**	**mg/Kg-dry**	1	09-Aug-2018 00:50
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**9.95**		**0.0100**	**0.0100**	**wt%**	1	06-Aug-2018 11:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-1 (5-6)
Collection Date: 31-Jul-2018 14:28

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-27
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A	**Method:SW6020**				Prep:SW3050A / 02-Aug-2018		Analyst: JC
Cadmium	**0.133**	J	**0.0287**	**0.532**	**mg/Kg-dry**	1	09-Aug-2018 00:52
Lead	**9.21**		**0.0138**	**0.532**	**mg/Kg-dry**	1	09-Aug-2018 00:52
MOISTURE	**Method:SW3550**						Analyst: DFF
Percent Moisture	**10.4**		**0.0100**	**0.0100**	**wt%**	1	06-Aug-2018 11:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-1
Collection Date: 31-Jul-2018 14:30

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-28
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
TCLP METALS BY SW6020A		**Method:SW1311/6020**	Leache:SW1311 / 03-Aug-2018	Prep:SW3010A / 06-Aug-2018			Analyst: JDE
Arsenic	U		0.00400	0.0500	mg/L	1	08-Aug-2018 22:47
Barium	**0.483**		**0.0190**	**0.200**	**mg/L**	1	08-Aug-2018 22:47
Cadmium	U		0.00200	0.0500	mg/L	1	08-Aug-2018 22:47
Chromium	U		0.00400	0.0500	mg/L	1	08-Aug-2018 22:47
Lead	U		0.00600	0.0500	mg/L	1	08-Aug-2018 22:47
Selenium	U		0.0110	0.0500	mg/L	1	08-Aug-2018 22:47
Silver	U		0.00200	0.0500	mg/L	1	08-Aug-2018 22:47
TCLP MERCURY BY SW7470A		**Method:SW7470**	Leache:SW1311 / 03-Aug-2018	Prep:SW7470 / 03-Aug-2018			Analyst: JBA
Mercury	U		0.0000300	0.000200	mg/L	1	03-Aug-2018 14:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-20 (0-1)
Collection Date: 31-Jul-2018 15:14

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-29
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 02-Aug-2018		Analyst: JC
Cadmium	**0.865**		**0.0278**	**0.515**	**mg/Kg-dry**	1	09-Aug-2018 00:54
Lead	**135**		**0.0134**	**0.515**	**mg/Kg-dry**	1	09-Aug-2018 00:54
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**6.29**		**0.0100**	**0.0100**	**wt%**	1	06-Aug-2018 11:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-20 (4-5)
Collection Date: 31-Jul-2018 15:16

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-30
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 02-Aug-2018		Analyst: JC
Cadmium	**0.400**	J	**0.0305**	**0.564**	**mg/Kg-dry**	1	09-Aug-2018 00:56
Lead	**86.6**		**0.0147**	**0.564**	**mg/Kg-dry**	1	09-Aug-2018 00:56
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**14.7**		**0.0100**	**0.0100**	**wt%**	1	06-Aug-2018 11:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-20 (7-8)
Collection Date: 31-Jul-2018 15:18

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-31
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 02-Aug-2018		Analyst: JC
Cadmium	**0.448**	J	**0.0297**	**0.551**	**mg/Kg-dry**	1	09-Aug-2018 00:59
Lead	**17.6**		**0.0143**	**0.551**	**mg/Kg-dry**	1	09-Aug-2018 00:59
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**12.2**		**0.0100**	**0.0100**	**wt%**	1	06-Aug-2018 11:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-20
Collection Date: 31-Jul-2018 15:20

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-32
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
TCLP METALS BY SW6020A		**Method:SW1311/6020**	Leache:SW1311 / 03-Aug-2018	Prep:SW3010A / 06-Aug-2018			Analyst: JDE
Arsenic	U		0.00400	0.0500	mg/L	1	08-Aug-2018 22:49
Barium	**0.304**		**0.0190**	**0.200**	**mg/L**	1	08-Aug-2018 22:49
Cadmium	U		0.00200	0.0500	mg/L	1	08-Aug-2018 22:49
Chromium	U		0.00400	0.0500	mg/L	1	08-Aug-2018 22:49
Lead	U		0.00600	0.0500	mg/L	1	08-Aug-2018 22:49
Selenium	U		0.0110	0.0500	mg/L	1	08-Aug-2018 22:49
Silver	U		0.00200	0.0500	mg/L	1	08-Aug-2018 22:49
TCLP MERCURY BY SW7470A		**Method:SW7470**	Leache:SW1311 / 03-Aug-2018	Prep:SW7470 / 03-Aug-2018			Analyst: JBA
Mercury	U		0.0000300	0.000200	mg/L	1	03-Aug-2018 14:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-19 (0-1)
Collection Date: 31-Jul-2018 16:16

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-33
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 02-Aug-2018		Analyst: JC
Cadmium	**0.814**		**0.0265**	**0.491**	**mg/Kg-dry**	1	09-Aug-2018 01:01
Lead	**134**		**0.0128**	**0.491**	**mg/Kg-dry**	1	09-Aug-2018 01:01
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**4.30**		**0.0100**	**0.0100**	**wt%**	1	06-Aug-2018 11:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-19 (6-7)
Collection Date: 31-Jul-2018 16:05

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-34
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 02-Aug-2018		Analyst: JC
Cadmium	**0.566**		**0.0300**	**0.556**	**mg/Kg-dry**	1	09-Aug-2018 01:03
Lead	**533**		**0.722**	**27.8**	**mg/Kg-dry**	50	09-Aug-2018 13:39
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**14.5**		**0.0100**	**0.0100**	**wt%**	1	06-Aug-2018 11:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-19 (7-8)
Collection Date: 31-Jul-2018 16:06

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-35
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 02-Aug-2018		Analyst: JC
Cadmium	**0.685**		**0.0313**	**0.579**	**mg/Kg-dry**	1	09-Aug-2018 01:05
Lead	**454**		**0.301**	**11.6**	**mg/Kg-dry**	20	09-Aug-2018 13:41
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**18.2**		**0.0100**	**0.0100**	**wt%**	1	06-Aug-2018 11:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-19
Collection Date: 31-Jul-2018 16:20

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-36
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
TCLP METALS BY SW6020A	**Method:SW1311/6020**		Leache:SW1311 / 03-Aug-2018	Prep:SW3010A / 06-Aug-2018			Analyst: JDE
Arsenic	U		0.00400	0.0500	mg/L	1	08-Aug-2018 22:51
Barium	**0.739**		**0.0190**	**0.200**	**mg/L**	1	08-Aug-2018 22:51
Cadmium	U		0.00200	0.0500	mg/L	1	08-Aug-2018 22:51
Chromium	U		0.00400	0.0500	mg/L	1	08-Aug-2018 22:51
Lead	**0.0136**	J	**0.00600**	**0.0500**	**mg/L**	1	08-Aug-2018 22:51
Selenium	U		0.0110	0.0500	mg/L	1	08-Aug-2018 22:51
Silver	U		0.00200	0.0500	mg/L	1	08-Aug-2018 22:51
TCLP MERCURY BY SW7470A	**Method:SW7470**		Leache:SW1311 / 03-Aug-2018	Prep:SW7470 / 03-Aug-2018			Analyst: JBA
Mercury	U		0.0000300	0.000200	mg/L	1	03-Aug-2018 14:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-12 (0-1)
Collection Date: 31-Jul-2018 16:40

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-37
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A	**Method:SW6020**				Prep:SW3050A / 02-Aug-2018		Analyst: JC
Cadmium	**0.478**	J	**0.0273**	**0.505**	**mg/Kg-dry**	1	09-Aug-2018 01:12
Lead	**30.7**		**0.0131**	**0.505**	**mg/Kg-dry**	1	09-Aug-2018 01:12
MOISTURE	**Method:SW3550**						Analyst: DFF
Percent Moisture	**7.69**		**0.0100**	**0.0100**	**wt%**	1	06-Aug-2018 11:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-12 (2-3)
Collection Date: 31-Jul-2018 16:42

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-38
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A	**Method:SW6020**				Prep:SW3050A / 02-Aug-2018		Analyst: JC
Cadmium	**0.362**	J	**0.0263**	**0.486**	**mg/Kg-dry**	1	09-Aug-2018 01:14
Lead	**21.4**		**0.0126**	**0.486**	**mg/Kg-dry**	1	09-Aug-2018 01:14
MOISTURE	**Method:SW3550**						Analyst: DFF
Percent Moisture	**4.61**		**0.0100**	**0.0100**	**wt%**	1	06-Aug-2018 11:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-12 (7-8)
Collection Date: 31-Jul-2018 16:44

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-39
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 02-Aug-2018		Analyst: JC
Cadmium	**0.519**	J	**0.0311**	**0.577**	**mg/Kg-dry**	1	09-Aug-2018 01:17
Lead	**18.1**		**0.0150**	**0.577**	**mg/Kg-dry**	1	09-Aug-2018 01:17
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**17.9**		**0.0100**	**0.0100**	**wt%**	1	06-Aug-2018 11:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-12
Collection Date: 31-Jul-2018 16:46

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-40
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
TCLP METALS BY SW6020A		**Method:SW1311/6020**	Leache:SW1311 / 03-Aug-2018	Prep:SW3010A / 06-Aug-2018			Analyst: JDE
Arsenic	U		0.00400	0.0500	mg/L	1	08-Aug-2018 22:53
Barium	**0.995**		**0.0190**	**0.200**	**mg/L**	1	08-Aug-2018 22:53
Cadmium	U		0.00200	0.0500	mg/L	1	08-Aug-2018 22:53
Chromium	U		0.00400	0.0500	mg/L	1	08-Aug-2018 22:53
Lead	U		0.00600	0.0500	mg/L	1	08-Aug-2018 22:53
Selenium	U		0.0110	0.0500	mg/L	1	08-Aug-2018 22:53
Silver	U		0.00200	0.0500	mg/L	1	08-Aug-2018 22:53
TCLP MERCURY BY SW7470A		**Method:SW7470**	Leache:SW1311 / 03-Aug-2018	Prep:SW7470 / 03-Aug-2018			Analyst: JBA
Mercury	**0.0000560**	J	**0.0000300**	**0.000200**	**mg/L**	1	03-Aug-2018 14:21

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-18 (0-1)
Collection Date: 31-Jul-2018 17:28

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-41
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 02-Aug-2018		Analyst: JC
Cadmium	**0.643**		**0.0287**	**0.531**	**mg/Kg-dry**	1	09-Aug-2018 01:19
Lead	**113**		**0.0138**	**0.531**	**mg/Kg-dry**	1	09-Aug-2018 01:19
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**8.74**		**0.0100**	**0.0100**	**wt%**	1	06-Aug-2018 11:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-18 (5-6)
Collection Date: 31-Jul-2018 17:30

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-42
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A	**Method:SW6020**				Prep:SW3050A / 02-Aug-2018		Analyst: JC
Cadmium	**0.321**	J	**0.0301**	**0.558**	**mg/Kg-dry**	1	09-Aug-2018 01:21
Lead	**105**		**0.0145**	**0.558**	**mg/Kg-dry**	1	09-Aug-2018 01:21
MOISTURE	**Method:SW3550**						Analyst: DFF
Percent Moisture	**12.3**		**0.0100**	**0.0100**	**wt%**	1	06-Aug-2018 11:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-18 (8-9)
Collection Date: 31-Jul-2018 17:32

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-43
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 02-Aug-2018		Analyst: JC
Cadmium	**0.630**		**0.0312**	**0.579**	**mg/Kg-dry**	1	09-Aug-2018 01:23
Lead	**14.1**		**0.0150**	**0.579**	**mg/Kg-dry**	1	09-Aug-2018 01:23
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**17.2**		**0.0100**	**0.0100**	**wt%**	1	06-Aug-2018 11:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: 2018-PB-18
Collection Date: 31-Jul-2018 17:34

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-44
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
TCLP METALS BY SW6020A		**Method:SW1311/6020**	Leache:SW1311 / 03-Aug-2018	Prep:SW3010A / 06-Aug-2018			Analyst: JDE
Arsenic	U		0.00400	0.0500	mg/L	1	08-Aug-2018 22:55
Barium	**0.768**		**0.0190**	**0.200**	**mg/L**	1	08-Aug-2018 22:55
Cadmium	U		0.00200	0.0500	mg/L	1	08-Aug-2018 22:55
Chromium	U		0.00400	0.0500	mg/L	1	08-Aug-2018 22:55
Lead	U		0.00600	0.0500	mg/L	1	08-Aug-2018 22:55
Selenium	U		0.0110	0.0500	mg/L	1	08-Aug-2018 22:55
Silver	U		0.00200	0.0500	mg/L	1	08-Aug-2018 22:55
TCLP MERCURY BY SW7470A		**Method:SW7470**	Leache:SW1311 / 03-Aug-2018	Prep:SW7470 / 03-Aug-2018			Analyst: JBA
Mercury	**0.0000430**	J	**0.0000300**	**0.000200**	**mg/L**	1	03-Aug-2018 14:22

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: DUP-03
Collection Date: 31-Jul-2018 00:00

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-45
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 02-Aug-2018		Analyst: JC
Cadmium	**0.724**		**0.0294**	**0.545**	**mg/Kg-dry**	1	09-Aug-2018 01:25
Lead	**13.6**		**0.0142**	**0.545**	**mg/Kg-dry**	1	09-Aug-2018 01:25
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**12.4**		**0.0100**	**0.0100**	**wt%**	1	06-Aug-2018 11:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
Sample ID: DUP-04
Collection Date: 31-Jul-2018 00:00

ANALYTICAL REPORT
WorkOrder:HS18080024
Lab ID:HS18080024-46
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		**Method:SW6020**			Prep:SW3050A / 02-Aug-2018		Analyst: JC
Cadmium	**0.383**	J	**0.0315**	**0.583**	**mg/Kg-dry**	1	09-Aug-2018 01:28
Lead	**11.5**		**0.0152**	**0.583**	**mg/Kg-dry**	1	09-Aug-2018 01:28
MOISTURE		**Method:SW3550**					Analyst: DFF
Percent Moisture	**16.4**		**0.0100**	**0.0100**	**wt%**	1	06-Aug-2018 11:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Parkwood Blvd
WorkOrder: HS18080024

Batch ID: 131100 **Method:** METALS BY SW6020A **Prep:** 3050_I_LOW

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18080024-01	1	0.5206	50 (mL)	96.04
HS18080024-02	1	0.5448	50 (mL)	91.78
HS18080024-03	1	0.5283	50 (mL)	94.64
HS18080024-05	1	0.5154	50 (mL)	97.01
HS18080024-06	1	0.5332	50 (mL)	93.77
HS18080024-07	1	0.5201	50 (mL)	96.14
HS18080024-09	1	0.5308	50 (mL)	94.2
HS18080024-10	1	0.5485	50 (mL)	91.16
HS18080024-11	1	0.5325	50 (mL)	93.9
HS18080024-14	1	0.535	50 (mL)	93.46
HS18080024-15	1	0.5198	50 (mL)	96.19
HS18080024-16	1	0.5165	50 (mL)	96.81
HS18080024-17	1	0.5192	50 (mL)	96.3
HS18080024-18	1	0.5109	50 (mL)	97.87
HS18080024-19	1	0.5489	50 (mL)	91.09
HS18080024-21	1	0.5486	50 (mL)	91.14
HS18080024-22	1	0.531	50 (mL)	94.16
HS18080024-23	1	0.5248	50 (mL)	95.27
HS18080024-25	1	0.5417	50 (mL)	92.3

Batch ID: 131131 **Method:** METALS BY SW6020A **Prep:** 3050_I_LOW

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18080024-26	1	0.5346	50 (mL)	93.53
HS18080024-27	1	0.5246	50 (mL)	95.31
HS18080024-29	1	0.5182	50 (mL)	96.49
HS18080024-30	1	0.5192	50 (mL)	96.3
HS18080024-31	1	0.5172	50 (mL)	96.67
HS18080024-33	1	0.5325	50 (mL)	93.9
HS18080024-34	1	0.5262	50 (mL)	95.02
HS18080024-35	1	0.5276	50 (mL)	94.77
HS18080024-37	1	0.5358	50 (mL)	93.32
HS18080024-38	1	0.5388	50 (mL)	92.8
HS18080024-39	1	0.528	50 (mL)	94.7
HS18080024-41	1	0.5161	50 (mL)	96.88
HS18080024-42	1	0.5111	50 (mL)	97.83
HS18080024-43	1	0.5218	50 (mL)	95.82
HS18080024-45	1	0.5237	50 (mL)	95.47
HS18080024-46	1	0.5129	50 (mL)	97.48

WEIGHT LOG

Client: Golder Associates
Project: Exide Parkwood Blvd
WorkOrder: HS18080024

Batch ID: 131175 **Method:** TCLP MERCURY BY SW7470A **Prep:** 1311_HGPR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18080024-04	1	10 (mL)	10 (mL)	1
HS18080024-08	1	10 (mL)	10 (mL)	1
HS18080024-12	1	10 (mL)	10 (mL)	1
HS18080024-13	1	10 (mL)	10 (mL)	1
HS18080024-20	1	10 (mL)	10 (mL)	1
HS18080024-24	1	10 (mL)	10 (mL)	1
HS18080024-28	1	10 (mL)	10 (mL)	1
HS18080024-32	1	10 (mL)	10 (mL)	1
HS18080024-36	1	10 (mL)	10 (mL)	1
HS18080024-40	1	10 (mL)	10 (mL)	1
HS18080024-44	1	10 (mL)	10 (mL)	1

Batch ID: 131201 **Method:** TCLP METALS BY SW6020A **Prep:** 3010A_TCLP

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18080024-04	1	1	10 (mL)	10
HS18080024-08	1	1	10 (mL)	10
HS18080024-12	1	1	10 (mL)	10
HS18080024-13	1	1	10 (mL)	10
HS18080024-20	1	1	10 (mL)	10
HS18080024-24	1	1	10 (mL)	10
HS18080024-28	1	1	10 (mL)	10
HS18080024-32	1	1	10 (mL)	10
HS18080024-36	1	1	10 (mL)	10
HS18080024-40	1	1	10 (mL)	10
HS18080024-44	1	1	10 (mL)	10

Client: Golder Associates
Project: Exide Parkwood Blvd
WorkOrder: HS18080024

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 131100	**Test Name :** METALS BY SW6020A			**Matrix:** Soil		
HS18080024-01	2018-PB-11 (0-1)	31 Jul 2018 09:22		02 Aug 2018 07:51	09 Aug 2018 13:37	50
HS18080024-01	2018-PB-11 (0-1)	31 Jul 2018 09:22		02 Aug 2018 07:51	08 Aug 2018 17:59	1
HS18080024-02	2018-PB-11 (3-4)	31 Jul 2018 09:24		02 Aug 2018 07:51	08 Aug 2018 18:02	1
HS18080024-03	2018-PB-11 (5-6)	31 Jul 2018 09:26		02 Aug 2018 07:51	08 Aug 2018 18:04	1
HS18080024-05	2018-PB-13 (0-1)	31 Jul 2018 10:15		02 Aug 2018 07:51	08 Aug 2018 18:06	1
HS18080024-06	2018-PB-13 (4-5)	31 Jul 2018 10:16		02 Aug 2018 07:51	08 Aug 2018 18:08	1
HS18080024-07	2018-PB-13 (5-6)	31 Jul 2018 10:18		02 Aug 2018 07:51	08 Aug 2018 23:49	1
HS18080024-07	2018-PB-13 (5-6)	31 Jul 2018 10:18		02 Aug 2018 07:51	08 Aug 2018 18:23	1
HS18080024-09	2018-PB-7 (1-2)	31 Jul 2018 10:52		02 Aug 2018 07:51	08 Aug 2018 23:51	1
HS18080024-09	2018-PB-7 (1-2)	31 Jul 2018 10:52		02 Aug 2018 07:51	08 Aug 2018 18:25	1
HS18080024-10	2018-PB-7 (3-4)	31 Jul 2018 10:54		02 Aug 2018 07:51	08 Aug 2018 23:53	1
HS18080024-10	2018-PB-7 (3-4)	31 Jul 2018 10:54		02 Aug 2018 07:51	08 Aug 2018 18:28	1
HS18080024-11	2018-PB-7 (5-6)	31 Jul 2018 10:56		02 Aug 2018 07:51	08 Aug 2018 23:56	1
HS18080024-11	2018-PB-7 (5-6)	31 Jul 2018 10:56		02 Aug 2018 07:51	08 Aug 2018 18:30	1
HS18080024-14	2018-PB-5 (2-3)	31 Jul 2018 11:38		02 Aug 2018 07:51	09 Aug 2018 00:03	1
HS18080024-14	2018-PB-5 (2-3)	31 Jul 2018 11:38		02 Aug 2018 07:51	08 Aug 2018 19:07	1
HS18080024-15	2018-PB-5 (4-5)	31 Jul 2018 11:40		02 Aug 2018 07:51	09 Aug 2018 00:05	1
HS18080024-15	2018-PB-5 (4-5)	31 Jul 2018 11:40		02 Aug 2018 07:51	08 Aug 2018 19:09	1
HS18080024-16	2018-PB-5 (5-6)	31 Jul 2018 11:42		02 Aug 2018 07:51	09 Aug 2018 00:07	1
HS18080024-16	2018-PB-5 (5-6)	31 Jul 2018 11:42		02 Aug 2018 07:51	08 Aug 2018 19:12	1
HS18080024-17	2018-PB-16 (2-3)	31 Jul 2018 12:20		02 Aug 2018 07:51	09 Aug 2018 00:09	1
HS18080024-17	2018-PB-16 (2-3)	31 Jul 2018 12:20		02 Aug 2018 07:51	08 Aug 2018 19:14	1
HS18080024-18	2018-PB-16 (3-4)	31 Jul 2018 12:22		02 Aug 2018 07:51	09 Aug 2018 00:12	1
HS18080024-19	2018-PB-16 (7-8)	31 Jul 2018 12:24		02 Aug 2018 07:51	09 Aug 2018 00:16	1
HS18080024-21	2018-PB-3 (2-3)	31 Jul 2018 13:20		02 Aug 2018 07:51	09 Aug 2018 00:18	1
HS18080024-22	2018-PB-3 (4-5)	31 Jul 2018 13:22		02 Aug 2018 07:51	09 Aug 2018 00:25	1
HS18080024-23	2018-PB-3 (7-8)	31 Jul 2018 13:24		02 Aug 2018 07:51	09 Aug 2018 00:36	1
HS18080024-25	2018-PB-1 (2-3)	31 Jul 2018 14:24		02 Aug 2018 07:51	09 Aug 2018 00:39	1

Client: Golder Associates
Project: Exide Parkwood Blvd
WorkOrder: HS18080024

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 131131	**Test Name :** METALS BY SW6020A			**Matrix:** Soil		
HS18080024-26	2018-PB-1 (4-5)	31 Jul 2018 14:26		02 Aug 2018 14:13	09 Aug 2018 00:50	1
HS18080024-27	2018-PB-1 (5-6)	31 Jul 2018 14:28		02 Aug 2018 14:13	09 Aug 2018 00:52	1
HS18080024-29	2018-PB-20 (0-1)	31 Jul 2018 15:14		02 Aug 2018 14:13	09 Aug 2018 00:54	1
HS18080024-30	2018-PB-20 (4-5)	31 Jul 2018 15:16		02 Aug 2018 14:13	09 Aug 2018 00:56	1
HS18080024-31	2018-PB-20 (7-8)	31 Jul 2018 15:18		02 Aug 2018 14:13	09 Aug 2018 00:59	1
HS18080024-33	2018-PB-19 (0-1)	31 Jul 2018 16:16		02 Aug 2018 14:13	09 Aug 2018 01:01	1
HS18080024-34	2018-PB-19 (6-7)	31 Jul 2018 16:05		02 Aug 2018 14:13	09 Aug 2018 13:39	50
HS18080024-34	2018-PB-19 (6-7)	31 Jul 2018 16:05		02 Aug 2018 14:13	09 Aug 2018 01:03	1
HS18080024-35	2018-PB-19 (7-8)	31 Jul 2018 16:06		02 Aug 2018 14:13	09 Aug 2018 13:41	20
HS18080024-35	2018-PB-19 (7-8)	31 Jul 2018 16:06		02 Aug 2018 14:13	09 Aug 2018 01:05	1
HS18080024-37	2018-PB-12 (0-1)	31 Jul 2018 16:40		02 Aug 2018 14:13	09 Aug 2018 01:12	1
HS18080024-38	2018-PB-12 (2-3)	31 Jul 2018 16:42		02 Aug 2018 14:13	09 Aug 2018 01:14	1
HS18080024-39	2018-PB-12 (7-8)	31 Jul 2018 16:44		02 Aug 2018 14:13	09 Aug 2018 01:17	1
HS18080024-41	2018-PB-18 (0-1)	31 Jul 2018 17:28		02 Aug 2018 14:13	09 Aug 2018 01:19	1
HS18080024-42	2018-PB-18 (5-6)	31 Jul 2018 17:30		02 Aug 2018 14:13	09 Aug 2018 01:21	1
HS18080024-43	2018-PB-18 (8-9)	31 Jul 2018 17:32		02 Aug 2018 14:13	09 Aug 2018 01:23	1
HS18080024-45	DUP-03	31 Jul 2018 00:00		02 Aug 2018 14:13	09 Aug 2018 01:25	1
HS18080024-46	DUP-04	31 Jul 2018 00:00		02 Aug 2018 14:13	09 Aug 2018 01:28	1
Batch ID 131175	**Test Name :** TCLP MERCURY BY SW7470A			**Matrix:** Soil		
HS18080024-04	2018-PB-11	31 Jul 2018 09:28	03 Aug 2018 08:00	03 Aug 2018 10:49	03 Aug 2018 13:58	1
HS18080024-08	2018-PB-13	31 Jul 2018 10:20	03 Aug 2018 08:00	03 Aug 2018 10:49	03 Aug 2018 14:03	1
HS18080024-12	2018-PB-7	31 Jul 2018 10:58	03 Aug 2018 08:00	03 Aug 2018 10:49	03 Aug 2018 14:09	1
HS18080024-13	2018-PB-5	31 Jul 2018 11:44	03 Aug 2018 08:00	03 Aug 2018 10:49	03 Aug 2018 14:10	1
HS18080024-20	2018-PB-16	31 Jul 2018 12:26	03 Aug 2018 08:00	03 Aug 2018 10:49	03 Aug 2018 14:12	1
HS18080024-24	2018-PB-3	31 Jul 2018 13:26	03 Aug 2018 08:00	03 Aug 2018 10:49	03 Aug 2018 14:14	1
HS18080024-28	2018-PB-1	31 Jul 2018 14:30	03 Aug 2018 08:00	03 Aug 2018 10:49	03 Aug 2018 14:15	1
HS18080024-32	2018-PB-20	31 Jul 2018 15:20	03 Aug 2018 08:00	03 Aug 2018 10:49	03 Aug 2018 14:17	1
HS18080024-36	2018-PB-19	31 Jul 2018 16:20	03 Aug 2018 08:00	03 Aug 2018 10:49	03 Aug 2018 14:19	1
HS18080024-40	2018-PB-12	31 Jul 2018 16:46	03 Aug 2018 08:00	03 Aug 2018 10:49	03 Aug 2018 14:21	1
HS18080024-44	2018-PB-18	31 Jul 2018 17:34	03 Aug 2018 08:00	03 Aug 2018 10:49	03 Aug 2018 14:22	1

Client: Golder Associates
Project: Exide Parkwood Blvd
WorkOrder: HS18080024

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 131201	**Test Name :** TCLP METALS BY SW6020A			**Matrix:** Soil		
HS18080024-04	2018-PB-11	31 Jul 2018 09:28	03 Aug 2018 08:00	06 Aug 2018 10:01	08 Aug 2018 20:23	1
HS18080024-08	2018-PB-13	31 Jul 2018 10:20	03 Aug 2018 08:00	06 Aug 2018 10:01	08 Aug 2018 22:33	1
HS18080024-12	2018-PB-7	31 Jul 2018 10:58	03 Aug 2018 08:00	06 Aug 2018 10:01	08 Aug 2018 22:35	1
HS18080024-13	2018-PB-5	31 Jul 2018 11:44	03 Aug 2018 08:00	06 Aug 2018 10:01	08 Aug 2018 22:37	1
HS18080024-20	2018-PB-16	31 Jul 2018 12:26	03 Aug 2018 08:00	06 Aug 2018 10:01	08 Aug 2018 22:39	1
HS18080024-24	2018-PB-3	31 Jul 2018 13:26	03 Aug 2018 08:00	06 Aug 2018 10:01	08 Aug 2018 22:41	1
HS18080024-28	2018-PB-1	31 Jul 2018 14:30	03 Aug 2018 08:00	06 Aug 2018 10:01	08 Aug 2018 22:47	1
HS18080024-32	2018-PB-20	31 Jul 2018 15:20	03 Aug 2018 08:00	06 Aug 2018 10:01	08 Aug 2018 22:49	1
HS18080024-36	2018-PB-19	31 Jul 2018 16:20	03 Aug 2018 08:00	06 Aug 2018 10:01	08 Aug 2018 22:51	1
HS18080024-40	2018-PB-12	31 Jul 2018 16:46	03 Aug 2018 08:00	06 Aug 2018 10:01	08 Aug 2018 22:53	1
HS18080024-44	2018-PB-18	31 Jul 2018 17:34	03 Aug 2018 08:00	06 Aug 2018 10:01	08 Aug 2018 22:55	1
Batch ID R321229	**Test Name :** MOISTURE			**Matrix:** Soil		
HS18080024-01	2018-PB-11 (0-1)	31 Jul 2018 09:22			06 Aug 2018 11:17	1
HS18080024-02	2018-PB-11 (3-4)	31 Jul 2018 09:24			06 Aug 2018 11:17	1
HS18080024-03	2018-PB-11 (5-6)	31 Jul 2018 09:26			06 Aug 2018 11:17	1
HS18080024-05	2018-PB-13 (0-1)	31 Jul 2018 10:15			06 Aug 2018 11:17	1
HS18080024-06	2018-PB-13 (4-5)	31 Jul 2018 10:16			06 Aug 2018 11:17	1
HS18080024-07	2018-PB-13 (5-6)	31 Jul 2018 10:18			06 Aug 2018 11:17	1
HS18080024-09	2018-PB-7 (1-2)	31 Jul 2018 10:52			06 Aug 2018 11:17	1
HS18080024-10	2018-PB-7 (3-4)	31 Jul 2018 10:54			06 Aug 2018 11:17	1
HS18080024-11	2018-PB-7 (5-6)	31 Jul 2018 10:56			06 Aug 2018 11:17	1
HS18080024-14	2018-PB-5 (2-3)	31 Jul 2018 11:38			06 Aug 2018 11:17	1
HS18080024-15	2018-PB-5 (4-5)	31 Jul 2018 11:40			06 Aug 2018 11:17	1
HS18080024-16	2018-PB-5 (5-6)	31 Jul 2018 11:42			06 Aug 2018 11:17	1
HS18080024-17	2018-PB-16 (2-3)	31 Jul 2018 12:20			06 Aug 2018 11:17	1
HS18080024-18	2018-PB-16 (3-4)	31 Jul 2018 12:22			06 Aug 2018 11:17	1
HS18080024-19	2018-PB-16 (7-8)	31 Jul 2018 12:24			06 Aug 2018 11:17	1
HS18080024-21	2018-PB-3 (2-3)	31 Jul 2018 13:20			06 Aug 2018 11:17	1
HS18080024-22	2018-PB-3 (4-5)	31 Jul 2018 13:22			06 Aug 2018 11:17	1
HS18080024-23	2018-PB-3 (7-8)	31 Jul 2018 13:24			06 Aug 2018 11:17	1
HS18080024-25	2018-PB-1 (2-3)	31 Jul 2018 14:24			06 Aug 2018 11:17	1
HS18080024-26	2018-PB-1 (4-5)	31 Jul 2018 14:26			06 Aug 2018 11:17	1

Client: Golder Associates
Project: Exide Parkwood Blvd
WorkOrder: HS18080024

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R321230	**Test Name :** MOISTURE			**Matrix:** Soil		
HS18080024-27	2018-PB-1 (5-6)	31 Jul 2018 14:28			06 Aug 2018 11:19	1
HS18080024-29	2018-PB-20 (0-1)	31 Jul 2018 15:14			06 Aug 2018 11:19	1
HS18080024-30	2018-PB-20 (4-5)	31 Jul 2018 15:16			06 Aug 2018 11:19	1
HS18080024-31	2018-PB-20 (7-8)	31 Jul 2018 15:18			06 Aug 2018 11:19	1
HS18080024-33	2018-PB-19 (0-1)	31 Jul 2018 16:16			06 Aug 2018 11:19	1
HS18080024-34	2018-PB-19 (6-7)	31 Jul 2018 16:05			06 Aug 2018 11:19	1
HS18080024-35	2018-PB-19 (7-8)	31 Jul 2018 16:06			06 Aug 2018 11:19	1
HS18080024-37	2018-PB-12 (0-1)	31 Jul 2018 16:40			06 Aug 2018 11:19	1
HS18080024-38	2018-PB-12 (2-3)	31 Jul 2018 16:42			06 Aug 2018 11:19	1
HS18080024-39	2018-PB-12 (7-8)	31 Jul 2018 16:44			06 Aug 2018 11:19	1
HS18080024-41	2018-PB-18 (0-1)	31 Jul 2018 17:28			06 Aug 2018 11:19	1
HS18080024-42	2018-PB-18 (5-6)	31 Jul 2018 17:30			06 Aug 2018 11:19	1
HS18080024-43	2018-PB-18 (8-9)	31 Jul 2018 17:32			06 Aug 2018 11:19	1
HS18080024-45	DUP-03	31 Jul 2018 00:00			06 Aug 2018 11:19	1
HS18080024-46	DUP-04	31 Jul 2018 00:00			06 Aug 2018 11:19	1

WorkOrder: HS18080024
InstrumentID: HG03
Test Code: 1311_HG
Test Number: SW7470
Test Name: TCLP Mercury by SW7470A

METHOD DETECTION / REPORTING LIMITS

Matrix: Leachate **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Mercury	7439-97-6	0.000100	0.0000940	0.0000300	0.000200

WorkOrder: HS18080024
InstrumentID: ICPMS05
Test Code: 1311_METALS_HS
Test Number: SW1311/6020
Test Name: TCLP Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Leachate **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Arsenic	7440-38-2	0.00100	0.00103	0.000400	0.00500
A	Barium	7440-39-3	0.00250	0.00287	0.00190	0.0200
A	Cadmium	7440-43-9	0.00100	0.000999	0.000200	0.00500
A	Chromium	7440-47-3	0.00100	0.000863	0.000400	0.00500
A	Lead	7439-92-1	0.00100	0.000964	0.000600	0.00500
A	Selenium	7782-49-2	0.00100	0.000936	0.00110	0.00500
A	Silver	7440-22-4	0.00100	0.000984	0.000200	0.00500

WorkOrder: HS18080024
InstrumentID: ICPMS04
Test Code: ICP_S_Low
Test Number: SW6020
Test Name: Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Solid **Units:** mg/Kg

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Cadmium	7440-43-9	0.100	0.0982	0.0270	0.500
A	Lead	7439-92-1	0.100	0.0922	0.0130	0.500

Client: Golder Associates
Project: Exide Parkwood Blvd
WorkOrder: HS18080024

QC BATCH REPORT

Batch ID: 131100 **Instrument: ICPMS04** **Method: SW6020**

MBLK Sample ID: **MBLK-131100** Units: **mg/Kg** Analysis Date: **08-Aug-2018 17:53**
Client ID: Run ID: **ICPMS04_321318** SeqNo: **4685092** PrepDate: **02-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cadmium	U	0.500								
Lead	U	0.500								

LCS Sample ID: **LCS-131100** Units: **mg/Kg** Analysis Date: **08-Aug-2018 17:55**
Client ID: Run ID: **ICPMS04_321318** SeqNo: **4685093** PrepDate: **02-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cadmium	9.731	0.500	10	0	97.3	80 - 120				
Lead	9.155	0.500	10	0	91.6	80 - 120				

MS Sample ID: **HS18080024-22MS** Units: **mg/Kg** Analysis Date: **09-Aug-2018 00:30**
Client ID: **2018-PB-3 (4-5)** Run ID: **ICPMS04_321364** SeqNo: **4685338** PrepDate: **02-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cadmium	9.339	0.482	9.63	0.07006	96.3	75 - 125				
Lead	14.76	0.482	9.63	6.824	82.4	75 - 125				

MSD Sample ID: **HS18080024-22MSD** Units: **mg/Kg** Analysis Date: **09-Aug-2018 00:32**
Client ID: **2018-PB-3 (4-5)** Run ID: **ICPMS04_321364** SeqNo: **4685339** PrepDate: **02-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cadmium	9.249	0.475	9.502	0.07006	96.6	75 - 125	9.339	0.971	20	
Lead	15.82	0.475	9.502	6.824	94.7	75 - 125	14.76	6.94	20	

PDS Sample ID: **HS18080024-22PDS** Units: **mg/Kg** Analysis Date: **09-Aug-2018 00:34**
Client ID: **2018-PB-3 (4-5)** Run ID: **ICPMS04_321364** SeqNo: **4685340** PrepDate: **02-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cadmium	9.34	0.471	9.416	0.07006	98.4	75 - 125				
Lead	15.71	0.471	9.416	6.824	94.4	75 - 125				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
WorkOrder: HS18080024

QC BATCH REPORT

Batch ID: 131100 **Instrument: ICPMS04** **Method: SW6020**

SD Sample ID: **HS18080024-22SD** Units: **mg/Kg** Analysis Date: **09-Aug-2018 00:27**
Client ID: **2018-PB-3 (4-5)** Run ID: **ICPMS04_321364** SeqNo: **4685337** PrepDate: **02-Aug-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Cadmium	U	2.35					0.07006	0	10	
Lead	6.882	2.35					6.824	0.843	10	

The following samples were analyzed in this batch:

HS18080024-01	HS18080024-02	HS18080024-03	HS18080024-05
HS18080024-06	HS18080024-07	HS18080024-09	HS18080024-10
HS18080024-11	HS18080024-14	HS18080024-15	HS18080024-16
HS18080024-17	HS18080024-18	HS18080024-19	HS18080024-21
HS18080024-22	HS18080024-23	HS18080024-25	

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
WorkOrder: HS18080024

QC BATCH REPORT

Batch ID: 131131 **Instrument: ICPMS04** **Method: SW6020**

MBLK Sample ID: **MBLK-131131** Units: **mg/Kg** Analysis Date: **09-Aug-2018 00:45**
Client ID: Run ID: **ICPMS04_321364** SeqNo: **4685345** PrepDate: **02-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cadmium	U	0.500								
Lead	U	0.500								

LCS Sample ID: **LCS-131131** Units: **mg/Kg** Analysis Date: **09-Aug-2018 00:48**
Client ID: Run ID: **ICPMS04_321364** SeqNo: **4685346** PrepDate: **02-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cadmium	9.901	0.500	10	0	99.0	80 - 120				
Lead	10.03	0.500	10	0	100	80 - 120				

MS Sample ID: **HS18080071-01MS** Units: **mg/Kg** Analysis Date: **09-Aug-2018 01:39**
Client ID: Run ID: **ICPMS04_321364** SeqNo: **4685372** PrepDate: **02-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cadmium	10.54	0.476	9.52	1.282	97.3	75 - 125				
Lead	120.7	0.476	9.52	92.91	292	75 - 125				SO

MSD Sample ID: **HS18080071-01MSD** Units: **mg/Kg** Analysis Date: **09-Aug-2018 01:41**
Client ID: Run ID: **ICPMS04_321364** SeqNo: **4685373** PrepDate: **02-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cadmium	10.33	0.473	9.463	1.282	95.7	75 - 125	10.54	1.99	20	
Lead	117.2	0.473	9.463	92.91	256	75 - 125	120.7	2.99	20	SO

PDS Sample ID: **HS18080071-01PDS** Units: **mg/Kg** Analysis Date: **09-Aug-2018 01:43**
Client ID: Run ID: **ICPMS04_321364** SeqNo: **4685374** PrepDate: **02-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cadmium	10.24	0.458	9.169	1.282	97.7	75 - 125				
Lead	100.2	0.458	9.169	92.91	79.1	75 - 125				O

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
WorkOrder: HS18080024

QC BATCH REPORT

Batch ID: 131131 **Instrument: ICPMS04** **Method: SW6020**

SD Sample ID: **HS18080071-01SD** Units: **mg/Kg** Analysis Date: **09-Aug-2018 01:37**
Client ID: Run ID: **ICPMS04_321364** SeqNo: **4685371** PrepDate: **02-Aug-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Cadmium	1.137	2.29					1.282	0	10	J
Lead	88.33	2.29					92.91	4.94	10	

The following samples were analyzed in this batch:

HS18080024-26	HS18080024-27	HS18080024-29	HS18080024-30
HS18080024-31	HS18080024-33	HS18080024-34	HS18080024-35
HS18080024-37	HS18080024-38	HS18080024-39	HS18080024-41
HS18080024-42	HS18080024-43	HS18080024-45	HS18080024-46

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
WorkOrder: HS18080024

QC BATCH REPORT

Batch ID: 131175 **Instrument: HG03** **Method: SW7470**

MBLK Sample ID: **GBLKT3-131175** Units: **mg/L** Analysis Date: **03-Aug-2018 13:41**
Client ID: Run ID: **HG03_321083** SeqNo: **4678876** PrepDate: **03-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	U	0.000200								

MBLK Sample ID: **MBLK-131175** Units: **mg/L** Analysis Date: **03-Aug-2018 13:43**
Client ID: Run ID: **HG03_321083** SeqNo: **4678877** PrepDate: **03-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	U	0.000200								

MBLK Sample ID: **GBLKT2-131175** Units: **mg/L** Analysis Date: **03-Aug-2018 13:39**
Client ID: Run ID: **HG03_321083** SeqNo: **4678875** PrepDate: **03-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	U	0.000200								

MBLK Sample ID: **GBLKT1-131175** Units: **mg/L** Analysis Date: **03-Aug-2018 13:38**
Client ID: Run ID: **HG03_321083** SeqNo: **4678874** PrepDate: **03-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	U	0.000200								

LCS Sample ID: **LCS-131175** Units: **mg/L** Analysis Date: **03-Aug-2018 13:48**
Client ID: Run ID: **HG03_321083** SeqNo: **4678878** PrepDate: **03-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00475	0.000200	0.005	0	95.0	80 - 120				

MS Sample ID: **HS18080024-04MS** Units: **mg/L** Analysis Date: **03-Aug-2018 14:00**
Client ID: **2018-PB-11** Run ID: **HG03_321083** SeqNo: **4678885** PrepDate: **03-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00484	0.000200	0.005	-0.000027	97.3	75 - 125				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
WorkOrder: HS18080024

QC BATCH REPORT

Batch ID: 131175 **Instrument: HG03** **Method: SW7470**

MSD Sample ID: **HS18080024-04MSD** Units: **mg/L** Analysis Date: **03-Aug-2018 14:02**
Client ID: **2018-PB-11** Run ID: **HG03_321083** SeqNo: **4678886** PrepDate: **03-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00481	0.000200	0.005	-0.000027	96.7	75 - 125	0.00484	0.622	20	

The following samples were analyzed in this batch:

HS18080024-04	HS18080024-08	HS18080024-12	HS18080024-13
HS18080024-20	HS18080024-24	HS18080024-28	HS18080024-32
HS18080024-36	HS18080024-40	HS18080024-44	

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
WorkOrder: HS18080024

QC BATCH REPORT

Batch ID: 131201 **Instrument: ICPMS05** **Method: SW1311/6020**

MBLK Sample ID: **MBLKT2-131201** Units: **mg/L** Analysis Date: **08-Aug-2018 20:15**
Client ID: Run ID: **ICPMS05_321327** SeqNo: **4685176** PrepDate: **06-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	U	0.0500								
Barium	U	0.200								
Cadmium	U	0.0500								
Chromium	U	0.0500								
Lead	U	0.0500								
Selenium	U	0.0500								
Silver	U	0.0500								

MBLK Sample ID: **MBLKT3-131201** Units: **mg/L** Analysis Date: **08-Aug-2018 20:17**
Client ID: Run ID: **ICPMS05_321327** SeqNo: **4685177** PrepDate: **06-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	U	0.0500								
Barium	U	0.200								
Cadmium	U	0.0500								
Chromium	U	0.0500								
Lead	U	0.0500								
Selenium	U	0.0500								
Silver	U	0.0500								

MBLK Sample ID: **MBLKT1-131201** Units: **mg/L** Analysis Date: **08-Aug-2018 20:09**
Client ID: Run ID: **ICPMS05_321327** SeqNo: **4685173** PrepDate: **06-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	U	0.0500								
Barium	U	0.200								
Cadmium	U	0.0500								
Chromium	U	0.0500								
Lead	U	0.0500								
Selenium	U	0.0500								
Silver	U	0.0500								

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
WorkOrder: HS18080024

QC BATCH REPORT

Batch ID: 131201 **Instrument: ICPMS05** **Method: SW1311/6020**

MBLK Sample ID: **MBLK-131201** Units: **mg/L** Analysis Date: **08-Aug-2018 20:19**
Client ID: Run ID: **ICPMS05_321327** SeqNo: **4685178** PrepDate: **06-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	U	0.00500								
Barium	U	0.0200								
Cadmium	U	0.00500								
Chromium	U	0.00500								
Lead	U	0.00500								
Selenium	U	0.00500								
Silver	U	0.00500								

LCS Sample ID: **LCS-131201** Units: **mg/L** Analysis Date: **08-Aug-2018 20:21**
Client ID: Run ID: **ICPMS05_321327** SeqNo: **4685179** PrepDate: **06-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.04927	0.00500	0.05	0	98.5	80 - 120				
Barium	0.04893	0.0200	0.05	0	97.9	80 - 120				
Cadmium	0.05045	0.00500	0.05	0	101	80 - 120				
Chromium	0.04732	0.00500	0.05	0	94.6	80 - 120				
Lead	0.0493	0.00500	0.05	0	98.6	80 - 120				
Selenium	0.05122	0.00500	0.05	0	102	80 - 120				
Silver	0.04999	0.00500	0.05	0	100.0	80 - 120				

MS Sample ID: **HS18080024-04MS** Units: **mg/L** Analysis Date: **08-Aug-2018 20:26**
Client ID: **2018-PB-11** Run ID: **ICPMS05_321327** SeqNo: **4685182** PrepDate: **06-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.4982	0.0500	0.5	0.00148	99.3	80 - 120				
Barium	1.399	0.200	0.5	0.909	98.0	80 - 120				
Cadmium	0.4774	0.0500	0.5	0.00125	95.2	80 - 120				
Chromium	0.4771	0.0500	0.5	0.00293	94.8	80 - 120				
Lead	0.4955	0.0500	0.5	0.00166	98.8	80 - 120				
Selenium	0.4966	0.0500	0.5	0.00646	98.0	80 - 120				
Silver	0.4811	0.0500	0.5	0.00021	96.2	80 - 120				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
WorkOrder: HS18080024

QC BATCH REPORT

Batch ID: 131201 **Instrument: ICPMS05** **Method: SW1311/6020**

MSD Sample ID: **HS18080024-04MSD** Units: **mg/L** Analysis Date: **08-Aug-2018 20:28**
Client ID: **2018-PB-11** Run ID: **ICPMS05_321327** SeqNo: **4685183** PrepDate: **06-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.492	0.0500	0.5	0.00148	98.1	80 - 120	0.4982	1.25	20	
Barium	1.395	0.200	0.5	0.909	97.3	80 - 120	1.399	0.278	20	
Cadmium	0.4838	0.0500	0.5	0.00125	96.5	80 - 120	0.4774	1.34	20	
Chromium	0.4781	0.0500	0.5	0.00293	95.0	80 - 120	0.4771	0.201	20	
Lead	0.4827	0.0500	0.5	0.00166	96.2	80 - 120	0.4955	2.63	20	
Selenium	0.506	0.0500	0.5	0.00646	99.9	80 - 120	0.4966	1.88	20	
Silver	0.4735	0.0500	0.5	0.00021	94.7	80 - 120	0.4811	1.59	20	

PDS Sample ID: **HS18080024-04PDS** Units: **mg/L** Analysis Date: **08-Aug-2018 20:30**
Client ID: **2018-PB-11** Run ID: **ICPMS05_321327** SeqNo: **4685184** PrepDate: **06-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	1.071	0.0500	1	0.00148	107	75 - 125				
Barium	1.92	0.200	1	0.909	101	75 - 125				
Cadmium	1.052	0.0500	1	0.00125	105	75 - 125				
Chromium	1.041	0.0500	1	0.00293	104	75 - 125				
Lead	1.059	0.0500	1	0.00166	106	75 - 125				
Selenium	1.119	0.0500	1	0.00646	111	75 - 125				
Silver	1.055	0.0500	1	0.00021	105	75 - 125				

SD Sample ID: **HS18080024-04SD** Units: **mg/L** Analysis Date: **08-Aug-2018 20:25**
Client ID: **2018-PB-11** Run ID: **ICPMS05_321327** SeqNo: **4685181** PrepDate: **06-Aug-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Arsenic	U	0.250					0.00148	0	10	
Barium	0.9336	1.00					0.909	0	10	J
Cadmium	U	0.250					0.00125	0	10	
Chromium	U	0.250					0.00293	0	10	
Lead	U	0.250					0.00166	0	10	
Selenium	U	0.250					0.00646	0	10	
Silver	U	0.250					0.00021	0	10	

The following samples were analyzed in this batch:

HS18080024-04	HS18080024-08	HS18080024-12	HS18080024-13
HS18080024-20	HS18080024-24	HS18080024-28	HS18080024-32
HS18080024-36	HS18080024-40	HS18080024-44	

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
WorkOrder: HS18080024

QC BATCH REPORT

Batch ID: **R321229** **Instrument:** **Balance1** **Method:** **SW3550**

DUP Sample ID: **HS18080024-26DUP** Units: **wt%** Analysis Date: **06-Aug-2018 11:17**
Client ID: **2018-PB-1 (4-5)** Run ID: **Balance1_321229** SeqNo: **4681930** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Percent Moisture	11.6	0.0100					9.95	15.3	20	

The following samples were analyzed in this batch:

HS18080024-01	HS18080024-02	HS18080024-03	HS18080024-05
HS18080024-06	HS18080024-07	HS18080024-09	HS18080024-10
HS18080024-11	HS18080024-14	HS18080024-15	HS18080024-16
HS18080024-17	HS18080024-18	HS18080024-19	HS18080024-21
HS18080024-22	HS18080024-23	HS18080024-25	HS18080024-26

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
WorkOrder: HS18080024

QC BATCH REPORT

Batch ID: R321230 **Instrument: Balance1** **Method: SW3550**

DUP Sample ID: **HS18080051-04DUP** Units: **wt%** Analysis Date: **06-Aug-2018 11:19**
Client ID: Run ID: **Balance1_321230** SeqNo: **4681950** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Percent Moisture	28.2	0.0100					26.7	5.46	20	

The following samples were analyzed in this batch:

HS18080024-27	HS18080024-29	HS18080024-30	HS18080024-31
HS18080024-33	HS18080024-34	HS18080024-35	HS18080024-37
HS18080024-38	HS18080024-39	HS18080024-41	HS18080024-42
HS18080024-43	HS18080024-45	HS18080024-46	

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Parkwood Blvd
WorkOrder: **HS18080024**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
Date	
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Oklahoma	2017-088	31-Aug-2018
North Carolina	624-2018	31-Dec-2018
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	L2231 Rev 3-30-2018	22-Dec-2018
Kentucky	123043 - 2018	30-Apr-2019

Date: 09-Aug-18

Sample Receipt Checklist

Client Name:	Golder St Louis	Date/Time Received:	**01-Aug-2018 08:35**
Work Order:	HS18080024	Received by:	**JRM**

Checklist completed by: *Paresh M. Giga* eSignature — 1-Aug-2018 Date

Reviewed by: *Dane J. Wacasey* eSignature — 2-Aug-2018 Date

Matrices: **Soil**

Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	1.9c/1.5c; 23.6c/23.2c U/C	IR11	
Cooler(s)/Kit(s):	42640 (TCLP)/44101		
Date/Time sample(s) sent to storage:	8/1/18 14:00		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

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Chain of Custody Form

Page 1 of 5

COC ID: 191194

large Blue 42640 -ice
large Blue-44101

ALS Project Manager: | ALS Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order	130208606	Project Name	130208606 Exide Parkwood Blvd	A	ICP_S_Low (6020 - Total Cd, Pb)
Work Order		Project Number	130208606	B	MOIST_SW3550 (Moisture%)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ICP_TW (6020 - Total Cd, Pb (EB))
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P	D	1311_TCLP RCRA Metals (1311/3010/6020/7470 - TCLP RCRA
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit	E	
				F	**HS18080024**
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021	G	Golder Associates
Phone	(314) 984-8800	Phone	(314) 984-8800	H	Exide Parkwood Blvd
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	2018-PB-11 (0-1)	07/31/18	0922	Soil	None	1	X	X									
2	2018-PB-11 (3-4)	"	0924	"	"	1	X	X									
3	2018-PB-11 (5-6)	"	0926	"	"	1	X	X									
4	2018-PB-11	"	0928	"	8	2				X							
5	2018-PB-13 (0-1)	"	1015	"	None	1	X	X									
6	2018-PB-13 (4-5)	"	1016	"	"	1	X	X									
7	2018-PB-13 (5-6)	"	1018	"	"	1	X	X									
8	2018-PB-13	"	1020	"	8	2				X							
9	2018-PB-7 (1-2)	"	1052	"	None	1	X	X									
10	2018-PB-7 (3-4)	"	1054	"	"	1	X	X									

Sampler(s) Please Print & Sign: Emily White

Shipment Method: FedEx

Required Turnaround Time: (Check Box) ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other

Results Due Date:

Relinquished by: Emily White — Date: 07/31/18 — Time: 1820 — Received by:

Relinquished by: — Date: 08/01/18 — Time: 08:35 — Received by (Laboratory): JM

Logged by (Laboratory): — Date: — Time: — Checked by (Laboratory):

Notes: Exide Parkwood

Cooler ID	Cooler Temp.
	uc
42640	1.9
44101	23.6
	ice
	CF -0.4

QC Package: (Check One Box Below)
☐ Level II Std QC ☒ TRRP Checklist
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

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Chain of Custody Form

COC ID: 191184

ALS Project Manager: | ALS Work Order #:

Customer Information		Project Information	
Purchase Order	130208606	Project Name	130208606 Exide Parkwood Blvd
Work Order		Project Number	130208606
Company Name	Golder Associates	Bill To Company	Golder Associates
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021
Phone	(314) 984-8800	Phone	(314) 984-8800
Fax		Fax	
e-Mail Address	ewhite@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com

Parameter/Method Request for Analysis

A ICP_S_Low (6020 - Total Cd, Pb)
B MOIST_SW3550 (Moisture%)
C ICP_TW (6020 - Total Cd, Pb (EB))
D 1311_TCLP RCRA Metals (1311/3010/6020/7470 - TCLP RCRA
E
F
G
H
I
J

HS18080024
Golder Associates
Exide Parkwood Blvd

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	2018-PB-7 (5-6)	07/31/18	1056	SOIL	None	1	X	X									
2	2018-PB-7		1058		8	2				X							
3	2018-PB-5		1144		8	2				X							
4	2018-PB-5 (2-3)		1138		None	1	X	X									
5	2018-PB-5 (4-5)		1140			1	X	X									
6	2018-PB-5 (5-6)		1142			1	X	X									
7	2018-PB-16 (2-3)		1220		None	1	X	X									
8	2018-PB-16 (3-4)		1222			1	X	X									
9	2018-PB-16 (7-8)		1224			1	X	X									
10	2018-PB-16		1226		8	2				X							

Sampler(s) Please Print & Sign: Emily White Emily White
Shipment Method: FedEx
Required Turnaround Time: (Check Box) ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other
Results Due Date:

Relinquished by: Emily White Date: 07/31/18 Time: 1820 Received by:
Relinquished by: Date: 08/01/18 Time: 08:35 Received by (Laboratory): JM
Logged by (Laboratory): Date: Time: Checked by (Laboratory):

Notes: Exide Parkwood

Cooler ID	Cooler Temp.
42640	1.9
44101	23.6
	IRC11

CF-0.4

QC Package: (Check One Box Below)
☐ Level II Std QC
☐ Level III Std QC/Raw Data
☐ Level IV SW846/CLP
☐ Other
☒ TRRP Checklist
☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

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Chain of Custody Form

COC ID: 191193

ALS Project Manager: | ALS Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order	130208606	Project Name	130208606 Exide Parkwood Blvd	A	ICP_S_Low (6020 - Total Cd, Pb)
Work Order		Project Number	130208606	B	MOIST_SW3550 (Moisture%)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ICP_TW (6020 - Total Cd, Pb (EB))
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P	D	1311_TCLP RCRA Metals (1311/3010/6020/7470 - TCLP RCRA
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit	E	
				F	
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021	G	
Phone	(314) 984-8800	Phone	(314) 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com	J	

HS18080024
Golder Associates
Exide Parkwood Blvd

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	2018-PB-3 (2-3)	07/31/18	1320	Soil	None	1	X	X									
2	2018-PB-3 (4-5)		1322			1	X	X									
3	2018-PB-3 (7-8)		1324			1	X	X									
4	2018-PB-3		1326		8	2				X							
5	2018-PB-1 (2-3)		1424		None	1	X	X									
6	2018-PB-1 (4-5)		1426			1	X	X									
7	2018-PB-1 (5-6)		1428			1	X	X									
8	2018-PB-1		1430		8	8				X							
9	2018-PB-20 (0-1)		1514		None	1	X	X									
10	2018-PB-20 (4-5)		1516			1	X	X									

Sampler(s) Please Print & Sign: Emily White Emily White

Shipment Method: FedEX

Required Turnaround Time: (Check Box) ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other

Results Due Date:

Relinquished by: Emily White	Date: 07/31/18	Time: 1820	Received by:	
Relinquished by:	Date: 08/01/18	Time: 08:35	Received by (Laboratory): JM	
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	

Notes: Exide Parkwood

Cooler ID	Cooler Temp.
	°C
42640	1.9
44101	23.6
	1R 11

QC Package: (Check One Box Below)
☐ Level II Std QC
☐ Level III Std QC/Raw Date
☐ Level IV SW846/CLP
☐ Other
☒ TRRP Checklist
☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

CF-0.4

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York, PA +1 717 505 5280

Chain of Custody Form

COC ID: 191192

ALS Project Manager: | ALS Work Order #:

Customer Information		Project Information	
Purchase Order	130208606	Project Name	130208606 Exide Parkwood Blvd
Work Order		Project Number	130208606
Company Name	Golder Associates	Bill To Company	Golder Associates
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021
Phone	(314) 984-8800	Phone	(314) 984-8800
Fax		Fax	
e-Mail Address	ewhite@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com

Parameter/Method Request for Analysis

A ICP_S_Low (6020 - Total Cd, Pb)
B MOIST_SW3550 (Moisture%)
C ICP_TW (6020 - Total Cd, Pb (EB))
D 1311_TCLP RCRA Metals (1311/3010/6020/7470 - TCLP RCRA
E
F
G
H
I
J

HS18080024
Golder Associates
Exide Parkwood Blvd

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	2018-PB-20 (7-8)	07/31/18	1518	Soil	None	1	X	X									
2	2018-PB-20		1520		8	2				X							
3	2018-PB-19 (0-1)		1616		None	1	X	X									
4	2018-PB-19 (6-7)		1605		"	1	X	X									
5	2018-PB-19 (7-8)		1606		"	1	X	X									
6	2018-PB-19		1620		8	2				X							
7	2018-PB-12 (0-1)		1640		None	1	X	X									
8	2018-PB-12 (2-3)		1642		"	1	X	X									
9	2018-PB-12 (7-8)		1644		"	1	X	X									
10	2018-PB-12		1646		8	8				X							

Sampler(s) Please Print & Sign: Emily White Emily White

Shipment Method: FedEx

Required Turnaround Time: (Check Box) ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other

Results Due Date:

Relinquished by: Emily White — Date: 07/31/18 — Time: 1820 — Received by:

Relinquished by: — Date: 08/01/18 — Time: 08:35 — Received by (Laboratory): JM

Logged by (Laboratory): — Date: — Time: — Checked by (Laboratory):

Notes: Exide Parkwood

Cooler ID	Cooler Temp.
42640	1.9
44101	2J.9
	1K11
	CF-0.4

QC Package: (Check One Box Below)
☐ Level II Std QC
☐ Level III Std QC/Raw Data
☐ Level IV SW846/CLP
☐ Other
☒ TRRP Checklist
☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

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York, PA +1 717 505 5280

Chain of Custody Form

COC ID: 191185

ALS Project Manager: | ALS Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order	130208606	Project Name	130208606 Exide Parkwood Blvd	A	ICP_S_Low (6020 - Total Cd, Pb)
Work Order		Project Number	130208606	B	MOIST_SW3550 (Moisture%)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ICP_TW (6020 - Total Cd, Pb (EB))
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P	D	1311_TCLP RCRA Metals (1311/3010/6020/7470 - TCLP RCRA
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit	E	
				F	
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021	G	
Phone	(314) 984-8800	Phone	(314) 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com	J	

HS18080024
Golder Associates
Exide Parkwood Blvd

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	2018-PB-18 (0-1)	07/31/18	1728	Soil	None	1	X	X									
2	2018-PB-18 (5-6)	"	1730	"	"	1	X	X									
3	2018-PB-18 (8-9)	"	1732	"	"	1	X	X									
4	2018-PB-18	"	1734	"	8	8				X							
5	DUP-03	"	-	"	None	1	X	X									
6	DUP-04	"	-	"	"	1	X	X									
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Emily White Emily White

Shipment Method: FedEx

Required Turnaround Time: (Check Box) ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
Emily White	8/31/18	1820	
Relinquished by:	Date:	Time:	Received by (Laboratory):
	08/01/18	08:35	JM
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes: Exide Parkwood

Cooler ID	Cooler Temp.
42640	1-9
44101	23.6
	IR 11

QC Package: (Check One Box Below)
☐ Level II Std QC
☐ Level III Std QC/Raw Data
☐ Level IV SW846/CLP
☐ Other
☒ TRRP Checklist
☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

CF-0.4

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
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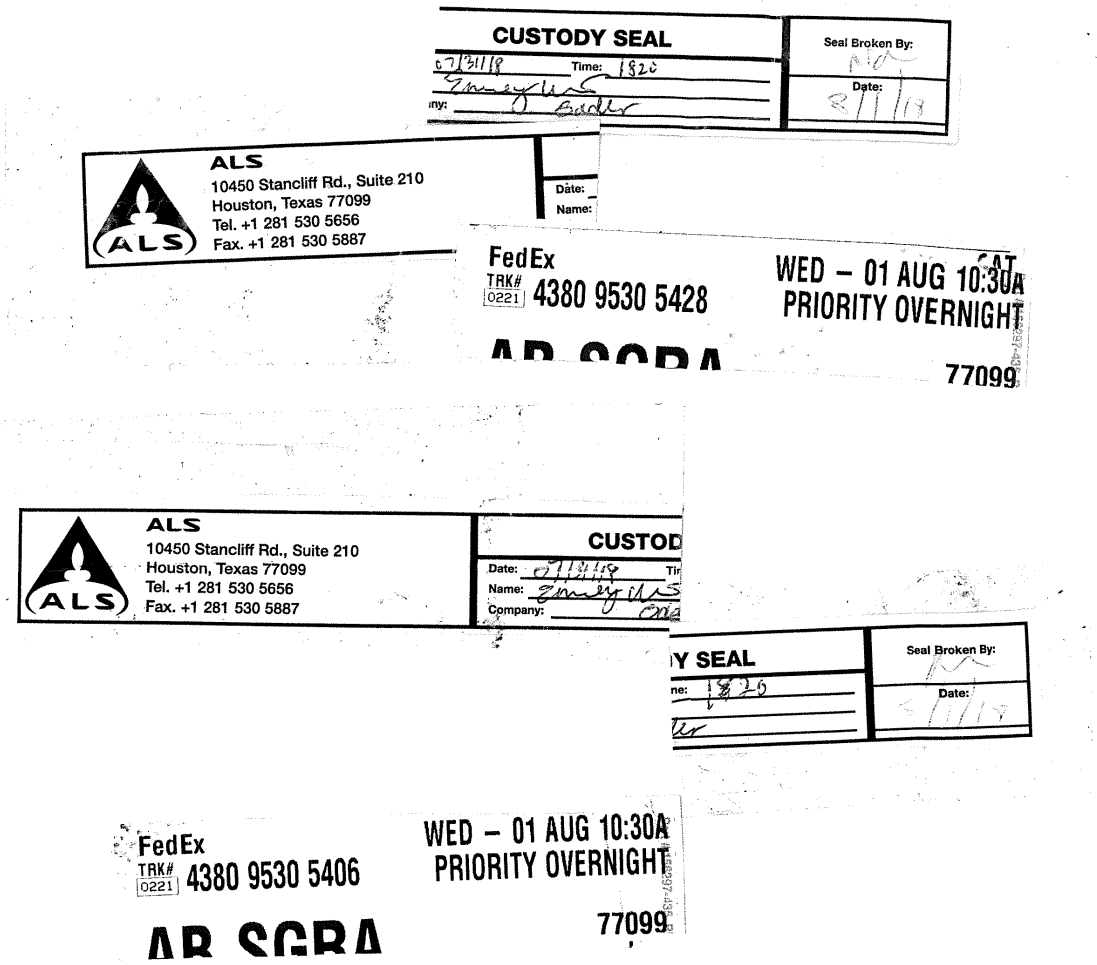
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Time:
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Fax. +1 281 530 5887
Date:
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Company:
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77099

ATTACHMENT C

DATA USABILITY SUMMARIES

DATA USABILITY SUMMARY
ALS WORK ORDERS: HS18071462
HS18080024

ROJECT NO: 130-2086-06 **CLIENT:** Exide Technologies

SAMPLE DATES: July 30-31, 2018

LABORATORY: ALS Group

WORK ORDERS: HS18071462; HS18080024

INTENDED USE: Parkwood Boulevard Parcel Investigation Report

SITE: Exide Recycling Center, 7471 5th Street, Frisco, TX

TESTS/METHODS

- SW-846 1311 – Toxicity Characteristic Leaching Procedure (TCLP)
- SW-846 6020A - Inductively Coupled Plasma-Mass Spectrometry (ICP/MS) (total metals)
- SW-846 7470A - Mercury in Liquid Wastes (Manual Cold-Vapor Technique)

SAMPLES

Eighty (80) soil samples were collected. Sixty (60) soil samples were analyzed for cadmium and lead. Twenty (20) soil samples were leached and analyzed for RCRA metals. See Table 1 for the sample list.

Golder completed a review of the above chemical analysis data for conformance with the requirements of the Texas Risk Reduction Program (TRRP) guidance document, Review and Reporting of COC Concentration Data (RGG-366/TRRP-13 Revised May 2010) and for adherence to project objectives. The results of the review are discussed in this data usability summary (DUS). Golder completed the review using the following laboratory and project submittals:

- Laboratory reportable data as defined in TRRP-13;
- Laboratory review checklists (LRC) with the associated exception reports;
- Laboratory Electronic Data Deliverable (EDD); and
- Project field notes from the sampling event.

The review of the reportable data included the quality control (QC) parameters listed below, as required per TRRP-13, using the applicable analytical method and project requirements:

- Data Completeness
- Chain-of-Custody Procedures
- Sample Condition - Holding Time, Preservation, and Containers
- Field Procedures
- Results Reporting Procedures
- Field and Laboratory Blanks
- Laboratory Control Spike (LCS)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries
- Field Duplicate Precision
- Detectability Check Sample (DCS)

Additionally, Golder used the LRC to evaluate the following QC parameters:

- Method Quantitation Limits (MQLs)
- Method Detection Limits (MDLs) and Sample Detection Limits (SDLs)
- Instrument Tuning, Calibration, and Performance
- Internal Standards

Criteria used for this data usability review are as follows:

- Precision: ±MQL difference or 30% relative percent difference (RPD) for laboratory duplicates and ± 3x MQL difference (if either result is less than 5x MQL) or 50% RPD for field duplicates as recommended in TRRP-13
- Accuracy: 70-130% spike recovery (and not less than 30% or data is rejected) as recommended in TRRP-13

If an item was found outside of the review criteria, the reviewer applied a data qualifier and bias code to the results for the affected samples in accordance with TRRP-13.

LABORATORY CERTIFICATION

At the time the laboratory data were generated for this project, the laboratory was NELAC accredited under the Texas Laboratory Accreditation Program (TLAP Certification T104704231) for the matrices, methods and parameters of analysis requested on the chain-of-custody forms.

USABILITY SUMMARY

Data are usable for the intended purpose. A list of all qualified results and definitions of the qualifier and bias codes are given in Table 2.

Reviewer: Carol Lovett 8/13/2018

QUALITY CONTROL PARAMETERS AND OUTCOMES

Data Completeness

The laboratory data package contains necessary data (i.e., the laboratory reportable data per TRRP-13) and the EDD contains sample results in acceptable format.

Chain-of-Custody

Proper sample custody procedures were used, which confirms that the integrity of the samples was maintained. The information on the custody records is complete and agrees with that in the field notes and laboratory reports.

Sample Condition

Samples were collected in appropriate containers, properly preserved in the field, and prepared and analyzed within the holding times as required in the analytical method. No temperature preservative is required for soil samples.

Field Procedures

The samples were collected and placed immediately into laboratory supplied containers and then into a cooler for overnight delivery to the laboratory.

Results Reporting Procedures

Soil results are reported as dry weight in milligrams/kilogram (mg/kg). Water results are reported in milligrams/liter (mg/L). Non-detects are reported using the SDL as specified per TRRP and detects between the SDL and MQL are reported with a laboratory J-flag. The concentration reported for detects between the SDL and MQL is below the calibration range and thus is considered estimated. Results for the DCS are included in the laboratory data packages.

Field and Laboratory Blanks

No field blanks were collected.

No analytes were detected in laboratory method and continuing calibration blanks.

Laboratory Control Sample

The LCS recoveries (%R) are within the TRRP-13 recommended criteria of 70 -130 %R.

Matrix Spike Recovery

The laboratory prepared one MS/MSD samples with each analytical batch. Non-project data were not evaluated. The MS/MSD recoveries were within the TRRP-13 recommended criteria of 70 – 130%R. Precision was within the TRRP-13 recommended criteria of 30 RPD. The post-digestate spike recovery was within the TRRP-13 recommended criteria of 70 – 130%R. The serial dilution percent difference was within method criteria of 10% difference.

Field Duplicate Precision

Four field duplicates were collected with these samples. Field duplicate results are presented in Table 3 and qualified results are presented in Table 2.

Instrument Tuning and Performance

According to the LRC, instrument tuning and interference check sample results met method requirements.

Instrument Calibration

According to the LRC, initial and continuing calibration data met method requirements for all reported results, which indicates the instruments were properly calibrated to measure analyte concentrations.

Internal Standards

According to the LRC, internal standard areas were acceptable.

TABLE 1
CROSS REFERENCE OF FIELD SAMPLE IDENTIFICATIONS AND LABORATORY IDENTIFICATIONS

Lab Sample Identification	Field Sample Identification	Sample Date	Total Metals	TCLP Metals	TCLP Mercury	Comments
HS18071462-01	2018-PB-8 (2-3)	7/30/2018	✓			
HS18071462-02	2018-PB-8 (4-5)	7/30/2018	✓			Total metals MS/MSD
HS18071462-03	2018-PB-8 (6-7)	7/30/2018	✓			
HS18071462-04	2018-PB-8	7/30/2018		✓	✓	TCLP metals MS/MSD
HS18071462-05	2018-PB-6 (1-2)	7/30/2018	✓			
HS18071462-06	2018-PB-6 (3-4)	7/30/2018	✓			
HS18071462-07	2018-PB-6 (5-6)	7/30/2018	✓			
HS18071462-08	2018-PB-6	7/30/2018		✓	✓	
HS18071462-09	2018-PB-14 (2-3)	7/30/2018	✓			
HS18071462-10	2018-PB-14 (4-5)	7/30/2018	✓			
HS18071462-11	2018-PB-14 (5-6)	7/30/2018	✓			
HS18071462-12	2018-PB-14	7/30/2018		✓	✓	
HS18071462-13	2018-PB-15 (2-3)	7/30/2018	✓			
HS18071462-14	2018-PB-15 (3-4)	7/30/2018	✓			
HS18071462-15	2018-PB-15 (5-6)	7/30/2018	✓			
HS18071462-16	2018-PB-15	7/30/2018		✓	✓	
HS18071462-17	2018-PB-4 (1-2)	7/30/2018	✓			
HS18071462-18	2018-PB-4 (3-4)	7/30/2018	✓			
HS18071462-19	2018-PB-4 (4-5)	7/30/2018	✓			
HS18071462-20	2018-PB-4	7/30/2018		✓	✓	
HS18071462-21	2018-PB-9 (0-1)	7/30/2018	✓			
HS18071462-22	2018-PB-9 (1-2)	7/30/2018	✓			
HS18071462-23	2018-PB-9 (6-7)	7/30/2018	✓			
HS18071462-24	2018-PB-9	7/30/2018		✓	✓	
HS18071462-25	2018-PB-17 (2-3)	7/30/2018	✓			
HS18071462-26	2018-PB-17 (3-4)	7/30/2018	✓			
HS18071462-27	2018-PB-17 (5-6)	7/30/2018	✓			
HS18071462-28	2018-PB-17	7/30/2018		✓	✓	
HS18071462-29	2018-PB-10 (3-4)	7/30/2018	✓			
HS18071462-30	2018-PB-10 (4-5)	7/30/2018	✓			
HS18071462-31	2018-PB-10 (6-7)	7/30/2018	✓			
HS18071462-32	2018-PB-10	7/30/2018		✓	✓	
HS18071462-33	DUP-01	7/30/2018	✓			Field duplicate of 2018-PB-6 (3-4)
HS18071462-34	DUP-02	7/30/2018		✓	✓	Field duplicate of 2018-PB-4
HS18080024-01	2018-PB-11 (0-1)	07/31/18	✓			
HS18080024-02	2018-PB-11 (3-4)	07/31/18	✓			
HS18080024-03	2018-PB-11 (5-6)	07/31/18	✓			
HS18080024-04	2018-PB-11	7/31/2018		✓	✓	TCLP metals, TCLP mercury MS/MSD
HS18080024-05	2018-PB-13 (0-1)	7/31/2018	✓			
HS18080024-06	2018-PB-13 (4-5)	7/31/2018	✓			
HS18080024-07	2018-PB-13 (5-6)	7/31/2018	✓			
HS18080024-08	2018-PB-13	7/31/2018		✓	✓	
HS18080024-09	2018-PB-7 (1-2)	7/31/2018	✓			
HS18080024-10	2018-PB-7 (3-4)	7/31/2018	✓			
HS18080024-11	2018-PB-7 (5-6)	7/31/2018	✓			
HS18080024-12	2018-PB-7	7/31/2018		✓	✓	
HS18080024-13	2018-PB-5	7/31/2018		✓	✓	
HS18080024-14	2018-PB-5 (2-3)	7/31/2018	✓			
HS18080024-15	2018-PB-5 (4-5)	7/31/2018	✓			
HS18080024-16	2018-PB-5 (5-6)	7/31/2018	✓			
HS18080024-17	2018-PB-16 (2-3)	7/31/2018	✓			

TABLE 1
CROSS REFERENCE OF FIELD SAMPLE IDENTIFICATIONS AND LABORATORY IDENTIFICATIONS

Lab Sample Identification	Field Sample Identification	Sample Date	Total Metals	TCLP Metals	TCLP Mercury	Comments
HS18080024-18	2018-PB-16 (3-4)	7/31/2018	✓			
HS18080024-19	2018-PB-16 (7-8)	7/31/2018	✓			
HS18080024-20	2018-PB-16	7/31/2018		✓	✓	
HS18080024-21	2018-PB-3 (2-3)	7/31/2018	✓			
HS18080024-22	2018-PB-3 (4-5)	7/31/2018	✓			Total metals MS/MSD
HS18080024-23	2018-PB-3 (7-8)	7/31/2018	✓			
HS18080024-24	2018-PB-3	7/31/2018		✓	✓	
HS18080024-25	2018-PB-1 (2-3)	7/31/2018	✓			
HS18080024-26	2018-PB-1 (4-5)	7/31/2018	✓			
HS18080024-27	2018-PB-1 (5-6)	7/31/2018	✓			
HS18080024-28	2018-PB-1	7/31/2018		✓	✓	
HS18080024-29	2018-PB-20 (0-1)	7/31/2018	✓			
HS18080024-30	2018-PB-20 (4-5)	7/31/2018	✓			
HS18080024-31	2018-PB-20 (7-8)	7/31/2018	✓			
HS18080024-32	2018-PB-20	7/31/2018		✓	✓	
HS18080024-33	2018-PB-19 (0-1)	7/31/2018	✓			
HS18080024-34	2018-PB-19 (6-7)	7/31/2018	✓			
HS18080024-35	2018-PB-19 (7-8)	7/31/2018	✓			
HS18080024-36	2018-PB-19	7/31/2018		✓	✓	
HS18080024-37	2018-PB-12 (0-1)	7/31/2018	✓			
HS18080024-38	2018-PB-12 (2-3)	7/31/2018	✓			
HS18080024-39	2018-PB-12 (7-8)	7/31/2018	✓			
HS18080024-40	2018-PB-12	7/31/2018		✓	✓	
HS18080024-41	2018-PB-18 (0-1)	7/31/2018	✓			
HS18080024-42	2018-PB-18 (5-6)	7/31/2018	✓			
HS18080024-43	2018-PB-18 (8-9)	7/31/2018	✓			
HS18080024-44	2018-PB-18	7/31/2018		✓	✓	
HS18080024-45	DUP-03	7/31/2018	✓			Field duplicate of 2018-PB-11 (5-6)
HS18080024-46	DUP-04	7/31/2018	✓			Field duplicate of 2018-PB-7 (3-4)

MS/MSD - Matrix spike/matrix spike duplicate
TCLP - Toxicity Characteristic Leaching Procedure

TABLE 2 - QUALIFIED DATA

Lab Sample ID	Field Sample ID	Analyte	Result	Units	Qualifier	Explanation
HS18071462-20	2018-PB-4	Barium	0.362	mg/L	J	Field duplicate precision did not meet acceptance criteria
HS18071462-34	DUP-02	Barium	0.816	mg/L	J	Field duplicate precision did not meet acceptance criteria

Notes:
ID - Identification
J - Data are qualified due to exceedance of one or more quality control criteria. The reported sample concentration is the approximate concentration of the analyte in the sample.
U - Not detected; the analyte was detected <5x the level in an associated blank and is not detected at the reported sample concentration.
mg/L - milligrams per liter

TABLE 3 - FIELD DUPLICATE PRECISION CALCULATIONS

Duplicate and Parent Sample Field Identification	Analyte	Sample Result	Duplicate Result	Units	RPD[a]	Accept or Reject	Qualifier Added
2018-PB-6 (3-4)/DUP-01	Cadmium	0.496	0.422	mg/kg	16.1	A	NA
	Lead	10.2	12.5	mg/kg	20.3	A	NA
2018-PB-4/DUP-02	Arsenic	0.00516	0.00718	mg/L	32.7	A (MQL)	NA
	Barium	0.362	0.816	mg/L	77.1	A	J
	Mercury	0.000173	0.000165	mg/L	4.7	A	NA
2018-PB-11 (5-6)/DUP-03	Cadmium	0.439	0.724	mg/kg	49.0	A (MQL)	NA
	Lead	14.5	13.6	mg/kg	6.4	A	NA
2018-PB-7 (3-4)/DUP-04	Cadmium	0.472	0.383	mg/kg	20.8	A	NA
	Lead	12.6	11.5	mg/kg	9.1	A	NA

Notes:

[a] Relative Percent Difference (RPD) = ((SR - DR)*200)/(SR + DR), where SR is the sample result and DR is the duplicate result.

A - Acceptable Data

Soil: The RPD test (<50%) applies if both results are greater than 5x MQL. Otherwise, the absolute difference test (< 3x MQL) applies.

ATTACHMENT D

STATE WELL REPORTS

STATE OF TEXAS WELL REPORT for Tracking #486419

Owner:	**Exide Technologies**	Owner Well #:	**2018-PB-1**
Address:	**7471 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**Parkwood Boulevard ROW Frisco, TX 75034**	Latitude:	**33° 08' 37.83" N**
		Longitude:	**096° 49' 31.95" W**
	In/along Parkwood Boulevard, between Eagan Way and Eubanks Street	Elevation:	**No Data**
Well County:	**Collin**		
Type of Work:	**New Well**	Proposed Use:	**Environmental Soil Boring**

Drilling Start Date: **7/31/2018** Drilling End Date: **7/31/2018**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**2.25**	**0**	**8**

Drilling Method: **Direct Push**

Borehole Completion: **Plugged**

Annular Seal Data: **No Data**

Seal Method: **Not Applicable**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **No Data**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Plug Information:

Description (number of sacks & material)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Cement	**0**	**2**
Bentonite	**2**	**8**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	No Data

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Comments: **This environmental soil boring was plugged on the same day as its installation**

Report Amended on 8/9/2018 by Request #25737

Report Amended on 4/26/2019 by Request #27684

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	1.7	concrete
1.7	5	brown, silty clay with gravel
5	8	gray, silty clay

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

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P.O. Box 12157
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(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #486421

Owner:	**Exide Technologies**	Owner Well #:	**2018-PB-3**
Address:	**7471 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**Parkwood Boulevard ROW Frisco, TX 75034**	Latitude:	**33° 08' 37.39" N**
		Longitude:	**096° 49' 32.11" W**
	In/along Parkwood Boulevard, between Eagan Way and Eubanks Street	Elevation:	**No Data**
Well County:	**Collin**		
Type of Work:	**New Well**	Proposed Use:	**Environmental Soil Boring**

Drilling Start Date: **7/31/2018** Drilling End Date: **7/31/2018**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**2.25**	**0**	**8**

Drilling Method: **Direct Push**

Borehole Completion: **Plugged**

Annular Seal Data: **No Data**

Seal Method: **Not Applicable**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **No Data**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Plug Information:

Description (number of sacks & material)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Cement	**0**	**2**
Bentonite	**2**	**8**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Comments: **This environmental soil boring was plugged on the same day as its installation**

Report Amended on 8/9/2018 by Request #25736

Report Amended on 4/26/2019 by Request #27685

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	1.5	concrete
1.5	3	darkt brown, silty gravel
3	5	orangish brown sand
5	8	brown, silty clay

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

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STATE OF TEXAS WELL REPORT for Tracking #486424

Owner:	**Exide Technologies**	Owner Well #:	**2018-PB-4**
Address:	**7471 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**Parkwood Boulevard ROW Frisco, TX 75034**	Latitude:	**33° 08' 37.32" N**
		Longitude:	**096° 49' 31.64" W**
	In/along Parkwood Boulevard, between Eagan Way and Eubanks Street	Elevation:	**No Data**
Well County:	**Collin**		
Type of Work:	**New Well**	Proposed Use:	**Environmental Soil Boring**

Drilling Start Date: **7/30/2018** Drilling End Date: **7/30/2018**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**2.25**	**0**	**9.5**

Drilling Method: **Direct Push**

Borehole Completion: **Plugged**

Annular Seal Data: **No Data**

Seal Method: **Not Applicable**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **No Data**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Plug Information:

Description (number of sacks & material)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Cement	**0**	**2**
Bentonite	**2**	**9.5**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	No Data

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Comments: **This environmental soil boring was plugged on the same day as its installation**

Report Amended on 8/9/2018 by Request #25735

Report Amended on 4/26/2019 by Request #27686

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	1.2	concrete
1.2	9.5	light gray, silty clay

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

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STATE OF TEXAS WELL REPORT for Tracking #486425

Owner:	**Exide Technologies**	Owner Well #:	**2018-PB-5**
Address:	**7471 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**Parkwood Boulevard ROW Frisco, TX 75034**	Latitude:	**33° 08' 31.32" N**
		Longitude:	**096° 49' 28.75" W**
	In/along Parkwood Boulevard, between Eagan Way and Eubanks Street	Elevation:	**No Data**
Well County:	**Collin**		
Type of Work:	**New Well**	Proposed Use:	**Environmental Soil Boring**

Drilling Start Date: **7/31/2018** Drilling End Date: **7/31/2018**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**2.25**	**0**	**8**

Drilling Method: **Direct Push**

Borehole Completion: **Plugged**

Annular Seal Data: **No Data**

Seal Method: **Not Applicable**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **No Data**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Plug Information:

Description (number of sacks & material)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Cement	**0**	**2**
Bentonite	**2**	**8**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Comments: **This environmental soil boring was plugged on the same day as its installation**

Report Amended on 8/9/2018 by Request #25734

Report Amended on 4/26/2019 by Request #27687

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**1.1**	**concrete**
1.1	**4**	**brown, silty clay**
4	**8**	**light gray, silty clay with gravel**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

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STATE OF TEXAS WELL REPORT for Tracking #486426

Owner:	**Exide Technologies**	Owner Well #:	**2018-PB-6**
Address:	**7471 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**Parkwood Boulevard ROW Frisco, TX 75034**	Latitude:	**33° 08' 31.62" N**
		Longitude:	**096° 49' 28.48" W**
	In/along Parkwood Boulevard, between Eagan Way and Eubanks Street	Elevation:	**No Data**
Well County:	**Collin**		
Type of Work:	**New Well**	Proposed Use:	**Environmental Soil Boring**

Drilling Start Date: **7/30/2018** Drilling End Date: **7/30/2018**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**2.25**	**0**	**8**

Drilling Method: **Direct Push**

Borehole Completion: **Plugged**

Annular Seal Data: **No Data**

Seal Method: **Not Applicable**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **No Data**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Plug Information:

Description (number of sacks & material)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Cement	**0**	**2**
Bentonite	**2**	**8**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Comments: **This environmental soil boring was plugged on the same day as its installation**

Report Amended on 8/9/2018 by Request #25733

Report Amended on 4/26/2019 by Request #27688

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**1.5**	**concrete**
1.5	**4.5**	**brown, silty clay**
4.5	**8**	**light gray, silty clay**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

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STATE OF TEXAS WELL REPORT for Tracking #486428

Owner:	**Exide Technologies**	Owner Well #:	**2018-PB-7**
Address:	**7471 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**Parkwood Boulevard ROW Frisco, TX 75034**	Latitude:	**33° 08' 30.85" N**
		Longitude:	**096° 49' 28.09" W**
	In/along Parkwood Boulevard, between Eagan Way and Eubanks Street	Elevation:	**No Data**
Well County:	**Collin**		
Type of Work:	**New Well**	Proposed Use:	**Environmental Soil Boring**

Drilling Start Date: **7/31/2018** Drilling End Date: **7/31/2018**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**2.25**	**0**	**8**

Drilling Method: **Direct Push**

Borehole Completion: **Plugged**

Annular Seal Data: **No Data**

Seal Method: **Not Applicable**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **No Data**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Plug Information:

Description (number of sacks & material)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Cement	**0**	**2**
Bentonite	**2**	**8**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Comments: **This environmental soil boring was plugged on the same day as its installation**

Report Amended on 8/9/2018 by Request #25732

Report Amended on 4/26/2019 by Request #27690

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**0.7**	**concrete**
0.7	**5**	**brown, silty clay**
5	**8**	**light gray, silty clay**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #486429

Owner:	**Exide Technologies**	Owner Well #:	**2018-PB-8**
Address:	**7471 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**Parkwood Boulevard ROW Frisco, TX 75034**	Latitude:	**33° 08' 31.14" N**
		Longitude:	**096° 49' 27.78" W**
	In/along Parkwood Boulevard, between Eagan Way and Eubanks Street	Elevation:	**No Data**
Well County:	**Collin**		
Type of Work:	**New Well**	Proposed Use:	**Environmental Soil Boring**

Drilling Start Date: **7/30/2018** Drilling End Date: **7/30/2018**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**2.25**	**0**	**8**

Drilling Method: **Direct Push**

Borehole Completion: **Plugged**

Annular Seal Data: **No Data**

Seal Method: **Not Applicable**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **No Data**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Plug Information:

Description (number of sacks & material)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Cement	**0**	**2**
Bentonite	**2**	**8**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Comments: **This environmental soil boring was plugged on the same day as its installation**

Report Amended on 4/26/2019 by Request #27691

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**0.7**	**concrete**
0.7	**8**	**light gray, silty clay**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

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P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #486432

Owner:	**Exide Technologies**	Owner Well #:	**2018-PB-9**
Address:	**7471 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**Parkwood Boulevard ROW Frisco, TX 75034**	Latitude:	**33° 08' 36.06" N**
		Longitude:	**096° 49' 31.37" W**
	In/along Parkwood Boulevard, between Eagan Way and Eubanks Street	Elevation:	**No Data**
Well County:	**Collin**		
Type of Work:	**New Well**	Proposed Use:	**Environmental Soil Boring**

Drilling Start Date: **7/30/2018** Drilling End Date: **7/30/2018**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**2.25**	**0**	**8**

Drilling Method: **Direct Push**

Borehole Completion: **Plugged**

Annular Seal Data: **No Data**

Seal Method: **Not Applicable**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **No Data**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Plug Information:

Description (number of sacks & material)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Cement	**0**	**0.5**
Bentonite	**0.5**	**8**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Comments: **This environmental soil boring was plugged on the same day as its installation**

Report Amended on 4/26/2019 by Request #27692

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**4**	**gray, silty clay**
4	**6**	**brown, silty clay**
6	**8**	**light gray, silty clay with gravel**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

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P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #486433

Owner:	**Exide Technologies**	Owner Well #:	**2018-PB-10**
Address:	**7471 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**Parkwood Boulevard ROW Frisco, TX 75034**	Latitude:	**33° 08' 32.81" N**
		Longitude:	**096° 49' 29.73" W**
	In/along Parkwood Boulevard, between Eagan Way and Eubanks Street	Elevation:	**No Data**
Well County:	**Collin**		
Type of Work:	**New Well**	Proposed Use:	**Environmental Soil Boring**

Drilling Start Date: **7/30/2018** Drilling End Date: **7/30/2018**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**2.25**	**0**	**8**

Drilling Method: **Direct Push**

Borehole Completion: **Plugged**

Annular Seal Data: **No Data**

Seal Method: **Not Applicable**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **No Data**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Plug Information:

Description (number of sacks & material)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Cement	**0**	**0.5**
Bentonite	**0.5**	**8**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	No Data

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Comments: **This environmental soil boring was plugged on the same day as its installation**

Report Amended on 4/26/2019 by Request #27693

Report Amended on 5/6/2019 by Request #27779

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	5.5	brown, silty clay with gravel
5.5	8	brown, silty clay

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

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(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #486434

Owner:	**Exide Technologies**	Owner Well #:	**2018-PB-11**
Address:	**7471 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**Parkwood Boulevard ROW Frisco, TX 75034**	Latitude:	**33° 08' 31.78" N**
		Longitude:	**096° 49' 28.48" W**
	In/along Parkwood Boulevard, between Eagan Way and Eubanks Street	Elevation:	**No Data**
Well County:	**Collin**		
Type of Work:	**New Well**	Proposed Use:	**Environmental Soil Boring**

Drilling Start Date: **7/31/2018** Drilling End Date: **7/31/2018**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**2.25**	**0**	**8**

Drilling Method: **Direct Push**

Borehole Completion: **Plugged**

Annular Seal Data: **No Data**

Seal Method: **Not Applicable**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **No Data**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Plug Information:

Description (number of sacks & material)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Cement	**0**	**0.5**
Bentonite	**0.5**	**8**

Water Quality:	Strata Depth (ft.)	Water Type
	No Data	No Data

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Comments: **This environmental soil boring was plugged on the same day as its installation**

Report Amended on 4/26/2019 by Request #27699

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	1	brown silt
1	5	gray, silty clay
5	8	gray, silty clay with gravel

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

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Texas Department of Licensing and Regulation
P.O. Box 12157
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(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #486435

Owner:	**Exide Technologies**	Owner Well #:	**2018-PB-12**
Address:	**7471 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**Parkwood Boulevard ROW Frisco, TX 75034**	Latitude:	**33° 08' 32.34" N**
		Longitude:	**096° 49' 30.1" W**
	In/along Parkwood Boulevard, between Eagan Way and Eubanks Street	Elevation:	**No Data**
Well County:	**Collin**		
Type of Work:	**New Well**	Proposed Use:	**Environmental Soil Boring**

Drilling Start Date: **7/31/2018** Drilling End Date: **7/31/2018**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**2.25**	**0**	**8**

Drilling Method: **Direct Push**

Borehole Completion: **Plugged**

Annular Seal Data: **No Data**

Seal Method: **Not Applicable**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **No Data**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Plug Information:

Description (number of sacks & material)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Cement	**0**	**2**
Bentonite	**2**	**8**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Comments: **This environmental soil boring was plugged on the same day as its installation**

Report Amended on 5/6/2019 by Request #27778

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**2**	**brown silt**
2	**3.5**	**pale brown silty with gravel**
3.5	**8**	**brown, silty clay**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

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P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #486436

Owner:	**Exide Technologies**	Owner Well #:	**2018-PB-13**
Address:	**7471 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**Parkwood Boulevard ROW Frisco, TX 75034**	Latitude:	**33° 08' 31.44" N**
		Longitude:	**096° 49' 29.18" W**
	In/along Parkwood Boulevard, between Eagan Way and Eubanks Street	Elevation:	**No Data**
Well County:	**Collin**		
Type of Work:	**New Well**	Proposed Use:	**Environmental Soil Boring**

Drilling Start Date: **7/31/2018** Drilling End Date: **7/31/2018**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**2.25**	**0**	**8**

Drilling Method: **Direct Push**

Borehole Completion: **Plugged**

Annular Seal Data: **No Data**

Seal Method: **Not Applicable**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **No Data**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Plug Information:

Description (number of sacks & material)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Cement	**0**	**0.5**
Bentonite	**0.5**	**8**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	No Data

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Comments: **This environmental soil boring was plugged on the same day as its installation**

Report Amended on 4/26/2019 by Request #27701

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	0.8	brown silt
0.8	4.5	brown silty clay
4.5	6	light gray, silty clay
6	8	light gray, silty clay with gravel

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

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P.O. Box 12157
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(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #486437

Owner:	**Exide Technologies**	Owner Well #:	**2018-PB-14**
Address:	**7471 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**Parkwood Boulevard ROW Frisco, TX 75034**	Latitude:	**33° 08' 31.81" N**
		Longitude:	**096° 49' 28.79" W**
	In/along Parkwood Boulevard, between Eagan Way and Eubanks Street	Elevation:	**No Data**
Well County:	**Collin**		
Type of Work:	**New Well**	Proposed Use:	**Environmental Soil Boring**

Drilling Start Date: **7/30/2018** Drilling End Date: **7/30/2018**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**2.25**	**0**	**8**

Drilling Method: **Direct Push**

Borehole Completion: **Plugged**

Annular Seal Data: **No Data**

Seal Method: **Not Applicable**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **No Data**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Plug Information:

Description (number of sacks & material)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Cement	**0**	**2**
Bentonite	**2**	**8**

Water Quality:	Strata Depth (ft.)	Water Type
	No Data	No Data

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Comments: **This environmental soil boring was plugged on the same day as its installation**

Report Amended on 4/26/2019 by Request #27702

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	1.1	concrete
1.1	8	gray, silty clay

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #486438

Owner:	**Exide Technologies**	Owner Well #:	**2018-PB-15**
Address:	**7471 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**Parkwood Boulevard ROW Frisco, TX 75034**	Latitude:	**33° 08' 32.41" N**
		Longitude:	**096° 49' 29.42" W**
	In/along Parkwood Boulevard, between Eagan Way and Eubanks Street	Elevation:	**No Data**
Well County:	**Collin**		
Type of Work:	**New Well**	Proposed Use:	**Environmental Soil Boring**

Drilling Start Date: **7/30/2018** Drilling End Date: **7/30/2018**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**2.25**	**0**	**8**

Drilling Method: **Direct Push**

Borehole Completion: **Plugged**

Annular Seal Data: **No Data**

Seal Method: **Not Applicable**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **No Data**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Plug Information:

Description (number of sacks & material)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Cement	**0**	**2**
Bentonite	**2**	**8**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	No Data

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Comments: **This environmental soil boring was plugged on the same day as its installation**

Report Amended on 4/26/2019 by Request #27703

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	1.3	concrete
1.3	2.5	light gray, silty clay with gravel
2.5	8	gray, silty clay

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

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Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #486440

Owner:	**Exide Technologies**	Owner Well #:	**2018-PB-16**
Address:	**7471 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**Parkwood Boulevard ROW Frisco, TX 75034**	Latitude:	**33° 08' 32.25" N**
		Longitude:	**096° 49' 29.84" W**
	In/along Parkwood Boulevard, between Eagan Way and Eubanks Street	Elevation:	**No Data**
Well County:	**Collin**		
Type of Work:	**New Well**	Proposed Use:	**Environmental Soil Boring**

Drilling Start Date: **7/31/2018** Drilling End Date: **7/31/2018**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**2.25**	**0**	**8**

Drilling Method: **Direct Push**

Borehole Completion: **Plugged**

Annular Seal Data: **No Data**

Seal Method: **Not Applicable**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **No Data**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Plug Information:

Description (number of sacks & material)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Cement	**0**	**2**
Bentonite	**2**	**8**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	No Data

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Comments: **This environmental soil boring was plugged on the same day as its installation**

Report Amended on 4/26/2019 by Request #27704

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	1	concrete
1	2	brown, silty clay
2	3	pale brown, silty clay with fill
3	7.5	brown, silty clay
7.5	8	light gray, silty clay

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

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P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #486441

Owner:	**Exide Technologies**	Owner Well #:	**2018-PB-17**
Address:	**7471 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**Parkwood Boulevard ROW Frisco, TX 75034**	Latitude:	**33° 08' 35.25" N**
		Longitude:	**096° 49' 31.31" W**
	In/along Parkwood Boulevard, between Eagan Way and Eubanks Street	Elevation:	**No Data**
Well County:	**Collin**		
Type of Work:	**New Well**	Proposed Use:	**Environmental Soil Boring**

Drilling Start Date: **7/30/2018** Drilling End Date: **7/30/2018**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**2.25**	**0**	**8**

Drilling Method: **Direct Push**

Borehole Completion: **Plugged**

Annular Seal Data: **No Data**

Seal Method: **Not Applicable**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **No Data**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Plug Information:

Description (number of sacks & material)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Cement	**0**	**0.5**
Bentonite	**0.5**	**8**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Comments: **This environmental soil boring was plugged on the same day as its installation**

Report Amended on 4/26/2019 by Request #27705

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**4**	**brown, silty clay with gravel and fill**
4	**8**	**pale brown, silty clay**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

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(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #486443

Owner:	**Exide Technologies**	Owner Well #:	**2018-PB-18**
Address:	**7471 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**Parkwood Boulevard ROW Frisco, TX 75034**	Latitude:	**33° 08' 33.56" N**
		Longitude:	**096° 49' 31.11" W**
	In/along Parkwood Boulevard, between Eagan Way and Eubanks Street	Elevation:	**No Data**
Well County:	**Collin**		
Type of Work:	**New Well**	Proposed Use:	**Environmental Soil Boring**

Drilling Start Date: **7/31/2018** Drilling End Date: **7/31/2018**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**2.25**	**0**	**10**

Drilling Method: **Direct Push**

Borehole Completion: **Plugged**

Annular Seal Data: **No Data**

Seal Method: **Not Applicable**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **No Data**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Plug Information:

Description (number of sacks & material)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Cement	**0**	**0.5**
Bentonite	**0.5**	**10**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Comments: **This environmental soil boring was plugged on the same day as its installation**

Report Amended on 4/26/2019 by Request #27706

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**3**	**brown silt**
3	**6.8**	**brown, silty clay with gravel**
6.8	**10**	**gray, silty clay**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

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(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #486444

Owner:	**Exide Technologies**	Owner Well #:	**2018-PB-19**
Address:	**7471 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**Parkwood Boulevard ROW Frisco, TX 75034**	Latitude:	**33° 08' 34.26" N**
		Longitude:	**096° 49' 31.38" W**
	In/along Parkwood Boulevard, between Eagan Way and Eubanks Street	Elevation:	**No Data**
Well County:	**Collin**		
Type of Work:	**New Well**	Proposed Use:	**Environmental Soil Boring**

Drilling Start Date: **7/31/2018** Drilling End Date: **7/31/2018**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**2.25**	**0**	**8**

Drilling Method: **Direct Push**

Borehole Completion: **Plugged**

Annular Seal Data: **No Data**

Seal Method: **Not Applicable**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **No Data**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Plug Information:

Description (number of sacks & material)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Cement	**0**	**0.5**
Bentonite	**0.5**	**8**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Roibert Williams** License Number: **59501**

Comments: **This environmental soil boring was plugged on the same day as its installation**

Report Amended on 4/26/2019 by Request #27707

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**0.5**	**brown silt**
0.5	**3.5**	**pale brown silt with gravel**
3.5	**4**	**brown, silty clay**
4	**7**	**brown, silty clay with gravel**
7	**8**	**brown, silty clay with fill**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

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Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #486445

Owner:	**Exide Technologies**	Owner Well #:	**2018-PB-20**
Address:	**7471 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**Parkwood Boulevard ROW Frisco, TX 75034**	Latitude:	**33° 08' 34.92" N**
		Longitude:	**096° 49' 31.24" W**
	In/along Parkwood Boulevard, between Eagan Way and Eubanks Street	Elevation:	**No Data**
Well County:	**Collin**		
Type of Work:	**New Well**	Proposed Use:	**Environmental Soil Boring**

Drilling Start Date: **7/31/2018** Drilling End Date: **7/31/2018**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**2.25**	**0**	**8**

Drilling Method: **Direct Push**

Borehole Completion: **Plugged**

Annular Seal Data: **No Data**

Seal Method: **Not Applicable**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **No Data**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Plug Information:

Description (number of sacks & material)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Cement	**0**	**0.5**
Bentonite	**0.5**	**8**

	Strata Depth (ft.)	Water Type
Water Quality:	**No Data**	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Comments: **This environmental soil boring was plugged on the same day as its installation**

Report Amended on 4/26/2019 by Request #27708

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**0.5**	**brown silt**
0.5	**4**	**pale brown silt with gravel**
4	**8**	**brown, silty clay with gravel**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

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P.O. Box 12157
Austin, TX 78711
(512) 334-5540

golder.com

APPENDIX 3.4

DEVELOPMENT OF PCLS PROTECTIVE OF ECOLOGICAL RECEPTORS FOR BANK SOIL

Development of PCLs Protective of Ecological Receptors for Bank Soil

Protective Concentration Levels (PCLs) were developed specifically for ecological exposure to the soils in the banks of Stewart Creek. Two species were considered relevant for this assessment: bank swallow and timber rattlesnake. Information on both species and PCL determinations for arsenic, cadmium and lead are presented below.

1.0 Bank Swallow (*Riparia riparia)*

Bank swallows live in low areas along rivers, streams, ocean coasts or reservoirs. Their territories usually include vertical cliffs or banks where they nest in colonies of 10 to 2,000 nests. Bank swallows almost exclusively eat flying or jumping insects, such as bees, wasps, ants, butterflies or moths. The swallows catch insects while flying, usually at a height of 50 feet above open water or open ground. They can feed singly or in large groups. Male bank swallows use their small, conical bills as well as their feet and wings to dig burrows that will lead to a nesting chamber. The burrows are perpendicular to the ground level and when finished, are dug about 25 inches into the side of the bank. The burrows are located near large bodies of water so that there is ample room for vertical flying and located usually in the upper third of the bank to avoid ground predators (Cornell, 2018).

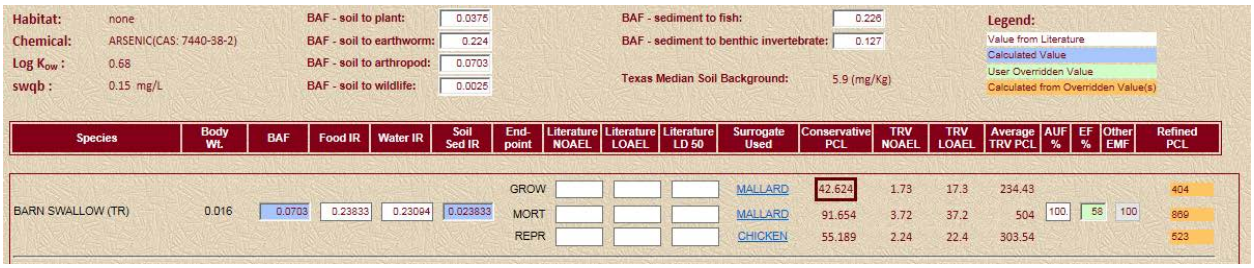
- **Migration:** Bank swallows breed from Alaska across northern Canada south to California, Texas, Virginia and North Carolina. They spend winters in the tropics (whatbird.com,2018). They breed along the Rio Grande River in Texas and into Northern Mexico. In the winter, the bank swallow migrates throughout South America. Some colonies spend winter along the western coastal slopes of Mexico (Wildlife Journal Junior, 2018). For the PCL calculations, it is assumed that the bank swallow is present 7 months out of the year.
- **Literature reported body weight:** 10-19 grams (Cornell, 2018), 13.83 grams (MacBriar, 1988), 14 grams (whatbird.com, 2018), 10.2 - 18.8 grams (biokids, 2018), average for males of 13.7 grams, average for females of 14.8 grams (Terres, 1980). For the PCL calculations, the average of all the above values listed of 14.3 grams was used.
- **Food Ingestion:** It is assumed that the bank swallow consumes only arthropods as does the barn swallow and therefore the barn swallow is an adequate surrogate species. The barn swallow is listed in the TCEQ PCL Database.

1.1 PCL Calculation for Bank Swallow

To calculate the PCLs for the bank swallow, the PCLs from the TCEQ's Database based on the barn swallow were developed and modified for the bodyweight and migration factor for the bank swallow.

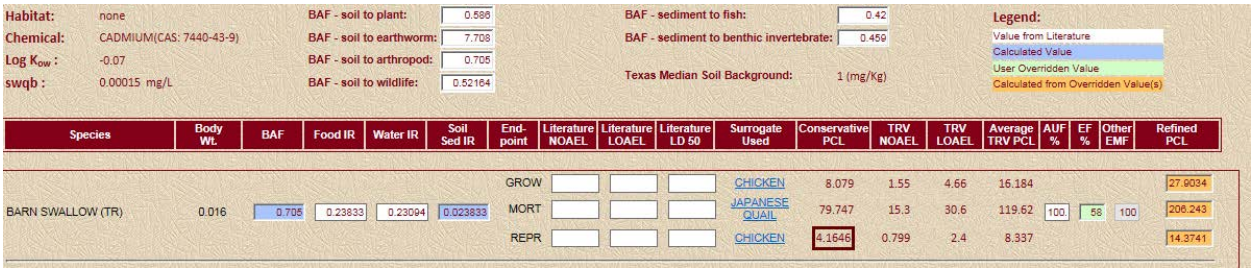
Arsenic: The Average TRV arsenic PCL for barn swallow is 234.43 mg/kg without modification. Accounting for migration (present only 58% of the year) the PCL = 404 mg/kg. The PCL was further modified to account for the difference in the body weight between the bank swallow (14.3 grams) and the barn swallow (16 grams) (14.3/16 = 0.89).

Soil arsenic PCL for the bank swallow = 404 x 0.89 = 359.56 mg/kg



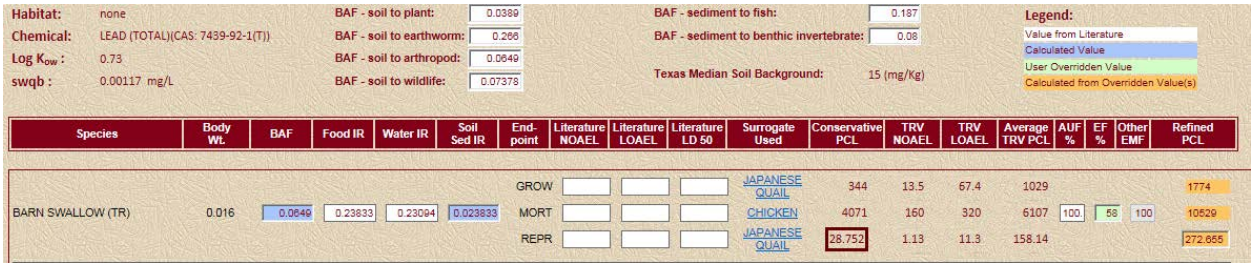
Cadmium: The Average TRV cadmium PCL for barn swallow is 8.34 mg/kg without modification. Accounting for migration (present only 58% of the year) the PCL = 14.37 mg/kg.

Soil cadmium PCL for the bank swallow = 14.37 x 0.89 = 12.79 mg/kg



Lead: The Average TRV lead PCL for barn swallow is 158.14 mg/kg without modification. Accounting for migration (present only 58% of the year) the PCL = 272.66 mg/kg.

Soil lead PCL for the bank swallow = 272.66 x 0.89 = 242.66 mg/kg



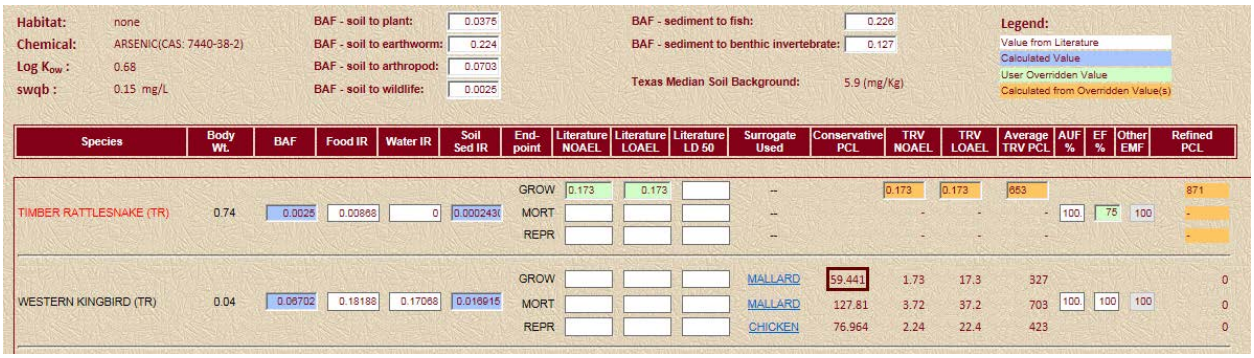
2.0 Timber Rattlesnake (*Crotalus horridus)*

The timber rattlesnake is a threatened species in Texas and could become exposed to the bank soil when moving in and out of Stewart Creek or when preying upon bank swallow nests.

2.1 PCL Calculation for Timber Rattlesnake

For the PCL calculations, the timber rattlesnake is assumed to be active 9 months out of the year and in hibernation 3 months out of the year. PCLs for the snake were developed using the TCEQ's PCL Database (version 1.8). To calculate the soil PCLs for the snake, the most conservative avian No Adverse Effect Level (NOAEL)-based Toxicity Reference Value (TRV) modified by a factor of 0.1 was used (note that the western kingbird is presented in the screen shots with the soil purpose of determining the avian TRV). Soil PCLs for the timber rattlesnake include:

Arsenic: 653 mg/kg (871 mg/kg if PCL modified for hibernation).



Habitat: none | Chemical: ARSENIC(CAS: 7440-38-2) | Log K_{ow}: 0.68 | swqb: 0.15 mg/L

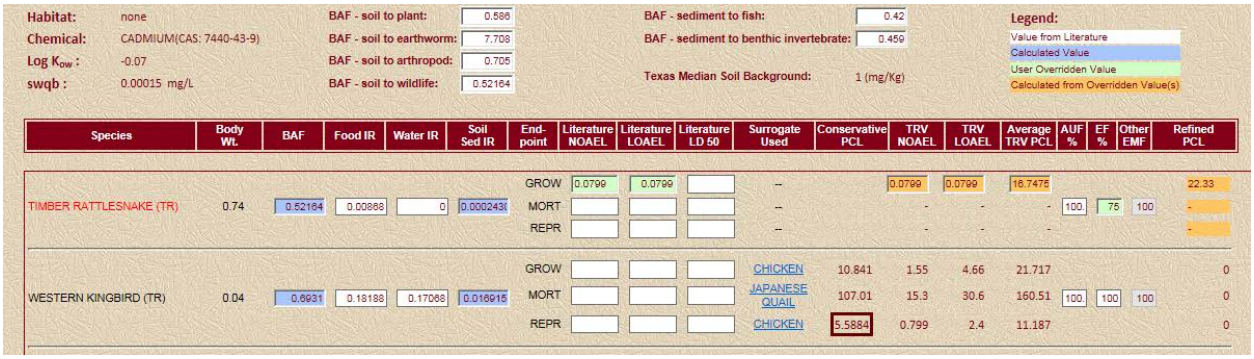
BAF - soil to plant: 0.0375 | BAF - soil to earthworm: 0.224 | BAF - soil to arthropod: 0.0703 | BAF - soil to wildlife: 0.0025

BAF - sediment to fish: 0.226 | BAF - sediment to benthic invertebrate: 0.127 | Texas Median Soil Background: 5.9 (mg/Kg)

Legend: Value from Literature; Calculated Value; User Overridden Value; Calculated from Overridden Value(s)

Species	Body Wt.	BAF	Food IR	Water IR	Soil Sed IR	End-point	Literature NOAEL	Literature LOAEL	Literature LD 50	Surrogate Used	Conservative PCL	TRV NOAEL	TRV LOAEL	Average TRV PCL	AUF %	EF %	Other EMF	Refined PCL
TIMBER RATTLESNAKE (TR)	0.74	0.0025	0.00868	0	0.000243(	GROW	0.173	0.173		--		0.173	0.173	653				871
						MORT				--		-	-	-	100	75	100	-
						REPR				--		-	-	-				-
WESTERN KINGBIRD (TR)	0.04	0.06702	0.18188	0.17068	0.016915	GROW				MALLARD	59.441	1.73	17.3	327				0
						MORT				MALLARD	127.81	3.72	37.2	703	100	100	100	0
						REPR				CHICKEN	76.964	2.24	22.4	423				0

Cadmium: 16.75 mg/kg (22.33 mg/kg if PCL is modified for hibernation)



Habitat: none | Chemical: CADMIUM(CAS: 7440-43-9) | Log K_{ow}: -0.07 | swqb: 0.00015 mg/L

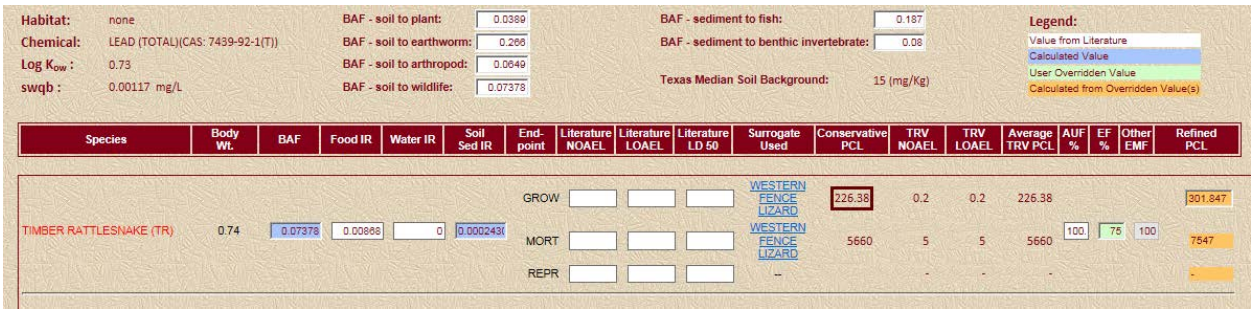
BAF - soil to plant: 0.586 | BAF - soil to earthworm: 7.708 | BAF - soil to arthropod: 0.705 | BAF - soil to wildlife: 0.52164

BAF - sediment to fish: 0.42 | BAF - sediment to benthic invertebrate: 0.459 | Texas Median Soil Background: 1 (mg/Kg)

Legend: Value from Literature; Calculated Value; User Overridden Value; Calculated from Overridden Value(s)

Species	Body Wt.	BAF	Food IR	Water IR	Soil Sed IR	End-point	Literature NOAEL	Literature LOAEL	Literature LD 50	Surrogate Used	Conservative PCL	TRV NOAEL	TRV LOAEL	Average TRV PCL	AUF %	EF %	Other EMF	Refined PCL
TIMBER RATTLESNAKE (TR)	0.74	0.52164	0.00868	0	0.000243(	GROW	0.0799	0.0799		--		0.0799	0.0799	16.7475				22.33
						MORT				--		-	-	-	100	75	100	-
						REPR				--		-	-	-				-
WESTERN KINGBIRD (TR)	0.04	0.6931	0.18188	0.17068	0.016915	GROW				CHICKEN	10.841	1.55	4.66	21.717				0
						MORT				JAPANESE QUAIL	107.01	15.3	30.6	160.51	100	100	100	0
						REPR				CHICKEN	5.5884	0.799	2.4	11.187				0

Lead: 226.38 mg/kg (301.85 mg/kg if PCL is modified for hibernation)



Habitat: none | Chemical: LEAD (TOTAL)(CAS: 7439-92-1(T)) | Log K_{ow}: 0.73 | swqb: 0.00117 mg/L

BAF - soil to plant: 0.0389 | BAF - soil to earthworm: 0.266 | BAF - soil to arthropod: 0.0649 | BAF - soil to wildlife: 0.07378

BAF - sediment to fish: 0.187 | BAF - sediment to benthic invertebrate: 0.08 | Texas Median Soil Background: 15 (mg/Kg)

Legend: Value from Literature; Calculated Value; User Overridden Value; Calculated from Overridden Value(s)

Species	Body Wt.	BAF	Food IR	Water IR	Soil Sed IR	End-point	Literature NOAEL	Literature LOAEL	Literature LD 50	Surrogate Used	Conservative PCL	TRV NOAEL	TRV LOAEL	Average TRV PCL	AUF %	EF %	Other EMF	Refined PCL
TIMBER RATTLESNAKE (TR)	0.74	0.07378	0.00868	0	0.000243(	GROW				WESTERN FENCE LIZARD	226.38	0.2	0.2	226.38				301.847
						MORT				WESTERN FENCE LIZARD	5660	5	5	5660	100	75	100	7547
						REPR				--		-	-	-				-

3.0 Final PCLs

As summary of the PCLs for both the bank swallow and timber rattlesnake are presented below. The final bank PCL is the lower of the PCLs for each species.

COC	Bank Swallow PCL (mg/kg)	Rattlesnake PCL (mg/kg)	Final Bank PCL (mg/kg)
Arsenic	359.56	871	**360**
Cadmium	12.79	22.33	**13**
Lead	242.66	301.85	**243**

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APPENDIX 3.5

2019 RESPONSE ACTION PLAN SITE INVESTIGATION REPORT

GOLDER

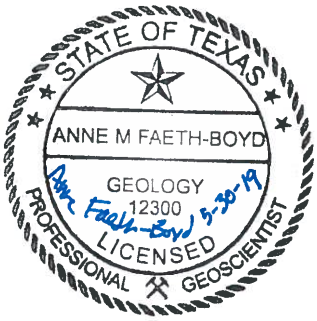
REPORT

2019 Response Action Plan Site Investigation Report

Exide Frisco Recycling Facility, 7471 Old 5th Street, Frisco, Texas 75034-5047, TCEQ SWR No. 30516, TCEQ Hazardous Waste Permit No. HW-50206, TCEQ Agreed Order Docket No. 2011-1712-IHW-E, EPA ID No. TXD006451090, Customer No. CN600129779, Regulated Entity No. RN100218643

Submitted to:

Mr. Brad Weaver
Director, Remediation
Exide Technologies
P.O. Box 250
7471 Old 5th Street
Frisco, TX 75034



GOLDER ASSOCIATES INC.
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130208606

May 30, 2019

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Exide Technologies (electronic)

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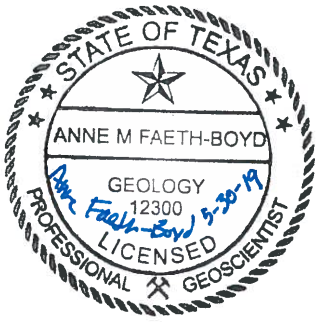

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Figure 2 Site Layout Map

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Attachment B DGW-MW-12 Monitoring Well Construction Log
Attachment C Well Development Forms
Attachment D Pumping Test Field Forms
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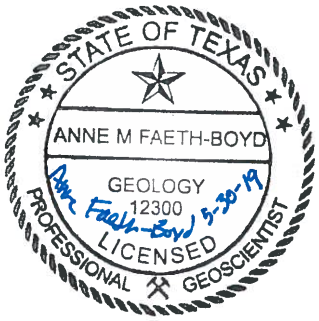

1.0 INTRODUCTION AND BACKGROUND

1.1 Introduction

Golder Associates Inc. (Golder) has prepared this 2019 Response Action Plan Site Investigation Report (2019 RAP SIR) for the Exide Technologies, Inc. (Exide) Former Operating Plant (FOP) (referred to throughout as the "Site") located at 7471 Old 5th Street in Frisco, Texas (Figure 1). The 2019 RAP SIR has been prepared following work completed in the first and second quarters of 2019 in support of Exide's FOP Resource Conservation and Recovery Act (RCRA) Permit Renewal Application with a Major Amendment and Compliance Plan (referred to throughout as the "Permit Renewal Application"). This Report includes the rationale and methodology used while performing hydrogeologic investigation activities for the implementation of a groundwater protection element at the Site.

1.2 Background

As part of overall Site remedial activities, a Corrective Action Management Unit (CAMU), hereafter referred to as the Remediation Consolidation Area (RCA), will be designed, engineered, constructed, and operated within the FOP. The proposed RCA will be located in an area of existing contamination and will be used as a consolidation area for soil and sediment excavated from other areas of the FOP, Stewart Creek, and the off-Site City of Frisco Railroad Museum. In addition to the RCA, one closed pre-RCRA landfill (the North Disposal Area [NDA]) and one closed Class 2 Landfill (the Slag Landfill) are located adjacent to the north of the proposed RCA. The locations of the NDA, the Slag Landfill, and the proposed RCA are shown on Figure 2.

In 2018, at the request of the Texas Commission on Environmental Quality (TCEQ), Golder conducted a Deep Groundwater Pre-Design Investigation (DGW PDI) to evaluate deep groundwater movement across the Site for the implementation of a groundwater protection element to address the potential for contaminant migration from the RCA to groundwater and the potential for discharge of contaminated groundwater to Stewart Creek. Results of the 2018 DGW PDI are presented under separate cover as Appendix 3.1 of the Response Action Plan. Based on requested modifications to the 2018 proposed groundwater protection element (a funnel and gate treatment system), additional hydrogeologic information for the revised location of the planned treatment gate (a permeable reaction barrier (PRB) located west of the Slag Landfill) was needed for design and modeling purposes. The location of the currently proposed funnel and gate system is shown on Figure 2.

2.0 OVERVIEW OF FIELD INVESTIGATION

The objective of the 2019 RAP Site Investigation was to gather additional hydrogeologic data necessary to evaluate and design the modified (from 2018) funnel and gate system as the groundwater protection element for the FOP. In general, the 2019 RAP Site Investigation consisted of the following activities:

- Field investigation of areas of the FOP where additional lithological information was needed for design of the RCA, groundwater protection element, and/or for groundwater modeling purposes
  - Six (6) boreholes were advanced to bedrock and continuously logged to identify transmissive units throughout the length of the borehole and establish an accurate depth to bedrock across the Site.
- Field investigation of areas to the west of the Slag Landfill in the vicinity of the proposed PRB (gate)
  - Four (4) boreholes were advanced to bedrock and continuously logged to identify transmissive units throughout the length of the borehole. Attention was directed to identify the presence of transmissive units or layering that had the potential to discharge groundwater to Stewart Creek.
  - One (1) borehole was converted into a monitoring well (DGW-MW-12) based on lithology observed during drilling and the observed presence of groundwater. The screened section was positioned to monitor the water elevation and water quality of the observed transmissive layer.
  - After installation, DGW-MW-12 was developed by surging and pumping in the screened level using a stainless-steel bailer and a submersible pump.
- Hydraulic conductivity testing of DGW-MW-12 using traditional slug testing methods was performed following well installation and development. Rising- and falling-head slug tests were conducted and analyzed to estimate the saturated hydraulic conductivity of DGW-MW-12.
- A pumping test was conducted at DGW-MW-12 to better establish aquifer characteristics including hydraulic conductivity in the area of the proposed gate (PRB).

This 2019 RAP SIR presents a summary of the procedures and data obtained during the 2019 RAP Site investigation. A detailed design for the proposed funnel and gate system is included using the new and existing Site data and is included as Appendix 3.7 to the Response Action Plan. Also included in Appendix 3.7 are the results of groundwater modeling of the proposed funnel and gate system, developed using existing Site data and data obtained during the 2019 RAP Site investigation.

3.0 FIELD PROCEDURES

3.1 Health and Safety

This work was performed under a Site-Specific Health and Safety Plan (HASP), in accordance with OSHA regulation 29 CFR 1910.120. Each subcontractor was responsible for its own health and safety program. This work was conducted using Level D Protection. All Golder and subcontracted personnel working on this Site who might be potentially exposed to hazardous materials had successfully completed 40-hour HAZWOPER training.

3.2 Site Access

Prior to mobilization to the field, Golder coordinated with Site personnel regarding access and utilities. All 2019 RAP Site investigation field activities were located within the Exide Site boundaries and approval for each location was obtained from Exide prior to initiating any field activities. The drilling subcontractor submitted the state-required public utility locate and Golder also contracted a private utility locate company to clear boring locations using ground penetrating radar (GPR), and visually surveyed the area prior to initiating drilling activities.

3.3 Drilling Activities

Drilling activities were completed by WEST Drilling, a Texas–licensed drilling subcontractor directly subcontracted to Golder. Figure 2 shows the locations of the soil borings.

Ten (10) vertical soil borings were advanced to bedrock using direct push sampling technology. All soil borings were sampled continuously using a three-inch continuous sampling system to identify transmissive units/layers and depth to bedrock. All borehole material was logged for lithology and classified based on the Unified Soil Classification System (USCS) by a Golder engineer. The dampness of each soil core was also noted during the logging process. Pertinent data concerning the drilling activities was recorded in the field boring logs. Battery case fragments were encountered in the soil cores at 2019-BH-07 and 2019-BH-08 during the 2019 RAP Site investigation (both located along the northern edge of the NDA, see Figure 2). All field borings logs are provided as Attachment A.

3.4 Monitoring Well Installation

Based on lithology encountered during drilling in the area to the west of the Slag Landfill (in the area of the proposed PRB gate), soil borings 2019-BH-02, 2019-BH-03, and 2019-BH-04 were left open overnight to evaluate for the presence of groundwater. Upon arrival at the Site the following morning, groundwater was present in 2019-BH-04. No water was present in either 2019-BH-02 or 2019-BH-03 and those boreholes were subsequently plugged and abandoned according to 16 Texas Administrative Code (TAC) §76.702 and 16 TAC §76.1004. 2019-BH-04 was converted into a monitoring well using a hollow stem auger drill rig and was renamed as DGW-MW-12.

DGW-MW-12 was constructed of two-inch diameter schedule 40 polyvinyl chloride (PVC) with a 0.010-inch slotted schedule 40 PVC screen. The screened interval was determined based on lithology, depth to bedrock, and presence of groundwater. DGW-MW-12 was constructed in accordance with Texas Water Development Board (TWDB), the United States Environmental Protection Agency (USEPA) and the Texas Commission on Environmental Quality (TCEQ) requirements. These requirements include the 30 TAC §330.421 (effective March 2006), the USEPA Region 4, Design and Installation of Monitoring Wells (effective January 2013), and reporting requirements set forth for licensed water well installers by the TWDB. The construction information for DGW-MW-12 is provided as Attachment B.

The drilling subcontractor submitted the necessary drilling and, as applicable, plugging reports to the TWDB and Texas Department of Licensing and Regulation (TDLR), as required, which are provided as Attachment F.

The nine (9) soil borings and DGW-MW-12 were surveyed by Brittain & Crawford LLC (B&C), a Texas-licensed land surveyor, on January 23, 2019 to appropriately determine groundwater and bedrock elevations above mean sea level (MSL).

3.5 Well Development

Following installation, DGW-MW-12 was developed with a submersible pump and a stainless-steel bailer. The monitoring well was developed (surged and pumped/bailed, repeat as needed) until the well was relatively free of sediment. Once well development had ceased, purging continued until field parameters were generally stable and urbidity was below 5 nephelometric turbidity units (NTUs). Well development forms are provided as Attachment C.

3.6 Hydraulic Conductivity Slug Testing

Following installation and development of DGW-MW-12, a hydraulic conductivity estimate was obtained using the “slug test” methodology (ASTM D-4044). A slug test is a field test used to estimate the hydraulic conductivity of formation materials adjacent to the screened section. The basic approach is to “instantaneously” change the water elevation in the well by raising or lowering the initial or static elevation and observing the return of the water level to static over time.

Prior to conducting the slug test, static water level was measured at DGW-MW-12 and surrounding nearby monitoring wells. A pressure transducer was then lowered down the well to a sufficient depth to allow insertion of a slug into the water column above the transducer. Once the transducer readings stabilized, two PVC slugs both measuring approximately 1 inch in diameter and 2.8 feet long were, quickly, but carefully lowered into the well to displace the water column thus raising the water elevation inside the well. Once the water elevation lowered to static conditions and stabilized as indicated on the transducer, the slugs were removed quickly and carefully thus artificially lowering the water elevation in the well. The water level elevation was continuously monitored until water levels returned to static conditions and stabilized. The slugs were decontaminated as described in Section 3.9.

Following completion of field activities, the data was analyzed using a combination of the Hvorslev Slug Test Solution and Golder proprietary software. Results of the slug test are provided in Table 1 and discussed in detail in Section 4.2.

3.7 Pumping Test

In early April 2019, Golder conducted a pumping test at DGW-MW-12 to better establish aquifer characteristics including hydraulic conductivity in the area of the proposed PRB gate. Prior to conducting the pumping test, static water level was measured at DGW-MW-12. A pressure transducer was then lowered down the well and positioned right above the bottom of the well. Once water level measurements stabilized, the pumping test began. Water was pumped using peristaltic pumps (multiple pumps were used simultaneously during portions of the test where a higher flow rate was desired). Golder began the continuous pumping test on the evening of April 10, 2019 at an initial flow rate of 500 milliliters per minute (mL/min). Over time, drawdown began to stabilize at this rate and the flow rate was increased to 750 mL/min and then subsequently to 1 liter/minute (L/min). At mid-day on April 11, 2019, DGW-MW-12 was nearing dry conditions (while pumping at a rate of 1 L/min) and the flow rate was decreased to 500 mL/min. DGW-MW-12 was then pumped at a constant rate of 500 mL/min for approximately 19 hours. On the morning of April 12, 2019, the pumps were again increased to 1L/min. After

approximately one hour at this rate, DGW-MW-12 went dry. The transducer was left in the monitoring well to measure recovery for approximately 24 hours. Approximately 405 gallons were removed from DGW-MW-12 during the pumping test. Pumping test field forms are provided in Attachment D. Backup, manual water level measurements were substituted for the analysis of the early portion of the test due to a hardware malfunction and loss of early test data files.

Following completion of field activities, the data was analyzed using HydroBench® (version 3.7) an in-house software developed by Golder, based on a numerical drillhole simulator using an automated matching procedure (nonlinear regression algorithms). HydroBench® includes the derivative of pressure (i.e., rate of pressure change) with respect to the natural logarithm of time that has been shown to significantly improve the diagnostic and quantitative analysis of constant-rate pumping tests (Spane and Wurstner 1993).

A discussion of results for the pumping test is described in Section 4.2.

3.8 Investigation-Derived Waste

All liquid investigation derived waste (IDW) from the January 2019 investigation, including drilling water, decontamination water, and development purge water was containerized on-Site in 55-gallon steel drums at the Site pending disposition. IDW from the April 2019 pumping test was containerized in the on-Site frac tanks at the Site pending disposition. All soil IDW from January 2019 was placed in 55-gallon steel drums and sampled for toxicity characteristic leaching procedure (TCLP) Resource Conservation and Recovery Act (RCRA) metals plus antimony, beryllium, and nickel as required for Texas disposal.

Following receipt of analytical data, soil IDW was removed from the Site and disposed of in DFW Landfill in Lewisville, Texas. Decontamination water was profiled with other on-Site water and disposed of in Turkey Creek Landfill in Alvarado, Texas.

3.9 Decontamination

Decontamination was conducted in general conformance with ASTM Standard D 5088-15a. The drill rig was decontaminated prior to arrival on-Site with attention to the working end and downhole equipment (i.e., rods, etc.). Decontamination consisted of washing the equipment in a potable water and Alconox™ solution, followed by a potable water rinse, and then a distilled water rinse.

4.0 GEOLOGY AND HYDROGEOLOGY RESULTS

4.1 Site Geology

The geology encountered at the Site generally consists of approximately 10 to 30 feet of moist to wet, clay-rich, colluvial soils (Quaternary undivided surficial deposits) overlying the Eagle Ford Shale Formation. Colluvium is a general term used to define soil material and rock debris that accumulates at the base of slopes due to erosional forces such as slides, slumps, sheet-floods, or debris flows. It is typically characterized by heterogeneous and poorly sorted material. The colluvial soils at the Site typically consist of clay or silty clay with minor occurrences of gravelly clay (gravel suspended in a clay matrix), sand, and clayey gravel lenses or layers. Bedrock in the vicinity of the FOP ranges from 12 to 30 feet below ground surface. Detailed regional and Site-specific geology is presented in Part B, Attachment G as part of the Permit Renewal.

During the 2019 RAP Site investigation, soils encountered were generally like borings advanced and recorded at the Site during previous investigations, with predominantly clay or silty clay with minor occurrences of gravelly clay and sand layers. In the area of the proposed PRB gate, boreholes 2019-BH-01 through 2019-BH-04 also indicated a predominantly clay matrix with minor occurrence of discrete transmissive units/layers. Borehole 2019-BH-01 shows approximately 23 ft of “CL” clay with a 7.5 ft thick more silty clay layer from elevation 615 ft MSL to 623 ft MSL. At 2019-BH-02, 22 of 24 feet of soil column was clay, with a 2-foot thick sand and silty-clay with gravel ‘seam’ at about 619 ft MSL and a ½ foot thick sand laying directly atop bedrock at 613 ft MSL. At 2019-BH-03, there is about 22.5 feet of clay with a “hair thin” sand atop bedrock and at 2019-BH-04, there was about 23 feet of clay with a thin clayey silt with trace of sand ‘seam’ at 620.5 ft MSL. Standing water was only reported at 2019-BH-04.

4.2 Hydraulic Conductivity

A summary of the hydraulic conductivity results from slug testing for both the 2019 RAP Site investigation and the 2018 DGW PDI is presented in Table 1. From slug test analyses, hydraulic conductivities at the Site ranged from 2E-02 to 2E-06 centimeters per second (cm/s) with the highest hydraulic conductivities measured in wells with the most coarse-grained soils and the lowest hydraulic conductivities measured in wells with the least amount of coarse-grained material. The results of the slug test performed at DGW-MW-12 resulted in similar hydraulic conductivities of monitoring wells at the site with a value of 3E-04 cm/s.

Drawdown over time is presented in graphical form as Attachment E. The results of the pumping test performed at DGW-MW-12 yielded a near-well transmissivity value of approximately 6E-06 (m^2/s) and a corresponding hydraulic conductivity value of 2E-04 cm/s over the saturated interval of the well, which is similar to estimates from slug testing. The longer duration of the pumping test relative to a slug test allowed for identification of the flow regime beyond several borehole diameters from DGW-MW-12. Applying the pressure derivative method (Bourdet et al., 1983) to the DGW-MW-12 pumping test data indicated the presence of low-flow/no-flow boundaries in the vicinity of the well, with a positive unit-slope in the late-time pressure response of the pressure derivative data plot, consistent with the observed hydro-stratigraphy at 2019-BH-01 through 04 (a predominantly clay matrix with two minor and discontinuous transmissive layers at about 619-623 ft MSL and directly atop bedrock at around 613-614 ft MSL.

5.0 CONCLUSIONS

Based on existing Site data, data obtained during the DGW PDI, and data obtained during the 2019 RAP Site investigation, bedrock is present across the entire FOP at a range of approximately 12 to 30 feet below ground surface. Site geology consists of primarily of 10 to 30 feet of moist to wet, clay-rich, colluvial soils (silty clay with minor and intermittent sand, silt, and gravel layers). The results of the slug test performed at DGW-MW-12 resulted in similar hydraulic conductivities of monitoring wells at the site with a value of 3.2E-04 cm/s. The results of the pumping test at DGW-MW-12 yielded a near-well transmissivity value of approximately 6E-06 (m^2/s) and a corresponding hydraulic conductivity value of 2E-04 cm/s and the presence of low-flow/no-flow boundaries in the vicinity of the well. This hydraulic characteristic is consistent with the observed hydro-stratigraphy of a predominantly clay matrix with two minor and discontinuous transmissive layers.

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United States Environmental Protection Agency, Region 4, Science and Ecosystem Support Division, Athens, Georgia, 2013. Design and Installation of Monitoring Wells. Effective January 29, 2013.

7.0 CLOSING

Golder appreciates the opportunity to assist Exide with this project. Please contact the undersigned if you have any questions or would like any additional information about this Report.

Golder Associates Inc.

Emily White

Emily P. White
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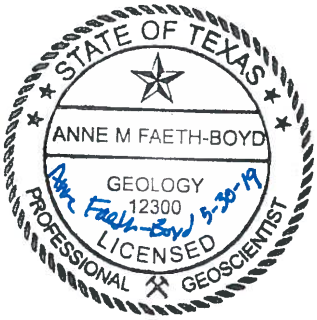
Associate and Senior Engineer



Todd H. Rees, Ph.D.
Program Leader

EPW/AMF/THR

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Tables

GOLDER

RESULTS

Subject:	Exide RAP Investigation Hydraulic Conductivity Testing		
Date:	11-Feb-19	**Analysis:**	J. Suozzi
Project No.:	130208606	**Checked:**	J. White
Project Short Title:	**Exide - Frisco RAP**	**Reviewed:**	T. Rees

Well ID	Saturated Interval (ft BGS)	Ground Surface Elevation (ft AMSL)	Top of Saturated Interval Elevation (ft AMSL)	Bottom of Interval Elevation (ft AMSL)	Transmissivity (T) (m^2/sec)	Hydraulic Conductivity (k) (cm/sec)	Date of Hydraulic Conductivity Testing	Test Sequence Analyzed
DGW-MW-1	10.2-29.7	635.52	625.32	605.82	8.E-05	1.E-03	5/22/2018	SLUG
DGW-MW-2	10.2-19.7	634.45	624.25	614.75	3.E-04	9.E-03	5/21/2018	SLUG
DGW-MW-3	5.98-19.7	633.68	627.70	613.98	9.E-06	2.E-04	5/21/2018	SLUG
DGW-MW-4	10.2-19.7	632.50	622.30	612.80	2.E-04	7.E-03	5/21/2018	SLUG
DGW-MW-5	6.82-19.7	626.99	620.17	607.29	7.E-04	2.E-02	5/21/2018	SLUG
DGW-MW-6	15.2-29.7	640.42	625.22	610.72	1.E-05	2.E-04	5/21/2018	SLUG
DGW-MW-7	15.2-29.7	639.95	624.75	610.25	4.E-04	8.E-03	5/21/2018	SLUG
DGW-MW-8	20.37-29.7	640.26	619.89	610.56	2.E-05	8.E-04	5/21/2018	SLUG
DGW-MW-9	14.26-24.7	642.22	627.96	617.52	2.E-04	6.E-03	5/21/2018	SLUG
DGW-MW-10	15.2-19.7	631.97	616.77	612.27	2.E-05	2.E-03	5/22/2018	SLUG
DGW-MW-12	14.2-24.2	637.02	622.82	612.84	1.E-05	3.E-04	1/26/2019	SLUG
MW-26	5.0-15.0	628.34	623.34	613.34	6.E-08	2.E-06	5/22/2018	SLUG
MW-27	5.0-15.0	629.89	624.89	614.89	9.E-08	3.E-06	5/22/2018	SLUG
MW-29	4.5-14.5	629.39	624.89	614.89	2.E-07	6.E-06	5/22/2018	SLUG
MW-44	7.01-15.0	634.33	627.32	619.33	5.E-07	2.E-05	5/22/2018	SLUG

Notes:

RAP - Response Action Plan

Saturated intervals for wells tested in May 2018 taken from water elevation survey conducted on May 22, 2018.

Saturated interval for DGW-MW-12 taken from well development conducted on January 24-25, 2019.

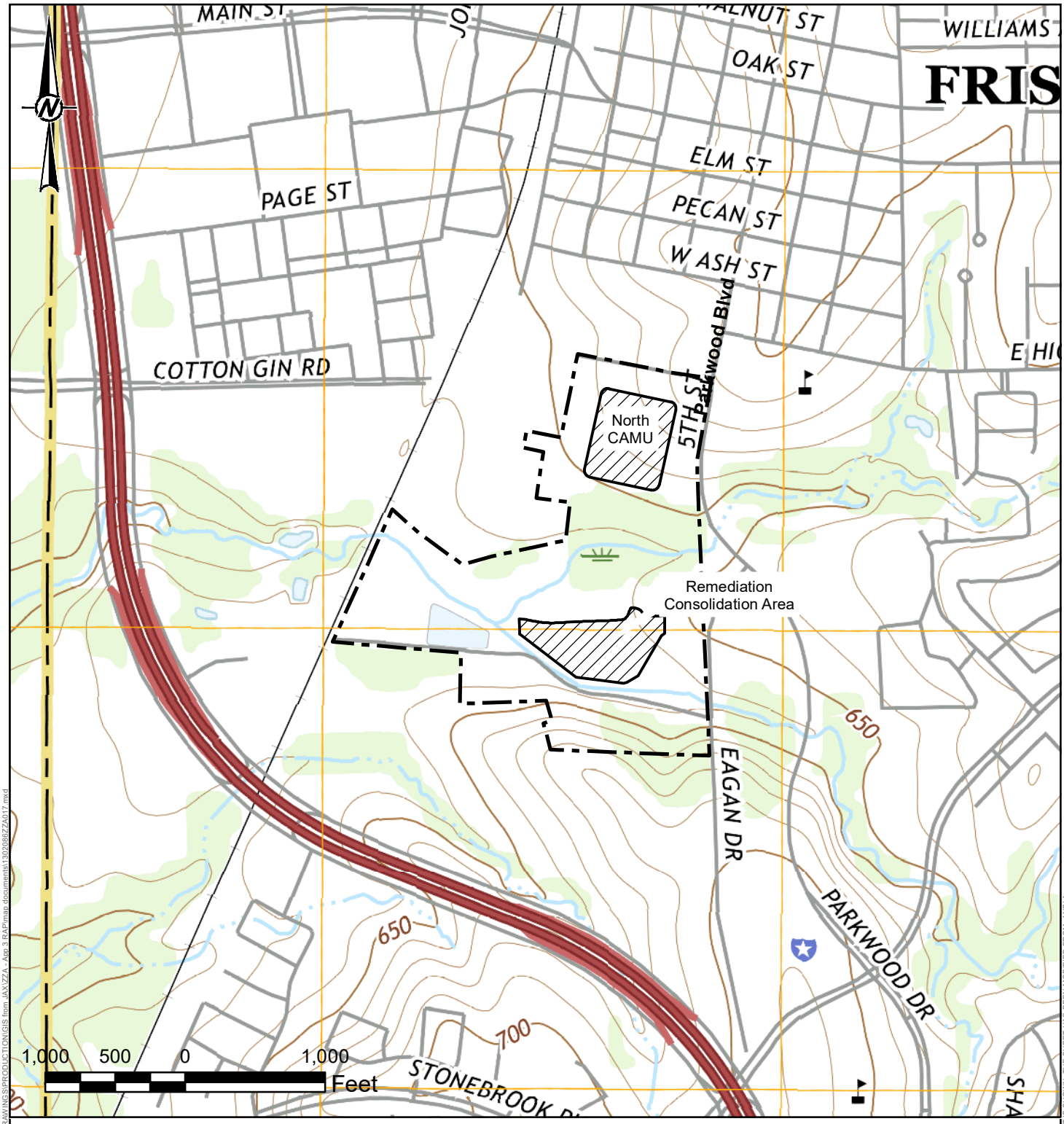
SLUG - Slug Recovery

ft - feet

AMSL - Above mean sea level

BGS - Below ground surface

Figures



LEGEND

- Corrective Action Management Unit
- Former Operating Plant Property Boundary

STATE OF TEXAS
ANNE M FAETH-BOYD
GEOLOGY
12300
LICENSED
PROFESSIONAL GEOSCIENTIST

REFERENCE

1. BASEMAP - USGS DIGITAL RASTER GRAPHIC FRISCO, TX 2016, UNITED STATES GEOLOGICAL SURVEY GEOPDF 2016

CLIENT
EXIDE TECHNOLOGIES

PROJECT
2019 SITE INVESTIGATION REPORT

TITLE
SITE LOCATION MAP

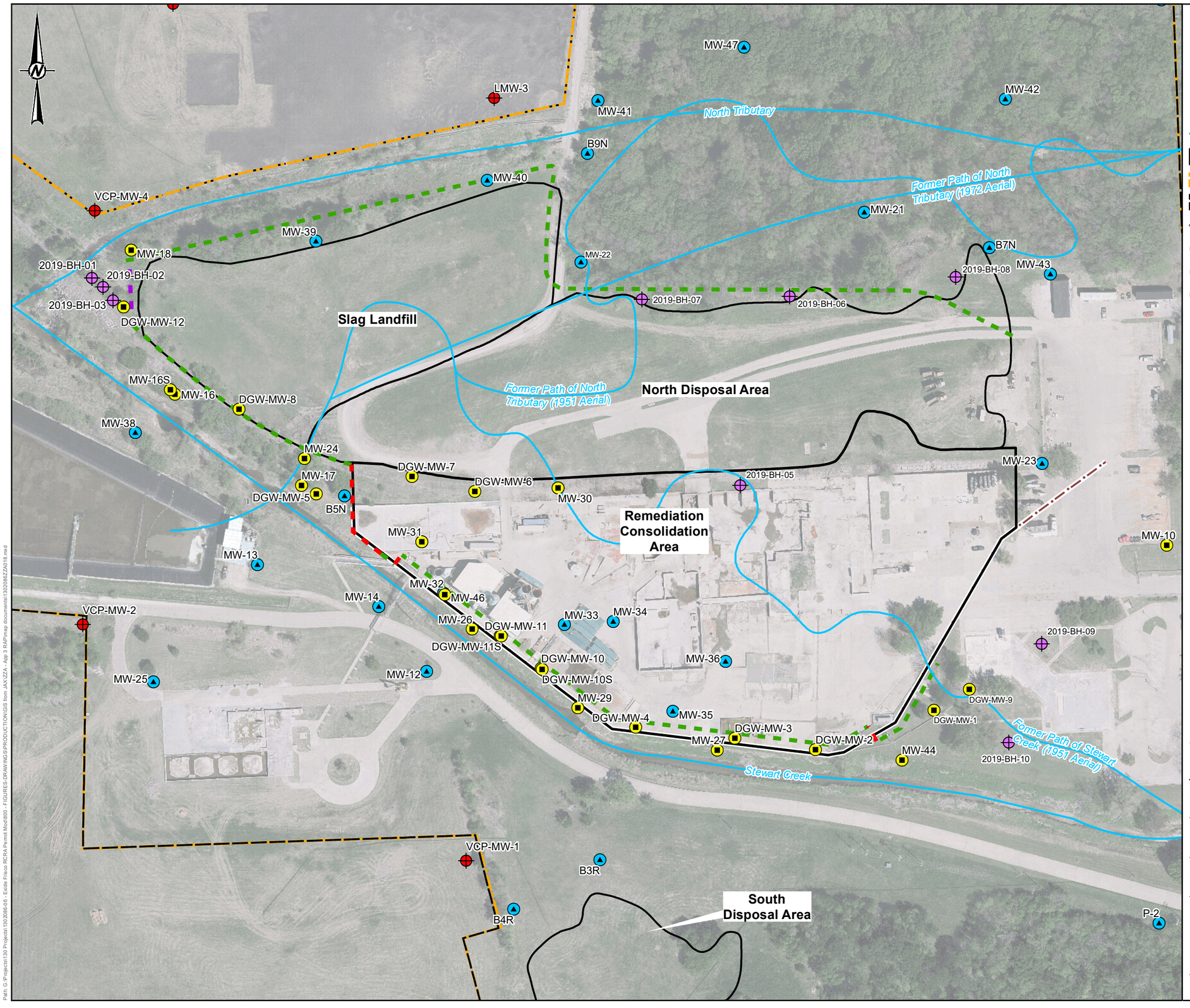
CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-30
PREPARED	EFT
DESIGN	JWT
REVIEW	EPW
APPROVED	AMF

PROJECT No.	CONTROL	Rev.	FIGURE
13-02086-06	1302086ZZA017.mxd	0	1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI A

Path: G:\Projects\130 Projects\1302086-06 - Exide Frisco RCRA Permit Mod\800 - FIGURES-DRAWINGS\PRODUCTION\GIS from JAY\ZZA - App 3 RAP\map documents\1302086ZZA017.mxd



LEGEND

- DGW-PDI Monitoring Wells
- Additional FOP Monitoring Wells
- 2019 RAP Soil Boring
- Other Off-Site Monitoring Wells
- Surface Water Centerline
- Disposal Area
- Former Operating Plant Property Boundary
- Former Undeveloped Buffer Property
- Proposed Flood Wall
- Proposed PRB (Gate) Location
- Proposed Slurry Wall Locations
- Proposed Sheet Pile (Funnel) Location

STATE OF TEXAS
ANNE M FAETH-BOYD
GEOLOGY
12300
LICENSED
PROFESSIONAL GEOSCIENTIST
5-30-19

150 75 0 150
Feet

REFERENCE

1. SITE FEATURES - GOLDER, 2014
2. DGW-PDI MONITORING WELL LOCATIONS & CREEK ELEVATIONS - BRITTAIN & CRAWFORD, 05/22/2018
3. AERIAL IMAGERY - PROVIDED BY DALLAS AERIAL SURVEY, DATED APRIL, 2017.
4. RAP - RESPONSE ACTION PLAN.
5. DGW-MW-12 AND 2019-BH'S DRILLED AND SURVEYED IN JANUARY 2019.

CLIENT
EXIDE TECHNOLOGIES

PROJECT
2019 SITE INVESTIGATION REPORT

TITLE
BORING LOCATION MAP

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-30
PREPARED	EFT
DESIGN	EPW
REVIEW	EPW
APPROVED	AMF/THR

PROJECT No. 13-02086-06 | CONTROL 1302086ZZA018 | Rev. 0 | FIGURE **2**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI B

Path: G:\Projects\1302086-06 - Exide Frisco RCRA Permit Mod\800 - FIGURES-DRAWINGS\PRODUCTION\GIS from JAX\ZZA - App 3 RAP\map documents\1302086ZZA018.mxd

ATTACHMENT A

Field Boring Logs

LOG OF 2019-BH-01

GOLDER

DRILLING METHOD: Direct Push
NORTHING: 7,102,416 FT
DATE/TIME: 01/21/2019, 1150
DRILLER: West Drilling, Robert Williams
EASTING: 2,479,280 FT
TOTAL DEPTH: 25 FT BGS
RIG: Geoprobe 7822DT
SURFACE ELEVATION: 636.48 FT AMSL

DEPTH (Feet)	RUN No.	PID (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
0	1		3.8/5.0		CL		(0.0-13.5) (CL) SILTY CLAY, trace fine grained sands, trace roots and gravel; dusky yellowish brown (10YR 2/2); cohesive, w~PL, firm. (0.2) Pink granite from railroad observed. (1.1) Shells observed, no roots remain. (2.5) Same as above (SAA) except with some dark yellowish brown (10YR 4/2); stiff.
5	2		5.0/5.0				(7.5) Soil color changes to only dusky yellowish brown (10YR 2/2); very stiff.
10	3		5.0/5.0				(10.5) Soil color changes to dark yellowish brown (10YR 4/2).
15	4		5.0/5.0		CL		(13.5-21.0) (CL) gravelly SILTY CLAY, rounded gravel, trace fine sand; dark yellowish brown (10YR 4/2); cohesive, w~PL, very stiff. (15.5) Soil color changes to moderate yellowish brown (10YR 5/4); stiff. (17.0) Soil color changes to pale yellowish brown (10YR 6/2) with dark yellowish orange (10YR 6/6) mottling; firm. (18.5) SAA except with larger gravels; soft, w>PL.
20	5		3.3/5.0		CL		(21.0-23.5) (CL) SILTY CLAY, some gravel, trace fine sand; light gray (N7) with dark yellowish orange (10YR 6/6) mottling; cohesive, w~PL, firm. (22.0) w>PL, very soft. (22.5) w~PL, stiff.
25					SHALE		(23.0) Soil color changes to medium gray (N5); hard. (23.5-25.0) SHALE; medium dark gray (N4); hard. END OF BOREHOLE AT 25.0 FEET BELOW GROUND SURFACE.
30							
35							

PROJECT No: 130-2086-06
COMPILED BY: AGA
PROJECT: Exide Frisco
CHECKED BY: EPW
LOCATION: West of Slag Landfill, Southeast of North Tributary
REVIEWED BY: THR

LOG OF 2019-BH-02

GOLDER

DRILLING METHOD: Direct Push
NORTHING: 7,102,402 FT
DATE/TIME: 01/21/2019, 1400
DRILLER: West Drilling, Robert Williams
EASTING: 2,479,298 FT
TOTAL DEPTH: 25 FT BGS
RIG: Geoprobe 7822DT
SURFACE ELEVATION: 636.70 FT AMSL

DEPTH (Feet)	RUN No.	PID (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
	1		3.7/5.0		CL		(0.0-7.5) (CL) gravelly SILTY CLAY, trace fine sand, trace roots; dusky yellowish brown (10YR 2/2) and dark yellowish brown (10YR 4/2); cohesive, w~PL, stiff.
5							(4.1) Soil color changes to dark yellowish brown (10YR 4/2) with dusky yellowish brown (10YR 2/2); very stiff.
	2		5.0/5.0				
					CL		(7.5-10.0) (CL) SILTY CLAY, some gravel (5%), trace fine sand; light gray (N7) with dark yellowish orange (10YR 6/6) mottling; cohesive, w~PL, very stiff.
10							(8.0) Soil color changes to dusky yellowish brown (10YR 2/2).
	3		5.0/5.0		CL		(10.0-17.5) (CL) gravelly SILTY CLAY, rounded gravel, trace fine sand; dark yellowish brown (10YR 4/2); cohesive, w~PL, very stiff.
15							
	4		5.0/5.0				
					CL&CG		(17.5-18.5) (CL and GC) SILTY CLAY and GRAVEL, rounded gravel; pale yellowish brown (10YR 6/2) with dark yellowish orange (10YR 6/6) mottling ; cohesive, w~PL, stiff.
					SM		(18.5-19.0) (SM) SILTY SAND; light brown (5YR 5/6); non-cohesive, moist.
20							
	5		3.7/5.0		CL		(19.0-24.5) (CL) SILTY CLAY, trace fine sand; light gray (N7) and dark yellowish orange (10YR 6/6); cohesive, w~PL, very stiff.
							(22.0) Same as above (SAA) except no dark yellowish orange (10YR 6/6).
							(23.0) Soil color changes to medium gray (N5); very stiff.
					SM		(24.0-24.5) (SM) SILTY SAND; light gray (N7); non-cohesive, dry.
25					SHALE		(24.5-25.0) SHALE; medium dark gray (N4); hard.
							END OF BOREHOLE AT 25.0 FEET BELOW GROUND SURFACE.
30							
35							

PROJECT No: 130-2086-06
COMPILED BY: AGA
PROJECT: Exide Frisco
CHECKED BY: EPW
LOCATION: West of Slag Landfill
REVIEWED BY: THR

LOG OF 2019-BH-03

GOLDER

DRILLING METHOD: Direct Push
NORTHING: 7,102,380 FT
DATE/TIME: 01/21/2019, 1525
DRILLER: West Drilling, Robert Williams
EASTING: 2,479,313 FT
TOTAL DEPTH: 23.5 FT BGS
RIG: Geoprobe 7822DT
SURFACE ELEVATION: 636.55 FT AMSL

DEPTH (Feet)	RUN No.	PID (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
	1		3.8/5.0		CL		(0.0-6.8) (CL) gravelly SILTY CLAY, trace fine sand, trace roots; dusky yellowish brown (10YR 2/2); cohesive, w~PL, stiff.
5							(4.2) larger gravels and tree roots observed.
	2		5.0/5.0				(5.1) Soil color changes to dusky yellowish brown (10YR 2/2) with dark yellowish orange (10YR 6/6).
							(6.8-23.0) (CL) SILTY CLAY, some gravel (10%); pale yellowish brown (10YR 6/2) with dark yellowish orange (10YR 6/6); cohesive, w~PL, stiff.
							(8.3) Soil color changes to dusky yellowish brown (10YR 2/2).
10	3		5.0/5.0				(10.1) Soil color changes to brownish gray (5YR 4/1).
							(12.0) Soil color changes to dark yellowish brown (10YR 4/2) with dark yellowish orange (10YR 6/6) mottling.
15	4		5.0/5.0		CL		(14.3) Soil color changes to light gray (N7) with dark yellowish orange (10YR 6/6) and grayish brown (5Y 8/4).
							(18.8) Soil color changes to light brown (5YR 5/6).
20							(18.9) Soil color changes to light gray (N7) with dark yellowish orange (10YR 6/6) and grayish brown (5Y 8/4).
	5		3.5/3.5				
					SHALE		(22.5) Soil color changes to medium gray (N5) with intermittent light gray (N7) (SM) SILTY SAND layers (hair thin).
25							(23.0-23.5) SHALE; medium gray (N5); hard.
							END OF BOREHOLE AT 23.5 FEET BELOW GROUND SURFACE.
30							
35							

PROJECT No: 130-2086-06
COMPILED BY: AGA
PROJECT: Exide Frisco
CHECKED BY: EPW
LOCATION: West of Slag Landfill
REVIEWED BY: THR

LOG OF 2019-BH-04 / DGW-MW-12

GOLDER

DRILLING METHOD: Direct Push
NORTHING: 7,102,370 FT
DATE/TIME: 01/21/2019, 1620
DRILLER: West Drilling, Robert Williams
EASTING: 2,479,330 FT
TOTAL DEPTH: 23.5 FT BGS
RIG: Geoprobe 7822DT
SURFACE ELEVATION: 637.02 FT AMSL

DEPTH (Feet)	RUN No.	PID (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
	1		3.2/5.0		CL		(0.0-16.5) (CL) SILTY CLAY, some gravels, trace fine sand, roots; dusky yellowish brown (10YR 2/2); cohesive, w~PL, stiff. (3.2) Soil color changes to light gray (N7), dusky yellowish brown (10YR 2/2), and dark yellowish orange (10YR 6/6). (4.1) Soil color changes to dusky yellowish brown (10YR 2/2).
5	2		5.0/5.0				(5.9) Same as above (SAA) except with dark yellowish brown (10YR 4/2). (6.5) SAA except no dark yellowish brown (10YR 4/2). (8.5) SAA except no roots remaining; stiff.
10	3		4.8/5.0				(10.5) Soil color changes to dark yellowish brown (10YR 4/2) to moderate yellowish brown (10YR 5/4); very stiff. (12.8) Soil color changes to light gray (N7) with dark yellowish orange (10YR 6/6); stiff.
15	4		4.6/5.0		MH		(16.5-16.7) (MH) CLAYEY SILT, trace fine sand; light gray (N7) with grayish brown (5Y 8/4); cohesive, w<PL, soft.
					CL		(16.7-23.0) (CL) SILTY CLAY, trace fine sand; light gray (N7) with grayish brown (5Y 8/4); cohesive, w~PL, very stiff. (17.8) SAA except no grayish brown (5Y 8/4) and with dark yellowish orange (10YR 6/6); hard.
20	5		4.1/3.5				(22.1) Soil color changes to medium gray (N5).
							(23.0-23.5) SHALE; medium gray (N5); Hard. END OF BOREHOLE AT 23.5 FEET BELOW GROUND SURFACE.
25							
30							
35							

PROJECT No: 130-2086-06
COMPILED BY: AGA
PROJECT: Exide Frisco
CHECKED BY: EPW
LOCATION: West of Slag Landfill
REVIEWED BY: THR

LOG OF 2019-BH-05

GOLDER

DRILLING METHOD: Direct Push
NORTHING: 7,102,090 FT
DATE/TIME: 01/22/2019, 1200
DRILLER: West Drilling, Robert Williams
EASTING: 2,480,296 FT
TOTAL DEPTH: 25 FT BGS
RIG: Geoprobe 7822DT
SURFACE ELEVATION: 639.97 FT AMSL

DEPTH (Feet)	RUN No.	PID (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
	1		3.9/5.0		CH		(0.0-7.3) (CH) CLAY, high plasticity, trace roots; dark yellowish brown (10YR 4/2); cohesive, w~PL, soft. (0.5) Same as above (SAA) except with trace sub-angular gravels. (2.1) SAA except with some fine grained sand (5%); soil color changes to dusky yellowish brown (10YR 2/2). (3.9) SAA except stiff.
5	2		4.5/5.0				(6.8) Soil color changes to light olive gray (5Y 5/2); very stiff.
					CL		(7.3-12.5) (CL) SILTY CLAY, low plasticity, some fine sand, trace roots; dusky yellowish brown (10YR 2/2); cohesive, w~PL, stiff. (11.1) SAA except with trace gravel. (11.5) SAA except some fine sand; no roots.
10	3		5.0/5.0				
					CL		(12.5-15.8) (CL) sandy SILTY CLAY, fine grained sand, trace gravel; dusky yellowish brown (10YR 2/2); cohesive, w>PL, soft-very soft.
15	4		5.0/5.0		GP&SM		(15.8-16.3) (GP&SM) GRAVEL and SILTY SAND, rounded gravels, fine grained sand; dusky yellowish brown (10YR 2/2); non-cohesive, wet, very loose.
					CL		(16.3-21.2) (CL) sandy SILTY CLAY, fine grained sand; dusky yellowish brown (10YR 2/2); cohesive, w>PL, soft. (20.0) Fall in noted at beginning of run.
20	5		5.0/5.0				
					CL		(21.2-24.5) (CL) SILTY CLAY, trace fine sand; light olive gray (5Y 5/2) with grayish brown (5Y 8/4); cohesive, w~PL, firm. (21.5) SAA except with dark yellowish orange (10YR 6/6); firm. (23.0) SAA except very stiff.
25					SHALE		(24.5-25.0) SHALE; medium gray (N5); hard. END OF BOREHOLE AT 25.0 FEET BELOW GROUND SURFACE.
30							
35							

PROJECT No: 130-2086-06
COMPILED BY: AGA
PROJECT: Exide Frisco
CHECKED BY: EPW
LOCATION: South of North Disposal Area
REVIEWED BY: THR

LOG OF 2019-BH-06

GOLDER

DRILLING METHOD: Direct Push
NORTHING: 7,102,387 FT
DATE/TIME: 01/22/2019, 1315
DRILLER: West Drilling, Robert Williams
EASTING: 2,480,374 FT
TOTAL DEPTH: 15 FT BGS
RIG: Geoprobe 7822DT
SURFACE ELEVATION: 636.45 FT AMSL

DEPTH (Feet)	RUN No.	PID (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
	1		3.9/5.0		CL		(0.0-2.5) (CL) SILTY CLAY, trace gravel, trace fine sand, trace roots; moderate yellowish brown (10YR 5/4); cohesive, w~PL, soft. (0.5) Same as above (SAA) except soil changes color to dark yellowish brown (10YR 4/2); firm-stiff.
					CL		(2.5-3.9) (CL) gravelly SILTY CLAY, sub-angular gravels, trace fine sand, trace roots; dark yellowish brown (10YR 4/2) with moderate yellowish brown (10YR 5/4); cohesive, W~PL, firm-stiff.
5	2		5.0/5.0		CL		(3.9-9.5) (CL) SILTY CLAY, some sub-angular gravels, trace fine sand, trace roots; dusky yellowish brown (10YR 2/2); cohesive, w~PL, stiff. (4.5) SAA except trace (2%) gravel. (6.0) SAA except some gravel (10%), no roots; very stiff. (7.0) Gravel increasing with depth.
10	3		5.0/5.0		GP&SM		(9.5-9.9) (GP&SM) GRAVEL and SILTY SAND; medium gray (N5) and dark yellowish orange (10YR 6/6); non-cohesive, moist, loose.
					CL		(9.9-12.5) (CL) SILTY CLAY, trace fine sand; light gray (N7) with dark yellowish orange (10YR 6/6); cohesive, w~PL, very stiff.
					SM		(12.5-12.6) (SM) SILTY SAND; light brown (5YR 5/6); non-cohesive, moist.
					CL		(12.6-14.5) (CL) SILTY CLAY, trace fine sand; light gray (N7) with dark yellowish orange (10YR 6/6); cohesive, w~PL, very stiff.
15					SHALE		(14.5-15.0) SHALE; medium gray (N5) with dark yellowish orange (10YR 6/6); hard. END OF BOREHOLE 15.0 FEET BELOW GROUND SURFACE.
20							
25							
30							
35							

PROJECT No: 130-2086-06
COMPILED BY: AGA
PROJECT: Exide Frisco
CHECKED BY: EPW
LOCATION: North of North Disposal Area
REVIEWED BY: THR

LOG OF 2019-BH-07

GOLDER

DRILLING METHOD: Direct Push
NORTHING: 7,102,382 FT
DATE/TIME: 01/22/2019, 1420
DRILLER: West Drilling, Robert Williams
EASTING: 2,480,142 FT
TOTAL DEPTH: 24 FT BGS
RIG: Geoprobe 7822DT
SURFACE ELEVATION: 636.01 FT AMSL

DEPTH (Feet)	RUN No.	PID (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
	1		2.5/5.0		CL		(0.0-2.5) (CL) SILTY CLAY, trace fine sand, some roots; dark yellowish brown (10YR 6/2) with dusky yellowish brown (10YR 2/2); cohesive, w~PL, firm.
					GP		(2.0) Soil color changes to only dusky yellowish brown (10YR 2/2).
							(2.5-3.0) (GP) GRAVEL, sub-angular gravel, battery case fragments noted; non-cohesive, moist, loose.
5	2		5.0/5.0		CL		(3.0-8.0) (CL) SILTY CLAY, trace fine sand, some roots; dusky yellowish brown (10YR 2/2); cohesive, w~PL, firm.
							(6.5) SAA except with some fine sand (10%), no roots remain.
					CL		(8.0-10.2) (CL) sandy SILTY CLAY, fine sand; dusky yellowish brown (10YR 2/2); cohesive, w~PL, firm.
10	3		5.0/5.0		CL&SP		(10.2-14.0) (CL&SP) SILTY CLAY and SAND, fine grained, trace rounded gravel; light olive gray (5Y 5/2) and dark yellow orange (10YR 6/6); cohesive, w~PL, firm.
							(12.7) Small pocket of sub-angular gravel, some medium grained sand.
							(13.0) Small pocket of rounded to sub-rounded gravel; stiff.
					GW&SW		(14.0-14.4) (GW&SW) GRAVEL and SAND, coarse grained sands; light olive gray (5Y 5/2); non-cohesive, wet, loose.
15	4		5.0/5.0		CL		(14.4-18.8) (CL) SILTY CLAY; medium dark gray (N4) with dark yellowish orange (10 YR 6/6) mottling; cohesive, w~PL, hard.
					OH		(18.8-20.0) (OH) sandy ORGANIC SILT, fine grained sand; medium dark gray (N4); cohesive, w~PL, firm.
20	5		4.0/4.0		CL		(20.0-21.1) (CL) SILTY CLAY, trace very fine sand; medium gray (N5); cohesive, w~PL, hard.
					SHALE		(21.1-24.0) SHALE; medium gray (N5); hard.
25							END OF BOREHOLE 24.0 FEET BELOW GROUND SURFACE.
30							
35							

PROJECT No: 130-2086-06
COMPILED BY: AGA
PROJECT: Exide Frisco
CHECKED BY: EPW
LOCATION: North of North Disposal Area, western edge
REVIEWED BY: THR

LOG OF 2019-BH-08

GOLDER

DRILLING METHOD: Direct Push
NORTHING: 7,102,417 FT
DATE/TIME: 01/22/2019, 1510
DRILLER: West Drilling, Robert Williams
EASTING: 2,480,634 FT
TOTAL DEPTH: 15 FT BGS
RIG: Geoprobe 7822DT
SURFACE ELEVATION: 642.40 FT AMSL

DEPTH (Feet)	RUN No.	PID (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
	1		2.0/5.0		CL		(0.0-1.0) (CL) gravelly SILTY CLAY, sub-angular gravel, trace roots (5%); dark yellowish brown (10YR 4/2) with medium gray (N5) and grayish orange (10YR 7/4); non-cohesive, moist, loose.
					GW		(1.0-2.8) (GW) GRAVEL, some silty clay (10%), sub-angular to sub-rounded gravel; dusky yellowish brown (10YR 2/2); non-cohesive, moist, loose.
							(2.7) Asphalt observed.
					CL&GW		(2.8-5.4) (CL&GW) SILTY CLAY and GRAVEL, sub-angular gravel; dusky yellowish brown (10YR 2/2); non-cohesive, moist, loose.
5							(4.8) Battery case fragment observed.
	2		1.9/5.0		SM		(5.4-10.0) (SM) SILTY SAND, very coarse grained; pale yellowish brown (10YR 6/2) with dark yellowish orange (10YR 6/6); cohesive, w~PL, soft.
							(5.8) w>PL.
10					GP&SP		(10.0-11.0) (GP&SP) silty GRAVEL and SAND, poorly graded sand; light olive gray (5Y 5/2); non-cohesive, wet, loose.
	3		4.5/5.0		GP&OH		(11.0-12.2) (GP&OH) GRAVEL and SILT, some fine sand; yellowish gray (5Y 7/2) and grayish brown (5Y 8/4); cohesive, w>PL, firm.
					CL		(12.2-14.5) (CL) SILTY CLAY; yellowish gray (5Y 7/2) and dark yellowish orange (10YR 6/6); cohesive, w~PL, hard.
15					SHALE		(14.5-15.0) SHALE; medium dark gray (N4); hard.
							END OF BOREHOLE 15.0 FEET BELOW GROUND SURFACE.
20							
25							
30							
35							

PROJECT No: 130-2086-06
COMPILED BY: AGA
PROJECT: Exide Frisco
CHECKED BY: EPW
LOCATION: North of North Disposal Area, eastern edge
REVIEWED BY: THR

LOG OF 2019-BH-09

GOLDER

DRILLING METHOD: Direct Push
NORTHING: 7,101,842 FT
DATE/TIME: 01/22/2019, 1610
DRILLER: West Drilling, Robert Williams
EASTING: 2,480,769 FT
TOTAL DEPTH: 20 FT BGS
RIG: Geoprobe 7822DT
SURFACE ELEVATION: 642.34 FT AMSL

DEPTH (Feet)	RUN No.	PID (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
					SP		(0.0-0.1) TOPSOIL.
	1		3.3/5.0		CL		(0.1-0.9) (SP) SAND, very fine grained, uniformly graded; dark yellowish orange (10YR 6/6) to moderate brown (5YR 4/4); non-cohesive, moist, very loose. (0.9-4.0) (CL) SILTY CLAY, trace fine sand; dark yellowish brown (10YR 4/2) and dusky yellowish brown (10YR 2/2); cohesive, w~PL, stiff.
5	2		5.0/5.0		OH&SP		(2.5) Same as above (SAA) except with trace gravel. (3.7) SAA except no gravel; soil changes color to dark yellowish brown (10YR 4/2). (4.0-12.1) (OH&SP) clayey ORGANIC SILT and SAND, very fine grained sand; moderate yellowish brown (10YR 5/4); cohesive, w~PL, soft. (8.0) SAA except with some gravel, gravel increasing with depth; soil changes color to dark yellowish brown (10YR 4/2).
10	3		5.0/5.0				(10.0) Calcite observed at end of 10 foot run. (10.2) SAA except soil changes color to yellowish gray (5Y 7/2) with dark yellowish orange (10YR 6/6) with some grayish brown (5Y 8/4); very stiff. (11.5) Soil changes color to dark yellowish brown (10YR 4/2).
					CL		(12.1-15.1) (CL) SILTY CLAY, some rounded gravels, trace fine sand; dusky yellowish brown (10YR 2/2); cohesive, w~PL, stiff. (13.7) Soil color moderate reddish brown (10R4/6) on seams.
15	4		2.1/5.0		SM		(15.1-17.5) (SM) SILTY SAND, fine grained; light olive gray (5Y 5/2) with moderate yellowish brown (10YR 5/4); non-cohesive, dry, compact.
					SHALE		(17.5-20.0) SHALE; medium dark gray (N4); hard.
20							END OF BOREHOLE 20.0 FEET BELOW GROUND SURFACE.
25							
30							
35							

PROJECT No: 130-2086-06
COMPILED BY: AGA
PROJECT: Exide Frisco
CHECKED BY: EPW
LOCATION: Near Admin building
REVIEWED BY: THR

LOG OF 2019-BH-10

GOLDER

DRILLING METHOD: Direct Push
NORTHING: 7,101,688 FT
DATE/TIME: 01/22/2019, 1650
DRILLER: West Drilling, Robert Williams
EASTING: 2,480,718 FT
TOTAL DEPTH: 18.5 FT BGS
RIG: Geoprobe 7822DT
SURFACE ELEVATION: 635.28 FT AMSL

DEPTH (Feet)	RUN No.	PID (PPM)	REC (Feet)	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
							(0.0-0.1) TOPSOIL, grass, roots.
	1		4.3/5.0		CL		(0.1-2.5) (CL) SILTY CLAY, trace gravels; dark yellowish brown (10YR 4/2); cohesive, w~PL, stiff.
							(2.1) Gravel increases with depth.
					CL&GP		(2.5-4.0) (CL&GP) SILTY CLAY and GRAVEL, sub-rounded to sub-angular gravel; dark yellowish brown (10YR 4/2); cohesive, w~PL, stiff.
					CL		(4.0-4.9) (CL) gravelly SILTY CLAY, sub-rounded to sub-angular; dark yellowish brown (10YR 4/2); cohesive, w~PL, stiff.
5	2		3.3/5.0		CL&SP		(4.9-10.2) (CL&GP) SILTY CLAY and GRAVEL, sub-rounded to sub-angular gravel, some fine to medium grained sand; grayish yellow (5Y 5/2); cohesive, w~PL, firm.
							(8.3) w>PL.
							(9.0) Soil color changes to medium gray (N5).
10	3		3.4/5.0		CL&GP		(10.2-14.1) (CL&GP) sandy SILTY CLAY and GRAVEL, sub-rounded to sub-angular gravel, fine grained sand (35%); medium gray (N5); cohesive, w~PL, firm.
							(12.0) sand decreases gradually with depth.
15	4		3.5/3.5		CL		(14.1-17.9) (CL) SILTY CLAY; medium dark gray (N4) with dark yellowish orange (10YR 6/6); cohesive, w~PL, very stiff.
							(16.5) Same as above except without dark yellowish orange (10YR 6/6).
					SHALE		(17.9-18.5) SHALE; medium dark gray (N4); hard.
							END OF BOREHOLE 18.5 FEET BELOW GROUND SURFACE.
20							
25							
30							
35							

PROJECT No: 130-2086-06
COMPILED BY: AGA
PROJECT: Exide Frisco
CHECKED BY: EPW
LOCATION: South West of Admin building
REVIEWED BY: THR

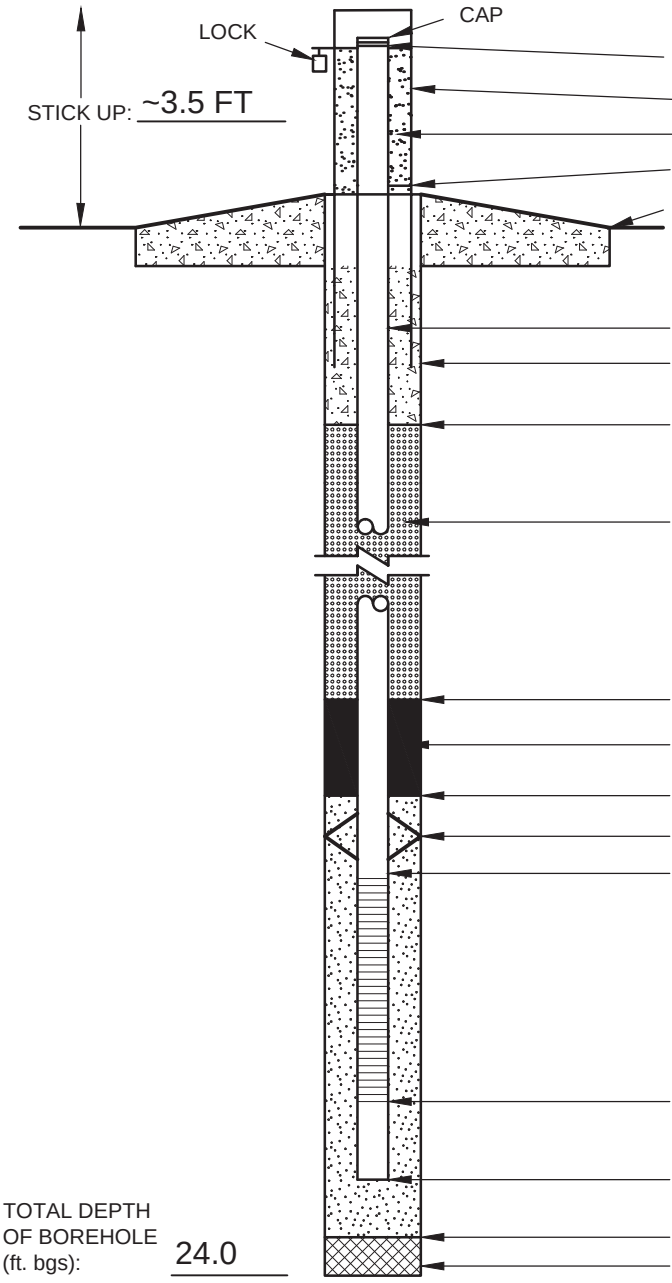
ATTACHMENT B

Monitoring Well Construction Log

GOLDER ABOVE GROUND MONITORING WELL CONSTRUCTION LOG

DGW-MW-12

PROJECT NAME: RAP Subsurface Investigation		PROJECT NUMBER: 130-2086-06
SITE NAME: Exide - Frisco		LOCATION: Frisco, TX
CLIENT: Exide Technologies		SURFACE ELEVATION: 637.02 FT AMSL
GEOLOGIST: E. White	NORTHING: 7102370 FT	EASTING: 2479330 FT
DRILLER: R. Williams	STATIC WATER LEVEL: 13.26 FT BTOC	COMPLETION DATE: 01/22/2019
DRILLING COMPANY: WEST Drilling		DRILLING METHODS: HSA



TOP OF CASING ELEVATION: 640.22 FT AMSL

PROTECTIVE CASING (yes / no): Aluminum

PEA GRAVEL OR SAND

WEEP HOLE

GROUND SURFACE ELEVATION: 637.02 FT AMSL

DIAMETER OF RISER PIPE (in.): 2.0 ID (PVC)

DIAMETER OF BOREHOLE (in.): 7.25

CONCRETE SEAL DEPTH (ft. bgs): 2.0

TYPE AND AMOUNT OF ANNULAR SEAL: NA (Bentonite only)

TOP OF BENTONITE SEAL DEPTH (ft. bgs): 2.0

TYPE AND AMOUNT OF BENTONITE SEAL: Bent. Plug (~225 lb)

TOP OF SAND PACK DEPTH (ft. bgs): 12.0

CENTRALIZER (yes / (no)) - TYPE: NA

TOP OF SCREEN DEPTH (ft. bgs): 14.2

TYPE OF SCREEN: PVC Schedule 40

SCREEN SLOT SIZE (in.): 0.010

SIZE OF SAND PACK: 16/30

AMOUNT OF SAND: ~200 lb

BOTTOM OF SCREEN DEPTH (ft. bgs): 23.7

BOTTOM OF WELL DEPTH (ft. bgs): 24.0

TOTAL DEPTH OF BOREHOLE (ft. bgs): 24.0

BOTTOM OF FILTER PACK (ft. bgs): 24.0

TYPE AND AMOUNT OF BACKFILL: NA

ADDITIONAL NOTES: AMSL - Above Mean Sea Level; lbs. - pounds; ft. - feet; bgs - below ground surface; ID- Inside Diameter; NA - Not Applicable; BTOC - Below Top of Casing; HSA - Hollow Stem Auger; Bent. - Bentonite; PVC - Polyvinyl chloride. Static water level measured on 01/26/2019 prior to conductivity testing.

CHECKED BY: AGA/THR

DATE CHECKED: 02/11/19

PREPARED BY: EPW

ATTACHMENT C

Monitoring Well Development Forms

GOLDER

WELL DEVELOPMENT/PURGING FORM

Project Ref: Exide - RAP Drilling **Project No.: 130-2086-06**

Location DGW-MW-12

Monitored By: EPW Date 01/24/19 Time 1409

01/25/19 @ 0826
WL: 13.27 FT BTOC
TD: 27.37 FT BTOC

@ 1235
WL: 15.61 FT BTOC
TD: 27.38 FT BTOC

Well Piezometer Data

(circle one)

Depth of Well (from top of PVC or ground)	13.91	feet
Depth of Water (from top of PVC or ground)	27.38	feet
Radius of Casing	1	inches
	0.083	feet
Casing Volume	0.294	cubic feet
	2.20	gallons

Development / Purging Discharge Data

Purging Method: SS Bailer; SS Monsoon

Start Purging Date: 01/24/19; 01/25/19 Time: 1425; 0905

Stop Purging Date: 01/24/19; 01/25/19 Time: 1735, 1205

Monitoring

Date	Time	Volume Discharge (gals)	Temp (°C)	pH	Spec.Cond. (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Redox Potential (+/- mV)	WL (ft BTOC)	Appearance of Water and Comments
01/24/19	1448	5.0	19.61	6.67	3.123	>1000	4.49	161.3	17.10	cloudy Brown Gray
Pump →	1550	10.0	19.20	6.60	3.126	>1000	1.10	148.1	17.13	"
	1630	15.0	19.69	6.58	3.163	>1000	1.32	140.8	17.87	"
	1702	20.0	19.48	6.61	3.157	>1000	1.99	139.3	18.59	"
Pause →	1735	25.0	19.60	6.58	3.187	>1000	2.11	135.0	19.05	"
01/25/19	0905	25.0	—	—	—	—	—	—	—	start pump
	0932	30.0	18.69	6.53	3.207	>1000	1.87	165.6	17.95	very gray/Brown
	1002	35.0	19.09	6.54	3.246	>1000	1.54	160.6	18.79	"
	1034	40.0	19.26	6.52	3.285	>1000	1.16	151.0	18.81	very cloudy gray
	1107	45.0	19.21	6.52	3.281	>1000	0.99	147.2	19.25	"
	1138	50.0	19.34	6.52	3.323	231	0.39	147.1	19.45	mostly clear
	1152	52.0	19.15	6.51	3.291	10.5	0.23	146.7	19.57	"
	1205	54.0	19.40	6.51	3.329	3.84	0.17	146.2	19.60	clear
			— DEVELOPMENT COMPLETE					—		

stop surging

ATTACHMENT D

Pumping Test Field Forms

GOLDER

WELL PURGING FORM

Project Ref: Exide - DGW-MW-12 Pump Test **Project No.: 130-2086-06**

Location DGW-MW-12

Monitored By: PBS/BCW/JTB Date 04/10/19-04/12/19 Time 1655

Transducer: log Start 16:57

Well Piezometer Data

(circle one)

Depth of Well (from top of PVC or ground)	27.59	feet
Depth of Water (from top of PVC or ground)	13.18	feet
Radius of Casing	2	inches
	0.08	feet
Casing Volume	14.41	feet
	2.35	gallons

Purging Discharge Data

Purging Method: Peristaltic Pump

Start Purging Date 4/10/19 Time 1655

Stop Purging Date 4/12/19 Time 0907

Monitoring

Date	Time	Volume Discharge (gals)	Temp (°C)	pH	Spec.Cond. (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Redox Potential (+/- mV)	Flow Rate ~~(L/min)~~ mL/min	WL (ft BTOC)	Appearance of Water and Comments
4/10/19	17:30	3.5	21.48	6.92	3.477	9.87	2.61	143.7	500	14.71	
4/10/19	18:00	7.0	22.83	6.77	3.507	4.59	2.30	167.3	500	15.92	
4/10/19	18:30	10.0	22.83	6.68	3.490	2.18	1.48	141.1	500	15.95	18:15 Start other Pump
4/10/19	19:00	15.0	21.49	6.74	3.471	1.20	2.36	140.2	500	16.24	
4/10/19	19:30	18.5	21.31	6.74	3.464	1.46	2.80	137.1	500	16.55	
4/10/19	20:00	22.0	20.63	6.73	3.474	0.86	1.65	135.2	500	16.80	
4/10/19	20:30	26.0	20.55	6.71	3.461	0.84	1.60	135.2	500	17.00	
4/10/19	21:00	30.0	20.31	6.77	3.461	0.43	1.67	139.1	500	17.13	
4/10/19	21:30	34.0	20.39	6.70	3.460	0.25	1.45	137.9	500	17.30	Jump to 750mL/min
4/10/19	22:00	40.0	19.99	6.71	3.480	0.78	1.61	138.2	750	18.22	
4/10/19	22:30	46.0	19.99	6.71	3.466	0.34	1.61	139.3	750	18.24	
4/10/19	23:00	52.0	19.65	6.82	3.515	0.27	2.90	135.4	750	18.43	
4/10/19	23:30	58.0	19.55	6.77	3.488	0.36	1.82	134.9	750	18.54	
4/11/19	24:00	66.0	19.45	6.75	3.335	0.25	1.91	135.0	750	18.62	
4/11/19	00:30	72.0	19.35	6.70	3.457	0.23	1.60	136.0	750	18.68	
4/11/19	01:00	76.0	19.35	6.70	3.483	0.30	1.53	138.0	750	18.78	
4/11/19	01:30	82.0	19.51	6.70	3.349	0.93	1.67	139.2	750	18.84	
4/11/19	02:00	86.0	19.41	6.70	3.455	0.36	1.52	137.1	750	18.95	
* 4/11/19	02:30	92.0	19.55	6.71	3.426	0.18	1.72	135.4	1000	18.54	Generator off pump slow] increase remote silicon]to 1L/min *
4/11/19	03:00	98.0	19:30	6.69	3.439	0.58	1.18	137.6	750	19.34	
4/11/19	03:30	104.0	19.11	6.70	3.507	0.38	1.77	136.0	750	19.27	
4/11/19	04:00	110.0	19:19	6.20	3.754	0.36	2.30	241.6	750	19.55	
	0430	116.0	19.21	6.71	3.516	0.36	1.76	134.7	750	19.60	
	0500	122.0	18.62	6.61	3.584	0.45	2.83	225.0	750	19.68	
	0530	128.0	18.61	6.64	3.562	0.15	2.76	217.0	750	19.72	
	0600	134.0	18.57	6.64	3.590	2.13	2.31	202.0	1000	20.65	Increase pump to 1L/min

* 02:30- Changing the flex tubing temporarily caused the flow rate to increase.

GOLDER

WELL PURGING FORM

Project Ref: Exide - DGW-MW-12 Pump Test **Project No.: 130-2086-06**

Location DGW-MW-12

Monitored By: PBS/BCW/JTB Date 04/10/19-04/12/19 Time 1655

Well Piezometer Data

(circle one)

Depth of Well (from top of (PVC) or ground)	27.59	feet
Depth of Water (from top of (PVC) or ground)	13.18	feet
Radius of Casing	2	inches
	0.08	feet
Casing Volume	14.41	feet
	2.35	gallons

Purging Discharge Data

Purging Method: Peristaltic Pump

Start Purging Date 4/10/19 Time 1655

Stop Purging Date 4/12/19 Time 0907

Monitoring

Date	Time	Volume Discharge (gals)	Temp (°C)	pH	Spec.Cond. (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Redox Potential (+/- mV)	Flow Rate ~~(L/min)~~ mL/min	WL (ft BTOC)	Appearance of Water and Comments
4/11/19	0630	142.0	18.55	6.60	3.700	1.80	1.93	166.2	1000	20.91	
	0700	150.0	18.61	6.62	3.684	0.76	1.46	167.3	1000	20.14	DOWN TO 800, MOVED BACK TO 1000
	0730	158.00	18.62	6.62	3.712	0.47	1.39	166.7	1000	21.16	
	0800	166.00	18.63	6.67	3.769	0.51	1.42	164.9	1000	21.83	
	0830	174.00	18.71	6.71	3.684	0.72	1.57	165.2	1000	21.66	AIR IN TUBING, NOT SURE IF
	0900	182.00	18.61	6.65	3.679	0.69	1.46	166.7	1000	22.03	TUBING IS AT TD.
	0930	190.00	18.63	6.62	3.702	0.54	1.52	167.1	1000	22.34	
	1000	198.00	18.59	6.64	3.709	0.69	1.49	168.4	1000	22.51	
	1030	206.00	18.48	6.65	3.665	4.12	1.72	167.7	1000	22.76	
	1100	214.00	18.09	6.71	3.702	4.73	0.61	165.2	1000	23.91	
	1130	222.00	18.46	6.75	3.679	6.10	1.89	166.2	1000	23.22	
	1200	230.00	18.52	6.78	3.684	6.74	1.74	168.1	1000	23.59	DOWN TO 900, MOVED BACK TO 1000
	1230	238.00	18.56	6.71	3.562	6.74	1.69	168.7	900	24.47	DOWN TO 900, MOVED BACK TO 1000
	1255	244.00	↑		↑		↑		750	23.11	MOVED DOWN TO 750
	1300	245.00	NOT MEASURED						500	22.96	MOVED DOWN TO 500
	1310	246.50							500	21.62	
	1315	247.00							500	21.09	
	1330	249.00							500	20.82	
	1400	253.00							500	20.43	
	1430	257.00	18.52	6.74	3.619	6.67	1.39	169.3	500	20.36	
	1500	261.00	18.51	6.71	3.629	6.69	1.42	168.7	500	20.29	
	1530	265.00	21.24	6.66	3.741	1.25	2.89	116.7	500	20.24	
	1600	269.00	21.32	6.60	3.736	1.05	1.48	104.1	500	20.26	
	1630	273.00	21.85	6.59	3.743	0.27	1.77	103.1	500	20.26	
	1700	277.00	20.65	6.58	3.779	0.41	1.29	102.5	500	20.26	
	1730	281.00	19.76	6.57	3.747	0.33	1.75	99.7	500	20.24	

GOLDER

WELL PURGING FORM

Project Ref: Exide - DGW-MW-12 Pump Test **Project No.: 130-2086-06**

Location DGW-MW-12

Monitored By: PBS/BCW/JTB Date 04/10/19-04/12/19 Time 1655

Well Piezometer Data

(circle one)

Depth of Well (from top of PVC or ground)	27.59	feet
Depth of Water (from top of PVC or ground)	13.18	feet
Radius of Casing	2	inches
	0.08	feet
Casing Volume	14.41	feet
	2.35	gallons

Purging Discharge Data

Purging Method: Peristaltic Pump

Start Purging Date 4/10/19 Time 1655

Stop Purging Date 4/12/19 Time 0907

Monitoring

Date	Time	Volume Discharge (gals)	Temp (°C)	pH	Spec.Cond. (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Redox Potential (+/- mV)	Flow Rate ~~(L/min)~~ mL/min	WL (ft BTOC)	Appearance of Water and Comments
4/11/19	1800	285.00	19.42	6.56	3.725	0.24	1.12	95.8	500	20.22	
	1830	289.00	19.57	6.58	3.731	0.43	1.87	98.7	500	20.22	*re-calibrate eq.
	1900	293.00	19.21	6.50	3.349	0.36	2.00	201.5	500	20.16	
	1930	297.00	18.60	6.63	3.336	0.20	1.83	154.1	500	20.17	
	2000	301.00	17.80	6.60	3.370	0.36	1.27	134.8	500	20.17	
	2030	305.00	17.71	6.62	3.355	0.41	1.48	120.8	500	20.08	
	2100	309.00	17.34	6.59	3.359	0.19	1.37	112.7	500	19.89	
	2130	313.00	17.07	6.62	3.388	0.19	1.58	111.7	500	19.73	
	2200	317.00	17.34	6.59	3.392	0.39	0.91	108.3	500	19.78	
	2230	321.00	16.79	6.60	3.467	0.40	6.60	105.8	500	18.80	Pump stopped temporarily 22:28
	2300	325.00	17.14	6.61	3.320	1.84	6.62	105.1	500	19.51	
	2330	329.00	17.09	6.60	3.409	1.69	6.63	104.4	500	18.98	
4/12/19	2400	334.00	16.40	6.60	3.386	1.31	6.60	102.0	500	19.85	
	0030	338.00	16.03	6.59	3.389	0.59	1.05	100.8	500	19.83	
	0100	342.00	16.41	6.59	3.377	0.30	1.24	98.2	500	20.12	
	0130	346.00	16.04	6.59	3.379	0.27	0.98	99.2	500	20.18	
	0200	350.00	16.45	6.60	3.359	0.25	1.18	97.8	500	20.24	
	0230	354.00	15.89	6.53	3.398	0.17	0.92	108.9	500	20.29	
	0300	358.00	16.16	6.59	3.380	0.29	1.30	108.9	500	20.32	
	0330	362.00	16.49	6.63	3.361	0.21	1.12	110.9	500	20.38	
	0400	366.00	15.11	6.59	3.412	0.31	1.07	114.9	500	20.42	
	0430	370.00	16.85	6.60	3.339	0.21	1.32	115.9	500	20.48	
	0500	374.00	15.93	6.60	3.397	0.26	1.10	121.3	500	20.52	
	0530	378.00	15.54	6.60	3.409	0.34	1.27	126.7	500	20.55	
	0600	382.00	15.39	6.65	3.395	0.19	1.20	129.1	500	20.56	
	0630	386.00	15.46	6.86	3.416	0.12	1.22	127.4	500	20.59	

GOLDER

WELL PURGING FORM

Project Ref: Exide - DGW-MW-12 Pump Test **Project No.: 130-2086-06**

Location DGW-MW-12

Monitored By: PBS/BCW/JTB Date 04/10/19-04/12/19 Time 1655

Well Piezometer Data

(circle one)

Depth of Well (from top of PVC or ground)	27.59	feet
Depth of Water (from top of PVC or ground)	13.18	feet
Radius of Casing	2	inches
	0.08	feet
Casing Volume	14.41	feet
	2.35	gallons

Purging Discharge Data

Purging Method: Peristaltic Pump

Start Purging Date 4/10/19 Time 1655

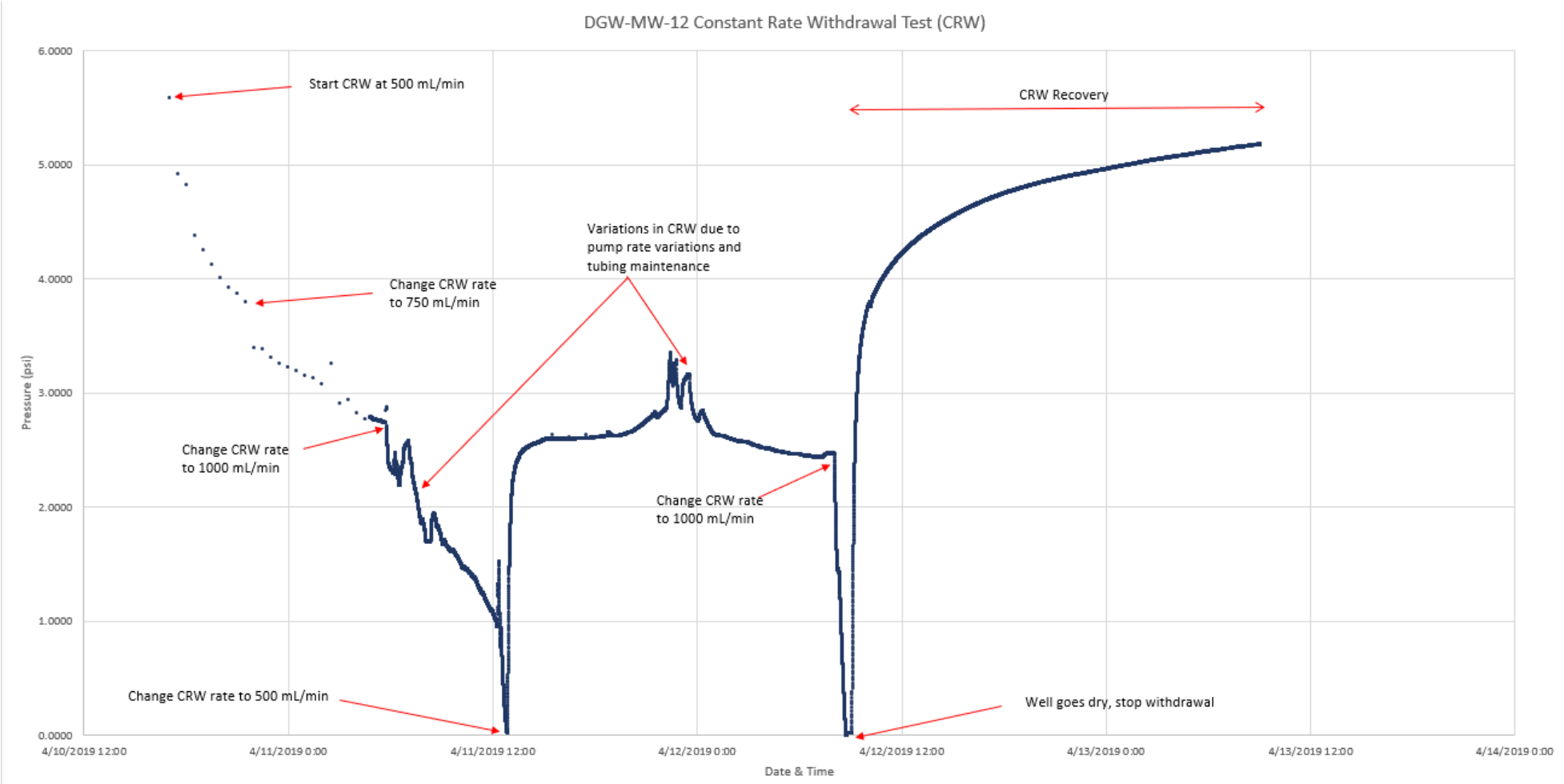
Stop Purging Date 4/12/19 Time 0907

Monitoring

Date	Time	Volume Discharge (gals)	Temp (°C)	pH	Spec.Cond. (_S/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Redox Potential (+/- mV)	Flow Rate ~~(L/min)~~ mL/min	WL (ft BTOC)	Appearance of Water and Comments
4/12	0700	390.00	16.1	6.05	3.671	0.27	1.21	167.2	500	20.62	
	0730	394.00	16.4	6.80	3.351	0.21	1.27	164.7	500	20.62	
	0800	398.00	16.2	6.65	3.401	0.29	1.29	147.6	500	20.56	
	0810	399.00	↑		↑		↑		1000	21.77	0805-changed rate to 1000 mL/min
	0815	399.5	NOT MEASURED					→	1000	22.92	
	0826	400.5							950	22.97	adjust back to 1000
	0828	400.7	↓		↓		↓		950	23.48	adjust back to 1000
	0830	400.9	16.6	6.67	3.402	10.9	1.49	161.7	1000	24.09	
	0837	401.9	NOT MEASURED					→	950	25.13	
	0843	402.5							950	25.94	adjust back to 1000
	0852	403.6	16.9	6.71	3.376	405	1.63	167.7	950	26.59	
	0900	404.6	NOT MEASURED					→	900	27.04	PUMPS MAXED OUT
	0905	405.2							800	27.22	VERY SILTY
	0907	405.4							NA	DRY	OFF, START RECOVERY
	0910	NA								24.30	
	0915									21.46	
	0923									19.78	
	0935									18.63	
	0942		↓	↓	↓	↓	↓	↓		18.18	

ATTACHMENT E

Pumping Test Overview Schematic



CLIENT
EXIDE TECHNOLOGIES

PROJECT
2019 SITE INVESTIGATION REPORT

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-14
PREPARED	JS
DESIGN	JS
REVIEW	EPW
APPROVED	AMF/THR

TITLE
PUMPING TEST OVERVIEW SCHEMATIC

PROJECT No. 130208606
Rev 0
APPENDIX E

ATTACHMENT F

State Well Reports

GOLDER

STATE OF TEXAS WELL REPORT for Tracking #503154

Owner:	**Exide Technologies**	Owner Well #:	**2019-BH-01**
Address:	**7471 S. 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**7471 S. 5th Street Frisco, TX 75034**	Latitude:	**33° 08' 31" N**
		Longitude:	**096° 49' 52" W**
Well County:	**Collin**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Environmental Soil Boring**

Drilling Start Date: **1/21/2019** Drilling End Date: **1/21/2019**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**2.25**	**0**	**25**

Drilling Method: **Direct Push**

Borehole Completion: **Plugged**

Annular Seal Data: **No Data**

Seal Method: **Not Applicable**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **No Data**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Plug Information:

Description (number of sacks & material)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Cement	**0**	**2**
Bentonite	**2**	**25**

Water Quality:	Strata Depth (ft.)	Water Type
	No Data	No Data

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Comments: **This environmental soil boring was plugged on 01/22/19**

Report Amended on 4/22/2019 by Request #27660

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	13.5	yellowish brown, silty clay
13.5	21	yellowish brown, gravelly, silty clay
21	23.5	light gray and yellowish orange, silty clay with gravel
23.5	25	gray shale

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Please include the report's Tracking Number on your written request.

Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #503156

Owner:	**Exide Technologies**	Owner Well #:	**2019-BH-02**
Address:	**7471 S. 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**7471 S. 5th Street Frisco, TX 75034**	Latitude:	**33° 08' 31" N**
		Longitude:	**096° 49' 52" W**
Well County:	**Collin**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Environmental Soil Boring**

Drilling Start Date: **1/21/2019** Drilling End Date: **1/21/2019**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**2.25**	**0**	**25**

Drilling Method: **Direct Push**

Borehole Completion: **Plugged**

Annular Seal Data: **No Data**

Seal Method: **Not Applicable**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **No Data**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

	Description (number of sacks & material)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Plug Information:	**Bentonite**	**0**	**25**

Water Quality:	Strata Depth (ft.)	Water Type
	No Data	No Data

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Comments: **This environmental soil boring was plugged on 01/22/19**

Report Amended on 4/22/2019 by Request #27661

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	24.5	yellowish brown and gray, silty clay with gravel and silty sand seams
24.5	25	gray shale

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

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Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #503157

Owner:	**Exide Technologies**	Owner Well #:	**2019-BH-03**
Address:	**7471 S. 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**7471 S. 5th Street Frisco, TX 75034**	Latitude:	**33° 08' 30" N**
		Longitude:	**096° 49' 52" W**
Well County:	**Collin**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Environmental Soil Boring**

Drilling Start Date: **1/21/2019** Drilling End Date: **1/21/2019**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**2.25**	**0**	**23.5**

Drilling Method: **Direct Push**

Borehole Completion: **Plugged**

Annular Seal Data: **No Data**

Seal Method: **Not Applicable**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **No Data**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

	Description (number of sacks & material)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Plug Information:	**Bentonite**	**0**	**23.5**

Water Quality:	Strata Depth (ft.)	Water Type
	No Data	No Data

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Comments: **This environmental soil boring was plugged on 01/22/19**

Report Amended on 4/22/2019 by Request #27662

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	23	yellowish brown and gray, silty clay with gravel
23	23.5	gray shale

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

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Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #503158

Owner:	**Exide Technologies**	Owner Well #:	**2019-BH-04 / DGW-MW-12**
Address:	**7471 S. 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**7471 S. 5th Street Frisco, TX 75034**	Latitude:	**33° 08' 30" N**
		Longitude:	**096° 49' 51" W**
Well County:	**Collin**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **1/21/2019** Drilling End Date: **1/22/2019**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**7.25**	**0**	**24**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Screened**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**0**	**2**	**Concrete**
	2	**12**	**Bentonite**
	12	**24**	**Sand**

Seal Method: **Gravity**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:	Strata Depth (ft.)	Water Type
	No Data	No Data

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Comments: **No Data**

Report Amended on 4/22/2019 by Request #27663

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	23	yellowish brown and gray, silty clay with gravel and silt seams
23	24	gray shale

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	Riser	New Plastic (PVC)	40	0	14
2	Screen	New Plastic (PVC)	40 0.010	14	24

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Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #503163

Owner:	**Exide Technologies**	Owner Well #:	**2019-BH-05**
Address:	**7471 S. 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**7471 S. 5th Street Frisco, TX 75034**	Latitude:	**33° 08' 27" N**
		Longitude:	**096° 49' 40" W**
Well County:	**Collin**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Environmental Soil Boring**

Drilling Start Date: **1/22/2019** Drilling End Date: **1/22/2019**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**2.25**	**0**	**25**

Drilling Method: **Direct Push**

Borehole Completion: **Plugged**

Annular Seal Data: **No Data**

Seal Method: **Not Applicable**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **No Data**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Plug Information:

Description (number of sacks & material)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Cement	**0**	**2**
Bentonite	**2**	**25**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Comments: **This environmental soil boring was plugged on 01/23/19**

Report Amended on 4/22/2019 by Request #27664

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**7.3**	**yellowish brown clay, with some gravel and sand**
7.3	**24.5**	**yellowish brown and gray, silty clay with gravel and sand**
24.5	**25**	**gray shale**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #503162

Owner:	**Exide Technologies**	Owner Well #:	**2019-BH-06**
Address:	**7471 S. 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**7471 S. 5th Street Frisco, TX 75034**	Latitude:	**33° 08' 30" N**
		Longitude:	**096° 49' 39" W**
Well County:	**Collin**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Environmental Soil Boring**

Drilling Start Date: **1/22/2019** Drilling End Date: **1/22/2019**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**2.25**	**0**	**15**

Drilling Method: **Direct Push**

Borehole Completion: **Plugged**

Annular Seal Data: **No Data**

Seal Method: **Not Applicable**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **No Data**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

	Description (number of sacks & material)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Plug Information:	**Bentonite**	**0**	**15**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Comments: **This environmental soil boring was plugged on 01/22/19**

Report Amended on 4/22/2019 by Request #27665

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**14.5**	**yellowish brown, silty clay, gravel and silty sand**
14.5	**15**	**gray shale**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #503164

Owner:	**Exide Technologies**	Owner Well #:	**2019-BH-07**
Address:	**7471 S. 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**7471 S. 5th Street Frisco, TX 75034**	Latitude:	**33° 08' 30" N**
		Longitude:	**096° 49' 42" W**
Well County:	**Collin**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Environmental Soil Boring**

Drilling Start Date: **1/22/2019** Drilling End Date: **1/22/2019**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**2.25**	**0**	**24**

Drilling Method: **Direct Push**

Borehole Completion: **Plugged**

Annular Seal Data: **No Data**

Seal Method: **Not Applicable**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **No Data**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Plug Information:

Description (number of sacks & material)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Cement	**0**	**2**
Bentonite	**2**	**24**

Water Quality:	Strata Depth (ft.)	Water Type
	No Data	No Data

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Comments: **This environmental soil boring was plugged on 01/23/19**

Report Amended on 4/22/2019 by Request #27666

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	21	yellowish brown and gray, silty clay, gravel, sand and silt
21	24	gray shale

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #503165

Owner:	**Exide Technologies**	Owner Well #:	**2019-BH-08**
Address:	**7471 S. 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**7471 S. 5th Street Frisco, TX 75034**	Latitude:	**33° 08' 30" N**
		Longitude:	**096° 49' 36" W**
Well County:	**Collin**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Environmental Soil Boring**

Drilling Start Date: **1/22/2019** Drilling End Date: **1/22/2019**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**2.25**	**0**	**15**

Drilling Method: **Direct Push**

Borehole Completion: **Plugged**

Annular Seal Data: **No Data**

Seal Method: **Not Applicable**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **No Data**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Plug Information:

Description (number of sacks & material)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Cement	**0**	**2**
Bentonite	**2**	**15**

Water Quality:	Strata Depth (ft.)	Water Type
	No Data	No Data

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Comments: **This environmental soil boring was plugged on 01/23/19**

Report Amended on 4/22/2019 by Request #27667

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	14.5	yellowish brown and gray, silty clay, gravel, sand and silt mixtures
14.5	15	gray shale

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #503167

Owner:	**Exide Technologies**	Owner Well #:	**2019-BH-09**
Address:	**7471 S. 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**7471 S. 5th Street Frisco, TX 75034**	Latitude:	**33° 08' 25" N**
		Longitude:	**096° 49' 35" W**
Well County:	**Collin**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Environmental Soil Boring**

Drilling Start Date: **1/22/2019** Drilling End Date: **1/22/2019**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**2.25**	**0**	**20**

Drilling Method: **Direct Push**

Borehole Completion: **Plugged**

Annular Seal Data: **No Data**

Seal Method: **Not Applicable**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **No Data**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

	Description (number of sacks & material)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Plug Information:	**Bentonite**	**0**	**20**

Water Quality:	Strata Depth (ft.)	Water Type
	No Data	No Data

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Comments: **This environmental soil boring was plugged on 01/22/19**

Report Amended on 4/22/2019 by Request #27668

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	17.5	yellowish brown and gray sand, silty clay, silt and gravel mixtures
17.5	20	gray shale

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

TEX. OCC. CODE Title 12, Chapter 1901.251, authorizes the owner (owner or the person for whom the well was drilled) to keep information in Well Reports confidential. The Department shall hold the contents of the well log confidential and not a matter of public record if it receives, by certified mail, a written request to do so from the owner.

Please include the report's Tracking Number on your written request.

Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #503169

Owner:	**Exide Technologies**	Owner Well #:	**2019-BH-10**
Address:	**7471 S. 5th Street Frisco, TX 75034**	Grid #:	**18-50-8**
Well Location:	**7471 S. 5th Street Frisco, TX 75034**	Latitude:	**33° 08' 23" N**
		Longitude:	**096° 49' 35" W**
Well County:	**Collin**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Environmental Soil Boring**

Drilling Start Date: **1/22/2019** Drilling End Date: **1/22/2019**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**2.25**	**0**	**18.5**

Drilling Method: **Direct Push**

Borehole Completion: **Plugged**

Annular Seal Data: **No Data**

Seal Method: **Not Applicable**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **No Data**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Plug Information:

Description (number of sacks & material)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Cement	**0**	**2**
Bentonite	**2**	**18.5**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **WEST Drilling**

101 Industrial Drive
Waxahachie, TX 75165

Driller Name: **Robert Williams** License Number: **59501**

Comments: **This environmental soil boring was plugged on 01/23/19**

Report Amended on 4/22/2019 by Request #27669

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**17.5**	**yellowish brown and gray, silty clay and gravel mixtures**
17.5	**18.5**	**gray shale**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

TEX. OCC. CODE Title 12, Chapter 1901.251, authorizes the owner (owner or the person for whom the well was drilled) to keep information in Well Reports confidential. The Department shall hold the contents of the well log confidential and not a matter of public record if it receives, by certified mail, a written request to do so from the owner.

Please include the report's Tracking Number on your written request.

Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

ATTACHMENT G

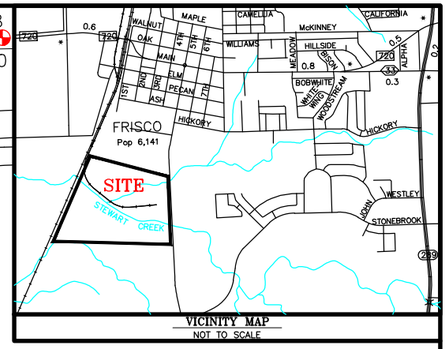
Survey Data

2019-BH-01, 636.48
2019-BH-02, 636.70
2019-BH-03, 636.55
DGW MW12, 636.72

2019-BH-07
636.01

2019-BH-06
636.45

2019-BH-08
642.40



DGW-MW-8
644.37

5038
EDGE WATER
618.21

5037
EDGE WATER
620.15

DGW-MW-5
630.47

DGW-MW-7
643.31

DGW-MW-6
643.30

2019-BH-05
639.97

CONTROL POINT "T-200"
1/2" IRON ROD STAMPED
"B & C RANDOM"
NORTHING: 7101870.92400
EASTING: 2479343.83400
ELEVATION: 629.18

CONTROL POINT "T-19"
"MAG NAIL SET"
NORTHING: 7101862.01600
EASTING: 2479787.00200
ELEVATION: 631.69

DGW-MW-11
631.69

DGW-MW-11S
631.89

DGW-MW-10
631.91

DGW-MW-10S
631.89

5046
EDGE WATER
625.82

DGW-MW-4
632.53

DGW-MW-3
633.54

DGW-MW-2
634.48

5045
EDGE WATER
627.18

CONTROL POINT "T-20"
"MAG NAIL SET"
NORTHING: 7101663.22200
EASTING: 2480049.29000
ELEVATION: 634.39

DGW-MW-9
645.11

DGW-MW-1
639.27

2019-BH-09, 642.34

2019-BH-10, 635.28

5047
EDGE WATER
627.93

WELL#	NORTHING	EASTING	VAULT RIM	CASING	GROUND	LATITUDE	LOGITUDE
DGW-MW-8	7102209.80	2479510.97	640.38	643.91	640.13	33°08'28.622984"	96°49'49.349979"
DGW-MW-12	7102370.33	2479329.83	636.72	640.22	637.02	33°08'30.239621"	96°49'51.450235"
2019-BH-01	7102415.86	2479280.44	N/A	N/A	636.48	33°08'30.697862"	96°49'52.022614"
2019-BH-02	7102401.96	2479297.79	N/A	N/A	636.70	33°08'30.557612"	96°49'51.821099"
2019-BH-03	7102380.19	2479313.46	N/A	N/A	636.55	33°08'30.339832"	96°49'51.640927"
2019-BH-05	7102090.38	2480296.46	N/A	N/A	639.97	33°08'27.317815"	96°49'40.134724"
2019-BH-06	7102386.94	2480374.07	N/A	N/A	636.45	33°08'30.239719"	96°49'39.166460"
2019-BH-07	7102382.30	2480142.36	N/A	N/A	636.01	33°08'30.230293"	96°49'41.892330"
2019-BH-08	7102416.82	2480633.68	N/A	N/A	642.40	33°08'30.494409"	96°49'36.107807"
2019-BH-09	7101841.95	2480768.72	N/A	N/A	642.34	33°08'24.785508"	96°49'34.627433"
2019-BH-10	7101687.93	2480717.54	N/A	N/A	635.28	33°08'23.269795"	96°49'35.258149"

NORTH

NOTE: ROADS, BUILDINGS AND CREEKS ON THIS MAP WERE LOCATED BY OTHERS AND NOT A PART OF THIS SURVEY. THESE ITEMS ARE FOR REFERENCE ONLY.

NOTE: ALL COORDINATES ARE GRID COORDINATES BASED ON NAD 83, TEXAS NORTH CENTRAL ZONE No. 4204, NAVD 88 WITH LATITUDE AND LONGITUDE BEING WGS 84

100 0 100 200 300
GRAPHIC SCALE – 1 INCH=100 FEET

STATE OF TEXAS
REGISTERED
JAMES L. BRITTAIN
1674
PROFESSIONAL
LAND SURVEYOR

LEGEND
MONITOR WELL
CREEKS OR DRAINAGE
ROADS

PREPARED MAY 22, 2018

BRITTAIN & CRAWFORD
LAND SURVEYING &
TOPOGRAPHIC MAPPING
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WEBSITE: www.brittain-crawford.com
FIRM CERTIFICATION# 1019000

EXHIBIT MAP
OF
MONITOR WELL LOCATIONS EXIDE RECYCLING CENTER

golder.com

APPENDIX 3.6

PERMEABLE REACTIVE BARRIER WALL COLUMN STUDY REPORT

GOLDER

REPORT

Permeable Reactive Barrier Wall Column Study Report

EXIDE FRISCO RECYCLING CENTER, 7471 OLD 5TH STREET, FRISCO, TEXAS 75034-5047, TCEQ SWR NO. 30516, TCEQ HAZARDOUS WASTE PERMIT NO. HW-50206, TCEQ AGREED ORDER DOCKET NO. 2011-1712-IHW-E, EPA ID NO. TXD006451090, CUSTOMER NO. CN600129779, REGULATED ENTITY NO. RN100218643

Submitted to:

Exide Technologies, Inc.
7471 Old 5th Street
Frisco, TX 75034

Submitted by:

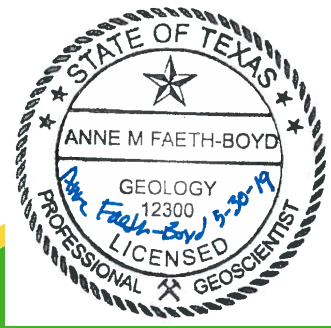
Golder Associates Inc.
13515 Barrett Parkway Drive, Suite 260
Ballwin, Missouri, USA 63021

+1 314 984-8800

130208606

May 30, 2019

GOLDER ASSOCIATES INC.
Geoscience Firm Registration
Certificate Number 50369



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Exide Technologies (electronic)

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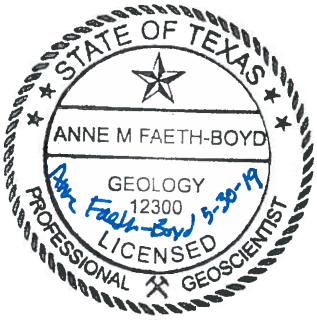

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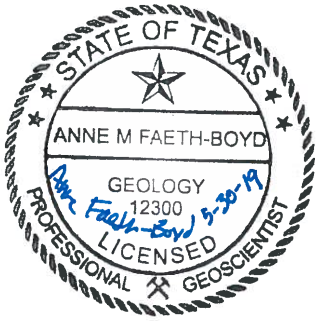

TABLES

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Table 2 – DGW-MW-11 Column Study Analytical Results

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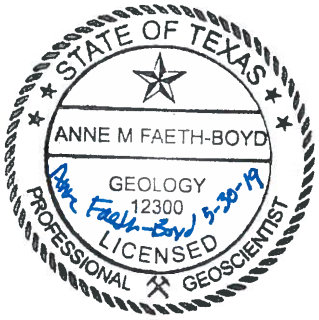

FIGURES

Figure 1 - Site Location Map

Figure 2 – Sample Location Map

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ATTACHMENT A – Groundwater Collection Forms

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1.0 INTRODUCTION AND BACKGROUND

In support of the Part B RCRA Permit Renewal Application, Golder Associates Inc. (Golder) has prepared this Permeable Reactive Barrier Column Study Summary Report (Report) for the Exide Technologies, Inc. (Exide) Former Operating Plant (FOP) located within the Frisco Recycling Center (FRC) located at 7471 Old Fifth Street in Frisco, Texas (Site). The Report outlines the rationale, methodology, analyses and conclusions for the column studies.

As described in the Part B RCRA Permit Renewal Application, the facility must be closed "in a manner that minimizes need for further maintenance and controls, or eliminates, to the extent necessary to protect human health and the environment, the post-closure release of hazardous waste, hazardous constituents, leachate, contaminated rainfall, or waste decomposition products to the groundwater, surface waters, or to the atmosphere."

A groundwater remedial evaluation (GRE) was conducted using similar criteria to address the potential for migration of Site chemicals of concern (COCs) to Stewart Creek from the groundwater to surface water discharge pathway and has been prepared to supplement the information included in this report. The GRE is included as Appendix 3.2. Based on the detailed evaluation in this GRE, In-Situ Chemical Reduction (ISCR) using Zero-Valent Iron (ZVI) was determined to be an applicable technology for treating Site groundwater. To apply the ISCR technology, a Funnel and Gate permeable reactive barrier (PRB) is recommended for the groundwater protection element at the FOP both a component of the Corrective Action Program at the Site and a component of the RCA CAMU design.

ISCR using ZVI is a proven technology for removing arsenic, antimony, cadmium, lead and selenium, the relevant COCs, from groundwater at the Site. The application of ISCR using a PRB is a proven and accepted remedy. To the extent it is may be viewed as a somewhat newer technology (compared to a slurry wall and pump and treat system), the CAMU criteria specifically encourage the incorporation of innovative technologies into the CAMU design. 40CFR 264.552(c)(6). The PRB offers a proven protection element without the adverse residuals of filter cakes, sludge, or removal of treated condensed leachate. When ZVI is co-applied with low-permeability slurry-wall sections ('funnels'), groundwater is directed towards permeable reactive barrier segments ('gates') where treatment is monitored and maintained. The Funnel and Gate is the most sustainable, low-energy remedy, and it avoids unnecessary waste generation and management. In addition, it maximizes future use of the surface site by avoiding the need for long-term above ground wastewater treatment facilities.

To provide detailed information on ZVI performance for the design of the Funnel and Gate system, column studies were performed to determine information regarding the longevity, composition, and performance of a PRB at the Site. Specifically, dynamic tests, including flow-through column tests using potential treatment mixtures of micron scale zero-valent iron and sand, and using Site groundwater were performed to provide an evaluation of PRB treatment design parameters and assess performance under simulated groundwater flow conditions. These types of tests are more reliable than static (or jar) tests as column tests incorporate the field condition of a constantly flowing source water flushing the reactive media over and over, pore volume after pore volume. Column tests provide dynamic reactive rate information, and information on how the longevity and permanence of the barrier material. Media biofouling and scaling can also be assessed through column testing.

Column testing can also be used to evaluate the geochemical fate of secondary parameters other than COCs as they move in groundwater through the reactive material; significant removal of inorganic ions such as calcium, magnesium and sulfate in the column could indicate that secondary treatment reactions may affect long-term

performance of the PRB to a greater extent than just the removal of Site COC metals. Inorganic ions consume ZVI and are potential sources of media scaling. These tests are also useful to examine the behavior of Site groundwater when in contact with the reactive medium. Groundwater constituents such as dissolved oxygen and alkalinity are typically affected by iron or other reactive media and these changes could impact the long-term performance of the medium.

2.0 FIELD SAMPLING METHODOLOGY

2.1 Overview of Sampling Events

2.1.1 August 2018 Sampling

In August 2018, monitoring wells that were installed in 2018 were resampled along with older wells with concentrations of metals detected in 2018 above applicable PCLs. These wells were sampled on August 1-3, 2018 and included DGW-MW-1 through DGW-MW-11, DGW-MW-10S, DGW-MW-11S, MW-10, MW-27, MW-30, MW-31, and MW-46. The purpose of this sampling event was to obtain additional data to assist with the selection of source wells for the column testing.

2.1.2 November 2018 Sampling

In order to evaluate varying types and concentrations of COCs at the Site, three sources of groundwater from the Site were originally proposed for use in the column studies as follows:

- Shallow groundwater in the French Drain System (FDS) potentially containing of As, Sb, Cd, Pb and Se. Sampling from the FDS as opposed to other shallow wells was selected due to the volume of water needed and the low yield in shallow groundwater wells.
- Deeper groundwater potentially containing As, Sb, Cd, Pb, and Se: MW-46
- Deeper groundwater with higher concentrations of As: DGW-MW-3

The field program for collecting water for the column studies included collection of pre-study analytical samples to confirm concentrations of COCs were present at the desired range for the column studies. Once confirmed, water was collected from the selected location for use in the column studies. Golder initially scheduled collection of column studies water in late September 2018. Due to heavy rains, the Site was inaccessible for water collection. Golder returned to evaluate Site conditions in late October 2018; however, heavy rains the day of the Site visit further prohibited the collection of groundwater to be used in the column studies.

In early November 2018, Golder collected analytical samples from the FDS, MW-46 and DGW-MW-3. Concentrations of metals were not in the desired range for the study for the FDS and MW-46 during the November 2018 sampling event (possibly due to recent heavy rainfall). DGW-MW-3 analytical results were consistent previous sampling results (May and August 2018) and contained arsenic exceeding the PCL. 50 liters (L) were collected al low flow from DGW-MW-3, placed directly into 1-L amber glass bottles taking care to have no free air space, and sent under chain of custody procedures to Golder Associates Ltd. in Montreal, Canada for use in the column studies. In order to reduce precipitation of metals, the amber 1 L bottles were collected at the same rate of purging and without headspace. Water was not sent for MW-46 or the FDS in November 2018. Analytical results from samples collected in November 2018 are included in Table 1.

2.1.3 December 2018 Sampling

Golder returned to the Site in early December 2018 to collect additional samples and column study volume for use in the remaining two columns. Golder collected analytical samples from several locations in order to evaluate the locations containing the most representative water for the study, focusing on locations with May/August 2018 PCL exceedances. In December 2018, Golder collected samples from the FDS, MW-30, MW-46, DGW-MW-11, and DGW-MW-11S. Additionally, Golder attempted to collect samples from shallow groundwater wells MW-32, MW-33, and MW-34; however, these shallower wells went dry during purging and no analytical samples were collected as yield was determined to be insufficient for the study.

Analytical results from the FDS appeared consistent with sample concentrations from the November 2018 sampling event and although neither lead nor cadmium concentrations were present exceeding PCLs, both total and dissolved antimony were detected exceeding the critical PCL. 60 L were collected from the FDS and sent under chain of custody procedures to Golder Ltd. in Montreal, Canada for use in the column studies.

Analytical results for MW-46 indicated no exceedances of critical PCLs of Site COCs and therefore was not selected for use in the column studies. Although originally not proposed due to low yield, DGW-MW-11 was chosen as the replacement to MW-46 based on concentrations of cadmium and lead exceeding critical PCLs. In December 2018, 37 liters were collected from DGW-MW-11 and shipped to Golder Associates Ltd. in Montreal, Canada under chain of custody procedures for use in the column studies.

2.1.4 January 2019 Sampling

Due to limited yield from DGW-MW-11 in December 2018, Golder collected an additional 26 L in January 2019 while on-Site for other Site activities. A total of 63 L from DGW-MW-11 was sent to Golder Associates Ltd, in Montreal, Canada for use in the column studies.

2.1.5 March and April 2019 - Extended Study Collection

In order to support the extended column study (as discussed in Section 6.0 below), additional volume was collected from DGW-MW-3, DGW-MW-11, and the FDS and sent to Golder Associates Ltd. in Montreal, Canada in March and April 2019.

2.2 Sampling Procedures

Sampling procedures were conducted in general accordance with the Revised Class 2 Landfill Groundwater Monitoring Plan, prepared by Pastor, Behling & Wheeler and dated July 31, 2013 (which TCEQ approved in a letter dated April 4, 2014) and in accordance with the applicable standard operating procedures (SOPs). Prior to sampling, monitoring wells were purged using low-flow methodology and using a peristaltic pump. The objective was to remove water at a rate that minimizes drawdown to the formation, to the extent practicable. The pump intake was set within the center of the screened interval for each monitoring well such that the water pumped was drawn from the formation and not the static water within the well casing above and or below the screen. If the well went dry during purging, sampling was performed the following day, provided that the well had sufficiently recharged to allow adequate sample collection. Samples were collected using the same pump used for purging. Each well had dedicated tubing, and samples were placed directly into sample containers. Due to low yield of shallow monitoring wells, a sample of water within the on-Site FDS was used as the representative sample of the shallow groundwater water beneath the concrete slab. Water from the FDS was collected as a grab sample at low flow using a peristaltic pump and placed directly into sample bottles. Sample collection forms are included as Appendix A.

2.3 Laboratory Analytical Methods

Analytical samples from field collection activities for pre-study analysis were shipped using standard chain of custody procedures to ALS Group in Houston, Texas. Dissolved samples were field filtered using a 0.45-micron filter prior to shipping to the analytical laboratory. Samples were analyzed for the following parameters:

- COC Metals (Sb, As, Cd, Pb, Se) and iron (total and dissolved) using EPA Method SW-846 6020;
- Major cations (Na^+, K^+, Mg^{2+}, and Ca^{2+}) using EPA Method SW-846 6020;

- Major anions (Cl^-, SO_4^{2-}, NO_3^-, HCO_3^-, CO_3^{2-}) using EPA Method SW-846 6020;
- Total dissolved solids using EPA Method SM 2540C;
- Total hardness using SM 2340B; and
- Alkalinity SM 2320B.

3.0 SUMMARY OF GROUNDWATER ANALYTICAL DATA

Golder evaluated and summarized groundwater data for the Site collected between 2014 and 2019. The results of groundwater data collected between 2014 and July 2018 were previously submitted to TCEQ and/or are included in Appendix 3.1 of the Response Action Plan (RAP). Results for groundwater samples collected in August 2018 are included in Table 1 with the samples collected between November 2018 and early January 2019 for the column study.

To evaluate groundwater analytical data, detected Site chemicals of concern (COCs) were compared to screening criteria from the TCEQ Texas Risk Reduction Program (TRRP) Guidance and values previously approved by TCEQ from the 2014 Affected Property Assessment Report (APAR). See Attachment H of the May 2019 Part B Permit Renewal Application, Protective Concentration Limits (PCLs) updated by TCEQ in April 2018, aquatic life surface water benchmark criteria updated by TCEQ in January 2017, and contact recreation values updated by TCEQ in March 2006 (https://www.tceq.texas.gov/remediation/trrp/guidance.html). Screening levels used to determine the Critical included comparison of:

- $^{GW}GW_{Ing}$ PCL (based on drinking water ingestion)
- $^{Air}GW_{Inh\text{-}V}$ PCL (based on indoor air inhalation, as applicable for TPH only)
- ^{SW}GW PCL (with a dilution factor of 0.15, based on recreation contact recreation criteria for wells along Stewart Creek)
- The ^{SW}GW PCL (based on chronic aquatic life criteria for monitoring wells along Stewart Creek assuming ecological criteria (perennial streams) assuming use of a 0.15 dilution factor. Per TRRP-24, specific aquatic life criteria for arsenic, cadmium and lead apply to dissolved rather than total concentrations since the dissolved phase represents the bioavailable form. Arsenic, cadmium, and lead RBELs based on hardness value of 106 mg/L for Segment 0823.)

The critical PCL for each COC is listed in Table 2. A summary of the groundwater exceedances of the Critical PCL for each well is discussed below.

3.1 Location-Specific Discussion

The following monitoring wells had detections of Site COCs above their respective PCLs:

- DGW-MW-2: Total arsenic (0.0132 mg/L) and dissolved arsenic (0.0127 mg/L) were detected above their critical PCLs of 0.01 mg/L in May 2018. Results from the August 2018 resampling event indicated detections of total and dissolved arsenic above their critical PCLs at concentrations of 0.0141 mg/L and 0.0152 mg/L, respectively.
- DGW-MW-3: Total arsenic (0.100 mg/L) and dissolved arsenic (0.103 mg/L) were detected above their critical PCLs of 0.010 mg/L in May 2018. In addition, TPH was detected above the critical PCL for TX 1005 method in May 2018. The sample was further analyzed per TRRP guidance using the TX 1006 method. Results of the TX 1006 analysis were all below the method quantitation limit (MQL). Results from the August 2018 resampling event (metals only) indicated detections of total and dissolved arsenic above their critical PCLs at concentrations of 0.151 mg/L and 0.149 mg/L, respectively. DGW-MW-3 was chosen for the column studies for the consistent presence of arsenic (in both total and dissolved forms) above the PCL. Results

from the November 2018 Column Study sampling event indicated detections of total and dissolved arsenic above their critical PCLs at concentrations of 0.158 mg/L and 0.145 mg/L, respectively.

- DGW-MW-6: Total arsenic (0.0134 mg/L) and dissolved arsenic (0.0136 mg/L) were detected above their critical PCLs of 0.010 mg/L in May 2018. Results from the August 2018 resampling event indicated detections of total arsenic above the critical PCL at a concentration of 0.0108 mg/L. Dissolved arsenic was not detected above its critical PCL in August 2018.
- DGW-MW-7: Total arsenic (0.0218 mg/L) and dissolved arsenic (0.0209 mg/L) were detected above their critical PCLs of 0.010 mg/L in May 2018. Results from the August 2018 resampling event indicated detections of total and dissolved arsenic above their critical PCLs at concentrations of 0.0267 mg/L and 0.0281 mg/L, respectively.
- DGW-MW-10: Total arsenic (0.0113 mg/L) and dissolved arsenic (0.0112 mg/L) were detected above their critical PCLs of 0.010 mg/L in May 2018. Results from the August 2018 resampling event indicated detections of total and dissolved arsenic above their critical PCLs at concentrations of 0.0174 mg/L and 0.0186 mg/L, respectively.
- DGW-MW-10S: There were no detections of COCs above their respective critical PCLs during the May 2018 sampling event. Results from the August 2018 resampling event indicated detections of total and dissolved arsenic above their critical PCLs (0.010 mg/L) at concentrations of 0.0412 mg/L and 0.0410 mg/L, respectively.
- DGW-MW-11: Total cadmium (0.0254 mg/L) and dissolved cadmium (0.0259 mg/L) were detected above their respective critical PCLs of 0.005 mg/L (total) and 0.0017 mg/L (dissolved) in May 2018. Total lead (0.0362 mg/L) and dissolved lead (0.0338 mg/L) were detected above their critical PCLs of 0.015 mg/L in May 2018. Results from the August 2018 resampling event indicated detections of total and dissolved cadmium above their critical PCLs (0.005 mg/L [total] and 0.0017 mg/L [dissolved]) at concentrations of 0.00592 mg/L and 0.00607 mg/L, respectively. There were no exceedances of total or dissolved lead in August 2018. DGW-MW-11 was resampled in December 2018 for potential use in the Column Study. Total lead (0.0383 mg/L) was detected above the critical PCL of 0.015 mg/L and dissolved cadmium (0.00249 mg/L) was detected above the critical PCL of 0.0017 mg/L in December 2018. Although previously not targeted due to low yield, DGW-MW-11 was chosen as a source for use in the Column Studies based on the concentrations observed. Due to the low yield of the well in December 2018, DGW-MW-11 was resampled in January 2019 for additional volume for the Column Studies. Total cadmium (0.00953 mg/L) and dissolved cadmium (0.00913 mg/L) were detected above their respective critical PCLs of 0.005 mg/L (total) and 0.0017 mg/L (dissolved) in January 2019. In addition, total lead (0.0276 mg/L) was detected above the critical PCL of 0.015 mg/L in January 2019.
- DGW-MW-11S: Total antimony (0.0240 mg/L) and dissolved antimony (0.0245 mg/L) were detected above their critical PCLs of 0.006 mg/L in May 2018. Dissolved cadmium (0.00382 mg/L) was detected above the critical PCL of 0.0017 mg/L in May 2018. Total lead (0.0285 mg/L) and dissolved lead (0.0411 mg/L) were detected above their critical PCLs of 0.015 mg/L in May 2018. Results from the August 2018 resampling event indicated detections of total and dissolved arsenic above their critical PCLs (0.010 mg/L) at concentrations of 0.0184 mg/L and 0.0183 mg/L, respectively. Results from the August 2018 resampling event also had a detection of total lead above the critical PCL at a concentration of 0.00299 mg/L and a detection of dissolved cadmium above the critical PCL at a concentration of 0.00191 mg/L. Antimony was not

detected (in either total or dissolved form) above critical PCLs during the August 2018 resampling event. Dissolved lead was not detected above the critical PCL in August 2018. Neither total nor dissolved arsenic was detected above their respective critical PCLs in May 2018 but were detected over critical PCLs in August 2018. DGW-MW-11S was resampled in December 2018 for potential use in the Column Studies; however, the location was not chosen as there were no detections above critical PCLs.

- MW-10: Total lead (0.0390 mg/L) was detected above the critical PCL of 0.015 mg/L during the May 2018 DGW PDI investigation. This was the first detection of lead at MW-10 over the critical PCL since March 2005. Prior to the May 2018 DGW PDI, MW-10 was last sampled as part of the Affected Property Report Assessment (APAR) investigations in March 2013 and no COCs were detected above their respective critical PCLs. MW-10 was resampled on August 1, 2018 to confirm the critical PCL exceedance from the May 2018 DGW PDI. Results from the August 2018 resampling event were below the critical PCL for total and dissolved lead.
- MW-27: Total arsenic (0.0112 mg/L) and dissolved arsenic (0.0102 mg/L) were detected above the critical PCL for arsenic (0.010 mg/L) during the DGW PDI. This was the first time arsenic was included in the requested analyses at MW-27. Prior to the DGW PDI, MW-27 was last sampled for total and dissolved lead and cadmium during the APAR investigation in February 2014. Additional analyses including polycyclic aromatic hydrocarbons and TPH (TX 1005) were collected in April 2013 (and there were no exceedances). Results from the August 2018 resampling event indicated detections of total and dissolved arsenic above their critical PCLs at concentrations of 0.0121 mg/L and 0.0117 mg/L, respectively. Although MW-27 contained concentrations of COCs exceeding critical PCLs, greater concentrations were present in other on-Site wells and MW-27 was not used in the Column Studies.
- MW-30: Total antimony (0.00868 mg/L) and dissolved antimony (0.00885 mg/L) were detected above the critical PCL for antimony (0.006 mg/L) during the DGW PDI. Total arsenic (0.0657 mg/L) and dissolved arsenic (0.0166 mg/L) were detected above the critical PCL for arsenic (0.01 mg/L) in May 2018. Total lead (0.0225 mg/L) was detected above the critical PCL for lead (0.015 mg/L) in May 2018. These detections were the first exceedances of lead detected at MW-30. Previously, MW-30 was only analyzed for total and dissolved cadmium and lead. MW-30 is located within the North Disposal Area and within the proposed RCA and was last sampled as part of the APAR investigation in April 2013. Results from the August 2018 resampling event indicated detections of total and dissolved arsenic above their critical PCLs at concentrations of 0.111 mg/L and 0.104 mg/L, respectively. Neither Antimony nor lead (in either total or dissolved form) were detected above their critical PCLs during the August 2018 resampling event. MW-30 was resampled in December 2018 for potential use in the Column Studies. Total antimony (0.00886 mg/L), total arsenic (0.109 mg/L), dissolved arsenic (0.0961 mg/L), and total lead (0.0230 mg/L) were detected above their respective critical PCLs in December 2018. Although MW-30 contained concentrations of COCs exceeding critical PCLs, greater concentrations were present in other on-Site wells and MW-30 was not used in the Column Studies.
- MW-31: Total arsenic (0.0106 mg/L) and dissolved arsenic (0.0101 mg/L) were detected above the critical PCL for arsenic (0.01 mg/L) in May 2018. Previously, MW-31 was only analyzed for total and dissolved cadmium and lead and no COCs were detected above their respective critical PCLs. MW-31 is located beneath the former Battery Storage Building and within the proposed RCA. MW-31 was last sampled as part of the APAR investigation in May 2013. Neither total nor dissolved arsenic was detected above critical PCLs in MW-31 during the August 2018 resampling event.

- MW-32: MW-32 was installed directly below the concrete slab at the Site at the direction of TCEQ and was sampled as part of the 2014 APAR investigation. Results from the 2014 APAR investigation indicated detections of dissolved cadmium (0.00639 mg/L) above the critical PCL (0.0017 mg/L) and dissolved lead (0.0164 mg/L) above the critical PCL (0.015 mg/L). MW-32 was not sampled during the May or August 2018 sampling events. MW-32 was purged in December 2018 for potential use in the Column Studies; however, the location went dry during purging and based on low yield was not chosen for use in the Column Studies. No analytical sample has been collected at this location since the 2014 APAR activities.
- MW-33: MW-33 was installed directly below the concrete slab at the Site at the direction of TCEQ and was sampled as part of the 2014 APAR investigation. Results from the 2014 APAR investigation indicated detections of dissolved lead (0.0557 mg/L) over the critical PCL (0.015 m/L) in January 2014. During a resampling event in February 2014, total cadmium (0.00715 mg/L), total lead (0.694 mg/L), and dissolved lead (0.101 mg/L) were detected over their respective critical PCLs (0.005 mg/L, 0.015 mg/L, and 0.015 mg/L, respectively). MW-33 was purged in December 2018 for potential use in the Column Studies; however, the location went dry during purging and based on low yield was not chosen for use in the Column Studies. No analytical sample has been collected at this location since the 2014 APAR activities.
- MW-34: MW-34 was installed directly below the concrete slab at the Site at the direction of TCEQ and was sampled as part of the 2014 APAR investigation. Results from the 2014 APAR investigation indicated detections of total cadmium (0.0346 mg/L) and dissolved cadmium (0.0386 mg/L) over their critical PCLs (0.005 mg/L and 0.0017 mg/L, respectively). Total lead (0.0357 mg/L) and dissolved lead (0.0575 mg/L) were detected over the critical PCL (0.015 mg/L). MW-34 was purged in December 2018 for potential use in the Column Studies; however, the location went dry during purging and based on low yield was not chosen for use in the Column Studies. No analytical sample has been collected at this location since the 2014 APAR activities.
- MW-46: Total lead (0.0354 mg/L) was detected above the critical PCL for lead (0.015 mg/L) in June 2018. Dissolved cadmium (0.00219 mg/L) was detected above the critical PCL for dissolved cadmium (0.0017 mg/L) in June 2018. During the APAR investigation, MW-46 had an exceedance of the critical PCLs for dissolved cadmium (0.00190 mg/L) and dissolved lead (0.0259 mg/L) in January 2014. The well was subsequently resampled in February and March 2014 and neither dissolved cadmium nor dissolved lead were detected over their respective critical PCLs. Neither total nor dissolved cadmium were detected above their respective critical PCLs in the August 2018 resampling event. Total lead was not detected above the critical PCL in August 2018.

Newly installed monitoring wells DGW-MW-1, DGW-MW-4, DGW-MW-5, DGW-MW-8, and DGW-MW-9 had no detections of COCs above their respective critical PCLs in neither the May/June 2018 DGW PDI sampling event nor the August 2018 resampling event.

The sampling during the DGW PDI of existing monitoring wells MW-16, MW-16S, MW-17, MW-18, MW-24, MW-26, MW-29, and MW-44 had no detections of COCs above their respective PCLs during the DGW PDI event in May 2018 and were therefore not sampled as part of the August 2018 resampling event nor were they considered for use in the Column Studies.

MW-35 and MW-36 were installed directly below the concrete slab at the Site at the direction of TCEQ as part of the 2014 APAR investigation; however, the wells did not produce sufficient yield for a sample. These wells were not sampled in 2018.

In order to represent shallow groundwater movement at the Site where yield was limited, the FDS was analyzed for use in the Column Studies. The FDS was sampled in both November and December 2018. Total antimony (0.0484 mg/L) and dissolved antimony (0.0484 mg/L) were detected above the critical PCL for both total and dissolved antimony (0.006 mg/L) in November 2018. Total antimony (0.0374 mg/L) and dissolved antimony (0.0346 mg/L) were detected above the critical PCL for both total and dissolved antimony (0.006 mg/L) in December 2018.

Golder completed a review of the groundwater analytical data collected in support of the column studies for conformance with the requirements of the Texas Risk Reduction Program (TRRP) guidance document, Review and Reporting of COC Concentration Data (RGG-366/TRRP-13 Revised May 2010) and for adherence to project objectives. The results of the review are discussed in the data usability summary (DUS) which is included as Appendix B. Laboratory analytical data packages are also included in Appendix B. No results required rejection of data.

3.2 Selection of Source Water

Based on sampling results described in Section 3.1, DGW-MW-3, DGW-MW-11, and the FDS were chosen for use in the columns studies. These locations were chosen in consideration of concentrations exceeding critical PCLs for Site COCs, location relative to the proposed RCA and groundwater yield.

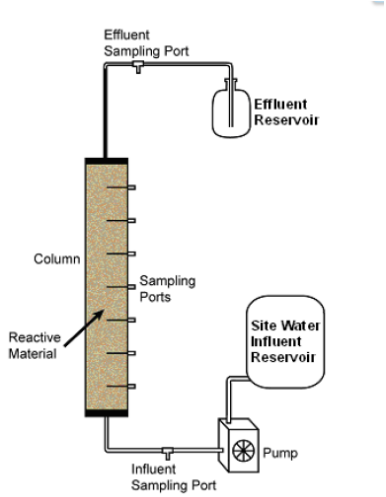
- DGW-MW-3 was chosen to represent concentrations of arsenic in groundwater exceeding the critical PCL. Arsenic concentrations in DGW-MW-3 were consistent based on all three sampling events in 2018 (May, August, and November).
- DGW-MW-11 was chosen to represent concentrations of lead and cadmium in groundwater (both total and dissolved) exceeding the critical PCL. In May 2018, detections of both total and dissolved cadmium at DGW-MW-11 were the highest concentrations measured in deep groundwater at the Site.
- The FDS was chosen to represent shallow groundwater conditions as well as concentrations of antimony in groundwater (both total and dissolved) exceeding the critical PCL. Concentrations of total and dissolved antimony were generally consistent between the November 2018 and December 2018 sampling events.

4.0 INITIAL LABORATORY COLUMN STUDY

4.1 Procedures

For each of the three water sources (DGW-MW-3, DGW-MW-11, and the FDS), three micron-scale zero valent iron (ZVI) mixtures (30%, 35% and 40% ZVI by weight with Ottawa sand) were evaluated in three separate columns to determine the design media for the funnel and gate treatment system. The column study objective was to evaluate ZVI:sand ratios resulting in the appropriate mix of material for the funnel and gate system. A fourth column with 100% sand served as a control in the study to assess removal of the COCs through mechanisms not related to ZVI.

The following figure presents a general schematic of the column set-up used to conduct the tests:



Source : Permeable Reactive Barrier: Technology Update, ITRC, June 2011

To feed the columns, the Site groundwater was first transferred from the 1-liter field amber collection bottles directly into Tedlar bags in a piston mode (bag starts empty and fills over time) using a peristaltic pump at a low flow rate of approximately 0.1 L/min. This method was used in order to minimize air entrapment and subsequent metals precipitation in the bags. In addition, careful attention was taken to avoid aspiration of sediments from the bottles. Additionally, in order to keep the geochemical conditions similar to the in-situ Site conditions, the following measures were undertaken for the columns testing:

- Use of zero head-space on all sampling bottles
- Air vacuum the Tedlar bags prior filling
- Purge the air in the columns with carbon dioxide prior filling the column with groundwater to help remove oxygenated air trapped in the media pores.

Each source water was then supplied to the influent end of the column (bottom of column) at a constant flow velocity using a low-flow laboratory pump (Masterflex L/S pump) at a flow rate of approximately 0.06 - 0.1 mL/min.

The column testing was performed in 5 cm diameter, 50 cm long clear polyvinyl chloride (PVC) pipes, each filled with 30%, 35% and 40% ratios of ZVI and sand by weight. During test column set-up, each mixture was measured for porosity, as follows:

Mixture (% w/w)	Porosity %
0	40.9
30	35.2
35	34.6
40	33.2

Each of the columns were operated at a Darcy velocity slightly higher (4-7 centimeters/day [cm/day]) than the field groundwater Darcy velocity (4 cm/day). Increasing the flow rate accounted for the potential mounding (increased gradient) in the field at the treatment gate, due to the funnels “gathering” groundwater flow, and to perform more pore-volume exchanges in the test column per given time. Sampling ports were placed at 0 cm (influent), 25 cm depth (midpoint) and 50 cm depth (effluent, end of column). Each port represented a different residence time of groundwater in the reactive medium.

During sampling, precipitation was minimized by keeping low levels of dissolved oxygen in the sampling bottles. This was achieved by connecting the column exit port to a collection tube in order to reach the bottom of the bottles. Furthermore, bottles were covered by a plastic film to minimize contact of water with air. For the iron columns, a geotextile was also placed at the tip of the sampling tube as a screen, to prevent any sand or ZVI sediment reaching the sampling bottle.

The sand used as part of the treatability study was Ottawa sand 20-30 Mesh supplied from Fisher Scientific Company. The ZVI used in the column treatability study was Ferox PRB zero valent iron, consistent with the ZVI that is anticipated to be used to treat Site groundwater (e.g. Ferox PRB, Hepure Technologies, 95+purity, 297 µm particle size). The Ferox PRB iron is marketed as having a uniform particle size (96% between the #20 and #60 mesh size), uniform particle density (7.86 grams per cubic centimeter, g/cm3) and uniform bulk density (2.92 g/cm3). Chemically, the Ferox PRB product is composed of (from MSDS, last obtained May 13, 2019 at https://hepure.com/product-list/ferox-zero-valent-iron-powders/)

- 96% zero-valent iron
- 2%-2.5% carbon
- 1%-1.5% silicon
- 0.1% Phosphorus
- 0.1% Sulfur

4.2 Laboratory Analysis Program

As outlined above, DGW-MW-3 was collected in November 2018 while DGW-MW-11 and the FDS volumes were collected in December 2018. For this reason, the three columns studies were initiated on different start dates. DGW-MW-3 was initiated on November 27, 2018, the FDS was initiated on December 13, 2018, and DGW-MW-11 was initiated on December 17, 2018.

The original column study program was performed for a total of 40 pore volumes for each source water. At the start of the test and every 5 pore volumes thereafter (one pore volume being equal to the liquid filled porosity of the ZVI-sand media), samples were collected at the inlet, outlet, and mid-point sampling ports along the length of the column. Samples were collected into laboratory supplied containers at the same flow rate as the column feed rate. The samples were analyzed for the following parameters:

- Site COC metals (Sb, As, Cd, Pb, and Se) and iron using EPA Method SW-846 6020;
- Major cations (Na^+, K^+, Mg^{2+}, and Ca^{2+}) using EPA Method SW-846 6020;
- Major anions (Cl^-, SO_4^{2-}, NO_3^-, HCO_3^-, CO_3^{2-}) using EPA Method SW-846 6020;

Samples that were analyzed for additional geochemical parameters were collected into laboratory supplied containers at the start of the test (at the inlet port) and at 5, 20, and 40 pore volumes (at the outlet port). The samples were analyzed for the following parameters:

- Total dissolved solids using EPA Method SM 2540C;
- Total hardness using SM 2340B; and
- Alkalinity SM 2320B.

All groundwater for analytical testing (except the direct measurement parameters of conductivity, ORP, temperature and pH) was shipped using standard chain of custody procedures to ALS Group in Houston, Texas. Dissolved samples were filtered using a 0.45-micron filter prior to shipping to the analytical laboratory. Direct measurements were taken using a calibrated portable multi-parameters probe in the fi Golder laboratory. Duplicate samples were collected at a rate of one per 20 samples.

5.0 INITIAL COLUMN STUDY RESULTS

Results from the original column study showed reduction of Site COCs in all three ZVI mixtures below critical PCLs, where they were present. Graphs presenting reduction data for each Site COC and the respective column are shown in Appendix C. All three ZVI mixtures removed of the COCs (where they were present) to below PCLs with no breakthrough observed during the original study over 40 pore volumes of simulated groundwater flow. A more detailed discussion for each COC and general geochemistry results is included below:

5.1 Arsenic at DGW-MW-3

From the column studies samples, arsenic was only observed above the PCL at DGW-MW-3 and total and dissolved arsenic results were similar. Although field and inlet concentrations were variable (indicating some loss of arsenic to precipitation during transport and storage), all but one of the inlet arsenic concentrations were above the PCL. There was a general decrease in arsenic observed in all columns (both iron and control) but arsenic concentrations were reduced below the detection limits in all of the iron columns before the mid-point of the column whereas the arsenic concentrations in the control columns generally declined at a slower rate and were detectable at both the mid-point and end of the control columns.

5.2 Lead at DGW-MW-11

From the column studies samples, lead was only observed above the PCL at DGW-MW-11. There was very little dissolved lead detected in the samples in general, and no dissolved lead detected above the PCL, so this discussion focuses on the total lead results.

There was a high degree of variability in lead concentrations between the field samples, samples collected at the start of the test, and column inlet samples collected throughout the test, with lower concentrations detected sequentially over time, indicating that lead likely was lost to precipitation during transport and storage. There was no lead detected in the mid-point or outlet in any of the columns containing iron or the controls, further indicating that precipitation with iron is a primary mechanism for lead removal. These column study results are also consistent with what has been observed over time at the Site with lead concentrations detected above the PCL infrequently and inconsistently (not present when wells are resampled).

5.3 Cadmium at DGW-MW-11

From the column studies samples, cadmium was only observed above the PCL at DGW-MW-11. Although the PCLs are different for total and dissolved cadmium, the results for total and dissolved cadmium were similar. Cadmium field samples and samples collected at the start of the test and at the inlet location throughout the test were variable, indicating variable cadmium concentrations in groundwater. In general, the cadmium concentrations in the control columns were variable (as is expected with the variable cadmium concentrations in groundwater) but were significantly reduced (with total and dissolved cadmium concentrations below the detection limit by the mid-point of the iron columns).

5.4 Antimony at French Drain

From the column studies samples, antimony was only observed above the PCL in the French Drain samples. Total and dissolved antimony concentrations and column studies results were similar. Antimony concentrations in samples collected in the field were generally similar to those collected at the start of the test and those collected at the inlet locations throughout the test, indicating that antimony was not precipitating out with iron and other metals. Antimony concentrations remained relatively consistent throughout the test in the control columns

(between inlet, mid-point and effluent locations) and were significantly reduced in iron columns (with total and dissolved antimony concentrations below the detection limit by the mid-point of the iron columns).

5.5 Selenium

There were no selenium detections above the PCL in any of the samples collected for the column studies. Although selenium was detected at all three source locations, the detections were low (many between the detection and reporting limit) and selenium concentrations were reduced in French Drain columns with iron (compared to the control).

5.6 Geochemical Data

The groundwater was analyzed for anions, additional cations and other geochemical parameters in order to evaluate the potential for minerals to precipitate and reduce the life length of the PRB. The results are presented in Table 2.

The groundwater contains a variable but generally high degree of hardness and alkalinity (other than the French Drain). Hard water is caused by minerals that dissolve into it – especially calcium and magnesium. The alkalinity of the groundwater is caused by the bicarbonate anions which are the soluble form of calcium. As shown in Tables 2 through 4, the hardness and alkalinity of the water drops as it flows though the ZVI mixture when compared to the concentrations obtained against the control results.

Hardness, iron, calcium and magnesium from DGW-MW-3 and DGW-MW-11 decrease when flowing through the iron columns but does not decrease significantly through the control columns. There were no significant changes in hardness, calcium or magnesium across the control or iron columns from the French Drain source water. Total and dissolved iron concentrations increased across the iron columns for French Drain source water.

The pH of the water from DGW-MW-3 and DGW-MW-11 increased (from a minimum influent pH of 5.74) when passing into the ZVI/sand mixture and the control column (max effluent pH of 9.16), and the pH of the French Drain source water decreased (from a max influent pH of 10.60) when passing through both the sand and the ZVI/sand mixture (min effluent pH of 6.06). As the pH of the water increases, bicarbonate (HCO_3^-) ions are converted to carbonate ions (CO_3^{2-}). The carbonate anions formed can then combine with the cations present in solution (Ca^{2+}, Fe^{2+}) to form carbonate mineral precipitates such as calcite ($CaCO_3$) and siderite ($FeCO_3$). Magnesium cations may also precipitate in solid solution with $CaCO_3$. At full-scale, this phenomenon could represent an issue for the long-term operation of the PRB.

- In the DGW-MW-3 (where pH decreased), total alkalinity in the influent was comprised primarily of bicarbonate, which was converted to carbonate in the effluent and also decreased in concentration, likely indicating precipitation of carbonate minerals.
- In the DGW-MW-11 column (where pH decreased) total alkalinity in the influent and effluent of all columns was comprised of primarily bicarbonate. Bicarbonate concentrations declined through the column but carbonate was not detected, likely indicating the precipitation of carbonate minerals.
- In the French Drain columns (where pH decreased), total alkalinity in the influent was comprised primarily of carbonate, which was converted to bicarbonate and decreased in concentration for the iron columns but did not show a significant reduction for the control columns.

There was not a significant change observed for total dissolved solid concentrations or sulfate concentrations and nitrate was not detected in groundwater.

6.0 EXTENDED LABORATORY COLUMN STUDY

In mid-March 2019, prior to completion of the original study, column results for all three water types indicated no breakthrough was occurring in any of the columns containing ZVI indicating that the iron was not exhausted in terms of treating column study COCs. Analytical results for the original column study are presented in Tables 2 through 4. In order to better investigate the longevity of the PRB, an extended column study was proposed and is discussed below.

6.1 New Source Feed

As described in Section 3.2.4, additional Site water was collected in March and April 2019 from all three original sources (DGW-MW-3, DGW-MW-11, and the FDS) to extend the study. Once the additional volume arrived at Golder Associates Ltd., the all three source waters were composited from the 1 L amber bottles into a 5 L plastic container using a peristaltic pump at a rate of approximately 100 mL/min in equivalent volumes, creating a “new source feed” (NSF). To establish initial concentrations of the NSF, a total and dissolved sample was collected from the 5 L composite and sent to ALS Group for analysis. Analytical results for the NSF initial sample are presented in Table 5 (as sample “NSF” dated March 26, 2019). To introduce greater COC loading to the column, following receipt of results, the NSF composite was spiked to approximately two times the maximum concentration detected at the Site (using data presented in the 2014 APAR through January 2019), as follows:

- Antimony: spiked to a concentration of 0.0968 mg/L
- Arsenic: spiked to a concentration of 0.316 mg/L
- Cadmium: spiked to a concentration of 0.0772 mg/L
- Lead: spiked to a concentration of 1.388 mg/L
- Selenium: spiked to a concentration of 2.16 mg/L
    - Although selenium has not been detected above it’s critical PCL (0.05 mg/L) in the vicinity of the RCA, the column was spiked to represent a concentration of approximately two times the maximum historical detection at LMW-9 (the only monitoring well at the Site to have a PCL exceedance for selenium).

The water soluble metal salts used to spike the Site water were: antimony (III) sulfate (Sigma Aldrich, 99% purity,), sodium arsenite (III) (SCP Science, 99.9% purity), cadmium chloride (SCP Science, 99.9% purity), lead nitrate (SCP Science, 99.9% purity), sodium selenate (VI) (SCP Science, 99.8% purity). These compounds were first dissolved and concentrated in demineralized water prior to spiking into the groundwater. A total of 0.05% v/v of salt solutions were added to the groundwater mixture in order to reach the concentrations required. The table below indicates the salt metal amounts used:

Metal salt	Metal Speciation	Metal Salt Solution Concentration (g/100 mL)	Volume Added Per Bag of 4.8L (mL)
Sb sulfate	Sb (III)	0.299	0.585
Na arsenite	As (III)	0.804	0.294
Cd chloride	Cd (II)	0.217	0.272
Pb nitrate	Pb (II)	1.781	0.598
Na selenate	Se (VI)	4.141	0.599

The NSF water was spiked as outlined above within the 5L plastic container. In order to maintain low oxygen levels (below 2 ppm) in the sample, a nitrogen purge was applied following the spike addition. Following the nitrogen purge, the Tedlar bags were filled as outlined in Section 5.1 above.

6.2 Modified Laboratory Procedure

For the extended study, the three 30% ZVI columns (the 30% ZVI column from each original source) and the control column from the French Drain were used.

The NSF was supplied to the influent end of each column (bottom of column) at a constant flow velocity using a low-flow laboratory pump at a flow rate of approximately 0.3-0.4 mL/min (approximately four times the Darcy velocity of the Site). The increase in velocity allowed an additional 40 pore volumes of the NSF to pass through the ZVI-sand mixtures in about one-third less time than the original column tests.

The column testing was performed within the same columns as the previous study as outlined in Section 5.1. With sampling ports still located at 0 cm (influent), 25 cm depth and 50 cm depth (effluent, end of column).

6.3 Modified Analysis Program

The extended column study program using the NSF was initiated on April 8, 2019 and continued through May 10, 2019. Based on increased flow rate and substantial evidence from the original study, the sampling program was reduced from the original scope. At the start of the extended study and every 10 pore volumes thereafter (one pore volume being equal to the total volume of liquid within the column), samples were collected at the inlet, outlet, and mid-point sampling ports along the length of the column. Samples were collected at the same flow rate as the column feed rate into laboratory supplied containers. The samples were analyzed for the following parameters Site COC metals (Sb, As, Cd, Pb, and Se) and iron using EPA Method SW-846 6020.

All water analyses except the direct measurement parameters (conductivity, ORP, temperature, and pH) were shipped using standard chain of custody procedures to ALS Group in Houston, Texas. Dissolved samples were filtered using a 0.45-micron filter prior to shipping to the analytical laboratory. Direct measurements were taken using a calibrated portable multi-parameters probe in the Golder lab. Duplicate samples were collected at a rate of one per 20 samples.

7.0 EXTENDED COLUMN STUDY RESULTS

Results from the extended column study showed continued reduction of Site COCs in all three 30% (by weight) ZVI-sand mixtures. Graphs presenting reduction data for each Site COC and the respective column are shown in Appendix C. A brief summary of the findings include:

- The extended column study simulated accelerated groundwater flow with increased COC concentrations (15 times anticipated conditions) which represented about 25 years of COC loading during the extended study.
- All three 30% ZVI-sand columns (DGW-MW-11, DGW-MW-3 and the French Drain) removed the spiked arsenic, cadmium and lead to below PCLs with no breakthrough observed at the 25 cm sampling port during the extended study.
- Antimony (total and dissolved) did breakthrough at the 25 cm sampling port at concentrations exceeding the PCL after 26 pore volumes in the French Drain column of the extended study, approximately.
- Selenium (total and dissolved) did breakthrough at the 50 cm sampling port in the 30% ZVI-sand columns at concentrations exceeding the PCL after 33 pore volumes in the GDW-MW-3 column of the extended study,

A more detailed discussion for each COC is included below:

7.1 Arsenic

For the extended column studies samples, arsenic was spiked to a concentration of 0.316 mg/l for a period of 40 pore volumes. There was a continued (from the initial column study) decrease in arsenic observed in the three 30% ZVI-sand columns using the new source feed. All arsenic concentrations were reduced below the detection limits before the mid-point of the column. For the control column, arsenic concentrations were very constant at the new source feed concentration, at both the mid-point and end of the control columns.

7.2 Lead

For the extended column studies samples, lead was spiked to a concentration of 1.388 mg/l for a period of 40 pore volumes. There was a continued (from the initial column study) decrease in lead observed in the three 30% ZVI-sand columns using the new source feed. All lead concentrations were reduced below the detection limits before the mid-point of the column. For the control column, lead concentrations also declined but were detectable at both the mid-point and end of the control columns at concentrations below the PCL. Lead removal in the control extended column study is similar to the initial study were lead was also removed in the control columns

7.3 Cadmium

For the extended column studies samples, cadmium was spiked to a concentration of 0.0772 mg/L for a period of 40 pore volumes. There was a continued (from the initial column study) decrease in cadmium observed in the three 30% ZVI-sand columns. All cadmium concentrations were reduced below the detection limits before the mid-point of the column. For the control column, cadmium concentrations were very constant at the new source feed concentration, at both the mid-point and end of the control columns.

7.4 Antimony

For the extended column studies samples, antimony was spiked to a concentration of 0.0968 mg/L for a period of 40 pore volumes. Though antimony was reduced to below the PCLs at the 50 cm sampling port, antimony (total

and dissolved) did breakthrough at the 25 cm sampling port in the 30% ZVI-sand columns at concentrations exceeding the PCL after 26 pore volumes of the extended study.

7.5 Selenium

For the extended column studies samples, selenium was spiked to a concentration of 2.16 mg/L for a period of 40 pore volumes. Selenium (total and dissolved) did breakthrough at the 25 cm sampling port in the 30% ZVI-sand columns at concentrations exceeding the PCL after 26 pore volumes of the extended study in the French Drain column. Breakthrough at the 50 cm sampling port at concentrations exceeding the PCL occurred after 33 pore volumes of the extended study in the DGW-MW-3 column.

7.6 Conclusions

Overall, adding the extended test to the original test, the column studies simulated about 3.4 years of groundwater flow through the PRB, and over 25 years of COC loading to the PRB (based on predicted arsenic concentrations).

The table below summarizes the anticipated design conditions and the original and extended column test conditions (a cross-sectional view of the PRB is provided as Figure 5 of Appendix 3.7 of the RAP:

	Design Condition at PRB	Original Column Test	Extended Column Test
Dimensions	100ft x 3 ft x 6ft	diameter = 5cm, length = 50cm	diameter = 5cm, length = 50 cm
Cross-sectional area of flow[1]	278,700 cm2	19.64 cm2	19.64 cm2
Saturated thickness	183 cm (6ft)	50 cm	50 cm
Pore volume (n = 0.33)	16,830 liters	0.324 liters	0.324 liters
Darcy flux	757 ml/min	0.06 – 0.10 ml/min	0.30 – 0.40 ml/min
Darcy flux per cm2	0.003 ml/min*cm2	0.003 – 0.005 ml/min*cm2	0.01 – 0.02 ml/min*cm2
Darcy velocity	4 cm/day	4 -7 cm/day	22 - 29 cm/day
Arsenic concentration	0.02 mg/l	0.01 – 0.08 mg/l	0.316 mg/l
Arsenic mass flux per cm2	32 ug/cm2*yr	32 – 53 ug/cm2*yr	315-420 ug/cm2*yr
Arsenic mass loading rate		near anticipated loading rate	10-15 x anticipated loading rate
Pore volumes per year	23.7	97 - 162	472 – 629
Pore volumes of simulated PRB		40	40
Years of PRB hydraulics simulated		1.7	1.7
Years of arsenic flux simulated		1.7 yrs	25.5 yrs

[1] The minimum flow path length for the PRB is 3 ft horizontally and 5 ft vertically. The minimum flow path length for a column is effectively 25 cm at the first sampling port, and the maximum would be at 50 cm at the last sampling port.

8.0 CONCLUSIONS

Using Site groundwater, the original and extended column studies simulated 3.4 years of groundwater flow through the PRB, and over 25 years of COC loading. The results from the extended column study showed continued reduction of Site COCs in all three 30% (by weight) ZVI-sand mixtures, and findings include:

- The extended column study simulated accelerated groundwater flow with increased COC concentrations (15 times anticipated conditions) which represented about 25 years of COC loading during the extended study.
- All three 30% ZVI-sand columns (DGW-MW-11, DGW-MW-3 and the French Drain) removed the spiked arsenic, cadmium and lead to below PCLs with no breakthrough observed at the 25 cm or 50 cm sampling port during the extended study.
- Antimony (total and dissolved) did breakthrough at the 25 cm sampling port at concentrations exceeding the PCL after 26 pore volumes in the French Drain column of the extended study, and is near breakthrough at the 50 cm sampling port after 41 pore volumes in the DGC-MW-3 column.
- Selenium (total and dissolved) did breakthrough at the25 cm sampling port at concentrations exceeding the PCL after 26 pore volumes in the French Drain column of the extended study and broke through the 50 cm sampling port in the 30% ZVI-sand columns at concentrations exceeding the PCL after 33 pore volumes in the GDW-MW-3 column.

Antimony and selenium indicated exhaustion of the columns (for those compounds) between 33 -41 pore volumes of the extended test, potentially equivalent to about 20 years of COC loading. Arsenic, cadmium and lead indicated no exhaustion of the columns for those compounds over the entire initial and extended column studies.

Additionally, although designated as a Site COC, selenium has only been detected above PCLs at the North CAMU and not within the proposed treatment areas of the PRB. The last exceedance of selenium at LMW-9 was in December 2015 at a concentration of 0.960 mg/L. LMW-9 collapsed in early 2016 and was replaced by LMW-9R in March 2016; selenium has been measured below PCLs in LMW-9R since it was installed. Due to spike concentrations and the very low levels of selenium detections in the area of the FOP, breakthrough of selenium within the column study is not a concern for the overall design of the PRB.

9.0 LIMITATIONS

The tests and recommendations are for the treatment of metals using ZVI and sand mixture in a PRB. This report has been prepared for the exclusive use of Exide Technologies. The factual information, interpretations, comments and recommendations contained herein are specific to the project described in this report and do not apply to any other project or site. The results enclosed in this report can vary for each sample and they are strictly valid only for the samples tested.

Conclusions and recommendations performed are based on the bench-scale tests conducted with specific native groundwater samples and they are strictly valid only for the samples tested. Reactive material selection and dosing, geochemistry assessment, chemical reduction effectiveness and quantity of reagent required for a full-scale treatment can be different compared to the real Site requirements. Factors such as the effects of scale, the subsurface heterogeneity, the preferential flow paths, formation clogging, the variable permeability can compromise the remediation effectiveness.

Unless otherwise specified, the interpretations, comments and recommendations presented in this report have been formulated following the scope of work and the general limitations described below, as well as in light of our knowledge of the current and/or planned use of the Site, the applicable regulations, standards and guidelines, and the professional rules and practices recognized and accepted at the time of the study, always taking into account the location of the Site.

10.0 CLOSING

Golder appreciates the opportunity to assist Exide with this project. Please contact the undersigned if you have any questions or would like any additional information about this Report.

Golder Associates Inc.

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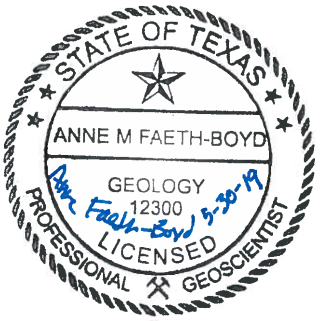

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Program Leader

EPW/AMF/THR

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Tables

Groundwater Analytical Data Summary
Appendix 3.7 Permeable Reactive Barrier Wall Column Studies Summary
Exide Frisco Recycling Center Response Action Plan

Sample ID		$^{GW}GW_{Ing}$ PCL[1]	$^{Air}GW_{Inh-V}$ PCL[1]	^{SW}SW PCL (based on Tier 1 Contact Recreation Water PCL)	^{SW}SW PCL (based on chronic aquatic life criteria)	Dilution Factor for Perennial Streams	^{SW}GW PCL (with dilution factor of 0.15, based on chronic aquatic life criteria)[2,4]	^{SW}GW PCL (with dilution factor of 0.15, based on contact recreation)[4]	Critical PCL[2]	MQL[5]	DGW-MW-1[4]		DGW-MW-2[4]		DGW-MW-3[4]			DGW-MW-4[4]	
Date Sampled											05/31/18	08/01/18	05/31/18	08/02/18	05/31/18	08/02/18	11/05/18	05/30/18	08/01/18
Screen Interval											10.2-29.7		10.2-19.7		5.2-19.7			10.2-19.7	
Total Metals by EPA Method SW-846 6020																			
Antimony	mg/L	0.006	--	0.199	2.2	0.15	14.67	1.33	0.006	0.00200	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000400 U
Arsenic	mg/L	0.01	--	0.0285	--	0.15	--	0.19	0.01	0.00200	**0.00533**	**0.00692**	**0.0132**	**0.0141**	**0.100**	**0.151**	**0.158**	**0.00564**	**0.00616**
Cadmium	mg/L	0.005	--	0.149	--	0.15	--	0.99	0.005	0.00200	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	**0.000216 J**	0.000200 U	0.000200 U
Lead	mg/L	0.015	--	0.015	--	0.15	--	0.10	0.015	0.00200	0.000600 U	0.000600 U	0.000600 U	0.000600 U	**0.000802 J**	**0.00130 J**	**0.000912 J**	0.000600 U	0.000600 U
Selenium	mg/L	0.05	--	4.13	0.005	0.15	0.0333	27.5	0.0333	0.00200	**0.00398**	0.00110 U	**0.00375**	0.00110 U	**0.00302**	**0.00172 J**	**0.00330**	**0.00174 J**	0.00110 U
Dissolved Metals by EPA Method SW-846 6020																			
Antimony	mg/L	0.006	--	0.199	--	0.15	--	1.33	0.006	0.00200	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000400 U	**0.00218**	0.000400 U	0.000400 U
Arsenic	mg/L	0.01	--	0.0285	0.15	0.15	1.00	0.19	0.01	0.00200	**0.00497**	**0.00785**	**0.0127**	**0.0152**	**0.103**	**0.149**	**0.145**	**0.00546**	**0.00632**
Cadmium	mg/L	0.005	--	0.149	0.000256	0.15	0.0017	0.99	0.0017	0.00200	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U
Lead	mg/L	0.015	--	0.015	0.00268	0.15	0.0179	0.10	0.015	0.00200	0.000600 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U	**0.000829 J**	**0.000615 J**	**0.000943 J**
Selenium	mg/L	0.05	--	4.13	--	0.15	--	27.5	0.050	0.00200	**0.00321**	0.00110 U	**0.00296**	0.00110 U	**0.00335**	**0.00169 J**	**0.00123 J**	**0.00318**	0.00110 **U**
Total Petroleum Hydrocarbons (TPH) by TX 1005																			
>nC12 to nC28	mg/L	0.98	970	37.4	--	0.15	--	249	0.98	0.47	NS	NS	0.20 U	NS	**3.10**	NS	NS	0.20 U	NS
>nC28 to nC35	mg/L	0.98	970	28.1	--	0.15	--	187	0.98	0.47	NS	NS	0.20 U	NS	0.20 U	NS	NS	0.20 U	NS
nC6 to nC12	mg/L	0.98	230	56.2	--	0.15	--	375	0.98	0.47	NS	NS	0.20 U	NS	0.20 U	NS	NS	0.20 U	NS
Total Petroleum Hydrocarbon	mg/L	--	--	--	--	--	--	--	--	0.47	NS	NS	0.20 U	NS	**3.10**	NS	NS	0.20 U	NS
Total Petroleum Hydrocarbons (TPH) by TX 1006																			
Not Detected																			
Remediation Design Parameters																			
Total Metals by EPA Method SW-846 6020																			
Calcium	mg/L	--	--	--	--	--	--	--	See note 7	0.500	**294**	NS	**277**	NS	**93.9**	NS	**112**	**229**	NS
Iron	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**1.92**	NS	**5.41**	NS	**7.04**	NS	**17.9**	**4.03**	NS
Magnesium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**21.9**	NS	**36.8**	NS	**11.5**	NS	**21.2**	**31.7**	NS
Potassium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	NS	NS	NS	NS	NS	NS	**2.29**	NS	NS
Sodium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	NS	NS	NS	NS	NS	NS	**184**	NS	NS
Dissolved Metals by EPA Method SW-846 6020																			
Calcium	mg/L	--	--	--	--	--	--	--	See note 7	0.500	**276**	NS	**125**	NS	**98.2**	NS	**114**	**198**	NS
Iron	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**1.62**	NS	**5.38**	NS	**7.05**	NS	**18.2**	**3.86**	NS
Magnesium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**21.7**	NS	**35.6**	NS	**11.6**	NS	**20.8**	**30.5**	NS
Potassium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	NS	NS	NS	NS	NS	NS	**2.39**	NS	NS
Sodium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	NS	NS	NS	NS	NS	NS	**185**	NS	NS
Alkalinity by SM 2320B																			
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	**616**	NS	**656**	NS	**548**	NS	**532**	**566**	NS
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	5.00 U	NS	5.00 U	NS	5.00 U	NS	5.00 U	5.00 U	NS
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	5.00 U	NS	5.00 U	NS	5.00 U	NS	NS	5.00 U	NS
Alkalinity, Total (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	**616**	NS	**656**	NS	**548**	NS	**532**	**566**	NS
Anions by E300.0																			
Chloride	mg/L	--	--	--	--	--	--	--	See note 7	0.500	**99.4**	NS	**103**	NS	**46.6**	NS	**47.1**	**87.8**	NS
Sulfate	mg/L	--	--	--	--	--	--	--	See note 7	5.00	**825**	NS	**812**	NS	**127**	NS	**251**	**810**	NS
Nitrate/Nitrite (as N)	mg/L	--	--	--	--	--	--	--	See note 7	0.200	0.0300 U	NS	0.0300 U	NS	0.0320 U	NS	0.0300 U	0.0300 U	NS
Total/Dissolved Organic Carbon by SM5310B																			
Total Organic Carbon (TOC)	mg/L	--	--	--	--	--	--	--	See note 7	1.00	**3.24**	NS	**6.24**	NS	**19.9**	NS	NS	**6.20**	NS
Dissolved Organic Carbon (DOC)	mg/L	--	--	--	--	--	--	--	See note 7	1.00	**3.32**	NS	**6.38**	NS	**17.8**	NS	NS	**5.74**	NS
Total Hardness by SM2340B																			
Hardness (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	1.00	NS	NS	NS	NS	NS	NS	**367**	NS	NS

Table 1

Groundwater Analytical Data Summary
Appendix 3.7 Permeable Reactive Barrier Wall Column Studies Summary
Exide Frisco Recycling Center Response Action Plan

Sample ID		$^{GW}GW_{Ing}$ PCL[1]	$^{Air}GW_{inh-V}$ PCL[1]	^{SW}SW PCL (based on Tier 1 Contact Recreation Water PCL)	^{SW}SW PCL (based on chronic aquatic life criteria)	Dilution Factor for Perennial Streams	^{SW}GW PCL (with dilution factor of 0.15, based on chronic aquatic life criteria)[2,4]	^{SW}GW PCL (with dilution factor of 0.15, based on contact recreation)[4]	Critical PCL[2]	MQL[5]	DGW-MW-5[4]		DGW-MW-6		DGW-MW-7		DGW-MW-8	
Date Sampled											05/30/18	08/01/18	05/30/18	08/01/18	05/30/18	08/01/18	05/30/18	08/02/18
Screen Interval											5.2-19.7		15.2-29.7		15.2-29.7		15.2-29.7	
Total Metals by EPA Method SW-846 6020																		
Antimony	mg/L	0.006	--	0.199	2.2	0.15	14.67	1.33	0.006	0.00200	0.000400 U	0.000400 U	**0.00117 J**	0.000400 U	**0.00160 J**	0.000400 U	**0.000919 J**	0.000400 U
Arsenic	mg/L	0.01	--	0.0285	--	0.15	--	0.19	0.01	0.00200	**0.00366**	**0.00400**	**0.0134**	**0.0108**	**0.0218**	**0.0267**	**0.00271**	**0.00794**
Cadmium	mg/L	0.005	--	0.149	--	0.15	--	0.99	0.005	0.00200	0.000200 U	0.000200 U	**0.000699 J**	0.000200 U	**0.000250 J**	0.000200 U	0.000200 U	0.000200 U
Lead	mg/L	0.015	--	0.015	--	0.15	--	0.10	0.015	0.00200	0.000600 U	0.000600 U	**0.00106 J**	**0.00153 J**	0.000600 U	0.000600 U	0.000600 U	0.000600 U
Selenium	mg/L	0.05	--	4.13	0.005	0.15	0.0333	27.5	0.0333	0.00200	**0.00272**	0.00110 U	**0.00242**	0.00110 U	**0.00585**	0.00110 U	**0.00723**	0.00110 U
Dissolved Metals by EPA Method SW-846 6020																		
Antimony	mg/L	0.006	--	0.199	--	0.15	--	1.33	0.006	0.00200	0.000400 U	0.000400 U	**0.00122 J**	0.000400 U	**0.00157 J**	0.000400 U	**0.000895 J**	0.000400 U
Arsenic	mg/L	0.01	--	0.0285	0.15	0.15	1.00	0.19	0.01	0.00200	**0.00340**	**0.00415**	**0.0136**	**0.00943**	**0.0209**	**0.0281**	**0.00232**	**0.00738**
Cadmium	mg/L	0.005	--	0.149	0.000256	0.15	0.0017	0.99	0.0017	0.00200	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U
Lead	mg/L	0.015	--	0.015	0.00268	0.15	0.0179	0.10	0.015	0.00200	0.000600 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U
Selenium	mg/L	0.05	--	4.13	--	0.15	--	27.5	0.050	0.00200	**0.00331**	0.00110 U	**0.00246**	0.00110 U	**0.00584**	**0.00130 J**	**0.00736**	0.00110 U
Total Petroleum Hydrocarbons (TPH) by TX 1005																		
>nC12 to nC28	mg/L	0.98	970	37.4	--	0.15	--	249	0.98	0.47	NS	NS	NS	NS	NS	NS	NS	NS
>nC28 to nC35	mg/L	0.98	970	28.1	--	0.15	--	187	0.98	0.47	NS	NS	NS	NS	NS	NS	NS	NS
nC6 to nC12	mg/L	0.98	230	56.2	--	0.15	--	375	0.98	0.47	NS	NS	NS	NS	NS	NS	NS	NS
Total Petroleum Hydrocarbon	mg/L	--	--	--	--	--	--	--	--	0.47	NS	NS	NS	NS	NS	NS	NS	NS
Total Petroleum Hydrocarbons (TPH) by TX 1006																		
Not Detected																		
Remediation Design Parameters																		
Total Metals by EPA Method SW-846 6020																		
Calcium	mg/L	--	--	--	--	--	--	--	See note 7	0.500	**197**	NS	**250 J**	NS	**333**	NS	**440**	NS
Iron	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**7.14**	NS	**28.3**	NS	**21.8**	NS	**0.704**	NS
Magnesium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**22.0**	NS	**39.4**	NS	**24.6**	NS	**108**	NS
Potassium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	NS	NS	NS	NS	NS	NS	NS	NS
Sodium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	NS	NS	NS	NS	NS	NS	NS	NS
Dissolved Metals by EPA Method SW-846 6020																		
Calcium	mg/L	--	--	--	--	--	--	--	See note 7	0.500	**174**	NS	**466 J**	NS	**367**	NS	**231**	NS
Iron	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**7.07**	NS	**29.1**	NS	**21.4**	NS	**0.332**	NS
Magnesium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**22.1**	NS	**43.0**	NS	**26.7**	NS	**112**	NS
Potassium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	NS	NS	NS	NS	NS	NS	NS	NS
Sodium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	NS	NS	NS	NS	NS	NS	NS	NS
Alkalinity by SM 2320B																		
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	**573**	NS	**520**	NS	**531**	NS	**693**	NS
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	5.00 U	NS	5.00 U	NS	5.00 U	NS	5.00 U	NS
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	5.00 U	NS	5.00 U	NS	5.00 U	NS	5.00 U	NS
Alkalinity, Total (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	**573**	NS	**520**	NS	**531**	NS	**693**	NS
Anions by E300.0																		
Chloride	mg/L	--	--	--	--	--	--	--	See note 7	0.500	**172**	NS	**120**	NS	**167**	NS	**421**	NS
Sulfate	mg/L	--	--	--	--	--	--	--	See note 7	5.00	**1,000**	NS	**1,330**	NS	**1,940**	NS	**1,680**	NS
Nitrate/Nitrite (as N)	mg/L	--	--	--	--	--	--	--	See note 7	0.200	0.0300 U	NS	0.0300 U	NS	0.0300 U	NS	0.0300 U	NS
Total/Dissolved Organic Carbon by SM5310B																		
Total Organic Carbon (TOC)	mg/L	--	--	--	--	--	--	--	See note 7	1.00	**6.68**	NS	**7.24**	NS	**7.66**	NS	**7.75**	NS
Dissolved Organic Carbon (DOC)	mg/L	--	--	--	--	--	--	--	See note 7	1.00	**6.21**	NS	**6.82**	NS	**7.07 J**	NS	**7.61 J**	NS
Total Hardness by SM2340B																		
Hardness (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	1.00	NS	NS	NS	NS	NS	NS	NS	NS

Table 1

Groundwater Analytical Data Summary
Appendix 3.7 Permeable Reactive Barrier Wall Column Studies Summary
Exide Frisco Recycling Center Response Action Plan

Sample ID		$^{GW}GW_{Ing}$ PCL[1]	$^{Air}GW_{Inh\text{-}V}$ PCL[1]	^{SW} SW PCL (based on Tier 1 Contact Recreation Water PCL)	^{SW}SW PCL (based on chronic aquatic life criteria)	Dilution Factor for Perennial Streams	^{SW}GW PCL (with dilution factor of 0.15, based on chronic aquatic life criteria)[2,4]	^{SW}GW PCL (with dilution factor of 0.15, based on contact recreation)[4]	Critical PCL[2]	MQL[5]	DGW-MW-9[4]		DGW-MW-10[4]		DGW-MW-10S[4]	
Date Sampled											05/31/18	08/01/18	05/30/18	08/01/18	05/31/18	08/01/18
Screen Interval											10.2-24.7		15.2-19.7		2.7-7.2	
Total Metals by EPA Method SW-846 6020																
Antimony	mg/L	0.006	--	0.199	2.2	0.15	14.67	1.33	0.006	0.00200	0.000400 U	0.000400 U	**0.000459 J**	0.000400 U	**0.00433**	**0.00136 J**
Arsenic	mg/L	0.01	--	0.0285	--	0.15	--	0.19	0.01	0.00200	**0.00270**	**0.00395**	**0.0113**	**0.0174**	**0.00852**	**0.0412**
Cadmium	mg/L	0.005	--	0.149	--	0.15	--	0.99	0.005	0.00200	0.000200 U	0.000200 U	0.000200 U	0.000200 U	**0.000930 J**	**0.000293 J**
Lead	mg/L	0.015	--	0.015	--	0.15	--	0.10	0.015	0.00200	**0.000738 J**	0.000600 U	**0.000855 J**	0.000600 U	**0.00772**	**0.00116**
Selenium	mg/L	0.05	--	4.13	0.005	0.15	0.0333	27.5	0.0333	0.00200	**0.00350**	0.00110 U	**0.00814**	**0.00150 J**	**0.00676**	**0.00215**
Dissolved Metals by EPA Method SW-846 6020																
Antimony	mg/L	0.006	--	0.199	--	0.15	--	1.33	0.006	0.00200	0.000400 U	0.000400 U	0.000400 U	0.000400 U	**0.00402**	0.000400 U
Arsenic	mg/L	0.01	--	0.0285	0.15	0.15	1.00	0.19	0.01	0.00200	**0.00245**	**0.00415**	**0.0112**	**0.0186**	**0.00522**	**0.0410**
Cadmium	mg/L	0.005	--	0.149	0.000256	0.15	0.0017	0.99	0.0017	0.00200	0.000200 U	0.000200 U	0.000200 U	0.000200 U	**0.000655 J**	0.000200 U
Lead	mg/L	0.015	--	0.015	0.00268	0.15	0.0179	0.10	0.015	0.00200	0.000600 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U
Selenium	mg/L	0.05	--	4.13	--	0.15	--	27.5	0.050	0.00200	**0.00323**	0.00110 U	**0.00848**	**0.00139 J**	**0.00715**	**0.00224**
Total Petroleum Hydrocarbons (TPH) by TX 1005																
>nC12 to nC28	mg/L	0.98	970	37.4	--	0.15	--	249	0.98	0.47	NS	NS	0.19 U	NS	0.20 U	NS
>nC28 to nC35	mg/L	0.98	970	28.1	--	0.15	--	187	0.98	0.47	NS	NS	0.19 U	NS	0.20 U	NS
nC6 to nC12	mg/L	0.98	230	56.2	--	0.15	--	375	0.98	0.47	NS	NS	0.19 U	NS	0.20 U	NS
Total Petroleum Hydrocarbon	mg/L	--	--	--	--	--	--	--	--	0.47	NS	NS	0.19 U	NS	0.20 U	NS
Total Petroleum Hydrocarbons (TPH) by TX 1006																
Not Detected																
Remediation Design Parameters																
Total Metals by EPA Method SW-846 6020																
Calcium	mg/L	--	--	--	--	--	--	--	See note 7	0.500	**556**	NS	**308**	NS	**264**	NS
Iron	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**17.6**	NS	**9.53**	NS	**2.69**	NS
Magnesium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**217**	NS	**54.0**	NS	**29.8**	NS
Potassium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	NS	NS	NS	NS	NS	NS
Sodium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	NS	NS	NS	NS	NS	NS
Dissolved Metals by EPA Method SW-846 6020																
Calcium	mg/L	--	--	--	--	--	--	--	See note 7	0.500	**546**	NS	**291**	NS	**184**	NS
Iron	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**17.6**	NS	**9.22**	NS	**0.0424 J**	NS
Magnesium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**216**	NS	**56.6**	NS	**31.1**	NS
Potassium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	NS	NS	NS	NS	NS	NS
Sodium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	NS	NS	NS	NS	NS	NS
Alkalinity by SM 2320B																
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	**744**	NS	**803**	NS	**529**	NS
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	5.00 U	NS	5.00 U	NS	5.00 U	NS
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	5.00 U	NS	5.00 U	NS	5.00 U	NS
Alkalinity, Total (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	**744**	NS	**803**	NS	**529**	NS
Anions by E300.0																
Chloride	mg/L	--	--	--	--	--	--	--	See note 7	0.500	**89.9**	NS	**279**	NS	**140**	NS
Sulfate	mg/L	--	--	--	--	--	--	--	See note 7	5.00	**2,910**	NS	**1,770**	NS	**4,740**	NS
Nitrate/Nitrite (as N)	mg/L	--	--	--	--	--	--	--	See note 7	0.200	0.0300 U	NS	0.0300 U	NS	0.164 U	NS
Total/Dissolved Organic Carbon by SM5310B																
Total Organic Carbon (TOC)	mg/L	--	--	--	--	--	--	--	See note 7	1.00	**5.63**	NS	**10.0**	NS	**18.0**	NS
Dissolved Organic Carbon (DOC)	mg/L	--	--	--	--	--	--	--	See note 7	1.00	**5.39**	NS	**9.56**	NS	**18.5**	NS
Total Hardness by SM2340B																
Hardness (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	1.00	NS	NS	NS	NS	NS	NS

Groundwater Analytical Data Summary
Appendix 3.7 Permeable Reactive Barrier Wall Column Studies Summary
Exide Frisco Recycling Center Response Action Plan

Sample ID		$^{GW}GW_{Ing}$ PCL[1]	$^{Air}GW_{Inh-V}$ PCL[1]	^{SW}SW PCL (based on Tier 1 Contact Recreation Water PCL)	^{SW}SW PCL (based on chronic aquatic life criteria)	Dilution Factor for Perennial Streams	^{SW}GW PCL (with dilution factor of 0.15, based on chronic aquatic life criteria)[2,4]	^{SW}GW PCL (with dilution factor of 0.15, based on contact recreation)[4]	Critical PCL[2]	MQL[5]	DGW-MW-11[4]				DGW-MW-11S[4]			MW-10	
Date Sampled											05/30/18	08/02/18	12/03/18	01/02/19	5/30/2018-5/31/2018	08/01/18	12/03/18	05/31/18	08/01/18
Screen Interval											10.2-17.2				2.2-6.7			7-17	
Total Metals by EPA Method SW-846 6020																			
Antimony	mg/L	0.006	--	0.199	2.2	0.15	14.67	1.33	0.006	0.00200	**0.00467 J**	**0.000853 J**	**0.000708 J**	**0.00224**	**0.0240**	**0.00183 J**	**0.000632 J**	**0.00283**	NS
Arsenic	mg/L	0.01	--	0.0285	--	0.15	--	0.19	0.01	0.00200	0.000200 U	**0.00196 J**	**0.00478**	0.000400 U	**0.00338**	**0.0184**	**0.00707**	**0.000977 J**	NS
Cadmium	mg/L	0.005	--	0.149	--	0.15	--	0.99	0.005	0.00200	**0.0254**	**0.00592**	**0.00289**	**0.00953**	**0.00346**	**0.00225**	**0.000964 J**	**0.00138 J**	NS
Lead	mg/L	0.015	--	0.015	--	0.15	--	0.10	0.015	0.00200	**0.0362**	**0.00760**	**0.0383**	**0.0276**	**0.0285 J**	**0.00299**	0.00300 U	**0.0390**	**0.0115**
Selenium	mg/L	0.05	--	4.13	0.005	0.15	0.0333	27.5	0.0333	0.00200	0.00550 U	0.00110 U	0.00110 U	0.00110 U	**0.00911**	**0.00250**	0.00110 U	**0.00328**	NS
Dissolved Metals by EPA Method SW-846 6020																			
Antimony	mg/L	0.006	--	0.199	--	0.15	--	1.33	0.006	0.00200	**0.00448 J**	**0.000622 J**	0.000686 U	**0.00202**	**0.0245**	**0.00121 J**	0.00101 U	**0.00230**	NS
Arsenic	mg/L	0.01	--	0.0285	0.15	0.15	1.00	0.19	0.01	0.00200	0.000200 U	**0.00213**	**0.00145 J**	0.000400 U	**0.00376**	**0.0183**	**0.00642**	0.000400 U	NS
Cadmium	mg/L	0.005	--	0.149	0.000256	0.15	0.0017	0.99	0.0017	0.00200	**0.0259**	**0.00607**	**0.00249**	**0.00913**	**0.00382**	**0.00191 J**	**0.00101 J**	**0.000881 J**	NS
Lead	mg/L	0.015	--	0.015	0.00268	0.15	0.0179	0.10	0.015	0.00200	**0.0338**	**0.00221**	0.00300 U	**0.00207**	**0.0411 J**	**0.00270**	**0.00439 J**	**0.000654 J**	**0.00143 J**
Selenium	mg/L	0.05	--	4.13	--	0.15	--	27.5	0.050	0.00200	0.00550 U	**0.00140 J**	0.00110 U	0.00110 U	**0.0110**	**0.0020 J**	0.00110 U	**0.00252**	NS
Total Petroleum Hydrocarbons (TPH) by TX 1005																			
>nC12 to nC28	mg/L	0.98	970	37.4	--	0.15	--	249	0.98	0.47	NS	NS	NS	NS	NS	NS	NS	NS	NS
>nC28 to nC35	mg/L	0.98	970	28.1	--	0.15	--	187	0.98	0.47	NS	NS	NS	NS	NS	NS	NS	NS	NS
nC6 to nC12	mg/L	0.98	230	56.2	--	0.15	--	375	0.98	0.47	NS	NS	NS	NS	NS	NS	NS	NS	NS
Total Petroleum Hydrocarbon	mg/L	--	--	--	--	--	--	--	--	0.47	NS	NS	NS	NS	NS	NS	NS	NS	NS
Total Petroleum Hydrocarbons (TPH) by TX 1006																			
Not Detected																			
Remediation Design Parameters																			
Total Metals by EPA Method SW-846 6020																			
Calcium	mg/L	--	--	--	--	--	--	--	See note 7	0.500	**544**	NS	**459**	NA	**368**	NS	**415**	**146**	NS
Iron	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**13.6**	NS	**3.45**	NA	**0.0631 J**	NS	**2.48**	**1.11**	NS
Magnesium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**302**	NS	**246**	NA	**105**	NS	**172**	**12.1**	NS
Potassium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	NS	NS	**17.7**	NA	NS	NS	**2.41**	NS	NS
Sodium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	NS	NS	**1,710**	NA	NS	NS	**2,100**	NS	NS
Dissolved Metals by EPA Method SW-846 6020																			
Calcium	mg/L	--	--	--	--	--	--	--	See note 7	0.500	**510**	NS	**474**	NA	**306**	NS	**493**	**142**	NS
Iron	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**14.0**	NS	**0.324**	NA	**0.473 J**	NS	**1.99**	**0.0188 J**	NS
Magnesium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**323**	NS	**267**	NA	**115**	NS	**151**	**11.5**	NS
Potassium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	NS	NS	**17.5**	NA	NS	NS	**2.49**	NS	NS
Sodium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	NS	NS	**1,860**	NA	NS	NS	**2,390**	NS	NS
Alkalinity by SM 2320B																			
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	**318**	NS	NA	NS	**265**	NS	NA	**315**	NS
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	5.00 U	NS	NA	NS	5.00 U	NS	NA	5.00 U	NS
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	5.00 U	NS	NS	NS	5.00 U	NS	NS	5.00 U	NS
Alkalinity, Total (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	**318**	NS	NA	NS	**265**	NS	NA	**315**	NS
Anions by E300.0																			
Chloride	mg/L	--	--	--	--	--	--	--	See note 7	0.500	**215**	NS	**221**	NS	**209**	NS	**234**	**32.4**	NS
Sulfate	mg/L	--	--	--	--	--	--	--	See note 7	5.00	**5,010**	NS	**4,950**	NS	**4,750**	NS	**5,610**	**810**	NS
Nitrate/Nitrite (as N)	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**1.33 J**	NS	0.0600 U	NS	**7.62**	NS	0.0600 U	**3.28**	NS
Total/Dissolved Organic Carbon by SM5310B																			
Total Organic Carbon (TOC)	mg/L	--	--	--	--	--	--	--	See note 7	1.00	**4.94**	NS	NS	NS	**11.7**	NS	NS	**2.16**	NS
Dissolved Organic Carbon (DOC)	mg/L	--	--	--	--	--	--	--	See note 7	1.00	**5.07**	NS	NS	NS	**12.2**	NS	NS	**2.34**	NS
Total Hardness by SM2340B																			
Hardness (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	1.00	NS	NS	NA	NS	NS	NS	NA	NS	NS

Table 1

Groundwater Analytical Data Summary
Appendix 3.7 Permeable Reactive Barrier Wall Column Studies Summary
Exide Frisco Recycling Center Response Action Plan

Sample ID		$^{GW}GW_{Ing}$ PCL[1]	$^{Air}GW_{Inh-V}$ PCL[1]	^{SW}SW PCL (based on Tier 1 Contact Recreation Water PCL)	^{SW}SW PCL (based on chronic aquatic life criteria)	Dilution Factor for Perennial Streams	^{SW}GW PCL (with dilution factor of 0.15, based on chronic aquatic life criteria)[2,4]	^{SW}GW PCL (with dilution factor of 0.15, based on contact recreation)[4]	Critical PCL[2]	MQL[5]	MW-16[4]	MW-16S[4]	MW-17[4]	MW-18[5]	MW-24	MW-26[4]	MW-27[4]		MW-29[4]
Date Sampled											05/31/18	05/31/18	06/04/18	06/04/18	05/30/18	06/04/18	05/31/18	08/02/18	05/31/18
Screen Interval											67.5-77.5	7-17	7-17	5.5-15.5	14-29	5-15	5-15		4.5-14.5
Total Metals by EPA Method SW-846 6020																			
Antimony	mg/L	0.006	--	0.199	2.2	0.15	14.67	1.33	0.006	0.00200	0.00110 U	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000400 U
Arsenic	mg/L	0.01	--	0.0285	--	0.15	--	0.19	0.01	0.00200	**0.00265**	**0.00392**	0.000400 U	**0.00139 J**	**0.00361**	**0.000995 J**	**0.0112**	**0.0121**	**0.00191 J**
Cadmium	mg/L	0.005	--	0.149	--	0.15	--	0.99	0.005	0.00200	0.000200 U	**0.000733 J**	0.000200 U	0.000200 U	0.000200 U	0.000200 U	**0.000578 J**	0.000200 U	0.000200 U
Lead	mg/L	0.015	--	0.015	--	0.15	--	0.10	0.015	0.00200	**0.00107 J**	0.000600 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U	**0.00726**	0.000600 U	0.000600 U
Selenium	mg/L	0.05	--	4.13	0.005	0.15	0.0333	27.5	0.0333	0.00200	**0.0325**	**0.0179**	**0.00693 J**	0.00110 U	**0.00687**	**0.00170 J**	**0.00299**	**0.00117 J**	**0.0190**
Dissolved Metals by EPA Method SW-846 6020																			
Antimony	mg/L	0.006	--	0.199	--	0.15	--	1.33	0.006	0.00200	**0.000763 J**	0.000400 U	0.00129 U	0.000400 U	0.000400 U	0.00295 U	0.000400 U	0.000400 U	0.000400 U
Arsenic	mg/L	0.01	--	0.0285	0.15	0.15	1.00	0.19	0.01	0.00200	**0.00246**	**0.000889 J**	0.000400 U	**0.000562 J**	**0.00113 J**	0.000400 U	**0.0102**	**0.0117**	**0.00152 J**
Cadmium	mg/L	0.005	--	0.149	0.000256	0.15	0.0017	0.99	0.0017	0.00200	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U
Lead	mg/L	0.015	--	0.015	0.00268	0.15	0.0179	0.10	0.015	0.00200	0.000600 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U	0.000600 U
Selenium	mg/L	0.05	--	4.13	--	0.15	--	27.5	0.050	0.00200	**0.0279**	**0.0209**	**0.0237 J**	0.00110 U	**0.00571**	**0.00704 J**	**0.00300**	0.00110 U	**0.0197**
Total Petroleum Hydrocarbons (TPH) by TX 1005																			
>nC12 to nC28	mg/L	0.98	970	37.4	--	0.15	--	249	0.98	0.47	NS	NS	NS	NS	NS	NS	NS	NS	0.20 U
>nC28 to nC35	mg/L	0.98	970	28.1	--	0.15	--	187	0.98	0.47	NS	NS	NS	NS	NS	NS	NS	NS	0.20 U
nC6 to nC12	mg/L	0.98	230	56.2	--	0.15	--	375	0.98	0.47	NS	NS	NS	NS	NS	NS	NS	NS	0.20 U
Total Petroleum Hydrocarbon	mg/L	--	--	--	--	--	--	--	--	0.47	NS	NS	NS	NS	NS	NS	NS	NS	0.20 U
Total Petroleum Hydrocarbons (TPH) by TX 1006																			
Not Detected																			
Remediation Design Parameters																			
Total Metals by EPA Method SW-846 6020																			
Calcium	mg/L	--	--	--	--	--	--	--	See note 7	0.500	**366**	**830**	**375**	**144**	**305 J**	**433**	**288**	NS	**546**
Iron	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**0.07410 J**	**2.39**	**1.83**	**0.418**	**2.42**	**3.69**	**26.3**	NS	**8.01**
Magnesium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**28.7**	**80.1**	**32.9**	**6.30**	**32.3**	**211**	**24.1**	NS	**232**
Potassium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	NS	NS	NS	NS	NS	NS	NS	NS	NS
Sodium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	NS	NS	NS	NS	NS	NS	NS	NS	NS
Dissolved Metals by EPA Method SW-846 6020																			
Calcium	mg/L	--	--	--	--	--	--	--	See note 7	0.500	**341**	**466**	**251**	**127**	**507 J**	**505**	**290**	NS	**393**
Iron	mg/L	--	--	--	--	--	--	--	See note 7	0.200	0.0120 U	**0.722**	**1.78**	0.0120 U	**1.39**	**4.52**	**25.5**	NS	**7.74**
Magnesium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**28.7**	**82.9**	**34.9**	**6.30**	**32.9**	**249 JL**	**23.6**	NS	**207**
Potassium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	NS	NS	NS	NS	NS	NS	NS	NS	NS
Sodium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	NS	NS	NS	NS	NS	NS	NS	NS	NS
Alkalinity by SM 2320B																			
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	**358**	**654**	**445**	**289**	**515**	**652**	**269**	NS	**658**
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	NS	5.00 U
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	NS	5.00 U
Alkalinity, Total (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	**358**	**654**	**445**	**289**	**515**	**652**	**269**	NS	**658**
Anions by E300.0																			
Chloride	mg/L	--	--	--	--	--	--	--	See note 7	0.500	**1,070**	**1,780**	**382**	**76.8**	**285**	**219**	**85.7**	NS	**1,160**
Sulfate	mg/L	--	--	--	--	--	--	--	See note 7	5.00	**611**	**1,050**	**2,070**	**180**	**1,910**	**3,740**	**896**	NS	**4,420**
Nitrate/Nitrite (as N)	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**1.51**	0.0300 U	0.0300 U	0.0350 U	0.0300 U	0.0300 U	0.0300 U	NS	0.0300 U
Total/Dissolved Organic Carbon by SM5310B																			
Total Organic Carbon (TOC)	mg/L	--	--	--	--	--	--	--	See note 7	1.00	**8.36**	**6.36**	**4.54**	**1.26**	**4.34**	**3.43**	**6.96**	NS	**11.5**
Dissolved Organic Carbon (DOC)	mg/L	--	--	--	--	--	--	--	See note 7	1.00	**8.12**	**6.17**	**4.89**	**1.67**	**4.85 J**	**3.66**	**6.76**	NS	**10.9**
Total Hardness by SM2340B																			
Hardness (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	1.00	NS	NS	NS	NS	NS	NS	NS	NS	NS

Groundwater Analytical Data Summary
Appendix 3.7 Permeable Reactive Barrier Wall Column Studies Summary
Exide Frisco Recycling Center Response Action Plan

Sample ID		$^{GW}GW_{Ing}$ PCL[1]	$^{Air}GW_{Inh-V}$ PCL[1]	^{SW}SW PCL (based on Tier 1 Contact Recreation Water PCL)	^{SW}SW PCL (based on chronic aquatic life criteria)	Dilution Factor for Perennial Streams	^{SW}GW PCL (with dilution factor of 0.15, based on chronic aquatic life criteria)[2,4]	^{SW}GW PCL (with dilution factor of 0.15, based on contact recreation)[4]	Critical PCL[2]	MQL[5]	MW-30			MW-31		MW-32	
Date Sampled											05/31/18	08/02/18	12/03/18	06/01/18	08/02/18	01/22/14	02/22/14
Screen Interval											12-32			8-23		2.5-5.0	
Total Metals by EPA Method SW-846 6020																	
Antimony	mg/L	0.006	--	0.199	2.2	0.15	14.67	1.33	0.006	0.00200	**0.00868**	**0.00466**	**0.00886**	0.000400 U	**0.000448 J**	NS	NS
Arsenic	mg/L	0.01	--	0.0285	--	0.15	--	0.19	0.01	0.00200	**0.0657**	**0.111**	**0.109**	**0.0106**	**0.00941**	NS	NS
Cadmium	mg/L	0.005	--	0.149	--	0.15	--	0.99	0.005	0.00200	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	R	IV
Lead	mg/L	0.015	--	0.015	--	0.15	--	0.10	0.015	0.00200	**0.0225**	**0.0110**	**0.0230**	0.000600 U	**0.00317**	R	IV
Selenium	mg/L	0.05	--	4.13	0.005	0.15	0.0333	27.5	0.0333	0.00200	**0.00328**	0.00110 U	0.00110 U	**0.00595**	0.00110 U	NS	NS
Dissolved Metals by EPA Method SW-846 6020																	
Antimony	mg/L	0.006	--	0.199	--	0.15	--	1.33	0.006	0.00200	**0.00885**	**0.000993 J**	**0.00423**	0.000400 U	0.000400 U	NS	NS
Arsenic	mg/L	0.01	--	0.0285	0.15	0.15	1.00	0.19	0.01	0.00200	**0.0166**	**0.104**	**0.0961**	**0.0101**	**0.00573**	NS	NS
Cadmium	mg/L	0.005	--	0.149	0.000256	0.15	0.0017	0.99	0.0017	0.00200	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	IV	**0.00639**
Lead	mg/L	0.015	--	0.015	0.00268	0.15	0.0179	0.10	0.015	0.00200	**0.0132**	0.000600 U	0.00120 U	**0.000633 J**	0.000600 U	IV	**0.0164**
Selenium	mg/L	0.05	--	4.13	--	0.15	--	27.5	0.050	0.00200	**0.00163 J**	0.00110 U	0.00110 U	**0.00550**	**0.00121 J**	NS	NS
Total Petroleum Hydrocarbons (TPH) by TX 1005																	
>nC12 to nC28	mg/L	0.98	970	37.4	--	0.15	--	249	0.98	0.47	NS	NS	NS	NS	NS	NS	NS
>nC28 to nC35	mg/L	0.98	970	28.1	--	0.15	--	187	0.98	0.47	NS	NS	NS	NS	NS	NS	NS
nC6 to nC12	mg/L	0.98	230	56.2	--	0.15	--	375	0.98	0.47	NS	NS	NS	NS	NS	NS	NS
Total Petroleum Hydrocarbon	mg/L	--	--	--	--	--	--	--	--	0.47	NS	NS	NS	NS	NS	NS	NS
Total Petroleum Hydrocarbons (TPH) by TX 1006																	
Not Detected																	
Remediation Design Parameters																	
Total Metals by EPA Method SW-846 6020																	
Calcium	mg/L	--	--	--	--	--	--	--	See note 7	0.500	**378**	NS	**329**	**391**	NS	NS	NS
Iron	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**23.1**	NS	**31.9**	**7.05**	NS	NS	NS
Magnesium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**29.2**	NS	**33.6**	**31.9**	NS	NS	NS
Potassium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	NS	NS	**2.41**	NS	NS	NS	NS
Sodium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	NS	NS	**159**	NS	NS	NS	NS
Dissolved Metals by EPA Method SW-846 6020																	
Calcium	mg/L	--	--	--	--	--	--	--	See note 7	0.500	**194 J**	NS	**335**	**301**	NS	NS	NS
Iron	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**6.35**	NS	**27.6**	**6.73**	NS	NS	NS
Magnesium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**32.5**	NS	**30.2**	**32.3**	NS	NS	NS
Potassium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	NS	NS	**2.37**	NS	NS	NS	NS
Sodium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	NS	NS	**163**	NS	NS	NS	NS
Alkalinity by SM 2320B																	
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	**547**	NS	NA	**761**	NS	NS	NS
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	5.00 U	NS	NA	5.00 U	NS	NS	NS
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	5.00 U	NS	NS	5.00 U	NS	NS	NS
Alkalinity, Total (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	**547**	NS	NA	**761**	NS	NS	NS
Anions by E300.0																	
Chloride	mg/L	--	--	--	--	--	--	--	See note 7	0.500	**114**	NS	**109**	**130**	NS	NS	NS
Sulfate	mg/L	--	--	--	--	--	--	--	See note 7	5.00	**950**	NS	**715**	**1,650**	NS	NS	NS
Nitrate/Nitrite (as N)	mg/L	--	--	--	--	--	--	--	See note 7	0.200	0.0300 U	NS	0.0600 U	0.0300 U	NS	NS	NS
Total/Dissolved Organic Carbon by SM5310B																	
Total Organic Carbon (TOC)	mg/L	--	--	--	--	--	--	--	See note 7	1.00	**8.28**	NS	NS	**10.4**	NS	NS	NS
Dissolved Organic Carbon (DOC)	mg/L	--	--	--	--	--	--	--	See note 7	1.00	**6.40**	NS	NS	**9.83**	NS	NS	NS
Total Hardness by SM2340B																	
Hardness (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	1.00	NS	NS	NA	NS	NS	NS	NS

Groundwater Analytical Data Summary
Appendix 3.7 Permeable Reactive Barrier Wall Column Studies Summary
Exide Frisco Recycling Center Response Action Plan

Sample ID		$^{GW}GW_{Ing}$ PCL[1]	$^{Air}GW_{Inh-V}$ PCL[1]	^{SW}SW PCL (based on Tier 1 Contact Recreation Water PCL)	^{SW}SW PCL (based on chronic aquatic life criteria)	Dilution Factor for Perennial Streams	^{SW}GW PCL (with dilution factor of 0.15, based on chronic aquatic life criteria)[2,4]	^{SW}GW PCL (with dilution factor of 0.15, based on contact recreation)[4]	Critical PCL[2]	MQL[5]	MW-33		MW-34			MW-35		MW-36	
Date Sampled											01/22/14	02/17/14	01/21/14	02/14/14	02/17/14	01/21/14	02/13/14	01/21/14	02/13/14
Screen Interval											2.5-5.0		2.5-5.0			2.5-5.0		2.5-5.0	
Total Metals by EPA Method SW-846 6020																			
Antimony	mg/L	0.006	--	0.199	2.2	0.15	14.67	1.33	0.006	0.00200	NS	NS	NS	NS	NS	NS	NS	NS	NS
Arsenic	mg/L	0.01	--	0.0285	--	0.15	--	0.19	0.01	0.00200	NS	NS	NS	NS	NS	NS	NS	NS	NS
Cadmium	mg/L	0.005	--	0.149	--	0.15	--	0.99	0.005	0.00200	R	**0.00715**	IV	**0.0346**	NS	IV	IV	IV	IV
Lead	mg/L	0.015	--	0.015	--	0.15	--	0.10	0.015	0.00200	R	**0.694**	IV	**0.0357**	NS	IV	IV	IV	IV
Selenium	mg/L	0.05	--	4.13	0.005	0.15	0.0333	27.5	0.0333	0.00200	NS	NS	NS	NS	NS	NS	NS	NS	NS
Dissolved Metals by EPA Method SW-846 6020																			
Antimony	mg/L	0.006	--	0.199	--	0.15	--	1.33	0.006	0.00200	NS	NS	NS	NS	NS	NS	NS	NS	NS
Arsenic	mg/L	0.01	--	0.0285	0.15	0.15	1.00	0.19	0.01	0.00200	NS	NS	NS	NS	NS	NS	NS	NS	NS
Cadmium	mg/L	0.005	--	0.149	0.000256	0.15	0.0017	0.99	0.0017	0.00200	**0.00360 J**	**0.00414 J**	IV	NS	**0.0386**	IV	IV	IV	IV
Lead	mg/L	0.015	--	0.015	0.00268	0.15	0.0179	0.10	0.015	0.00200	**0.0557**	**0.101**	IV	NS	**0.0575**	IV	IV	IV	IV
Selenium	mg/L	0.05	--	4.13	--	0.15	--	27.5	0.050	0.00200	NS	NS	NS	NS	NS	NS	NS	NS	NS
Total Petroleum Hydrocarbons (TPH) by TX 1005																			
>nC12 to nC28	mg/L	0.98	970	37.4	--	0.15	--	249	0.98	0.47	NS	NS	NS	NS	NS	NS	NS	NS	NS
>nC28 to nC35	mg/L	0.98	970	28.1	--	0.15	--	187	0.98	0.47	NS	NS	NS	NS	NS	NS	NS	NS	NS
nC6 to nC12	mg/L	0.98	230	56.2	--	0.15	--	375	0.98	0.47	NS	NS	NS	NS	NS	NS	NS	NS	NS
Total Petroleum Hydrocarbon	mg/L	--	--	--	--	--	--	--	--	0.47	NS	NS	NS	NS	NS	NS	NS	NS	NS
Total Petroleum Hydrocarbons (TPH) by TX 1006																			
Not Detected																			
Remediation Design Parameters																			
Total Metals by EPA Method SW-846 6020																			
Calcium	mg/L	--	--	--	--	--	--	--	See note 7	0.500	NS	NS	NS	NS	NS	NS	NS	NS	NS
Iron	mg/L	--	--	--	--	--	--	--	See note 7	0.200	NS	NS	NS	NS	NS	NS	NS	NS	NS
Magnesium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	NS	NS	NS	NS	NS	NS	NS	NS	NS
Potassium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	NS	NS	NS	NS	NS	NS	NS	NS	NS
Sodium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	NS	NS	NS	NS	NS	NS	NS	NS	NS
Dissolved Metals by EPA Method SW-846 6020																			
Calcium	mg/L	--	--	--	--	--	--	--	See note 7	0.500	NS	NS	NS	NS	NS	NS	NS	NS	NS
Iron	mg/L	--	--	--	--	--	--	--	See note 7	0.200	NS	NS	NS	NS	NS	NS	NS	NS	NS
Magnesium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	NS	NS	NS	NS	NS	NS	NS	NS	NS
Potassium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	NS	NS	NS	NS	NS	NS	NS	NS	NS
Sodium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	NS	NS	NS	NS	NS	NS	NS	NS	NS
Alkalinity by SM 2320B																			
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	NS	NS	NS	NS	NS	NS	NS	NS	NS
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	NS	NS	NS	NS	NS	NS	NS	NS	NS
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	NS	NS	NS	NS	NS	NS	NS	NS	NS
Alkalinity, Total (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	NS	NS	NS	NS	NS	NS	NS	NS	NS
Anions by E300.0																			
Chloride	mg/L	--	--	--	--	--	--	--	See note 7	0.500	NS	NS	NS	NS	NS	NS	NS	NS	NS
Sulfate	mg/L	--	--	--	--	--	--	--	See note 7	5.00	NS	NS	NS	NS	NS	NS	NS	NS	NS
Nitrate/Nitrite (as N)	mg/L	--	--	--	--	--	--	--	See note 7	0.200	NS	NS	NS	NS	NS	NS	NS	NS	NS
Total/Dissolved Organic Carbon by SM5310B																			
Total Organic Carbon (TOC)	mg/L	--	--	--	--	--	--	--	See note 7	1.00	NS	NS	NS	NS	NS	NS	NS	NS	NS
Dissolved Organic Carbon (DOC)	mg/L	--	--	--	--	--	--	--	See note 7	1.00	NS	NS	NS	NS	NS	NS	NS	**6.28**	NS
Total Hardness by SM2340B																			
Hardness (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	1.00	NS	NS	NS	NS	NS	NS	NS	NS	NS

Groundwater Analytical Data Summary
Appendix 3.7 Permeable Reactive Barrier Wall Column Studies Summary
Exide Frisco Recycling Center Response Action Plan

Sample ID		$^{GW}GW_{Ing}$ PCL[1]	$^{Air}GW_{Inh\text{-}V}$ PCL[1]	^{SW} SW PCL (based on Tier 1 Contact Recreation Water PCL)	^{SW}SW PCL (based on chronic aquatic life criteria)	Dilution Factor for Perennial Streams	^{SW}GW PCL (with dilution factor of 0.15, based on chronic aquatic life criteria)[2,4]	^{SW}GW PCL (with dilution factor of 0.15, based on contact recreation)[4]	Critical PCL[2]	MQL[5]	MW-44[4]	MW-46[4]								French Drain	
Date Sampled											06/01/18	01/22/14	02/17/14	03/27/14	06/01/18	08/01/18	11/06/18	12/03/18	11/05/18	12/03/18
Screen Interval											5-15	10-20							N/A	
Total Metals by EPA Method SW-846 6020																					
Antimony	mg/L	0.006	--	0.199	2.2	0.15	14.67	1.33	0.006	0.00200	0.000400 U	NS	NS	NS	**0.00263**	0.000400 U	0.000800 U	0.000400 U	**0.0484**	**0.0374**
Arsenic	mg/L	0.01	--	0.0285	--	0.15	--	0.19	0.01	0.00200	**0.00326**	NS	NS	NS	**0.00461**	**0.00514**	**0.00317 J**	**0.00228**	0.00215 U	**0.00219**
Cadmium	mg/L	0.005	--	0.149	--	0.15	--	0.99	0.005	0.00200	0.000200 U	R	**0.00812**	**0.000794**	**0.00204**	**0.000740 J**	**0.000791 J**	**0.000959 J**	**0.00165 J**	**0.000273 J**
Lead	mg/L	0.015	--	0.015	--	0.15	--	0.10	0.015	0.00200	**0.000842 J**	R	**0.00185**	**0.00546**	**0.0354**	**0.000876 J**	0.00120 U	0.00120 U	**0.00630**	**0.00362**
Selenium	mg/L	0.05	--	4.13	0.005	0.15	0.0333	27.5	0.0333	0.00200	**0.00627**	NS	NS	NS	**0.00754**	**0.00134 J**	0.00220 U	0.00110 U	**0.00473 J**	**0.00774**
Dissolved Metals by EPA Method SW-846 6020																				
Antimony	mg/L	0.006	--	0.199	--	0.15	--	1.33	0.006	0.00200	0.000400 U	NS	NS	NS	**0.000569 J**	0.000400 U	0.000800 U	0.000400 U	**0.0484**	**0.0346**
Arsenic	mg/L	0.01	--	0.0285	0.15	0.15	1.00	0.19	0.01	0.00200	**0.00108 J**	NS	NS	NS	**0.00187 J**	**0.00481**	**0.00309 J**	**0.00176 J**	0.00263 U	**0.00209**
Cadmium	mg/L	0.005	--	0.149	0.000256	0.15	0.0017	0.99	0.0017	0.00200	0.000200 U	**0.00190 J**	**0.000834**	**0.000797**	**0.00219**	**0.000776 J**	**0.000969 J**	**0.000900 J**	**0.000766 J**	0.000200 U
Lead	mg/L	0.015	--	0.015	0.00268	0.15	0.0179	0.10	0.015	0.00200	0.000600 U	**0.0259**	**0.00488**	**0.00302 J**	**0.00183 J**	0.000600 U	0.00120 U	0.00120 U	**0.00254**	**0.000614 J**
Selenium	mg/L	0.05	--	4.13	--	0.15	--	27.5	0.050	0.00200	**0.00661**	NS	NS	NS	**0.00793**	**0.00163 J**	0.00220 U	0.00110 U	**0.00760 J**	**0.00685**
Total Petroleum Hydrocarbons (TPH) by TX 1005																				
>nC12 to nC28	mg/L	0.98	970	37.4	--	0.15	--	249	0.98	0.47	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
>nC28 to nC35	mg/L	0.98	970	28.1	--	0.15	--	187	0.98	0.47	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
nC6 to nC12	mg/L	0.98	230	56.2	--	0.15	--	375	0.98	0.47	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Total Petroleum Hydrocarbon	mg/L	--	--	--	--	--	--	--	--	0.47	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Total Petroleum Hydrocarbons (TPH) by TX 1006																				
Not Detected																				
Remediation Design Parameters																				
Total Metals by EPA Method SW-846 6020																				
Calcium	mg/L	--	--	--	--	--	--	--	See note 7	0.500	**492**	NS	NS	NS	NS	NS	**597**	**499**	**194**	**186**
Iron	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**11.1**	NS	NS	NS	NS	NS	**66.6**	**67.5**	**0.147 J**	**0.0569 J**
Magnesium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**65.3**	NS	NS	NS	NS	NS	**231**	**216**	**1.66**	**1.33**
Potassium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	NS	NS	NS	NS	NS	NS	**4.62**	**4.93**	**12.5**	**13.2**
Sodium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	NS	NS	NS	NS	NS	NS	**695**	**625**	**127**	**231**
Dissolved Metals by EPA Method SW-846 6020																				
Calcium	mg/L	--	--	--	--	--	--	--	See note 7	0.500	**367**	NS	NS	NS	NS	NS	**565**	**556**	**176**	**178**
Iron	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**8.27**	NS	NS	NS	NS	NS	**76.1**	**65.3**	0.117 U	**0.0175 J**
Magnesium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	**64.7**	NS	NS	NS	NS	NS	**241**	**240**	**1.70**	**1.25**
Potassium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	NS	NS	NS	NS	NS	NS	**5.01**	**5.75**	**12.4**	**13.8**
Sodium	mg/L	--	--	--	--	--	--	--	See note 7	0.200	NS	NS	NS	NS	NS	NS	**664**	**687**	**130**	**228**
Alkalinity by SM 2320B																				
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	**567**	NS	NS	NS	NS	NS	**358**	NA	5.00 U	NA
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	5.00 U	NS	NS	NS	NS	NS	5.00 U	NA	**34.3**	NA
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	5.00 U	NS	NS	NS	NS	NS	NS	NS	NS	NS
Alkalinity, Total (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	5.00	**567**	NS	NS	NS	NS	NS	**358**	NA	**37.7**	NA
Anions by E300.0																				
Chloride	mg/L	--	--	--	--	--	--	--	See note 7	0.500	**301**	NS	NS	NS	NS	NS	**485**	**506**	**28.0**	**28.2**
Sulfate	mg/L	--	--	--	--	--	--	--	See note 7	5.00	**1,680**	NS	NS	NS	NS	NS	**2,760**	**2,920**	**710**	**964**
Nitrate/Nitrite (as N)	mg/L	--	--	--	--	--	--	--	See note 7	0.200	0.0300 U	NS	NS	NS	NS	NS	0.150 U	0.0600 U	0.0300 U	**1.47**
Total/Dissolved Organic Carbon by SM5310B																				
Total Organic Carbon (TOC)	mg/L	--	--	--	--	--	--	--	See note 7	1.00	**6.14**	NS	NS	NS	NS	NS	NS	NS	NS	NS
Dissolved Organic Carbon (DOC)	mg/L	--	--	--	--	--	--	--	See note 7	1.00	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Total Hardness by SM2340B																				
Hardness (as $CaCO_3$)	mg/L	--	--	--	--	--	--	--	See note 7	1.00	NS	NS	NS	NS	NS	NS	**2,440**	NA	**491**	NA

Groundwater Analytical Data Summary
Exide Frisco Recycling Center Response Action Plan

Notes:
Detected analytes are bolded.
Green highlight indicates analyte exceeds Critical PCL.
NA - Not analyzed for constituent.
NS - Not Sampled.
J - Analyte concentration estimated.
U - Analyte not detected above method quantitation limit (MQL). Value shown is sample detection limit (SDL).
L - Bias likely low.
R - Indicates data rejection due to sample collection error (not properly filtered).
IV - Insufficient volume
-- Indicates PCL not available.
(1) Samples for dissolved analysis field filtered with a 0.45 micron filter.
(2) ^{SW}GW PCL set to ^{SW}SW RBEL based on chronic aquatic life criteria for monitoring wells along Stewart Creek assuming ecological criteria (perennial streams) assuming use of a 0.15 dilution factor. Per TRRP-24, specific aquatic life criteria for arsenic, cadmium and lead apply to dissolved rather than total concentrations since the dissolved phase represents the bioavailable form. Also per TRRP-24, the SWGW PCL applies to monitoring wells where there is a potential to discharge to surface water. Arsenic, cadmium, and lead RBELs based on hardness value of 106 mg/L for Segment 0823. Chronic aquatic life criteria updated by TCEQ in January 2017.
(3) Critical PCLs are minimum of the Apaaril 2018 TRRP commercial-industrial Tier 1 $^{GW}GW_{Ing}$ and $^{Air}GW_{Inh\text{-}V}$ PCLs, or applicable ^{SW}GW PCLs.
(4) For purposes of this assessment, all groundwater wells were considered a potential point of discharge where the ^{SW}GW PCL for may apply (assuming a dilution factor of 0.15)
(5) MQL values shown are based on 2018 data. No MQL values exceeded applicable PCLs.
(6) Direct Human Contact Recreation Water Tier 1 PCL (last updated March 2006) used to evaluate exposure to constituents of concern (COCs) through the accidental ingestion of surface water and dermal contact. When no value was listed (lead), the drinking water standards were used.
(7) These constituents were included for design considerations only and are not COCs at the Site.
(8) ^{SW}GW PCL (SW RBEL based on chronic aquatic life criteria, no dilution factor) added for reference purposes.
See report text for additional discussion on critical PCLs.

Prepared by: BCW 06/05/2018
Updated by: AGA 08/23/2018, BCW 01/11/2019, EPW 02/20/2019
Checked by: AGA 08/13/2018, BEF 12/05/2018, EPW 02/19/2019, AGA 02/21/2019
Reviewed by: AMF/THR 09/05/2018, AMF 05/30/2019

							ICP-MS Total and Dissolved Metals by EPA Method SW6020A										ICP-MS Total and Dissolved Metals by EPA Method SW6020A									
							Total Lead (mg/L)	Dissolved Lead (mg/L)	Total Cadmium (mg/L)	Dissolved Cadmium (mg/L)	Total Arsenic (mg/L)	Dissolved Arsenic (mg/L)	Total Antimony (mg/L)	Dissolved Antimony (mg/L)	Total Selenium (mg/L)	Dissolved Selenium (mg/L)	Total Calcium (mg/L)	Dissolved Calcium (mg/L)	Total Iron (mg/L)	Dissolved Iron (mg/L)	Total Magnesium (mg/L)	Dissolved Magnesium (mg/L)	Total Potassium (mg/L)	Dissolved Potassium (mg/L)	Total Sodium (mg/L)	Dissolved Sodium (mg/L)
[GW]GW_{Ing} PCL[1]							0.015	0.015	0.005	0.005	0.01	0.01	0.006	0.006	0.05	0.05	--	--	--	--	--	--	--	--	--	--
[SW] SW PCL (based on Tier 1 Contact Recreation Water PCL)							0.015	0.015	0.149	0.149	0.0285	0.0285	0.199	0.199	4.13	4.13	--	--	--	--	--	--	--	--	--	--
[SW] SW PCL (based on chronic aquatic life criteria)							--	0.00268	--	0.000256	--	0.15	2.2	--	0.005	--	--	--	--	--	--	--	--	--	--	--
Dilution Factor for Perennial Streams							0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	--	--	--	--	--	--	--	--	--	--
[SW] GW PCL (with dilution factor of 0.15, based on chronic aquatic life criteria)[2,4]							--	0.0179	--	0.0017	--	1.00	14.7	--	0.0333	--	--	--	--	--	--	--	--	--	--	--
[SW] GW PCL (with dilution factor of 0.15, based on contact recreation)[4]							0.10	0.10	0.99	0.99	0.19	0.19	1.33	1.33	27.5	27.5	--	--	--	--	--	--	--	--	--	--
Critical PCL[2]							0.015	0.015	0.005	0.0017	0.01	0.01	0.006	0.006	0.0333	0.050	--	--	--	--	--	--	--	--	--	--
MQL[5]							0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	--	--	--	--	--	--	--	--	--	--
Sample	**Sample Column and Pore Volume**	**Sample Location**	**Column**	**PV**	**Date of Geochemistry Sample**	**Date of Metals Sample**	**Total Lead (mg/L)**	**Dissolved Lead (mg/L)**	**Total Cadmium (mg/L)**	**Dissolved Cadmium (mg/L)**	**Total Arsenic (mg/L)**	**Dissolved Arsenic (mg/L)**	**Total Antimony (mg/L)**	**Dissolved Antimony (mg/L)**	**Total Selenium (mg/L)**	**Dissolved Selenium (mg/L)**	**Total Calcium (mg/L)**	**Dissolved Calcium (mg/L)**	**Total Iron (mg/L)**	**Dissolved Iron (mg/L)**	**Total Magnesium (mg/L)**	**Dissolved Magnesium (mg/L)**	**Total Potassium (mg/L)**	**Dissolved Potassium (mg/L)**	**Total Sodium (mg/L)**	**Dissolved Sodium (mg/L)**
DGW-MW-11 (Field)	Field 2		-1	0	NS	01/02/19	**0.0276**	**0.00207**	**0.00953**	**0.00913**	0.000400 U	0.00200 U	**0.00224**	**0.00202**	0.00110 U	0.00110 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DGW-MW-11 (Field)	Field 1		-1	0	12/03/18	12/03/18	**0.0383**	0.00300 U	**0.00289**	**0.00249**	**0.00478**	**0.00145 J**	**0.000708 J**	0.000686 U	0.00110 U	0.00110 U	**459**	**474**	**3.45**	**0.324**	**246**	**267**	**17.7**	**17.5**	**1,710**	**1,860**
DGW-MW-11-T0-Control	Control Start	1 - inlet	0	0	12/17/18	12/17/18	**0.0266**	**0.00444**	**0.00929**	**0.00947**	**0.00169 J**	**0.000482 J**	**0.000897 J**	**0.00261**	**0.00300**	0.00235 U	**529**	**430**	**38.0**	**33.3**	**341**	**302**	**21.1**	**19.4**	**1,720**	**1,440**
DGW-MW-11-T0-30-35-40	30% PV 0	1 - inlet	30	0	12/17/18	12/17/18	**0.0362 J**	**0.00190 J**	**0.0107**	**0.0110**	0.00200 U	**0.000450 J**	0.00200 U	**0.00132 J**	0.00550 U	0.00111 U	**487**	**491**	**21.1**	**17.9**	**315**	**342**	**21.9**	**21.2 JL**	**1,570**	**1,640**
DGW-MW-11-T0-30-35-40	35% PV 0	1 - inlet	35	0	12/17/18	12/17/18	**0.0362 J**	**0.00190 J**	**0.0107**	**0.0110**	0.00200 U	**0.000450 J**	0.00200 U	**0.00132 J**	0.00550 U	0.00111 U	**487**	**491**	**21.1**	**17.9**	**315**	**342**	**21.9**	**21.2 JL**	**1,570**	**1,640**
DGW-MW-11-T0-30-35-40	40 % PV 0	1 - inlet	40	0	12/17/18	12/17/18	**0.0362 J**	**0.00190 J**	**0.0107**	**0.0110**	0.00200 U	**0.000450 J**	0.00200 U	**0.00132 J**	0.00550 U	0.00111 U	**487**	**491**	**21.1**	**17.9**	**315**	**342**	**21.9**	**21.2 JL**	**1,570**	**1,640**
DGW-MW-11-PV5inlet-Control	Control PV 5	1 - inlet	0	5	NS	01/04/19	**0.0259**	0.00300 U	**0.00989**	**0.00967 J**	**0.000636 J**	0.00200 U	0.000882 U	0.00200 U	**0.00172 J**	0.00550 U	**466**	**468**	**28.3**	**19.2**	**329**	**303**	**20.4**	**22.5**	**1,530**	**1,650**
DGW-MW-11-PV5mid-Control	Control PV 5	2 - mid	0	5	NS	01/04/19	0.000600 U	0.00300 U	**0.00956**	**0.00934 J**	0.000400 U	0.00200 U	0.000436 U	0.00200 U	0.00110 U	0.00550 U	**474**	**487**	**0.0535 J**	0.0600 U	**334**	**306**	**21.2**	**22.3**	**1,470**	**1,720**
DGW-MW-11-PV5out-Control	Control PV 5	3 - outlet	0	5	01/02/19	01/03/19	0.000600 U	0.000600 U	**0.00902**	**0.00974**	0.000400 U	0.000400 U	0.000661 U	0.000719 U	0.00110 U	**0.00173 J**	**423**	**497**	0.0120 U	0.0120 U	**317**	**338**	**20.9**	**20.8**	**1,580**	**1,480**
DGW-MW-11-PV5inlet-30-35-40	30% PV 5	1 - inlet	30	5	NS	01/04/19	**0.00472**	0.00300 U	**0.00124 J**	**0.00128 J**	**0.00143 J**	0.00200 U	0.000400 U	0.00200 U	0.00110 U	0.00550 U	**442**	**512**	**9.77**	0.0600 U	**290**	**268**	**18.1**	**19.4**	**1,730**	**1,910**
DGW-MW-11-PV5mid-30	30% PV 5	2 - mid	30	5	NS	01/04/19	0.000600 U	0.00300 U	0.000200 U	0.00100 U	0.000400 U	0.00200 U	0.000400 U	0.00200 U	0.00110 U	0.00550 U	**291**	**290**	**17.6**	**0.255 J**	**285**	**272**	**18.0**	**18.6**	**1,690**	**1,890**
DGW-MW-11-PV5out-30	30% PV 5	3 - outlet	30	5	01/02/19	01/03/19	0.000600 U	0.00300 U	0.000200 U	0.00100 U	0.000400 U	0.00200 U	0.000943 U	0.00200 U	0.00110 U	0.00550 U	**263**	**285**	**1.82**	0.0600 U	**283**	**271**	**18.3**	**19.0**	**1,840**	**1,560**
DGW-MW-11-PV5inlet-30-35-40	35% PV 5	1 - inlet	35	5	NS	01/04/19	**0.00472**	0.00300 U	**0.00124 J**	**0.00128 J**	**0.00143 J**	0.00200 U	0.000400 U	0.00200 U	0.00110 U	0.00550 U	**442**	**512**	**9.77**	0.0600 U	**290**	**268**	**18.1**	**19.4**	**1,730**	**1,910**
DGW-MW-11-PV5mid-35	35% PV 5	2 - mid	35	5	NS	01/04/19	0.000600 U	0.00300 U	0.000200 U	0.00100 U	0.000400 U	0.00200 U	0.000400 U	0.00200 U	0.00110 U	0.00550 U	**269**	**278**	**13.4**	**0.574 J**	**293**	**255**	**18.1**	**18.3**	**1,660**	**1,890**
DGW-MW-11-PV5out-35	35% PV 5	3 - outlet	35	5	01/02/19	01/03/19	0.000600 U	0.00300 U	0.000200 U	0.00100 U	0.000400 U	0.00200 U	0.000400 U	0.00200 U	0.00110 U	0.00550 U	**257**	**286**	**1.29**	0.0600 U	**278**	**262**	**17.9**	**20.1**	**1,700**	**1,860**
DGW-MW-11-PV5inlet-30-35-40	40% PV 5	1 - inlet	40	5	NS	01/04/19	**0.00472**	0.00300 U	**0.00124 J**	**0.00128 J**	**0.00143 J**	0.00200 U	0.000400 U	0.00200 U	0.00110 U	0.00550 U	**442**	**512**	**9.77**	0.0600 U	**290**	**268**	**18.1**	**19.4**	**1,730**	**1,910**
DGW-MW-11-PV5mid-40	40% PV 5	2 - mid	40	5	NS	01/04/19	0.000600 U	0.00300 U	0.000200 U	0.00100 U	0.000400 U	0.00200 U	0.000511 U	0.00200 U	0.00110 U	0.00550 U	**267**	**277**	**4.76**	**0.138 J**	**278**	**258**	**17.7**	**18.3**	**1,680**	**1,910**
DGW-MW-11-PV5out-40	40% PV 5	3 - outlet	40	5	01/02/19	01/03/19	0.000600 U	0.00300 U	0.000200 U	0.00100 U	0.000400 U	0.00200 U	0.000400 U	0.00200 U	0.00110 U	0.00550 U	**291**	**274**	**0.553**	0.0600 U	**301**	**272**	**17.3**	**18.9**	**1,740**	**1,880**
DGW-MW-11-PV10inlet-control	Control PV 10	1 - inlet	0	10	NS	01/11/19	**0.00970 J**	0.00300 U	**0.00857 J**	**0.00972 J**	0.00200 U	0.00200 U	**0.00231 J**	0.00200 U	0.00550 U	0.00550 U	**511**	**370**	**6.98**	**1.65**	**302**	**211**	**22.0**	**16.2**	**1,730**	**1,220**
DGW-MW-11-PV10mid-control	Control PV 10	2 - mid	0	10	NS	01/12/19	0.00300 U	0.00300 U	**0.00861 J**	**0.00752 J**	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**441**	**361**	0.0600 U	**0.385 J**	**282**	**221**	**20.9**	**15.9**	**1,470**	**1,140**
DGW-MW-11-PV10out-control	Control PV 10	3 - outlet	0	10	NS	01/11/19	0.00300 U	0.00300 U	**0.00912 J**	**0.0107**	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**509**	**458**	0.0600 U	0.0600 U	**298**	**286**	**23.9**	**21.7**	**1,530**	**1,410**
DGW-MW-11-PV10inlet-30-35-40	30% PV 10	1 - inlet	30	10	NS	01/11/19	**0.00513 J**	0.00300 U	**0.00956 J**	**0.00876 J**	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**512 J**	**370**	**20.5**	**20.5**	**313**	**229**	**22.7**	**17.2**	**1,630**	**1,220**
DGW-MW-11-PV10inlet-30-35-40 (DUP)	30% PV 10	1 - inlet	30	10	NS	01/11/19	**0.00575 J**	0.00300 U	**0.00954 J**	**0.00963 J**	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**376 J**	**462**	**16.0**	**20.0 J**	**242**	**289**	**17.4**	**20.7**	**1,280**	**1,520**
DGW-MW-11-PV10mid-30	30% PV 10	2 - mid	30	10	NS	01/12/19	0.00300 U	0.00300 U	0.00100 U	0.00100 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**345**	**404**	**20.8**	**11.3**	**270**	**285**	**18.8**	**21.4**	**1,420**	**1,500**
DGW-MW-11-PV10out-30	30% PV 10	3 - outlet	30	10	NS	01/11/19	0.00300 U	0.00300 U	0.00100 U	0.00100 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**358**	**300**	**5.54**	**0.699 J**	**289**	**231**	**21.0**	**18.4**	**1,570**	**1,250**
DGW-MW-11-PV10inlet-30-35-40	35% PV 10	1 - inlet	35	10	NS	01/11/19	**0.00513 J**	0.00300 U	**0.00956 J**	**0.00876 J**	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**512 J**	**370**	**20.5**	**20.5**	**313**	**229**	**22.7**	**17.2**	**1,630**	**1,220**
DGW-MW-11-PV10inlet-30-35-40 (DUP)	35% PV 10	1 - inlet	35	10	NS	01/11/19	**0.00575 J**	0.00300 U	**0.00954 J**	**0.00963 J**	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**376 J**	**462**	**16.0**	**20.0 J**	**242**	**289**	**17.4**	**20.7**	**1,280**	**1,520**
DGW-MW-11-PV10mid-35	35% PV 10	2 - mid	35	10	NS	01/12/19	0.00300 U	0.00300 U	0.00100 U	0.00100 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**320**	**379**	**15.9**	**9.36**	**242**	**275**	**18.2**	**20.6**	**1,300**	**1,470**
DGW-MW-11-PV10out-35	35% PV 10	3 - outlet	35	10	NS	01/11/19	0.00300 U	0.00300 U	0.00100 U	0.00100 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**380**	**357**	**5.61**	**1.19**	**309**	**262**	**23.5**	**21.7**	**1,640**	**1,420**
DGW-MW-11-PV10inlet-30-35-40	40% PV 10	1 - inlet	40	10	NS	01/11/19	**0.00513 J**	0.00300 U	**0.00956 J**	**0.00876 J**	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**512 J**	**370**	**20.5**	**20.5**	**313**	**229**	**22.7**	**17.2**	**1,630**	**1,220**
DGW-MW-11-PV10inlet-30-35-40 (DUP)	40% PV 10	1 - inlet	40	10	NS	01/11/19	**0.00575 J**	0.00300 U	**0.00954 J**	**0.00963 J**	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**376 J**	**462**	**16.0**	**20.0 J**	**242**	**289**	**17.4**	**20.7**	**1,280**	**1,520**
DGW-MW-11-PV10mid-40	40% PV 10	2 - mid	40	10	NS	01/12/19	0.00300 U	0.00300 U	0.00100 U	0.00100 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**309**	**356**	**9.78**	**3.96**	**232**	**258**	**18.6**	**18.9**	**1,270**	**1,370**
DGW-MW-11-PV10out-40	40% PV 10	3 - outlet	40	10	NS	01/11/19	0.00300 U	0.00300 U	0.00100 U	0.00100 U	0.00200 U	0.00200 U	**0.00418 J**	0.00200 U	0.00550 U	0.00550 U	**400**	**326**	**1.69**	0.0600 U	**319**	**246**	**25.3**	**19.8**	**1,730**	**1,350**
DGW-MW-11-PV15inlet-control	Control PV 15	1 - inlet	0	15	NS	01/22/19	**0.00574 J**	0.00300 U	**0.00943 J**	**0.00984 J**	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**497**	**509**	**24.0**	**17.1**	**313**	**316**	**21.7**	**21.9**	**1,470**	**1,580**
DGW-MW-11-PV15mid-control	Control PV 15	2 - mid	0	15	NS	01/23/19	0.00300 U	0.00300 U	**0.00928 J**	**0.00983 J**	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**495**	**581**	0.0600 U	0.0600 U	**316**	**353**	**21.9**	**24.5**	**1,720**	**1,700**
DGW-MW-11-PV15out-control	Control PV 15	3 - outlet	0	15	NS	01/22/19	0.00300 U	0.00300 U	**0.0118**	**0.0101**	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**513**	**497**	0.0600 U	0.0600 U	**312**	**299**	**21.6**	**20.7**	**1,640**	**1,670**
DGW-MW-11-PV15inlet-30-35-40	30% PV 15	1 - inlet	30	15	NS	01/22/19	**0.0131**	0.00300 U	**0.00710 J**	**0.00773 J**	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**492**	**519**	**29.8**	**19.8**	**309**	**323**	**20.8**	**22.0**	**1,720**	**1,660**
DGW-MW-11-PV15mid-30	30% PV 15	2 - mid	30	15	NS	01/23/19	0.00300 U	0.00300 U	0.00100 U	0.00100 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**398**	**388**	**16.6**	0.0600 U	**310**	**297**	**20.4**	**21.1**	**1,670**	**1,630**
DGW-MW-11-PV15out-30	30% PV 15	3 - outlet	30	15	NS	01/22/19	0.00300 U	0.00300 U	0.00100 U	0.00100 U	0.00200 U	0.00200 U	**0.00282 J**	0.00200 U	0.00550 U	0.00550 U	**395**	**457**	**5.08**	**3.24**	**305**	**347**	**21.3**	**22.9**	**1,720**	**1,680**
DGW-MW-11-PV15inlet-30-35-40	35% PV 15	1 - inlet	35	15	NS	01/22/19	**0.0131**	0.00300 U	**0.00710 J**	**0.00773 J**	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**492**	**519**	**29.8**	**19.8**	**309**	**323**	**20.8**	**22.0**	**1,720**	**1,660**
DGW-MW-11-PV15mid-35	35% PV 15	2 - mid	35	15	NS	01/23/19	0.00300 U	0.00300 U	0.00100 U	0.00100 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**393**	**459**	**11.0**	**0.960 J**	**300**	**340**	**20.4**	**24.1**	**1,610**	**1,630**
DGW-MW-11-PV15out-35	35% PV 15	3 - outlet	35	15	NS	01/22/19	0.00300 U	0.00300 U	0.00100 U	0.00100 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**399**	**393**	**4.8**	**0.193 J**	**312**	**315**	**21.8**	**21.7**	**1,640**	**1,630**
DGW-MW-11-PV15inlet-30-35-40	40% PV 15	1 - inlet	40	15	NS	01/22/19	**0.0131**	0.00300 U	**0.00710 J**	**0.00773 J**	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**492**	**519**	**29.8**	**19.8**	**309**	**323**	**20.8**	**22.0**	**1,720**	**1,660**
DGW-MW-11-PV15mid-40	40% PV 15	2 - mid	40	15	NS	01/23/19	0.00300 U	0.00300 U	0.00100 U	0.00100 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**397**	**401**	**3.82**	**0.0974 J**	**304**	**306**	**20.5**	**21.4**	**1,540**	**1,550**
DGW-MW-11-PV15out-40	40% PV 15	3 - outlet	40	15	NS	01/22/19	0.00300 U	0.00300 U	0.00100 U	0.00100 U	0.00200 U	0.00200 U	0.00219 U	0.00200 U	0.00550 U	0.00550 U	**387**	**424**	**1.60**	0.0600 U	**298**	**322**	**20.2**	**22.5**	**1,530**	**1,670**
DGW-MW11-PV20inlet-control	Control PV 20	1 - inlet	0	20	NS	02/06/19	**0.00252**	0.00300 U	**0.00562**	**0.00552 J**	**0.000442 J**	0.00200 U	**0.000668 J**	**0.00423 J**	0.00110 U	0.00550 U	**528**	**504**	**8.48**	**1.31**	**321**	**287**	**20.6**	**19.2**	**1,970**	**2,010**
DGW-MW11-PV20mid-control	Control PV 20	2 - mid	0	20	NS	02/07/19	0.000600 U	0.00300 U	**0.00556**	**0.00512 J**	0.000400 U	0.00200 U	**0.000524 J**	0.00200 U	**0.00130 J**	0.00550 U	**495**	**476**	0.0120 U	0.0600 U	**315**	**269**	**21.6**	**17.3**	**1,930**	**2,040**
DGW-MW-11-PV20out-control	Control PV 20	3 - outlet	0	20	02/04/19	02/06/19	0.000600 U	0.00300 U	**0.00590**	**0.00619 J**	**0.00119 J**	0.00200 U	**0.000460 J**	0.00200 U	0.00110 U	0.00550 U	**529**	**521**	0.0120 U	0.0600 U	**327**	**308**	**21.5**	**20.1**	**1,990**	**1,930**
DGW-MW11-PV20inlet-30-35-40	30% PV 20	1 - inlet	30	20	NS	02/06/19	**0.00326**	0.00300 U	**0.00672**	**0.00621 J**	**0.000405 J**	0.00200 U	**0.000510 J**	0.00200 U	**0.00114 J**	0.00550 U	**540**	**486**	**8.17**	**2.52**	**338**	**286**	**24.6**	**20.7**	**1,860**	**1,870**
DGW-MW11-PV20mid-30	30% PV 20	2 - mid	30	20	NS	02/07/19	0.000600 U	0.00300 U	0.000200 U	0.00100 U	0.000400 U	0.00200 U	0.000400 U	0.00200 U	0.00110 U	0.00550 U	**405**	**368**	**6.38**	**0.212 J**	**333**	**280**	**26.1**	**20.3**	**1,900**	**1,810**
DGW-MW11-PV20out-30	30% PV 20	3 - outlet	30	20	02/04/19	02/06/19	0.000600 U	0.00300 U	0.000200 U	0.00100 U	0.000400 U	0.00200 U	0.000400 U	0.00200 U	0.00110 U	0.00550 U	**369**	**364**	**3.72**	0.0600 U	**328**	**316**	**24.2**	**23.0**	**1,860**	**1,780**
DGW-MW11-PV20inlet-30-35-40	35% PV 20	1 - inlet	35	20	NS	02/06/19	**0.00326**	0.00300 U	**0.00672**	**0.00621 J**	**0.000405 J**	0.00200 U	**0.000510 J**	0.00200 U	**0.00114 J**	0.00550 U	**540**	**486**	**8.17**	**2.52**	**338**	**286**	**24.6**	**20.7**	**1,860**	**1,870**
DGW-MW11-PV20mid-35	35% PV 20	2 - mid	35	20	NS	02/07/19	0.000600 U	0.00300 U	0.000200 U	0.00100 U	0.000400 U	0.00200 U	0.000400 U	0.00200 U	0.00110 U	0.00550 U	**418**	**367**	**3.49**	**0.0959 J**	**355**	**284**	**26.7**	**21.6**	**1,990**	**1,830**
DGW-MW11-PV20out-35-DUP	35% PV 20	3 - outlet	35	20	NS	02/05/19	0.00300 U	0.00300 U	0.00100 U	0.00100 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**368**	**356**	**2.64**	0.0600 U	**300**	**292**	**22.7**	**21.3**	**1,830**	**1,580**
DGW-MW-11-PV20out-35	35% PV 20	3 - outlet	35	20	02/04/19	02/06/19	0.000600 U	0.00300 U	0.000200 U	0.00100 U	0.000400 U	0.00200 U	0.000400 U	0.00200 U	0.00110 U	0.00550 U	**370**	**380**	**2.20**	0.0600 U	**321**	**320**	**24.5**	**23.7**	**1,870**	**1,870**
DGW-MW11-PV20inlet-30-35-40	40% PV 20	1 - inlet	40	20	NS	02/06/19	**0.00326**	0.00300 U	**0.00672**	**0.00621 J**	**0.000405 J**	0.00200 U	**0.000510 J**	0.00200 U	**0.00114 J**	0.00550 U	**540**	**486**	**8.17**	**2.52**	**338**	**286**	**24.6**	**20.7**	**1,860**	**1,870**
DGW-MW11-PV20mid-40	40% PV 20	2 - mid	40	20	NS	02/07/19	0.000600 U	0.00300 U	0.000200 U	0.00100 U	0.000400 U	0.00200 U	0.000400 U	0.00200 U	0.00110 U	0.00550 U	**377**	**369**	**0.906**	0.0600 U	**330**	**285**	**26.1**	**21.7**	**1,870**	**1,820**
DGW-MW-11-PV20out-40	40% PV 20	3 - outlet	40	20	02/04/19	02/06/19	0.000600 U	0.00300 U	0.000200 U	0.00100 U	0.000400 U	0.00200 U	0.000400 U	0.00200 U	0.00110 U	0.00550 U	**348**	**365**	**1.39**	0.0600 U	**314**	**315**	**24.7**	**23.3**	**1,800**	**1,790**

Table 2
DGW-MW-11 Column Study Analytical Results
Appendix 3.7 Permeable Reactive Barrier Column Studies Summary
Exide Frisco Recycling Center Response Action Plan

							ICP-MS Total and Dissolved Metals by EPA Method SW6020A										ICP-MS Total and Dissolved Metals by EPA Method SW6020A									
							Total Lead (mg/L)	Dissolved Lead (mg/L)	Total Cadmium (mg/L)	Dissolved Cadmium (mg/L)	Total Arsenic (mg/L)	Dissolved Arsenic (mg/L)	Total Antimony (mg/L)	Dissolved Antimony (mg/L)	Total Selenium (mg/L)	Dissolved Selenium (mg/L)	Total Calcium (mg/L)	Dissolved Calcium (mg/L)	Total Iron (mg/L)	Dissolved Iron (mg/L)	Total Magnesium (mg/L)	Dissolved Magnesium (mg/L)	Total Potassium (mg/L)	Dissolved Potassium (mg/L)	Total Sodium (mg/L)	Dissolved Sodium (mg/L)
[GW]GW_{Ing} PCL[1]							0.015	0.015	0.005	0.005	0.01	0.01	0.006	0.006	0.05	0.05	--	--	--	--	--	--	--	--	--	--
[SW] SW PCL (based on Tier 1 Contact Recreation Water PCL)							0.015	0.015	0.149	0.149	0.0285	0.0285	0.199	0.199	4.13	4.13	--	--	--	--	--	--	--	--	--	--
[SW] SW PCL (based on chronic aquatic life criteria)							--	0.00268	--	0.000256	--	0.15	2.2	--	0.005	--	--	--	--	--	--	--	--	--	--	--
Dilution Factor for Perennial Streams							0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	--	--	--	--	--	--	--	--	--	--
[SW] GW PCL (with dilution factor of 0.15, based on chronic aquatic life criteria)[2,4]							--	0.0179	--	0.0017	--	1.00	14.7	--	0.0333	--	--	--	--	--	--	--	--	--	--	--
[SW] GW PCL (with dilution factor of 0.15, based on contact recreation)[4]							0.10	0.10	0.99	0.99	0.19	0.19	1.33	1.33	27.5	27.5	--	--	--	--	--	--	--	--	--	--
Critical PCL[2]							0.015	0.015	0.005	0.0017	0.01	0.01	0.006	0.006	0.0333	0.050	--	--	--	--	--	--	--	--	--	--
MQL[5]							0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	--	--	--	--	--	--	--	--	--	--
Sample	**Sample Column and Pore Volume**	**Sample Location**	**Column**	**PV**	**Date of Geochemistry Sample**	**Date of Metals Sample**	**Total Lead (mg/L)**	**Dissolved Lead (mg/L)**	**Total Cadmium (mg/L)**	**Dissolved Cadmium (mg/L)**	**Total Arsenic (mg/L)**	**Dissolved Arsenic (mg/L)**	**Total Antimony (mg/L)**	**Dissolved Antimony (mg/L)**	**Total Selenium (mg/L)**	**Dissolved Selenium (mg/L)**	**Total Calcium (mg/L)**	**Dissolved Calcium (mg/L)**	**Total Iron (mg/L)**	**Dissolved Iron (mg/L)**	**Total Magnesium (mg/L)**	**Dissolved Magnesium (mg/L)**	**Total Potassium (mg/L)**	**Dissolved Potassium (mg/L)**	**Total Sodium (mg/L)**	**Dissolved Sodium (mg/L)**
DGW-MW11-PV25inlet-control	Control PV 25	1 - inlet	0	25	NS	02/19/19	0.00300 U	0.00300 U	**0.00651 J**	**0.00616 J**	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**510**	**475**	**2.45**	0.0600 U	**290**	**276**	**18.8**	**18.4**	**1,750**	**1,640**
DGW-MW11-PV25mid-control	Control PV 25	2 - mid	0	25	NS	02/19/19	0.00300 U	0.00300 U	**0.00506 J**	**0.00554 J**	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**542**	**502**	**0.648 J**	0.0600 U	**317**	**291**	**18.9**	**19.1**	**2,030**	**1,760**
DGW-MW11-PV25out-control	Control PV 25	3 - outlet	0	25	NS	02/18/19	0.00300 U	0.00300 U	**0.00524 J**	**0.00474 J**	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**509**	**534**	0.0600 U	0.0600 U	**290**	**305**	**19.1**	**19.0**	**1,760**	**1,830**
DGW-MW11-PV25inlet-30-35-40	30% PV 25	1 - inlet	30	25	NS	02/19/19	**0.00576 J**	0.00300 U	**0.00305 J**	**0.00272 J**	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**518**	**509**	**6.71**	0.0600 U	**279**	**283**	**17.7**	**18.1**	**2,080**	**1,860**
DGW-MW11-PV25mid-30	30% PV 25	2 - mid	30	25	NS	02/19/19	0.00300 U	0.00300 U	0.00100 U	0.00100 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**338**	**340**	**8.70**	0.0600 U	**278**	**291**	**18.6**	**18.7**	**2,240**	**1,950**
DGW-MW11-PV25out-30	30% PV 25	3 - outlet	30	25	NS	02/18/19	0.00300 U	0.00300 U	0.00100 U	0.00100 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**256**	**254**	**5.09**	0.0600 U	**273**	**273**	**18.8**	**18.1**	**1,870**	**1,840**
DGW-MW11-PV25inlet-30-35-40	35% PV 25	1 - inlet	35	25	NS	02/19/19	**0.00576 J**	0.00300 U	**0.00305 J**	**0.00272 J**	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**518**	**509**	**6.71**	0.0600 U	**279**	**283**	**17.7**	**18.1**	**2,080**	**1,860**
DGW-MW11-PV25mid-35	35% PV 25	2 - mid	35	25	NS	02/19/19	0.00300 U	0.00300 U	0.00100 U	0.00100 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**317**	**325**	**4.56**	**0.142 J**	**278**	**295**	**19.8**	**19.4**	**2,250**	**1,910**
DGW-MW11-PV25out-35	35% PV 25	3 - outlet	35	25	NS	02/18/19	0.00300 U	0.00300 U	0.00100 U	0.00100 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**268**	**223**	**1.33**	0.0600 U	**279**	**235**	**18.5**	**19.8**	**1,890**	**1,930**
DGW-MW11-PV25inlet-30-35-40	40% PV 25	1 - inlet	40	25	NS	02/19/19	**0.00576 J**	0.00300 U	**0.00305 J**	**0.00272 J**	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**518**	**509**	**6.71**	0.0600 U	**279**	**283**	**17.7**	**18.1**	**2,080**	**1,860**
DGW-MW11-PV25mid-40	40% PV 25	2 - mid	40	25	NS	02/19/19	0.00300 U	0.00300 U	0.00100 U	0.00100 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**275**	**301**	**1.47**	0.0600 U	**278**	**290**	**18.8**	**19.4**	**2,060**	**1,940**
DGW-MW11-PV25out-40	40% PV 25	3 - outlet	40	25	NS	02/18/19	0.00300 U	0.00300 U	0.00100 U	0.00100 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**247**	**231**	**1.05**	0.0600 U	**283**	**262**	**19.0**	**18.7**	**1,910**	**1,810**
DGW-MW11-PV30inlet-control	Control PV 30	1 - inlet	0	30	NS	03/04/2019	0.00300 U	0.00300 U	**0.00766 J**	**0.00720 J**	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**468**	**466**	**1.87**	**0.853 J**	**280**	**282**	**15.9**	**16.2**	**1,840**	**1,820**
DGW-MW11-PV30mid-control	Control PV 30	2 - mid	0	30	NS	03/05/2019	0.00300 U	0.00300 U	**0.00601 J**	**0.00615 J**	0.00200 U	0.00200 U	0.00200 U	0.00259 U	0.00550 U	0.00550 U	**488**	**476**	**0.419 J**	**0.437 J**	**292**	**285**	**16.8**	**16.3**	**1,880**	**1,900**
DGW-MW11-PV30out-control	Control PV 30	3 - outlet	0	30	NS	03/04/2019	0.00300 U	0.00300 U	**0.00375 J**	**0.00285 J**	0.00200 U	0.00200 U	0.00200 U	0.00273 U	0.00200 U	0.00550 U	**491**	**468**	**0.334 J**	**0.516 J**	**290**	**277**	**16.5**	**16.2**	**1,880**	**1,840**
DGW-MW11-PV30inlet-30-35-40	30% PV 30	1 - inlet	30	30	NS	03/04/2019	0.00300 U	0.00300 U	**0.00734 J**	**0.00677 J**	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**455**	**454**	**9.92**	**6.43**	**286**	**290**	**17.8**	**18.1**	**1,660**	**1,700**
DGW-MW11-PV30mid-30	30% PV 30	2 - mid	30	30	NS	03/05/2019	0.00300 U	0.00300 U	0.00100 U	0.00100 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**385**	**394**	**7.54**	**1.60**	**301**	**308**	**19.0**	**19.3**	**1,760**	**1,810**
DGW-MW11-PV30out-30	30% PV 30	3 - outlet	30	30	NS	03/04/2019	0.00300 U	0.00300 U	0.00100 U	0.00100 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**328**	**332**	**1.97**	**0.547 J**	**298**	**299**	**19.0**	**19.5**	**1,710**	**1,770**
DGW-MW11-PV30out-30-DUP	30% PV 30	3 - outlet	30	30	NS	03/03/2019	0.00300 U	0.00300 U	0.00100 U	0.00100 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**313**	**302**	**1.64**	0.0600 UJ	**273**	**284**	**18.0**	**17.9**	**1,750**	**1,810**
DGW-MW11-PV30inlet-30-35-40	35% PV 30	1 - inlet	35	30	NS	03/04/2019	0.00300 U	0.00300 U	**0.00734 J**	**0.00677 J**	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**455**	**454**	**9.92**	**6.43**	**286**	**290**	**17.8**	**18.1**	**1,660**	**1,700**
DGW-MW11-PV30mid-35	35% PV 30	2 - mid	35	30	NS	03/05/2019	0.00300 U	0.00300 U	0.00100 U	0.00100 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**359**	**357**	**8.64**	**1.23**	**290**	**287**	**18.5**	**18.3**	**1,690**	**1,710**
DGW-MW11-PV30out-35	35% PV 30	3 - outlet	35	30	NS	03/04/2019	0.00300 U	0.00300 U	0.00100 U	0.00100 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**324**	**317**	**2.02**	**0.573 J**	**297**	**286**	**18.9**	**18.5**	**1,720**	**1,750**
DGW-MW11-PV30inlet-30-35-40	40% PV 30	1 - inlet	40	30	NS	03/04/2019	0.00300 U	0.00300 U	**0.00734 J**	**0.00677 J**	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**455**	**454**	**9.92**	**6.43**	**286**	**290**	**17.8**	**18.1**	**1,660**	**1,700**
DGW-MW11-PV30mid-40	40% PV 30	2 - mid	40	30	NS	03/05/2019	0.00300 U	0.00300 U	0.00100 U	0.00100 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**315**	**338**	**1.75**	**0.652 J**	**266**	**300**	**18.5**	**19.3**	**1,740**	**1,760**
DGW-MW11-PV30out-40	40% PV 30	3 - outlet	40	30	NS	03/04/2019	0.00300 U	0.00300 U	0.00100 U	0.00100 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**291**	**290**	**1.59**	**0.647 J**	**286**	**279**	**18.4**	**18.3**	**1,690**	**1,740**
DGW-MW11-PV35inlet-control	Control PV 35	1 - inlet	0	35	NS	03/14/2019	**0.00324 J**	0.00300 U	**0.00800 J**	**0.00779 J**	0.00200 U	0.00200 U	0.00214 U	0.00200 U	0.00550 U	0.00550 U	**446**	**482**	**1.93**	0.0600 U	**263**	**273**	**14.9**	**16.1**	**1,680**	**1,770**
DGW-MW11-PV35mid-control	Control PV 35	2 - mid	0	35	NS	03/15/2019	0.00300 U	0.00300 U	**0.00742 J**	**0.00767 J**	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**450**	**489**	0.0600 U	0.0600 U	**269**	**276**	**15.2**	**16.1**	**1,830**	**1,760**
DGW-MW11-PV35out-control	Control PV 35	3 - outlet	0	35	NS	03/14/2019	0.00300 U	0.00300 U	**0.00736 J**	**0.00738 J**	0.00200 U	0.00200 U	0.00288 U	**0.00870 J**	0.00550 U	0.00550 U	**438**	**491**	0.0600 U	0.0600 U	**256**	**274**	**14.4**	**16.3**	**1,710**	**1,760**
DGW-MW11-PV35inlet-30-35-40	30% PV 35	1 - inlet	30	35	NS	03/14/2019	0.00300 U	0.00300 U	**0.00614 J**	**0.00521 J**	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**452**	**489**	**3.39**	**0.289 J**	**268**	**282**	**16.6**	**17.9**	**1,620**	**1,690**
DGW-MW11-PV35mid-30	30% PV 35	2 - mid	30	35	NS	03/15/2019	0.00300 U	0.00300 U	0.00100 U	0.00100 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**349**	**351**	**8.80**	**0.947 J**	**273**	**262**	**16.8**	**17.0**	**1,750**	**1,760**
DGW-MW11-PV35out-30	30% PV 35	3 - outlet	30	35	NS	03/14/2019	0.00300 U	0.00300 U	0.00100 U	0.00100 U	0.00200 U	0.00200 U	0.00249 U	0.00248 U	0.00550 U	0.00550 U	**282**	**312**	**1.69**	0.0600 U	**263**	**278**	**17.0**	**18.8**	**1,650**	**1,740**
DGW-MW11-PV35inlet-30-35-40	35% PV 35	1 - inlet	35	35	NS	03/14/2019	0.00300 U	0.00300 U	**0.00614 J**	**0.00521 J**	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**452**	**489**	**3.39**	**0.289 J**	**268**	**282**	**16.6**	**17.9**	**1,620**	**1,690**
DGW-MW11-PV35mid-35	35% PV 35	2 - mid	35	35	NS	03/15/2019	0.00300 U	0.00300 U	0.00100 U	0.00100 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	**0.00555 J**	0.00550 U	**331**	**346**	**4.54**	**0.482 J**	**274**	**273**	**17.0**	**17.9**	**1,540**	**1,810**
DGW-MW11-PV35out-35	35% PV 35	3 - outlet	35	35	NS	03/14/2019	0.00300 U	0.00300 U	0.00100 U	0.00100 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**282**	**294**	**2.07**	0.0600 U	**262**	**268**	**17.1**	**18.3**	**1,720**	**1,730**
DGW-MW11-PV35inlet-30-35-40	40% PV 35	1 - inlet	40	35	NS	03/14/2019	0.00300 U	0.00300 U	**0.00614 J**	**0.00521 J**	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**452**	**489**	**3.39**	**0.289 J**	**268**	**282**	**16.6**	**17.9**	**1,620**	**1,690**
DGW-MW11-PV35mid-40	40% PV 35	2 - mid	40	35	NS	03/15/2019	0.00300 U	0.00300 U	0.00100 U	0.00100 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**286**	**312**	**1.02**	**0.123 J**	**261**	**278**	**17.1**	**18.1**	**1,690**	**1,730**
DGW-MW11-PV35out-40	40% PV 35	3 - outlet	40	35	NS	03/14/2019	0.00300 U	0.00300 U	0.00100 U	0.00100 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00550 U	**260**	**286**	**1.00**	0.0600 U	**257**	**271**	**16.8**	**18.6**	**1,740**	**1,810**
DGW-MW11-PV40inlet-control	Control PV 40	1 - inlet	0	40	NS	03/27/2019	0.00300 U	0.00300 U	**0.00646 J**	**0.00746 J**	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	**0.00914 J**	**477**	**513**	**4.24**	**1.68**	**280**	**309**	**18.2**	**19.5**	**1,670**	**1,700**
DGW-MW11-PV40inlet-control-DUP	Control PV 40	1 - inlet	0	40	NS	03/27/2019	0.00300 U	0.00300 U	**0.00722 J**	**0.00683 J**	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	**0.0106**	**502**	**475**	**4.47**	**1.58**	**298**	**286**	**19.0**	**18.0**	**1,740**	**1,650**
DGW-MW11-PV40mid-control	Control PV 40	2 - mid	0	40	NS	03/27/2019	0.00300 U	0.00300 U	**0.00848 J**	**0.00807 J**	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00725 U	**503**	**477**	0.0600 U	0.0600 U	**298**	**289**	**18.9**	**18.1**	**1,800**	**1,730**
DGW-MW11-PV40out-control	Control PV 40	3 - outlet	0	40	03/25/2019	03/26/2019	0.00300 U	0.00300 U	**0.00764 J**	**0.00854 J**	0.00200 U	0.00200 U	0.00200 U	0.00247 U	0.00550 U	0.00826 U	**465**	**500**	0.0600 U	0.0600 U	**274**	**294**	**17.5**	**18.6**	**1,450**	**1,760**
DGW-MW11-PV40inlet-30-35-40	30% PV 40	1 - inlet	30	40	NS	03/27/2019	**0.00405 J**	0.00300 U	**0.00605 J**	**0.00591 J**	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	**0.00944 J**	**475**	**474**	**7.88**	**2.06**	**284**	**290**	**17.9**	**17.7**	**1,690**	**1,640**
DGW-MW11-PV40mid-30	30% PV 40	2 - mid	30	40	NS	03/27/2019	0.00300 U	0.00300 U	0.00100 U	0.00100 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	**0.0117**	**430**	**405**	**15.0**	**0.306 J**	**314**	**294**	**19.8**	**18.6**	**1,820**	**1,740**
DGW-MW11-PV40out-30	30% PV 40	3 - outlet	30	40	03/25/2019	03/26/2019	0.00300 U	0.00300 U	0.00100 U	0.00100 U	0.00200 U	0.00200 U	0.00200 U	0.00292 U	0.00550 U	0.00550 U	**312**	**313**	**0.743 J**	0.0600 U	**277**	**288**	**18.2**	**18.4**	**1,730**	**1,670**
DGW-MW11-PV40inlet-30-35-40	35% PV 40	1 - inlet	35	40	NS	03/27/2019	**0.00405 J**	0.00300 U	**0.00605 J**	**0.00591 J**	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	**0.00944 J**	**475**	**474**	**7.88**	**2.06**	**284**	**290**	**17.9**	**17.7**	**1,690**	**1,640**
DGW-MW11-PV40mid-35	35% PV 40	2 - mid	35	40	NS	03/27/2019	0.00300 U	0.00300 U	0.00100 U	0.00100 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00743 U	**393**	**381**	**9.42**	**0.297 J**	**299**	**289**	**19.0**	**18.4**	**1,740**	**1,720**
DGW-MW11-PV40out-35	35% PV 40	3 - outlet	35	40	03/25/2019	03/26/2019	0.00300 U	0.00300 U	0.00100 U	0.00100 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	0.00587 U	**317**	**315**	**1.65**	0.0600 U	**284**	**285**	**18.5**	**18.6**	**1,690**	**1,690**
DGW-MW11-PV40inlet-30-35-40	40% PV 40	1 - inlet	40	40	NS	03/27/2019	**0.00405 J**	0.00300 U	**0.00605 J**	**0.00591 J**	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	**0.00944 J**	**475**	**474**	**7.88**	**2.06**	**284**	**290**	**17.9**	**17.7**	**1,690**	**1,640**
DGW-MW11-PV40mid-40	40% PV 40	2 - mid	40	40	NS	03/27/2019	0.00300 U	0.00300 U	0.00100 U	0.00100 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	**0.0116**	**343**	**339**	**2.27**	0.0600 U	**286**	**293**	**18.8**	**18.6**	**1,760**	**1,760**
DGW-MW11-PV40out-40	40% PV 40	3 - outlet	40	40	03/25/2019	03/26/2019	0.00300 U	0.00300 U	0.00100 U	0.00100 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00550 U	**0.00888 J**	**286**	**305**	**1.32**	0.0600 U	**283**	**295**	**18.4**	**19.7**	**1,690**	**1,750**

Table 2
DGW-MW-11 Column Study Analytical Results
Appendix 3.7 Permeable Reactive Barrier Column Studies Summary
Exide Frisco Recycling Center Response Action Plan

							Anions by E300.0			Hardness, Total as CaCO3 By SM2340B	Total Dissolved Solids by SM2540C	Alkalinity by SM2320B			Physical Chemistry Parameters					
							Chloride (mg/L)	Sulfate (mg/L)	Nitrate/Nitrite (as N) (mg/L)	Hardness (As CaCO3) (mg/L)	Total Dissolved Solids (Residue, Filterable) (mg/L)	Alkalinity, Bicarbonate (as $CaCO_3$) (mg/L)	Alkalinity, Carbonate (as $CaCO_3$) (mg/L)	Alkalinity, Total (as $CaCO_3$) (mg/L)	Temperature (ºC)	pH	Specific Conductivity (µS/cm)	Redox Potential (mV)	Dissolved Oxygen (ppm)	Total Dissolved Solids (g/L)
$^{GW}GW_{Ing}$ PCL[1]							--	--	--	--	--	--	--	--	--	--	--	--	--	--
^{SW}SW PCL (based on Tier 1 Contact Recreation Water PCL)							--	--	--	--	--	--	--	--	--	--	--	--	--	--
^{SW}SW PCL (based on chronic aquatic life criteria)							--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dilution Factor for Perennial Streams							--	--	--	--	--	--	--	--	--	--	--	--	--	--
^{SW}GW PCL (with dilution factor of 0.15, based on chronic aquatic life criteria)[2,4]							--	--	--	--	--	--	--	--	--	--	--	--	--	--
^{SW}GW PCL (with dilution factor of 0.15, based on contact recreation)[4]							--	--	--	--	--	--	--	--	--	--	--	--	--	--
Critical PCL[2]							See note 7	See note 7	See note 7	--	--	See note 7	See note 7	See note 7	--	--	--	--	--	--
MQL[5]							0.500	5.00	0.200	--	--	5.00	5.00	5.00	--	--	--	--	--	--
Sample	**Sample Column and Pore Volume**	**Sample Location**	**Column**	**PV**	**Date of Geochemistry Sample**	**Date of Metals Sample**	**Chloride (mg/L)**	**Sulfate (mg/L)**	**Nitrate/Nitrite (as N) (mg/L)**	**Hardness (As CaCO3) (mg/L)**	**Total Dissolved Solids (Residue, Filterable) (mg/L)**	**Alkalinity, Bicarbonate (as $CaCO_3$) (mg/L)**	**Alkalinity, Carbonate (as $CaCO_3$) (mg/L)**	**Alkalinity, Total (as $CaCO_3$) (mg/L)**	**Temperature (ºC)**	**pH**	**Specific Conductivity (µS/cm)**	**Redox Potential (mV)**	**Dissolved Oxygen (ppm)**	**Total Dissolved Solids (g/L)**
DGW-MW-11 (Field)	Field 2		-1	0	NS	01/02/19	NS	NS	NS	NS	NS	NS	NS	NS	18.70	6.11	9,102	178.2	0.43	NM
DGW-MW-11 (Field)	Field 1		-1	0	12/03/18	12/03/18	**221**	**4,950**	0.0600 U	NA	NA	NA	NA	NA	20.90	6.25	8,308	99.3	0.19*	NM
DGW-MW-11-T0-Control	Control Start	1 - inlet	0	0	12/17/18	12/17/18	**206**	**5,020**	0.300 U	**2,730**	**7,650**	**264**	5.00 U	**264**	16.49	5.74	8,827	160.1	3.85	4.164
DGW-MW-11-T0-30-35-40	30% PV 0	1 - inlet	30	0	12/17/18	12/17/18	**214**	**5,140**	0.300 U	**2,510**	**7,700**	**212**	5.00 U	**212**	15.79	5.88	8,793	161.5	3.63	4.151
DGW-MW-11-T0-30-35-40	35% PV 0	1 - inlet	35	0	12/17/18	12/17/18	**214**	**5,140**	0.300 U	**2,510**	**7,700**	**212**	5.00 U	**212**	15.79	5.88	8,793	161.5	3.63	4.151
DGW-MW-11-T0-30-35-40	40 % PV 0	1 - inlet	40	0	12/17/18	12/17/18	**214**	**5,140**	0.300 U	**2,510**	**7,700**	**212**	5.00 U	**212**	15.79	5.88	8,793	161.5	3.63	4.151
DGW-MW-11-PV5inlet-Control	Control PV 5	1 - inlet	0	5	NS	01/04/19	NS	NS	NS	**2,520**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-11-PV5mid-Control	Control PV 5	2 - mid	0	5	NS	01/04/19	NS	NS	NS	**2,560**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-11-PV5out-Control	Control PV 5	3 - outlet	0	5	01/02/19	01/03/19	**211**	**5,410**	0.300 U	**2,360**	**9,730**	**224**	5.00 U	**224**	19.10	6.22	4,720	212.7	5.43	3.163
DGW-MW-11-PV5inlet-30-35-40	30% PV 5	1 - inlet	30	5	NS	01/04/19	NS	NS	NS	**2,300**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-11-PV5mid-30	30% PV 5	2 - mid	30	5	NS	01/04/19	NS	NS	NS	**1,900**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-11-PV5out-30	30% PV 5	3 - outlet	30	5	01/02/19	01/03/19	**228**	**5,170**	0.0600 U	**1,820**	**5,150**	**93.1**	5.00 U	**93.1**	18.80	6.83	6,610	188.4	5.78	4.353
DGW-MW-11-PV5inlet-30-35-40	35% PV 5	1 - inlet	35	5	NS	01/04/19	NS	NS	NS	**2,300**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-11-PV5mid-35	35% PV 5	2 - mid	35	5	NS	01/04/19	NS	NS	NS	**1,880**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-11-PV5out-35	35% PV 5	3 - outlet	35	5	01/02/19	01/03/19	**231**	**5,140**	0.0600 U	**1,790**	**7,680**	**72.3**	5.00 U	**72.3**	19.20	7.42	8,152	167.4	5.53	5.336
DGW-MW-11-PV5inlet-30-35-40	40% PV 5	1 - inlet	40	5	NS	01/04/19	NS	NS	NS	**2,300**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-11-PV5mid-40	40% PV 5	2 - mid	40	5	NS	01/04/19	NS	NS	NS	**1,810**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-11-PV5out-40	40% PV 5	3 - outlet	40	5	01/02/19	01/03/19	**229**	**5,080**	0.300 U	**1,970**	**8,810**	**90.3**	5.00 U	**90.3**	19.09	7.60	8,715	162.1	5.32	5.712
DGW-MW-11-PV10inlet-control	Control PV 10	1 - inlet	0	10	NS	01/11/19	NS	NS	NS	**2,520**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-11-PV10mid-control	Control PV 10	2 - mid	0	10	NS	01/12/19	NS	NS	NS	**2,260**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-11-PV10out-control	Control PV 10	3 - outlet	0	10	NS	01/11/19	NS	NS	NS	**2,500**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-11-PV10inlet-30-35-40	30% PV 10	1 - inlet	30	10	NS	01/11/19	NS	NS	NS	**2,570**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-11-PV10inlet-30-35-40 (DUP)	30% PV 10	1 - inlet	30	10	NS	01/11/19	NS	NS	NS	**1,940**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-11-PV10mid-30	30% PV 10	2 - mid	30	10	NS	01/12/19	NS	NS	NS	**1,970**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-11-PV10out-30	30% PV 10	3 - outlet	30	10	NS	01/11/19	NS	NS	NS	**2,080**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-11-PV10inlet-30-35-40	35% PV 10	1 - inlet	35	10	NS	01/11/19	NS	NS	NS	**2,570**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-11-PV10inlet-30-35-40 (DUP)	35% PV 10	1 - inlet	35	10	NS	01/11/19	NS	NS	NS	**1,940**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-11-PV10mid-35	35% PV 10	2 - mid	35	10	NS	01/12/19	NS	NS	NS	**1,800**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-11-PV10out-35	35% PV 10	3 - outlet	35	10	NS	01/11/19	NS	NS	NS	**2,220**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-11-PV10inlet-30-35-40	40% PV 10	1 - inlet	40	10	NS	01/11/19	NS	NS	NS	**2,570**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-11-PV10inlet-30-35-40 (DUP)	40% PV 10	1 - inlet	40	10	NS	01/11/19	NS	NS	NS	**1,940**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-11-PV10mid-40	40% PV 10	2 - mid	40	10	NS	01/12/19	NS	NS	NS	**1,730**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-11-PV10out-40	40% PV 10	3 - outlet	40	10	NS	01/11/19	NS	NS	NS	**2,310**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-11-PV15inlet-control	Control PV 15	1 - inlet	0	15	NS	01/22/19	NS	NS	NS	**2,530**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-11-PV15mid-control	Control PV 15	2 - mid	0	15	NS	01/23/19	NS	NS	NS	**2,540**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-11-PV15out-control	Control PV 15	3 - outlet	0	15	NS	01/22/19	NS	NS	NS	**2,570**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-11-PV15inlet-30-35-40	30% PV 15	1 - inlet	30	15	NS	01/22/19	NS	NS	NS	**2,500**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-11-PV15mid-30	30% PV 15	2 - mid	30	15	NS	01/23/19	NS	NS	NS	**2,270**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-11-PV15out-30	30% PV 15	3 - outlet	30	15	NS	01/22/19	NS	NS	NS	**2,240**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-11-PV15inlet-30-35-40	35% PV 15	1 - inlet	35	15	NS	01/22/19	NS	NS	NS	**2,500**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-11-PV15mid-35	35% PV 15	2 - mid	35	15	NS	01/23/19	NS	NS	NS	**2,220**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-11-PV15out-35	35% PV 15	3 - outlet	35	15	NS	01/22/19	NS	NS	NS	**2,280**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-11-PV15inlet-30-35-40	40% PV 15	1 - inlet	40	15	NS	01/22/19	NS	NS	NS	**2,500**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-11-PV15mid-40	40% PV 15	2 - mid	40	15	NS	01/23/19	NS	NS	NS	**2,240**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-11-PV15out-40	40% PV 15	3 - outlet	40	15	NS	01/22/19	NS	NS	NS	**2,190**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV20inlet-control	Control PV 20	1 - inlet	0	20	NS	02/06/19	NS	NS	NS	**2,640**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV20mid-control	Control PV 20	2 - mid	0	20	NS	02/07/19	NS	NS	NS	**2,530**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-11-PV20out-control	Control PV 20	3 - outlet	0	20	02/04/19	02/06/19	**215**	**4,990**	0.0300 UJL	**2,670**	**8,280**	**303**	5.00 U	**303**	19.43	7.01	9,553	127.9	4.48	6.212
DGW-MW11-PV20inlet-30-35-40	30% PV 20	1 - inlet	30	20	NS	02/06/19	NS	NS	NS	**2,740**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV20mid-30	30% PV 20	2 - mid	30	20	NS	02/07/19	NS	NS	NS	**2,380**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-11-PV20out-30	30% PV 20	3 - outlet	30	20	02/04/19	02/06/19	**219**	**5,390**	0.0300 UJL	**2,270**	**7,920**	**70.4**	5.00 U	**70.4**	18.54	7.49	9,594	122.2	4.74	6.238
DGW-MW11-PV20inlet-30-35-40	35% PV 20	1 - inlet	35	20	NS	02/06/19	NS	NS	NS	**2,740**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV20mid-35	35% PV 20	2 - mid	35	20	NS	02/07/19	NS	NS	NS	**2,510**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV20out-35-DUP	35% PV 20	3 - outlet	35	20	NS	02/05/19	NS	NS	NS	**2,150**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-11-PV20out-35	35% PV 20	3 - outlet	35	20	02/04/19	02/06/19	**206**	**5,240**	0.0300 UJL	**2,250**	**7,760**	**63.8**	5.00 U	**63.8**	19.33	7.52	9,389	111.5	4.87	6.104
DGW-MW11-PV20inlet-30-35-40	40% PV 20	1 - inlet	40	20	NS	02/06/19	NS	NS	NS	**2,740**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV20mid-40	40% PV 20	2 - mid	40	20	NS	02/07/19	NS	NS	NS	**2,300**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-11-PV20out-40	40% PV 20	3 - outlet	40	20	02/04/19	02/06/19	**206**	**5,050**	0.0300 UJL	**2,160**	**7,740**	**57.9**	5.00 U	**57.9**	18.91	7.59	9,402	108.5	4.79	6.112

Table 2
DGW-MW-11 Column Study Analytical Results
Appendix 3.7 Permeable Reactive Barrier Column Studies Summary
Exide Frisco Recycling Center Response Action Plan

							Anions by E300.0			Hardness, Total as CaCO3 By SM2340B	Total Dissolved Solids by SM2540C	Alkalinity by SM2320B			Physical Chemistry Parameters					
							Chloride (mg/L)	Sulfate (mg/L)	Nitrate/Nitrite (as N) (mg/L)	Hardness (As CaCO3) (mg/L)	Total Dissolved Solids (Residue, Filterable) (mg/L)	Alkalinity, Bicarbonate (as $CaCO_3$) (mg/L)	Alkalinity, Carbonate (as $CaCO_3$) (mg/L)	Alkalinity, Total (as $CaCO_3$) (mg/L)	Temperature (ºC)	pH	Specific Conductivity (µS/cm)	Redox Potential (mV)	Dissolved Oxygen (ppm)	Total Dissolved Solids (g/L)
$^{GW}GW_{Ing}$ PCL[1]							--	--	--	--	--	--	--	--	--	--	--	--	--	--
^{SW} SW PCL (based on Tier 1 Contact Recreation Water PCL)							--	--	--	--	--	--	--	--	--	--	--	--	--	--
^{SW}SW PCL (based on chronic aquatic life criteria)							--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dilution Factor for Perennial Streams							--	--	--	--	--	--	--	--	--	--	--	--	--	--
^{SW}GW PCL (with dilution factor of 0.15, based on chronic aquatic life criteria)[2,4]							--	--	--	--	--	--	--	--	--	--	--	--	--	--
^{SW}GW PCL (with dilution factor of 0.15, based on contact recreation)[4]							--	--	--	--	--	--	--	--	--	--	--	--	--	--
Critical PCL[2]							See note 7	See note 7	See note 7	--	--	See note 7	See note 7	See note 7	--	--	--	--	--	--
MQL[5]							0.500	5.00	0.200	--	--	5.00	5.00	5.00	--	--	--	--	--	--
Sample	**Sample Column and Pore Volume**	**Sample Location**	**Column**	**PV**	**Date of Geochemistry Sample**	**Date of Metals Sample**	**Chloride (mg/L)**	**Sulfate (mg/L)**	**Nitrate/Nitrite (as N) (mg/L)**	**Hardness (As CaCO3) (mg/L)**	**Total Dissolved Solids (Residue, Filterable) (mg/L)**	**Alkalinity, Bicarbonate (as $CaCO_3$) (mg/L)**	**Alkalinity, Carbonate (as $CaCO_3$) (mg/L)**	**Alkalinity, Total (as $CaCO_3$) (mg/L)**	**Temperature (ºC)**	**pH**	**Specific Conductivity (µS/cm)**	**Redox Potential (mV)**	**Dissolved Oxygen (ppm)**	**Total Dissolved Solids (g/L)**
DGW-MW11-PV25inlet-control	Control PV 25	1 - inlet	0	25	NS	02/19/19	NS	NS	NS	**2,470**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV25mid-control	Control PV 25	2 - mid	0	25	NS	02/19/19	NS	NS	NS	**2,660**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV25out-control	Control PV 25	3 - outlet	0	25	NS	02/18/19	NS	NS	NS	**2,470**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV25inlet-30-35-40	30% PV 25	1 - inlet	30	25	NS	02/19/19	NS	NS	NS	**2,440**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV25mid-30	30% PV 25	2 - mid	30	25	NS	02/19/19	NS	NS	NS	**1,990**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV25out-30	30% PV 25	3 - outlet	30	25	NS	02/18/19	NS	NS	NS	**1,760**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV25inlet-30-35-40	35% PV 25	1 - inlet	35	25	NS	02/19/19	NS	NS	NS	**2,440**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV25mid-35	35% PV 25	2 - mid	35	25	NS	02/19/19	NS	NS	NS	**1,940**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV25out-35	35% PV 25	3 - outlet	35	25	NS	02/18/19	NS	NS	NS	**1,820**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV25inlet-30-35-40	40% PV 25	1 - inlet	40	25	NS	02/19/19	NS	NS	NS	**2,440**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV25mid-40	40% PV 25	2 - mid	40	25	NS	02/19/19	NS	NS	NS	**1,830**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV25out-40	40% PV 25	3 - outlet	40	25	NS	02/18/19	NS	NS	NS	**1,780**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV30inlet-control	Control PV 30	1 - inlet	0	30	NS	03/04/2019	NS	NS	NS	**2,320**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV30mid-control	Control PV 30	2 - mid	0	30	NS	03/05/2019	NS	NS	NS	**2,420**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV30out-control	Control PV 30	3 - outlet	0	30	NS	03/04/2019	NS	NS	NS	**2,420**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV30inlet-30-35-40	30% PV 30	1 - inlet	30	30	NS	03/04/2019	NS	NS	NS	**2,310**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV30mid-30	30% PV 30	2 - mid	30	30	NS	03/05/2019	NS	NS	NS	**2,200**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV30out-30	30% PV 30	3 - outlet	30	30	NS	03/04/2019	NS	NS	NS	**2,050**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV30out-30-DUP	30% PV 30	3 - outlet	30	30	NS	03/03/2019	NS	NS	NS	**1,910**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV30inlet-30-35-40	35% PV 30	1 - inlet	35	30	NS	03/04/2019	NS	NS	NS	**2,310**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV30mid-35	35% PV 30	2 - mid	35	30	NS	03/05/2019	NS	NS	NS	**2,090**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV30out-35	35% PV 30	3 - outlet	35	30	NS	03/04/2019	NS	NS	NS	**2,030**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV30inlet-30-35-40	40% PV 30	1 - inlet	40	30	NS	03/04/2019	NS	NS	NS	**2,310**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV30mid-40	40% PV 30	2 - mid	40	30	NS	03/05/2019	NS	NS	NS	**1,880**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV30out-40	40% PV 30	3 - outlet	40	30	NS	03/04/2019	NS	NS	NS	**1,900**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV35inlet-control	Control PV 35	1 - inlet	0	35	NS	03/14/2019	NS	NS	NS	**2,200**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV35mid-control	Control PV 35	2 - mid	0	35	NS	03/15/2019	NS	NS	NS	**2,230**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV35out-control	Control PV 35	3 - outlet	0	35	NS	03/14/2019	NS	NS	NS	**2,150**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV35inlet-30-35-40	30% PV 35	1 - inlet	30	35	NS	03/14/2019	NS	NS	NS	**2,230**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV35mid-30	30% PV 35	2 - mid	30	35	NS	03/15/2019	NS	NS	NS	**2,000**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV35out-30	30% PV 35	3 - outlet	30	35	NS	03/14/2019	NS	NS	NS	**1,790**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV35inlet-30-35-40	35% PV 35	1 - inlet	35	35	NS	03/14/2019	NS	NS	NS	**2,230**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV35mid-35	35% PV 35	2 - mid	35	35	NS	03/15/2019	NS	NS	NS	**1,950**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV35out-35	35% PV 35	3 - outlet	35	35	NS	03/14/2019	NS	NS	NS	**1,780**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV35inlet-30-35-40	40% PV 35	1 - inlet	40	35	NS	03/14/2019	NS	NS	NS	**2,230**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV35mid-40	40% PV 35	2 - mid	40	35	NS	03/15/2019	NS	NS	NS	**1,790**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV35out-40	40% PV 35	3 - outlet	40	35	NS	03/14/2019	NS	NS	NS	**1,710**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV40inlet-control	Control PV 40	1 - inlet	0	40	NS	03/27/2019	NS	NS	NS	**2,340**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV40inlet-control-DUP	Control PV 40	1 - inlet	0	40	NS	03/27/2019	NS	NS	NS	**2,480**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV40mid-control	Control PV 40	2 - mid	0	40	NS	03/27/2019	NS	NS	NS	**2,480**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV40out-control	Control PV 40	3 - outlet	0	40	03/25/2019	03/26/2019	**230**	**5,010**	3.00 UJL	**2,290**	**8,080**	**566**	5.00 U	**566**	19.74	7.98	8,337	-11.6	5.07	5.407
DGW-MW11-PV40inlet-30-35-40	30% PV 40	1 - inlet	30	40	NS	03/27/2019	NS	NS	NS	**2,360**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV40mid-30	30% PV 40	2 - mid	30	40	NS	03/27/2019	NS	NS	NS	**2,370**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV40out-30	30% PV 40	3 - outlet	30	40	03/25/2019	03/26/2019	**230**	**5,210**	0.150 UJL	**1,920**	**7,240**	**77.2**	5.00 U	**77.2**	19.42	8.48	8,018	-27.9	4.72	5.211
DGW-MW11-PV40inlet-30-35-40	35% PV 40	1 - inlet	35	40	NS	03/27/2019	NS	NS	NS	**2,360**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV40mid-35	35% PV 40	2 - mid	35	40	NS	03/27/2019	NS	NS	NS	**2,210**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV40out-35	35% PV 40	3 - outlet	35	40	03/25/2019	03/26/2019	**227**	**4,990**	0.150 UJL	**1,960**	**7,310**	**68.9**	5.00 U	**68.9**	19.74	8.36	8,142	-30.9	5.46	5.293
DGW-MW11-PV40inlet-30-35-40	40% PV 40	1 - inlet	40	40	NS	03/27/2019	NS	NS	NS	**2,360**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV40mid-40	40% PV 40	2 - mid	40	40	NS	03/27/2019	NS	NS	NS	**2,030**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW11-PV40out-40	40% PV 40	3 - outlet	40	40	03/25/2019	03/26/2019	**215**	**5,110**	0.150 UJL	**1,880**	**4,430**	**66.0**	5.00 U	**66.0**	19.65	8.35	8,055	-37.3	5.37	5.234

							ICP-MS Total and Dissolved Metals by EPA Method SW6020A										ICP-MS Total and Dissolved Metals by EPA Method SW6020A									
							Total Arsenic (mg/L)	Dissolved Arsenic (mg/L)	Total Antimony (mg/L)	Dissolved Antimony (mg/L)	Total Cadmium (mg/L)	Dissolved Cadmium (mg/L)	Total Lead (mg/L)	Dissolved Lead (mg/L)	Total Selenium (mg/L)	Dissolved Selenium (mg/L)	Total Calcium (mg/L)	Dissolved Calcium (mg/L)	Total Iron (mg/L)	Dissolved Iron (mg/L)	Total Magnesium (mg/L)	Dissolved Magnesium (mg/L)	Total Potassium (mg/L)	Dissolved Potassium (mg/L)	Total Sodium (mg/L)	Dissolved Sodium (mg/L)
[GW]GW_{Ing} PCL[1]							0.01	0.01	0.006	0.006	0.005	0.005	0.015	0.015	0.05	0.05	--	--	--	--	--	--	--	--	--	--
[SW] SW PCL (based on Tier 1 Contact Recreation Water PCL)							0.0285	0.0285	0.199	0.199	0.149	0.149	0.015	0.015	4.13	4.13	--	--	--	--	--	--	--	--	--	--
[SW]SW PCL (based on chronic aquatic life criteria)							--	0.15	2.2	--	--	0.000256	--	0.00268	0.005	--	--	--	--	--	--	--	--	--	--	--
Dilution Factor for Perennial Streams							0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	--	--	--	--	--	--	--	--	--	--
[SW]GW PCL (with dilution factor of 0.15, based on chronic aquatic life criteria)[2,4]							--	1.00	14.7	--	--	0.0017	--	0.0179	0.0333	--	--	--	--	--	--	--	--	--	--	--
[SW]GW PCL (with dilution factor of 0.15, based on contact recreation)[4]							0.19	0.19	1.33	1.33	0.99	0.99	0.10	0.10	27.5	27.5	--	--	--	--	--	--	--	--	--	--
Critical PCL[2]							0.01	0.01	0.006	0.006	0.005	0.0017	0.015	0.015	0.0333	0.050	--	--	--	--	--	--	--	--	--	--
MQL[5]							0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	--	--	--	--	--	--	--	--	--	--
Sample	**Sample Column and Pore Volume**	**Sample Location**	**Column**	**PV**	**Date of Geochemistry Sample**	**Date of Metals Sample**	**Total Arsenic (mg/L)**	**Dissolved Arsenic (mg/L)**	**Total Antimony (mg/L)**	**Dissolved Antimony (mg/L)**	**Total Cadmium (mg/L)**	**Dissolved Cadmium (mg/L)**	**Total Lead (mg/L)**	**Dissolved Lead (mg/L)**	**Total Selenium (mg/L)**	**Dissolved Selenium (mg/L)**	**Total Calcium (mg/L)**	**Dissolved Calcium (mg/L)**	**Total Iron (mg/L)**	**Dissolved Iron (mg/L)**	**Total Magnesium (mg/L)**	**Dissolved Magnesium (mg/L)**	**Total Potassium (mg/L)**	**Dissolved Potassium (mg/L)**	**Total Sodium (mg/L)**	**Dissolved Sodium (mg/L)**
DGW-MW-3 (Field)	Field		-1	0	11/05/18	11/05/18	**0.158**	**0.145**	0.000400 U	**0.00218**	**0.000216 J**	0.000200 U	**0.000912 J**	**0.000829 J**	**0.00330**	**0.00123 J**	**112**	**114**	**17.9**	**18.2**	**21.2**	**20.8**	**2.29**	**2.39**	**184**	**185**
DGW-MW3-T02-Control	Control Start 2	1 - inlet	0	0	NS	03/15/2019	**0.0853**	**0.0418**	0.000400 U	0.000487 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**113**	**120**	**7.72**	**3.17**	**14.1**	**14.8**	**1.53**	**1.54**	**177**	**172**
DGW-MW-3-T0-Control	Control Start	1- inlet	0	0	11/27/18	11/27/18	**0.0471**	**0.0284**	**0.000525 J**	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	**0.00170 J**	**111**	**108**	**6.19**	**2.92**	**20.5**	**20.2**	**1.98**	**1.75**	**188**	**196**
DGW-MW3-T02-30-35-40	30% PV 40	1 - inlet	30	0	NS	03/15/2019	**0.0768**	**0.0390**	0.000400 U	0.000432 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**109**	**118**	**7.07**	**3.04**	**14.0**	**14.9**	**1.47**	**1.48**	**176**	**168**
DGW-MW-3-T0-30-35-40	30% PV 0	1 - inlet	30	0	11/27/18	11/27/18	**0.0474**	**0.0370**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	**0.00265**	**115**	**108**	**6.24**	**3.41**	**21.6**	**23.2**	**2.10**	**2.27**	**194**	**190**
DGW-MW-3-T0-30-35-40	35% PV 0	1 - inlet	35	0	11/27/18	11/27/18	**0.0474**	**0.0370**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	**0.00265**	**115**	**108**	**6.24**	**3.41**	**21.6**	**23.2**	**2.10**	**2.27**	**194**	**190**
DGW-MW-3-T0-30-35-40	40% PV 0	1 - inlet	40	0	11/27/18	11/27/18	**0.0474**	**0.0370**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	**0.00265**	**115**	**108**	**6.24**	**3.41**	**21.6**	**23.2**	**2.10**	**2.27**	**194**	**190**
DGW-MW-3-PV5inlet-Control	Control PV 5	1 - inlet	0	5	NS	12/14/18	**0.0230**	**0.0114**	**0.000616 J**	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	**0.00168 J**	**113**	**115**	**2.01**	**0.0201 J**	**21.0**	**20.3**	**2.11**	**1.91**	**199**	**221**
DGW-MW-3-PV5mid-Control	Control PV 5	2 - mid	0	5	NS	12/14/18	**0.00240**	**0.00180 J**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00228 U	**114**	**114**	**0.104 J**	0.0155 U	**20.7**	**20.7**	**2.16**	**2.02**	**203**	**208**
DGW-MW-3-PV5out-Control	Control PV 5	3 - outlet	0	5	12/10/18	12/11/18	**0.00266**	**0.00213**	0.000400 U	**0.000409 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00160 U	**108**	**102**	**0.110 J**	0.0120 U	**21.0**	**18.6**	**2.30**	**2.01**	**200**	**170**
DGW-MW-3-PV5inlet-30-35-40	30% PV 5	1 - inlet	30	5	NS	12/14/18	**0.0828**	**0.0128**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	**0.00153 J**	**113**	**106**	**13.1**	0.0120 U	**20.5**	**19.0**	**1.96**	**1.81**	**201**	**174**
DGW-MW-3-PV5mid-30	30% PV 5	2 - mid	30	5	NS	12/14/18	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00154 U	**16.5**	**13.9**	**0.774**	0.0120 U	**17.3**	**16.2**	**2.10**	**1.91**	**196**	**179**
DGW-MW-3-PV5out-30	30% PV 5	3 - outlet	30	5	12/10/18	12/11/18	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00128 U	**11.3**	**9.94**	**0.0801 J**	**0.0924**	**14.1**	**13.9**	**2.23**	**2.11**	**194**	**210**
DGW-MW-3-PV5inlet-30-35-40	35% PV 5	1 - inlet	35	5	NS	12/14/18	**0.0828**	**0.0128**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	**0.00153 J**	**113**	**106**	**13.1**	0.0120 U	**20.5**	**19.0**	**1.96**	**1.81**	**201**	**174**
DGW-MW-3-PV5mid-35	35% PV 5	2 - mid	35	5	NS	12/14/18	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00131 U	**16.2**	**14.2**	**0.505**	0.0146 U	**17.4**	**17.0**	**2.10**	**1.95**	**201**	**212**
DGW-MW-3-PV5out-35	35% PV 5	3 - outlet	35	5	12/10/18	12/11/18	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**7.69**	**6.80**	0.0120 U	0.0120 U	**13.2**	**12.9**	**2.35**	**2.12**	**195**	**209**
DGW-MW-3-PV5inlet-30-35-40	40% PV 5	1 - inlet	40	5	NS	12/14/18	**0.0828**	**0.0128**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	**0.00153 J**	**113**	**106**	**13.1**	0.0120 U	**20.5**	**19.0**	**1.96**	**1.81**	**201**	**174**
DGW-MW-3-PV5mid-40	40% PV 5	2 - mid	40	5	NS	12/14/18	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00111 U	**14.4**	**11.4**	**0.583**	0.0120 U	**16.8**	**15.2**	**2.10**	**1.88**	**199**	**173**
DGW-MW-3-PV5out-40	40% PV 5	3 - outlet	40	5	12/10/18	12/11/18	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00111 U	**1.81**	**1.72**	0.0120 U	0.0126 U	**11.9**	**11.9**	**2.21**	**2.10**	**196**	**194**
DGW-MW-3-PV10inlet-Control	Control PV 10	1 - inlet	0	10	NS	12/20/18	**0.0543**	**0.00659**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	**0.00131 J**	**108**	**111**	**7.82**	**0.0207 J**	**21.3**	**20.2**	**2.18**	**2.16**	**208**	**190**
DGW-MW-3-PV10mid-Control	Control PV 10	2 - mid	0	10	NS	12/21/18	**0.00287**	**0.00257**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00147 J**	**0.00132 J**	**104**	**115**	**0.167 J**	**0.0270 J**	**20.0**	**21.1**	**1.88**	**2.10**	**202**	**184**
DGW-MW-3-PV10out-Control	Control PV 10	3 - outlet	0	10	NS	12/20/18	**0.00210**	**0.00184 J**	0.000550 U	0.000427 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	**0.00116 J**	**107**	**116**	**0.114 J**	**0.0461 J**	**21.2**	**20.9**	**2.11**	**2.17**	**207**	**198**
DGW-MW-3-PV10inlet-30-35-40	30% PV 10	1 - inlet	30	10	NS	12/20/18	**0.0170**	**0.0125**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00186 J**	0.00110 U	**110**	**126**	**0.905**	**0.0191 J**	**22.7**	**23.6**	**2.47**	**2.58**	**208**	**176**
DGW-MW-3-PV10mid-30	30% PV 10	2 - mid	30	10	NS	12/21/18	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00111 J**	0.00110 U	**14.2**	**17.0**	**0.213**	0.0120 U	**18.3**	**18.3**	**2.31**	**2.39**	**207**	**173**
DGW-MW-3-PV10out-30	30% PV 10	3 - outlet	30	10	NS	12/20/18	0.000400 U	0.000400 U	0.00306 U	0.000491 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**10.1**	**11.9**	0.0371 U	0.0120 U	**17.3**	**16.6**	**2.40**	**2.30**	**207**	**190**
DGW-MW-3-PV10inlet-30-35-40	35% PV 10	1 - inlet	35	10	NS	12/20/18	**0.0170**	**0.0125**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00186 J**	0.00110 U	**110**	**126**	**0.905**	**0.0191 J**	**22.7**	**23.6**	**2.47**	**2.58**	**208**	**176**
DGW-MW-3-PV10mid-35	35% PV 10	2 - mid	35	10	NS	12/21/18	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**14.7**	**16.8**	**0.503**	0.0120 U	**18.4**	**18.0**	**2.33**	**2.20**	**213**	**195**
DGW-MW-3-PV10out-35	35% PV 10	3 - outlet	35	10	NS	12/20/18	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**9.44**	**12.3**	0.0245 U	0.0120 U	**15.3**	**16.1**	**2.29**	**2.36**	**207**	**196**
DGW-MW-3-PV10inlet-30-35-40	40% PV 10	1 - inlet	40	10	NS	12/20/18	**0.0170**	**0.0125**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00186 J**	0.00110 U	**110**	**126**	**0.905**	**0.0191 J**	**22.7**	**23.6**	**2.47**	**2.58**	**208**	**176**
DGW-MW-3-PV10mid-40	40% PV 10	2 - mid	40	10	NS	12/21/18	**0.000402 J**	0.000400 U	0.000553 U	0.000626 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**13.5**	**16.4**	**2.16**	0.0120 U	**17.9**	**18.4**	**2.58**	**2.74**	**210**	**198**
DGW-MW-3-PV10out-40	40% PV 10	3 - outlet	40	10	NS	12/20/18	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**9.03**	**10.9**	0.0237 U	0.0120 U	**15.0**	**15.5**	**2.34**	**2.33**	**202**	**190**
DGW-MW-3-PV15inlet-Control	Control PV 15	1 - inlet	0	15	NS	01/04/19	**0.0134**	**0.00873**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00149 J**	0.00110 U	**108**	**111**	**0.550**	**0.0228 J**	**20.1**	**20.5**	**2.86**	**2.78**	**198**	**188**
DGW-MW-3-PV15mid-Control	Control PV 15	2 - mid	0	15	NS	01/04/19	**0.00471**	**0.00372**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00132 J**	0.00110 U	**106**	**117**	**0.182 J**	**0.0141 J**	**20.7**	**21.8**	**1.97**	**2.16**	**207**	**205**
DGW-MW-3-PV15out-Control	Control PV 15	3 - outlet	0	15	NS	01/03/19	**0.00177 J**	**0.00123 J**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**107**	**117**	**0.146 J**	0.0120 U	**20.2**	**21.6**	**2.01**	**2.10**	**205**	**193**
DGW-MW-3-PV15out-Control (DUP)	Control PV 10	3 - outlet	0	15	NS	01/02/19	**0.00170 J**	NS	0.000400 U	NS	0.000200 U	NS	0.000600 U	NS	0.00110 U	NS	**114**	NS	**0.0977 J**	NS	**21.3**	NS	**2.11**	NS	**194**	NS
DGW-MW-3-PV15inlet-30-35-40	30% PV 15	1 - inlet	30	15	NS	01/04/19	**0.0182**	**0.0142**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**105**	**108**	**0.597**	**0.0209 J**	**19.6**	**19.6**	**2.13**	**2.22**	**202**	**193**
DGW-MW-3-PV15mid-30	30% PV 15	2 - mid	30	15	NS	01/04/19	0.000400 U	0.000400 U	**0.00114 J**	0.00106 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**10.3**	**13.5**	**0.0909 J**	0.0120 U	**16.1**	**18.1**	**1.90**	**2.24**	**203**	**209**
DGW-MW-3-PV15out-30 (DUP)	30% PV 15	3 - outlet	30	15	NS	01/02/19	0.000400 U	NS	0.000400 U	NS	0.000200 U	NS	0.000600 U	NS	0.00110 U	NS	**9.08**	NS	**0.0470 J**	NS	**15.3**	NS	**2.13**	NS	**168**	NS
DGW-MW-3-PV15out-30	30% PV 15	3 - outlet	30	15	NS	01/03/19	0.000400 U	0.000400 U	0.000400 U	0.000418 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**7.05**	**8.38**	**0.108 J**	0.0120 U	**14.3**	**14.6**	**1.88**	**1.99**	**204**	**173**
DGW-MW-3-PV15inlet-30-35-40	35% PV 15	1 - inlet	35	15	NS	01/04/19	**0.0182**	**0.0142**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**105**	**108**	**0.597**	**0.0209 J**	**19.6**	**19.6**	**2.13**	**2.22**	**202**	**193**
DGW-MW-3-PV15mid-35	35% PV 15	2 - mid	35	15	NS	01/04/19	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**9.46**	**11.8**	**0.449**	0.0120 U	**15.1**	**15.9**	**1.87**	**2.01**	**177**	**175**
DGW-MW-3-PV15out-35 (DUP)	35% PV 10	3 - outlet	35	15	NS	01/02/19	0.000400 U	NS	0.000400 U	NS	0.000200 U	NS	0.000600 U	NS	0.00110 U	NS	**7.80**	NS	**0.0222 J**	NS	**12.3**	NS	**2.07**	NS	**176**	NS
DGW-MW-3-PV15out-35	35% PV 15	3 - outlet	35	15	NS	01/03/19	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**5.99**	**7.05**	0.0503 U	0.0120 U	**11.3**	**11.6**	**1.84**	**1.92**	**200**	**189**
DGW-MW-3-PV15inlet-30-35-40	40% PV 15	1 - inlet	40	15	NS	01/04/19	**0.0182**	**0.0142**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**105**	**108**	**0.597**	**0.0209 J**	**19.6**	**19.6**	**2.13**	**2.22**	**202**	**193**
DGW-MW-3-PV15mid-40	40% PV 15	2 - mid	40	15	NS	01/04/19	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**9.00**	**11.2**	**0.748**	0.0120 U	**15.0**	**15.8**	**1.84**	**2.01**	**179**	**198**
DGW-MW-3-PV15out-40 (DUP)	40% PV 15	3 - outlet	40	15	NS	01/02/19	0.000400 U	NS	0.000400 U	NS	0.000200 U	NS	0.000600 U	NS	0.00110 U	NS	**8.25**	NS	0.0120 U	NS	**13.0**	NS	**2.02**	NS	**192**	NS
DGW-MW-3-PV15out-40	40% PV 15	3 - outlet	40	15	NS	01/03/19	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**6.89**	**7.87**	0.0214 U	0.0120 U	**12.8**	**12.4**	**1.89**	**1.95**	**205**	**180**
DGW-MW-3-PV20inlet-Control	Control PV 20	1 - inlet	0	20	NS	01/17/19	**0.0172**	**0.00837 J**	0.000400 U	0.00200 U	0.000200 U	0.00100 U	0.000600 U	0.003000 U	0.00110 U	0.00550 U	**104**	**97.3**	**1.12**	0.0600 U	**18.6**	**18.0**	**1.85**	**2.16**	**179**	**164**
DGW-MW-3-PV20mid-Control	Control PV 20	2 - mid	0	20	NS	01/16/19	**0.00447**	**0.00402**	0.000400 U	0.000701 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**90.1**	**101**	**0.138 J**	**0.0136 J**	**16.4**	**19.6**	**2.03**	**2.18**	**158**	**181**
DGW-MW-3-PV20out-Control	Control PV 20	3 - outlet	0	20	01/14/19	01/15/19	0.000993 U	**0.00224 J**	0.000400 U	0.00200 U	0.000200 U	0.00100 U	0.000600 U	0.003000 U	0.00110 U	0.00550 U	**92.2**	**100**	**0.111 J**	0.0600 U	**17.6**	**18.5**	**1.99**	**2.29**	**168**	**168**
DGW-MW-3-PV20inlet-30-35-40	30% PV 20	1 - inlet	30	20	NS	01/17/19	**0.0167**	**0.00704**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**100**	**119**	**1.21**	**0.0223 J**	**18.4**	**21.2**	**1.83**	**1.96**	**177**	**238**
DGW-MW-3-PV20mid-30	30% PV 20	2 - mid	30	20	NS	01/17/19	0.000400 U	**0.000511 J**	0.000400 U	0.000437 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**9.12**	**9.59**	**0.0266 J**	0.0120 U	**14.5**	**16.2**	**2.00**	**2.35**	**181**	**198**
DGW-MW-3-PV20out-30	30% PV 20	3 - outlet	30	20	01/14/19	01/15/19	0.000400 U	0.00200 U	0.000400 U	0.00200 U	0.000200 U	0.00100 U	0.000600 U	0.003000 U	0.00110 U	0.00550 U	**6.61**	**7.40**	**0.310**	0.0600 U	**13.7**	**17.2**	**2.03**	**2.18**	**181**	**171**
DGW-MW-3-PV20inlet-30-35-40	35% PV 20	1 - inlet	35	20	NS	01/17/19	**0.0167**	**0.00704**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**100**	**119**	**1.21**	**0.0223 J**	**18.4**	**21.2**	**1.83**	**1.96**	**177**	**238**
DGW-MW-3-PV20mid-35 (DUP)	35% PV 20	2 - mid	35	20	NS	01/18/19	0.000400 U	**0.000463 J**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**9.14**	**8.88**	**0.193 J**	0.0120 U	**13.6**	**15.2**	**2.00**	**2.12**	**182**	**190**
DGW-MW-3-PV20mid-35	35% PV 20	2 - mid	35	20	NS	01/17/19	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**9.11**	**9.00**	**0.448**	0.0120 U	**13.9**	**14.5**	**1.89**	**2.11**	**180**	**182**
DGW-MW-3-PV20out-35	35% PV 20	3 - outlet	35	20	01/14/19	01/15/19	0.000400 U	0.00200 U	0.000400 U	0.00200 U	0.000200 U	0.00100 U	0.000600 U	0.003000 U	0.00110 U	0.00550 U	**6.18**	**6.26**	0.0120 U	0.0600 U	**10.5**	**14.0**	**1.99**	**2.09**	**167**	**172**
DGW-MW-3-PV20inlet-30-35-40	40% PV 20	1 - inlet	40	20	NS	01/17/19	**0.0167**	**0.00704**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**100**	**119**	**1.21**	**0.0223 J**	**18.4**	**21.2**	**1.83**	**1.96**	**177**	**238**

Table 3
DGW-MW-3 Column Study Analytical Results
Appendix 3.7 Permeable Reactive Barrier Column Studies Summary
Exide Frisco Recycling Center Response Action Plan

							ICP-MS Total and Dissolved Metals by EPA Method SW6020A										ICP-MS Total and Dissolved Metals by EPA Method SW6020A									
							Total Arsenic (mg/L)	Dissolved Arsenic (mg/L)	Total Antimony (mg/L)	Dissolved Antimony (mg/L)	Total Cadmium (mg/L)	Dissolved Cadmium (mg/L)	Total Lead (mg/L)	Dissolved Lead (mg/L)	Total Selenium (mg/L)	Dissolved Selenium (mg/L)	Total Calcium (mg/L)	Dissolved Calcium (mg/L)	Total Iron (mg/L)	Dissolved Iron (mg/L)	Total Magnesium (mg/L)	Dissolved Magnesium (mg/L)	Total Potassium (mg/L)	Dissolved Potassium (mg/L)	Total Sodium (mg/L)	Dissolved Sodium (mg/L)
[GW]GW_{hq} PCL[1]							0.01	0.01	0.006	0.006	0.005	0.005	0.015	0.015	0.05	0.05	--	--	--	--	--	--	--	--	--	--
[SW] SW PCL (based on Tier 1 Contact Recreation Water PCL)							0.0285	0.0285	0.199	0.199	0.149	0.149	0.015	0.015	4.13	4.13	--	--	--	--	--	--	--	--	--	--
[SW]SW PCL (based on chronic aquatic life criteria)							--	0.15	2.2	--	--	0.000256	--	0.00268	0.005	--	--	--	--	--	--	--	--	--	--	--
Dilution Factor for Perennial Streams							0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	--	--	--	--	--	--	--	--	--	--
[SW]GW PCL (with dilution factor of 0.15, based on chronic aquatic life criteria)[2,4]							--	1.00	14.7	--	--	0.0017	--	0.0179	0.0333	--	--	--	--	--	--	--	--	--	--	--
[SW]GW PCL (with dilution factor of 0.15, based on contact recreation)[4]							0.19	0.19	1.33	1.33	0.99	0.99	0.10	0.10	27.5	27.5	--	--	--	--	--	--	--	--	--	--
Critical PCL[2]							0.01	0.01	0.006	0.006	0.005	0.0017	0.015	0.015	0.0333	0.050	--	--	--	--	--	--	--	--	--	--
MQL[5]							0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	--	--	--	--	--	--	--	--	--	--
Sample	**Sample Column and Pore Volume**	**Sample Location**	**Column**	**PV**	**Date of Geochemistry Sample**	**Date of Metals Sample**	**Total Arsenic (mg/L)**	**Dissolved Arsenic (mg/L)**	**Total Antimony (mg/L)**	**Dissolved Antimony (mg/L)**	**Total Cadmium (mg/L)**	**Dissolved Cadmium (mg/L)**	**Total Lead (mg/L)**	**Dissolved Lead (mg/L)**	**Total Selenium (mg/L)**	**Dissolved Selenium (mg/L)**	**Total Calcium (mg/L)**	**Dissolved Calcium (mg/L)**	**Total Iron (mg/L)**	**Dissolved Iron (mg/L)**	**Total Magnesium (mg/L)**	**Dissolved Magnesium (mg/L)**	**Total Potassium (mg/L)**	**Dissolved Potassium (mg/L)**	**Total Sodium (mg/L)**	**Dissolved Sodium (mg/L)**
DGW-MW-3-PV20mid-40	40% PV 20	2 - mid	40	20	NS	01/19/19	0.000400 U	**0.000563 J**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**8.54**	**8.74**	**0.363**	0.0120 U	**13.8**	**15.4**	**1.95**	**2.18**	**186**	**198**
DGW-MW-3-PV20out-40	40% PV 20	3 - outlet	40	20	01/14/19	01/15/19	0.000400 U	0.00200 U	0.000400 U	0.00200 U	0.000200 U	0.00100 U	0.000600 U	0.003000 U	0.00110 U	0.00550 U	**5.88**	**5.94**	0.0120 U	0.0600 U	**10.9**	**13.8**	**2.07**	**2.06**	**174**	**148**
DGW-MW-3-PV25inlet-control	Control PV 25	1 - inlet	0	25	NS	01/29/19	**0.0153**	**0.009080**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00115 J**	0.00110 U	**119**	**115**	**0.588**	**0.0188 J**	**20.0**	**21.4**	**1.99**	**2.04**	**193**	**191**
DGW-MW-3-PV25mid-control	Control PV 25	2 - mid	0	25	NS	01/30/19	**0.00539**	**0.00462**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00184 J**	0.00110 U	**120**	**121**	**0.141 J**	0.0120 U	**20.7**	**22.1**	**2.05**	**2.12**	**188**	**190**
DGW-MW-3-PV25out-control	Control PV 25	3 - outlet	0	25	NS	01/29/19	**0.00210**	**0.00149 J**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00118 J**	0.00110 U	**122**	**109**	**0.0843 J**	0.0120 U	**20.8**	**22.1**	**2.16**	**2.15**	**201**	**194**
DGW-MW-3-PV25inlet-30-35-40	30% PV 25	1 - inlet	30	25	NS	01/29/19	**0.0159**	**0.0125**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00143 J**	0.00110 U	**118**	**120**	**0.373**	**0.0215 J**	**20.3**	**22.0**	**2.05**	**2.13**	**193**	**189**
DGW-MW-3-PV25mid-30	30% PV 25	2 - mid	30	25	NS	01/30/19	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00223**	0.00110 U	**9.55**	**9.60**	**0.0411 J**	0.0120 U	**16.4**	**17.6**	**2.09**	**2.34**	**205**	**199**
DGW-MW-3-PV25out-30	30% PV 25	3 - outlet	30	25	NS	01/29/19	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00113 J**	0.00110 U	**7.25**	**7.25**	**0.0797 J**	0.0120 U	**15.1**	**15.5**	**2.12**	**2.25**	**204**	**199**
DGW-MW-3-PV25inlet-30-35-40	35% PV 25	1 - inlet	35	25	NS	01/29/19	**0.0159**	**0.0125**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00143 J**	0.00110 U	**118**	**120**	**0.373**	**0.0215 J**	**20.3**	**22.0**	**2.05**	**2.13**	**193**	**189**
DGW-MW-3-PV25mid-35	35% PV 25	2 - mid	35	25	NS	01/30/19	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**9.93**	**9.14**	**0.365**	0.0120 U	**16**	**15.9**	**2.14**	**2.09**	**209**	**196**
DGW-MW-3-PV25out-35	35% PV 25	3 - outlet	35	25	NS	01/29/19	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00154 J**	0.00110 U	**6.39**	**6.37**	0.0120 U	0.0120 U	**11.5**	**12.2**	**2.09**	**2.26**	**198**	**180**
DGW-MW-3-PV25inlet-30-35-40	40% PV 25	1 - inlet	40	25	NS	01/29/19	**0.0159**	**0.0125**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00143 J**	0.00110 U	**118**	**120**	**0.373**	**0.0215 J**	**20.3**	**22.0**	**2.05**	**2.13**	**193**	**189**
DGW-MW-3-PV25mid-40	40% PV 25	2 - mid	40	25	NS	01/30/19	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**8.73**	**7.90**	**0.542**	0.0120 U	**15.3**	**14.8**	**2.18**	**2.09**	**194**	**205**
DGW-MW-3-PV25out-40	40% PV 25	3 - outlet	40	25	NS	01/29/19	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**6.10**	**5.99**	0.0120 U	0.0120 U	**11.5**	**11.8**	**2.11**	**2.20**	**191**	**184**
DGW-MW3-PV30inlet-control	Control PV 30	1 - inlet	0	30	NS	02/08/2019	**0.0167**	**0.0107**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**117**	**105**	**0.763**	**0.0244 J**	**22.2**	**21.9**	**2.18**	**2.13**	**206**	**207**
DGW-MW3-PV30inlet-control-DUP	Control PV 30	1 - inlet	0	30	NS	02/08/2019	**0.0162**	**0.0107**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**119**	**107**	**0.795**	**0.0225 J**	**22.3**	**22.6**	**2.13**	**2.18**	**206**	**211**
DGW-MW3-PV30mid-control	Control PV 30	2 - mid	0	30	NS	02/10/2019	**0.0107**	**0.00964**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**113**	**102**	**0.238**	0.0120 U	**22.5**	**21.4**	**2.22**	**2.17**	**208**	**212**
DGW-MW3-PV30out-control	Control PV 30	3 - outlet	0	30	NS	02/08/2019	**0.00228**	**0.00196 J**	0.00228 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00110 J**	0.00110 U	**119**	**110**	**0.130 J**	0.0120 U	**23.0**	**21.4**	**2.26**	**2.16**	**206**	**212**
DGW-MW3-PV30inlet-30-35-40	30 % PV 30	1 - inlet	30	30	NS	02/08/2019	**0.0250**	**0.0159**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**120**	**106**	**1.30**	**0.0199 J**	**22.8**	**21.3**	**2.18**	**2.05**	**213**	**208**
DGW-MW3-PV30mid-30	30% PV 30	2 - mid	30	30	NS	02/10/2019	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**6.87**	**6.39**	**0.114 J**	0.0120 U	**11.2**	**11.0**	**2.02**	**1.90**	**204**	**208**
DGW-MW3-PV30out-30	30% PV 30	3 - outlet	30	30	NS	02/08/2019	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**7.18**	**6.96**	**0.454**	0.0120 U	**14.9**	**15.1**	**2.32**	**2.24**	**216**	**218**
DGW-MW3-PV30inlet-30-35-40	35 % PV 30	1 - inlet	35	30	NS	02/08/2019	**0.0250**	**0.0159**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**120**	**106**	**1.30**	**0.0199 J**	**22.8**	**21.3**	**2.18**	**2.05**	**213**	**208**
DGW-MW3-PV30mid-35	35% PV 30	2 - mid	35	30	NS	02/10/2019	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	**0.000776 J**	0.00110 U	0.00110 U	**7.25**	**6.95**	**0.217**	0.0120 U	**10.2**	**10.1**	**1.95**	**1.91**	**200**	**209**
DGW-MW3-PV30out-35	35% PV 30	3 - outlet	35	30	NS	02/08/2019	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**6.65**	**6.19**	**0.124 J**	0.0120 U	**11.8**	**11.5**	**2.32**	**2.25**	**213**	**215**
DGW-MW3-PV30inlet-30-35-40	40 % PV 30	1 - inlet	40	30	NS	02/08/2019	**0.0250**	**0.0159**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**120**	**106**	**1.30**	**0.0199 J**	**22.8**	**21.3**	**2.18**	**2.05**	**213**	**208**
DGW-MW3-PV30mid-40	40% PV 30	2 - mid	40	30	NS	02/10/2019	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**6.89**	**6.34**	**0.694**	0.0120 U	**10.7**	**10.5**	**2.04**	**1.97**	**212**	**209**
DGW-MW3-PV30out-40	40% PV 30	3 - outlet	40	30	NS	02/08/2019	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**6.09**	**5.76**	**0.136 J**	0.0120 U	**11.0**	**11.0**	**2.39**	**2.26**	**217**	**207**
DGW-MW3-PV35inlet-control	Control PV 35	1 - inlet	0	35	NS	02/25/2019	**0.0166**	**0.00773**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00118 J**	0.00110 U	**116**	**121**	**1.22**	**0.153 J**	**21.9**	**21.7**	**2.06**	**2.14**	**186**	**196**
DGW-MW3-PV35mid-control	Control PV 35	2 - mid	0	35	NS	02/26/2019	**0.00611**	**0.00531**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00112 J**	0.00110 U	**110**	**116**	0.220 U	**0.0841 J**	**21.0**	**21.5**	**2.01**	**2.11**	**195**	**205**
DGW-MW3-PV35out-control	Control PV 35	3 - outlet	0	35	NS	02/25/2019	**0.00511**	**0.00484**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00111 J**	**0.00127 J**	**106**	**113**	**0.130 J**	0.0677 U	**22.4**	**21.2**	**2.18**	**2.07**	**191**	**198**
DGW-MW3-PV35inlet-30-35-40	30% PV 35	1 - inlet	30	35	NS	02/25/2019	**0.0140**	**0.00892**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00116 J**	**0.00119 J**	**113**	**120**	**0.584**	0.0766 U	**21.1**	**21.4**	**1.98**	**2.05**	**188**	**191**
DGW-MW3-PV35mid-30	30% PV 35	2 - mid	30	35	NS	02/26/2019	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**8.16**	**8.69**	0.173 U	**0.0865 J**	**15.1**	**15.8**	**2.04**	**2.16**	**198**	**202**
DGW-MW3-PV35out-30	30% PV 35	3 - outlet	30	35	NS	02/25/2019	0.000400 U	0.000400 U	0.000404 U	0.00203 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**6.55**	**6.69**	0.258 U	0.0189 U	**13.4**	**13.2**	**2.10**	**2.11**	**194**	**204**
DGW-MW3-PV35inlet-30-35-40	35% PV 35	1 - inlet	35	35	NS	02/25/2019	**0.0140**	**0.00892**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00116 J**	**0.00119 J**	**113**	**120**	**0.584**	0.0766 U	**21.1**	**21.4**	**1.98**	**2.05**	**188**	**191**
DGW-MW3-PV35mid-35	35% PV 35	2 - mid	35	35	NS	02/26/2019	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**8.96**	**8.97**	0.240 U	**0.0947 J**	**15.0**	**14.8**	**2.00**	**1.99**	**192**	**192**
DGW-MW3-PV35out-35	35% PV 35	3 - outlet	35	35	NS	02/25/2019	0.000400 U	0.000400 U	0.000400 U	0.000796 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**6.12**	**6.24**	0.0592 U	0.0413 U	**10.8**	**10.6**	**2.11**	**2.12**	**190**	**198**
DGW-MW3-PV35inlet-30-35-40	40% PV 35	1 - inlet	40	35	NS	02/25/2019	**0.0140**	**0.00892**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00116 J**	**0.00119 J**	**113**	**120**	**0.584**	0.0766 U	**21.1**	**21.4**	**1.98**	**2.05**	**188**	**191**
DGW-MW3-PV35mid-40	40% PV 35	2 - mid	40	35	NS	02/26/2019	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**7.46**	**8.92**	0.218 U	**0.102 J**	**13.8**	**15.9**	**2.03**	**2.42**	**194**	**195**
DGW-MW3-PV35out-40	40% PV 35	3 - outlet	40	35	NS	02/25/2019	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**5.50**	**5.89**	0.0715 U	0.0120 U	**10.5**	**11.0**	**2.04**	**2.15**	**198**	**199**
DGW-MW3-PV40inlet-control	Control PV 40	1 - inlet	0	40	NS	03/13/2019	**0.0248**	**0.00501**	0.000524 U	0.000426 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00179 J**	**0.00112 J**	**109**	**122**	**2.17**	**0.0425 J**	**19.9**	**21.9**	**1.95**	**2.13**	**186**	**185**
DGW-MW3-PV40mid-control	Control PV 40	2 - mid	0	40	NS	03/13/2019	**0.00514**	**0.00499**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00123 J**	0.00110 U	**111**	**120**	**0.0953 J**	**0.0176 J**	**20.5**	**22.0**	**1.99**	**2.12**	**194**	**200**
DGW-MW3-PV40out-Control	Control PV 40	3 - outlet	0	40	03/11/2019	03/12/2019	**0.00298**	**0.00280**	**0.000761 J**	0.000935 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00126 J**	**0.00161 J**	**116**	**120**	**0.0909 J**	**0.0342 J**	**20.6**	**21.4**	**2.05**	**2.09**	**188**	**187**
DGW-MW3-PV40inlet-30-35-40-DUP	30% PV 40	1 - inlet	30	40	NS	03/13/2019	**0.00923**	**0.00541**	0.000400 U	0.000616 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00116 J**	**0.00152 J**	**109**	**123**	**0.461**	**0.0227 J**	**20.7**	**21.2**	**1.95**	**2.04**	**192**	**179**
DGW-MW3-PV40inlet-30-35-40	30% PV 40	1 - inlet	30	40	NS	03/13/2019	**0.00905**	**0.00556**	0.000400 U	0.000402 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00160 J**	**0.00138 J**	**110**	**120**	**0.475**	**0.0305 J**	**19.5**	**21.5**	**1.88**	**2.02**	**182**	**186**
DGW-MW3-PV40mid-30	30% PV 40	2 - mid	30	40	NS	03/13/2019	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**8.51**	**8.87**	**0.0706 J**	**0.0148 J**	**14.4**	**14.7**	**1.91**	**1.97**	**193**	**183**
DGW-MW3-PV40out-30	30% PV 40	3 - outlet	30	40	03/11/2019	03/12/2019	0.000400 U	0.000400 U	0.000648 U	0.000610 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**7.10**	**7.17**	**0.124 J**	**0.0315 J**	**13.5**	**13.3**	**2.09**	**2.06**	**183**	**187**
DGW-MW3-PV40inlet-30-35-40-DUP	35% PV 40	1 - inlet	35	40	NS	03/13/2019	**0.00923**	**0.00541**	0.000400 U	0.000616 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00116 J**	**0.00152 J**	**109**	**123**	**0.461**	**0.0227 J**	**20.7**	**21.2**	**1.95**	**2.04**	**192**	**179**
DGW-MW3-PV40inlet-30-35-40	35% PV 40	1 - inlet	35	40	NS	03/13/2019	**0.00905**	**0.00556**	0.000400 U	0.000402 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00160 J**	**0.00138 J**	**110**	**120**	**0.475**	**0.0305 J**	**19.5**	**21.5**	**1.88**	**2.02**	**182**	**186**
DGW-MW3-PV40mid-35	35% PV 40	2 - mid	35	40	NS	03/13/2019	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**9.24**	**9.85**	**0.199 J**	**0.0258 J**	**13.8**	**14.8**	**1.88**	**1.98**	**186**	**176**
DGW-MW3-PV40out-35	35% PV 40	3 - outlet	35	40	03/11/2019	03/12/2019	0.000400 U	0.000400 U	0.000455 U	0.000412 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**6.59**	**6.78**	**0.0367 J**	**0.0404 J**	**10.7**	**10.9**	**2.15**	**2.13**	**195**	**185**
DGW-MW3-PV40inlet-30-35-40-DUP	40% PV 40	1 - inlet	40	40	NS	03/13/2019	**0.00923**	**0.00541**	0.000400 U	0.000616 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00116 J**	**0.00152 J**	**109**	**123**	**0.461**	**0.0227 J**	**20.7**	**21.2**	**1.95**	**2.04**	**192**	**179**
DGW-MW3-PV40inlet-30-35-40	40% PV 40	1 - inlet	40	40	NS	03/13/2019	**0.00905**	**0.00556**	0.000400 U	0.000402 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00160 J**	**0.00138 J**	**110**	**120**	**0.475**	**0.0305 J**	**19.5**	**21.5**	**1.88**	**2.02**	**182**	**186**
DGW-MW3-PV40mid-40	40% PV 40	2 - mid	40	40	NS	03/13/2019	0.000400 U	0.000400 U	0.000400 U	0.000832 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**8.34**	**8.26**	**0.120 J**	0.0120 U	**14.0**	**14.0**	**2.03**	**2.05**	**183**	**180**
DGW-MW3-PV40out-40	40% PV 40	3 - outlet	40	40	03/11/2019	03/12/2019	0.000400 U	0.000400 U	0.000400 U	0.000456 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**5.67**	**6.44**	**0.0350 J**	**0.0404 J**	**9.86**	**11.2**	**2.00**	**2.19**	**184**	**188**

Table 3

DGW-MW-3 Column Study Analytical Results

Appendix 3.7 Permeable Reactive Barrier Column Studies Summary

Exide Frisco Recycling Center Response Action Plan

							Anions by E300.0			Hardness, Total as CaCO3 By SM2340B	Total Dissolved Solids by SM2540C	Alkalinity by SM2320B			Physical Chemistry Parameters					
							Chloride (mg/L)	Sulfate (mg/L)	Nitrate/Nitrite (as N) (mg/L)	Hardness (As CaCO3) (mg/L)	Total Dissolved Solids (Residue, Filterable) (mg/L)	Alkalinity, Bicarbonate (as $CaCO_3$) (mg/L)	Alkalinity, Carbonate (as $CaCO_3$) (mg/L)	Alkalinity, Total (as $CaCO_3$) (mg/L)	Temperature (°C)	pH	Specific Conductivity (µS/cm)	Redox Potential (mV)	Dissolved Oxygen (ppm)	Total Dissolved Solids
$^{GW}GW_{hq}PCL$[1]							--	--	--	--	--	--	--	--	--	--	--	--	--	--
^{SW}SW PCL (based on Tier 1 Contact Recreation Water PCL)							--	--	--	--	--	--	--	--	--	--	--	--	--	--
^{SW}SW PCL (based on chronic aquatic life criteria)							--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dilution Factor for Perennial Streams							--	--	--	--	--	--	--	--	--	--	--	--	--	--
^{SW}GW PCL (with dilution factor of 0.15, based on chronic aquatic life criteria)[2,4]							--	--	--	--	--	--	--	--	--	--	--	--	--	--
^{SW}GW PCL (with dilution factor of 0.15, based on contact recreation)[4]							--	--	--	--	--	--	--	--	--	--	--	--	--	--
Critical PCL[2]							See note 7	See note 7	See note 7	--	--	See note 7	See note 7	See note 7	--	--	--	--	--	--
MQL[5]							0.500	5.00	0.200	--	--	5.00	5.00	5.00	--	--	--	--	--	--
Sample	**Sample Column and Pore Volume**	**Sample Location**	**Column**	**PV**	**Date of Geochemistry Sample**	**Date of Metals Sample**	**Chloride (mg/L)**	**Sulfate (mg/L)**	**Nitrate/Nitrite (as N) (mg/L)**	**Hardness (As CaCO3) (mg/L)**	**Total Dissolved Solids (Residue, Filterable) (mg/L)**	**Alkalinity, Bicarbonate (as $CaCO_3$) (mg/L)**	**Alkalinity, Carbonate (as $CaCO_3$) (mg/L)**	**Alkalinity, Total (as $CaCO_3$) (mg/L)**	**Temperature (°C)**	**pH**	**Specific Conductivity (µS/cm)**	**Redox Potential (mV)**	**Dissolved Oxygen (ppm)**	**Total Dissolved Solids (g/L)**
DGW-MW-3 (Field)	Field		-1	0	11/05/18	11/05/18	**47.1**	**251**	0.0300 U	**367**	**938**	**532**	5.00 U	**532**	25.48	6.63	1,504	2.9	3.89*	NM
DGW-MW3-T02-Control	Control Start 2	1 - inlet	0	0	NS	03/15/2019	NS	NS	NS	**340**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-T0-Control	Control Start	1- inlet	0	0	11/27/18	11/27/18	**46.3**	**202**	0.0770 UJ	**362**	**884**	**524**	5.00 U	**524**	16.30	6.70	1,200	-25.7	2.60	1.00
DGW-MW3-T02-30-35-40	30% PV 40	1 - inlet	30	0	NS	03/15/2019	NS	NS	NS	**330**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-T0-30-35-40	30% PV 0	1 - inlet	30	0	11/27/18	11/27/18	**46.4**	**204**	0.0770 UJ	**376**	**904**	**527**	5.00 U	**527**	15.60	6.80	1,085	-25.6	1.70	0.87
DGW-MW-3-T0-30-35-40	35% PV 0	1 - inlet	35	0	11/27/18	11/27/18	**46.4**	**204**	0.0770 UJ	**376**	**904**	**527**	5.00 U	**527**	15.60	6.80	1,085	-25.6	1.70	0.87
DGW-MW-3-T0-30-35-40	40% PV 0	1 - inlet	40	0	11/27/18	11/27/18	**46.4**	**204**	0.0770 UJ	**376**	**904**	**527**	5.00 U	**527**	15.60	6.80	1,085	-25.6	1.70	0.87
DGW-MW-3-PV5inlet-Control	Control PV 5	1 - inlet	0	5	NS	12/14/18	NS	NS	NS	**369**	NS	NS	NS	NS	16.70	6.70	1,373	9.60	2.54	NM
DGW-MW-3-PV5mid-Control	Control PV 5	2 - mid	0	5	NS	12/14/18	NS	NS	NS	**370**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV5out-Control	Control PV 5	3 - outlet	0	5	12/10/18	12/11/18	**46.9**	**217**	0.0300 U	**356**	**898**	**488**	5.00 U	**488**	19.40	7.71	1,198	131.5	6.53	0.869
DGW-MW-3-PV5inlet-30-35-40	30% PV 5	1 - inlet	30	5	NS	12/14/18	NS	NS	NS	**367**	NS	NS	NS	NS	18.90	6.69	1,357	17.3	5.57	NM
DGW-MW-3-PV5mid-30	30% PV 5	2 - mid	30	5	NS	12/14/18	NS	NS	NS	**112**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV5out-30	30% PV 5	3 - outlet	30	5	12/10/18	12/11/18	**46.7**	**224**	0.0300 U	**86.3**	**630**	**192**	**24.8**	**216**	18.95	8.85	888	-19.4	6.05	0.653
DGW-MW-3-PV5inlet-30-35-40	35% PV 5	1 - inlet	35	5	NS	12/14/18	NS	NS	NS	**367**	NS	NS	NS	NS	18.90	6.69	1,357	17.3	5.57	NM
DGW-MW-3-PV5mid-35	35% PV 5	2 - mid	35	5	NS	12/14/18	NS	NS	NS	**112**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV5out-35	35% PV 5	3 - outlet	35	5	12/10/18	12/11/18	**46.0**	**230**	0.0300 U	**73.6**	**600**	**174**	**27.6**	**201**	19.68	8.91	885	-52.7	6.00	0.639
DGW-MW-3-PV5inlet-30-35-40	40% PV 5	1 - inlet	40	5	NS	12/14/18	NS	NS	NS	**367**	NS	NS	NS	NS	18.90	6.69	1,357	17.3	5.57	NM
DGW-MW-3-PV5mid-40	40% PV 5	2 - mid	40	5	NS	12/14/18	NS	NS	NS	**105**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV5out-40	40% PV 5	3 - outlet	40	5	12/10/18	12/11/18	**48.1**	**223**	0.0300 U	**53.5**	**586**	**160**	**21.6**	**181**	19.20	8.94	845	14.6	5.85	0.611
DGW-MW-3-PV10inlet-Control	Control PV 10	1 - inlet	0	10	NS	12/20/18	NS	NS	NS	**357**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV10mid-Control	Control PV 10	2 - mid	0	10	NS	12/21/18	NS	NS	NS	**342**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV10out-Control	Control PV 10	3 - outlet	0	10	NS	12/20/18	NS	NS	NS	**354**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV10inlet-30-35-40	30% PV 10	1 - inlet	30	10	NS	12/20/18	NS	NS	NS	**368**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV10mid-30	30% PV 10	2 - mid	30	10	NS	12/21/18	NS	NS	NS	**111**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV10out-30	30% PV 10	3 - outlet	30	10	NS	12/20/18	NS	NS	NS	**96.5**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV10inlet-30-35-40	35% PV 10	1 - inlet	35	10	NS	12/20/18	NS	NS	NS	**368**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV10mid-35	35% PV 10	2 - mid	35	10	NS	12/21/18	NS	NS	NS	**112**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV10out-35	35% PV 10	3 - outlet	35	10	NS	12/20/18	NS	NS	NS	**86.6**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV10inlet-30-35-40	40% PV 10	1 - inlet	40	10	NS	12/20/18	NS	NS	NS	**368**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV10mid-40	40% PV 10	2 - mid	40	10	NS	12/21/18	NS	NS	NS	**107**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV10out-40	40% PV 10	3 - outlet	40	10	NS	12/20/18	NS	NS	NS	**84.3**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV15inlet-Control	Control PV 15	1 - inlet	0	15	NS	01/04/19	NS	NS	NS	**352**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV15mid-Control	Control PV 15	2 - mid	0	15	NS	01/04/19	NS	NS	NS	**350**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV15out-Control	Control PV 15	3 - outlet	0	15	NS	01/03/19	NS	NS	NS	**348**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV15out-Control (DUP)	Control PV 10	3 - outlet	0	15	NS	01/02/19	NS	NS	NS	**372**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV15inlet-30-35-40	30% PV 15	1 - inlet	30	15	NS	01/04/19	NS	NS	NS	**343**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV15mid-30	30% PV 15	2 - mid	30	15	NS	01/04/19	NS	NS	NS	**92.0**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV15out-30 (DUP)	30% PV 15	3 - outlet	30	15	NS	01/02/19	NS	NS	NS	**85.7**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV15out-30	30% PV 15	3 - outlet	30	15	NS	01/03/19	NS	NS	NS	**76.5**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV15inlet-30-35-40	35% PV 15	1 - inlet	35	15	NS	01/04/19	NS	NS	NS	**343**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV15mid-35	35% PV 15	2 - mid	35	15	NS	01/04/19	NS	NS	NS	**85.8**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV15out-35 (DUP)	35% PV 10	3 - outlet	35	15	NS	01/02/19	NS	NS	NS	**70.1**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV15out-35	35% PV 15	3 - outlet	35	15	NS	01/03/19	NS	NS	NS	**61.5**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV15inlet-30-35-40	40% PV 15	1 - inlet	40	15	NS	01/04/19	NS	NS	NS	**343**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV15mid-40	40% PV 15	2 - mid	40	15	NS	01/04/19	NS	NS	NS	**84.2**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV15out-40 (DUP)	40% PV 15	3 - outlet	40	15	NS	01/02/19	NS	NS	NS	**74.1**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV15out-40	40% PV 15	3 - outlet	40	15	NS	01/03/19	NS	NS	NS	**69.9**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV20inlet-Control	Control PV 20	1 - inlet	0	20	NS	01/17/19	NS	NS	NS	**336**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV20mid-Control	Control PV 20	2 - mid	0	20	NS	01/16/19	NS	NS	NS	**293**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV20out-Control	Control PV 20	3 - outlet	0	20	01/14/19	01/15/19	**49.3**	**217**	0.0300 U	**303**	**798**	**453**	**10.3**	**463**	18.77	7.68	2,750	162	5.94	1.788
DGW-MW-3-PV20inlet-30-35-40	30% PV 20	1 - inlet	30	20	NS	01/17/19	NS	NS	NS	**325**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV20mid-30	30% PV 20	2 - mid	30	20	NS	01/17/19	NS	NS	NS	**82.5**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV20out-30	30% PV 20	3 - outlet	30	20	01/14/19	01/15/19	**47.5**	**175**	0.0300 U	**72.9**	**552**	**227**	**44.3**	**271**	18.61	9.06	2,103	119	5.25	1.367
DGW-MW-3-PV20inlet-30-35-40	35% PV 20	1 - inlet	35	20	NS	01/17/19	NS	NS	NS	**325**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV20mid-35 (DUP)	35% PV 20	2 - mid	35	20	NS	01/18/19	NS	NS	NS	**78.8**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV20mid-35	35% PV 20	2 - mid	35	20	NS	01/17/19	NS	NS	NS	**80.0**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV20out-35	35% PV 20	3 - outlet	35	20	01/14/19	01/15/19	**48.5**	**181**	0.0300 U	**58.7**	**546**	**213**	**41.8**	**255**	18.96	9.16	2,100	106.9	5.45	1.364
DGW-MW-3-PV20inlet-30-35-40	40% PV 20	1 - inlet	40	20	NS	01/17/19	NS	NS	NS	**325**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM

Table 3

DGW-MW-3 Column Study Analytical Results

Appendix 3.7 Permeable Reactive Barrier Column Studies Summary

Exide Frisco Recycling Center Response Action Plan

							Anions by E300.0			Hardness, Total as CaCO3 By SM2340B	Total Dissolved Solids by SM2540C	Alkalinity by SM2320B			Physical Chemistry Parameters					
							Chloride (mg/L)	Sulfate (mg/L)	Nitrate/Nitrite (as N) (mg/L)	Hardness (As CaCO3) (mg/L)	Total Dissolved Solids (Residue, Filterable) (mg/L)	Alkalinity, Bicarbonate (as $CaCO_3$) (mg/L)	Alkalinity, Carbonate (as $CaCO_3$) (mg/L)	Alkalinity, Total (as $CaCO_3$) (mg/L)	Temperature (°C)	pH	Specific Conductivity (µS/cm)	Redox Potential (mV)	Dissolved Oxygen (ppm)	Total Dissolved Solids
[GW]GW_{Ing} PCL[1]							--	--	--	--	--	--	--	--	--	--	--	--	--	--
[SW] SW PCL (based on Tier 1 Contact Recreation Water PCL)							--	--	--	--	--	--	--	--	--	--	--	--	--	--
[SW]SW PCL (based on chronic aquatic life criteria)							--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dilution Factor for Perennial Streams							--	--	--	--	--	--	--	--	--	--	--	--	--	--
[SW]GW PCL (with dilution factor of 0.15, based on chronic aquatic life criteria)[2,4]							--	--	--	--	--	--	--	--	--	--	--	--	--	--
[SW]GW PCL (with dilution factor of 0.15, based on contact recreation)[4]							--	--	--	--	--	--	--	--	--	--	--	--	--	--
Critical PCL[2]							See note 7	See note 7	See note 7	--	--	See note 7	See note 7	See note 7	--	--	--	--	--	--
MQL[5]							0.500	5.00	0.200	--	--	5.00	5.00	5.00	--	--	--	--	--	--
Sample	**Sample Column and Pore Volume**	**Sample Location**	**Column**	**PV**	**Date of Geochemistry Sample**	**Date of Metals Sample**	**Chloride (mg/L)**	**Sulfate (mg/L)**	**Nitrate/Nitrite (as N) (mg/L)**	**Hardness (As CaCO3) (mg/L)**	**Total Dissolved Solids (Residue, Filterable) (mg/L)**	**Alkalinity, Bicarbonate (as $CaCO_3$) (mg/L)**	**Alkalinity, Carbonate (as $CaCO_3$) (mg/L)**	**Alkalinity, Total (as $CaCO_3$) (mg/L)**	**Temperature (°C)**	**pH**	**Specific Conductivity (µS/cm)**	**Redox Potential (mV)**	**Dissolved Oxygen (ppm)**	**Total Dissolved Solids (g/L)**
DGW-MW-3-PV20mid-40	40% PV 20	2 - mid	40	20	NS	01/19/19	NS	NS	NS	**78.2**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV20out-40	40% PV 20	3 - outlet	40	20	01/14/19	01/15/19	**47.5**	**186**	0.0300 U	**59.6**	**556**	**212**	**37.1**	**249**	18.74	9.10	2,089	105.2	5.46	1.359
DGW-MW-3-PV25inlet-control	Control PV 25	1 - inlet	0	25	NS	01/29/19	NS	NS	NS	**380**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV25mid-control	Control PV 25	2 - mid	0	25	NS	01/30/19	NS	NS	NS	**385**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV25out-control	Control PV 25	3 - outlet	0	25	NS	01/29/19	NS	NS	NS	**390**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV25inlet-30-35-40	30% PV 25	1 - inlet	30	25	NS	01/29/19	NS	NS	NS	**378**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV25mid-30	30% PV 25	2 - mid	30	25	NS	01/30/19	NS	NS	NS	**91.4**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV25out-30	30% PV 25	3 - outlet	30	25	NS	01/29/19	NS	NS	NS	**80.3**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV25inlet-30-35-40	35% PV 25	1 - inlet	35	25	NS	01/29/19	NS	NS	NS	**378**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV25mid-35	35% PV 25	2 - mid	35	25	NS	01/30/19	NS	NS	NS	**90.7**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV25out-35	35% PV 25	3 - outlet	35	25	NS	01/29/19	NS	NS	NS	**63.3**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV25inlet-30-35-40	40% PV 25	1 - inlet	40	25	NS	01/29/19	NS	NS	NS	**378**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV25mid-40	40% PV 25	2 - mid	40	25	NS	01/30/19	NS	NS	NS	**84.8**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW-3-PV25out-40	40% PV 25	3 - outlet	40	25	NS	01/29/19	NS	NS	NS	**62.6**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW3-PV30inlet-control	Control PV 30	1 - inlet	0	30	NS	02/08/2019	NS	NS	NS	**384**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW3-PV30inlet-control-DUP	Control PV 30	1 - inlet	0	30	NS	02/08/2019	NS	NS	NS	**389**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW3-PV30mid-control	Control PV 30	2 - mid	0	30	NS	02/10/2019	NS	NS	NS	**375**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW3-PV30out-control	Control PV 30	3 - outlet	0	30	NS	02/08/2019	NS	NS	NS	**392**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW3-PV30inlet-30-35-40	30 % PV 30	1 - inlet	30	30	NS	02/08/2019	NS	NS	NS	**394**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW3-PV30mid-30	30% PV 30	2 - mid	30	30	NS	02/10/2019	NS	NS	NS	**63.3**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW3-PV30out-30	30% PV 30	3 - outlet	30	30	NS	02/08/2019	NS	NS	NS	**79.3**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW3-PV30inlet-30-35-40	35 % PV 30	1 - inlet	35	30	NS	02/08/2019	NS	NS	NS	**394**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW3-PV30mid-35	35% PV 30	2 - mid	35	30	NS	02/10/2019	NS	NS	NS	**60.1**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW3-PV30out-35	35% PV 30	3 - outlet	35	30	NS	02/08/2019	NS	NS	NS	**65.2**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW3-PV30inlet-30-35-40	40 % PV 30	1 - inlet	40	30	NS	02/08/2019	NS	NS	NS	**394**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW3-PV30mid-40	40% PV 30	2 - mid	40	30	NS	02/10/2019	NS	NS	NS	**61.3**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW3-PV30out-40	40% PV 30	3 - outlet	40	30	NS	02/08/2019	NS	NS	NS	**60.5**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW3-PV35inlet-control	Control PV 35	1 - inlet	0	35	NS	02/25/2019	NS	NS	NS	**380**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW3-PV35mid-control	Control PV 35	2 - mid	0	35	NS	02/26/2019	NS	NS	NS	**361**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW3-PV35out-control	Control PV 35	3 - outlet	0	35	NS	02/25/2019	NS	NS	NS	**357**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW3-PV35inlet-30-35-40	30% PV 35	1 - inlet	30	35	NS	02/25/2019	NS	NS	NS	**369**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW3-PV35mid-30	30% PV 35	2 - mid	30	35	NS	02/26/2019	NS	NS	NS	**82.6**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW3-PV35out-30	30% PV 35	3 - outlet	30	35	NS	02/25/2019	NS	NS	NS	**71.5**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW3-PV35inlet-30-35-40	35% PV 35	1 - inlet	35	35	NS	02/25/2019	NS	NS	NS	**369**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW3-PV35mid-35	35% PV 35	2 - mid	35	35	NS	02/26/2019	NS	NS	NS	**84.1**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW3-PV35out-35	35% PV 35	3 - outlet	35	35	NS	02/25/2019	NS	NS	NS	**59.8**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW3-PV35inlet-30-35-40	40% PV 35	1 - inlet	40	35	NS	02/25/2019	NS	NS	NS	**369**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW3-PV35mid-40	40% PV 35	2 - mid	40	35	NS	02/26/2019	NS	NS	NS	**75.5**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW3-PV35out-40	40% PV 35	3 - outlet	40	35	NS	02/25/2019	NS	NS	NS	**57.0**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW3-PV40inlet-control	Control PV 40	1 - inlet	0	40	NS	03/13/2019	NS	NS	NS	**354**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW3-PV40mid-control	Control PV 40	2 - mid	0	40	NS	03/13/2019	NS	NS	NS	**362**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW3-PV40out-Control	Control PV 40	3 - outlet	0	40	03/11/2019	03/12/2019	**48.9**	**224**	0.0300 U	**374**	**774**	**453**	**28.8**	**482**	19.06	7.89	1,317	-20.3	5.78	0.856
DGW-MW3-PV40inlet-30-35-40-DUP	30% PV 40	1 - inlet	30	40	NS	03/13/2019	NS	NS	NS	**357**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW3-PV40inlet-30-35-40	30% PV 40	1 - inlet	30	40	NS	03/13/2019	NS	NS	NS	**355**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW3-PV40mid-30	30% PV 40	2 - mid	30	40	NS	03/13/2019	NS	NS	NS	**80.6**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW3-PV40out-30	30% PV 40	3 - outlet	30	40	03/11/2019	03/12/2019	**45.8**	**145**	0.0300 U	**73.3**	**504**	**233**	**64.2**	**298**	18.76	9.06	944	-56.4	4.95	0.614
DGW-MW3-PV40inlet-30-35-40-DUP	35% PV 40	1 - inlet	35	40	NS	03/13/2019	NS	NS	NS	**357**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW3-PV40inlet-30-35-40	35% PV 40	1 - inlet	35	40	NS	03/13/2019	NS	NS	NS	**355**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW3-PV40mid-35	35% PV 40	2 - mid	35	40	NS	03/13/2019	NS	NS	NS	**79.9**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW3-PV40out-35	35% PV 40	3 - outlet	35	40	03/11/2019	03/12/2019	**45.5**	**150**	0.0300 U	**60.5**	**456**	**217**	**63.0**	**280**	19.46	9.06	934	-47.3	6.69	0.607
DGW-MW3-PV40inlet-30-35-40-DUP	40% PV 40	1 - inlet	40	40	NS	03/13/2019	NS	NS	NS	**357**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW3-PV40inlet-30-35-40	40% PV 40	1 - inlet	40	40	NS	03/13/2019	NS	NS	NS	**355**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW3-PV40mid-40	40% PV 40	2 - mid	40	40	NS	03/13/2019	NS	NS	NS	**78.5**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
DGW-MW3-PV40out-40	40% PV 40	3 - outlet	40	40	03/11/2019	03/12/2019	**47.7**	**144**	0.0300 U	**54.8**	**424**	**233**	**46.4**	**279**	18.80	9.01	929	-52.2	4.86	0.604

Table 4
French Drain Column Study Analytical Results
Appendix 3.7 Permeable Reactive Barrier Column Studies Summary
Exide Frisco Recycling Center Response Action Plan

							ICP-MS Total and Dissolved Metals by EPA Method SW6020A										ICP-MS Total and Dissolved Metals by EPA Method SW6020A									
							Total Antimony (mg/L)	Dissolved Antimony (mg/L)	Total Arsenic (mg/L)	Dissolved Arsenic (mg/L)	Total Cadmium (mg/L)	Dissolved Cadmium (mg/L)	Total Lead (mg/L)	Dissolved Lead (mg/L)	Total Selenium (mg/L)	Dissolved Selenium (mg/L)	Total Calcium (mg/L)	Dissolved Calcium (mg/L)	Total Iron (mg/L)	Dissolved Iron (mg/L)	Total Magnesium (mg/L)	Dissolved Magnesium (mg/L)	Total Potassium (mg/L)	Dissolved Potassium (mg/L)	Total Sodium (mg/L)	Dissolved Sodium (mg/L)
[GW]GW$_{ing}$ PCL[1]							0.006	0.006	0.01	0.01	0.005	0.005	0.015	0.015	0.05	0.05	--	--	--	--	--	--	--	--	--	--
[SW] SW PCL (based on Tier 1 Contact Recreation Water PCL)							0.199	0.199	0.0285	0.0285	0.149	0.149	0.015	0.015	4.13	4.13	--	--	--	--	--	--	--	--	--	--
[SW]SW PCL (based on chronic aquatic life criteria)							2.2	--	--	0.15	--	0.000256	--	0.00268	0.005	--	--	--	--	--	--	--	--	--	--	--
Dilution Factor for Perennial Streams							0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	--	--	--	--	--	--	--	--	--	--
[SW]GW PCL (with dilution factor of 0.15, based on chronic aquatic life criteria)[2,4]							14.7	--	--	1.00	--	0.0017	--	0.0179	0.0333	--	--	--	--	--	--	--	--	--	--	--
[SW]GW PCL (with dilution factor of 0.15, based on contact recreation)[4]							1.33	1.33	0.19	0.19	0.99	0.99	0.10	0.10	27.5	27.5	--	--	--	--	--	--	--	--	--	--
Critical PCL[2]							0.006	0.006	0.01	0.01	0.005	0.0017	0.015	0.015	0.0333	0.050	--	--	--	--	--	--	--	--	--	--
MQL[5]							0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	--	--	--	--	--	--	--	--	--	--
Sample	**Sample Column and Pore Volume**	**Sample Location**	**Column**	**PV**	**Date of Geochemistry Sample**	**Date of Metals Sample**	**Total Antimony (mg/L)**	**Dissolved Antimony (mg/L)**	**Total Arsenic (mg/L)**	**Dissolved Arsenic (mg/L)**	**Total Cadmium (mg/L)**	**Dissolved Cadmium (mg/L)**	**Total Lead (mg/L)**	**Dissolved Lead (mg/L)**	**Total Selenium (mg/L)**	**Dissolved Selenium (mg/L)**	**Total Calcium (mg/L)**	**Dissolved Calcium (mg/L)**	**Total Iron (mg/L)**	**Dissolved Iron (mg/L)**	**Total Magnesium (mg/L)**	**Dissolved Magnesium (mg/L)**	**Total Potassium (mg/L)**	**Dissolved Potassium (mg/L)**	**Total Sodium (mg/L)**	**Dissolved Sodium (mg/L)**
French Drain (Field)	Field 1		-1	0	11/05/18	11/05/18	**0.0484**	**0.0484**	0.00215 U	0.00263 U	**0.00165 J**	**0.000766 J**	**0.00630**	**0.00254**	**0.00473 J**	**0.00760 J**	**194**	**176**	**0.147 J**	0.117 U	**1.66**	**1.70**	**12.5**	**12.4**	**127**	**130**
French Drain (Field)	Field 2		-1	0	12/03/18	12/03/18	**0.0374**	**0.0346**	**0.00219**	**0.00209**	**0.000273 J**	0.000200 U	**0.00362**	**0.000614 J**	**0.00774**	**0.00685**	**186**	**178**	**0.0569 J**	**0.0175 J**	**1.33**	**1.25**	**13.2**	**13.8**	**231**	**228**
FD-T0-Control	Control PV 0	1- inlet	0	0	12/13/18	12/13/18	**0.0328**	**0.0351**	**0.00138 J**	**0.00112 J**	0.000200 U	0.000200 U	**0.00138 J**	0.000600 U	**0.00658**	**0.00639**	**195**	**209**	**0.0244 J**	**0.0147 J**	**1.25**	**1.19**	**11.8**	**11.1**	**259**	**270**
FD-T0-30-35-40	30% PV 0	1- inlet	30	0	12/13/18	12/13/18	**0.0354**	**0.0346**	**0.00157 J**	**0.00121 J**	0.000200 U	0.000200 U	**0.00143 J**	0.000600 U	**0.00696**	**0.00627**	**229**	**197**	**0.0281 J**	0.0120 U	**1.33**	**1.17**	**11.9**	**10.6**	**287**	**249**
FD-T0-30-35-40	35% PV 0	1- inlet	35	0	12/13/18	12/13/18	**0.0354**	**0.0346**	**0.00157 J**	**0.00121 J**	0.000200 U	0.000200 U	**0.00143 J**	0.000600 U	**0.00696**	**0.00627**	**229**	**197**	**0.0281 J**	0.0120 U	**1.33**	**1.17**	**11.9**	**10.6**	**287**	**249**
FD-T0-30-35-40	40% PV 0	1- inlet	40	0	12/13/18	12/13/18	**0.0354**	**0.0346**	**0.00157 J**	**0.00121 J**	0.000200 U	0.000200 U	**0.00143 J**	0.000600 U	**0.00696**	**0.00627**	**229**	**197**	**0.0281 J**	0.0120 U	**1.33**	**1.17**	**11.9**	**10.6**	**287**	**249**
FD-PV5inlet-Control	Control PV 5	1- inlet	0	5	NS	12/28/18	**0.0339**	**0.0328**	**0.00125 J**	**0.00128 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00738**	0.00633 U	**191**	**192**	0.0120 U	0.0752 U	**1.09**	**1.21**	**11.3**	**11.7**	**241**	**232**
FD-PV5mid-Control	Control PV 5	2 - mid	0	5	NS	12/28/18	**0.0332**	**0.0338**	**0.00144 J**	**0.00148 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00646 U	0.00600 U	**205**	**200**	**0.0254 J**	0.0522 U	**1.25**	**1.36**	**11.2**	**11.6**	**248**	**251**
FD-PV5out-Control	Control PV 5	3 - outlet	0	5	12/26/18	12/27/18	**0.0310**	**0.0319**	**0.000831 J**	**0.00108 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00593 U	0.00615 U	**186**	**196**	**0.0214 J**	0.0226 U	**1.27**	**1.41**	**11.3**	**11.5**	**241**	**257**
FD-PV5inlet-30-35-40	30% PV 5	1- inlet	30	5	NS	12/28/18	**0.0333**	**0.0335**	**0.000951 J**	**0.000970 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00653 U	0.00609 U	**187**	**189**	0.0120 U	0.0588 U	**1.04**	**1.12**	**11.8**	**12.4**	**231**	**234**
FD-PV5mid-30	30% PV 5	2 - mid	30	5	NS	12/28/18	0.000428 U	0.000432 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**175**	**182**	**1.05**	0.0498 U	**0.959**	**1.03**	**10.8**	**11.3**	**241**	**242**
FD-PV5out-30	30% PV 5	3 - outlet	30	5	12/26/18	12/27/18	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**193**	**188**	**0.0775 J**	0.0762 U	**0.990**	**1.08**	**11.2**	**12.3**	**235**	**248**
FD-PV5inlet-30-35-40	35% PV 5	1- inlet	35	5	NS	12/28/18	**0.0333**	**0.0335**	**0.000951 J**	**0.000970 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00653 U	0.00609 U	**187**	**189**	0.0120 U	0.0588 U	**1.04**	**1.12**	**11.8**	**12.4**	**231**	**234**
FD-PV5mid-35	35% PV 5	2 - mid	35	5	NS	12/28/18	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00119 U	0.00110 U	**195**	**191**	**1.28**	0.0339 U	**1.03**	**1.07**	**11.4**	**11.5**	**238**	**226**
FD-PV5out-35	35% PV 5	3 - outlet	35	5	12/26/18	12/27/18	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**195**	**195**	**0.165 J**	**0.255**	**1.07**	**1.14**	**11.5**	**11.9**	**239**	**251**
FD-PV5inlet-30-35-40	40% PV 5	1- inlet	40	5	NS	12/28/18	**0.0333**	**0.0335**	**0.000951 J**	**0.000970 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00653 U	0.00609 U	**187**	**189**	0.0120 U	0.0588 U	**1.04**	**1.12**	**11.8**	**12.4**	**231**	**234**
FD-PV5mid-40	40% PV 5	2 - mid	40	5	NS	12/28/18	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**173**	**183**	**1.24**	0.0163 U	**0.983**	**1.14**	**10.7**	**11.4**	**231**	**248**
FD-PV5out-40	40% PV 5	3 - outlet	40	5	12/26/18	12/27/18	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**171**	**184**	**0.0259 J**	0.0883 U	**0.984**	**1.07**	**10.9**	**11.9**	**240**	**253**
FD-PV10inlet-Control	Control PV 10	1- inlet	0	10	NS	01/09/19	**0.0366**	**0.0320**	**0.00173 J**	0.000879 U	0.000200 U	0.000200 U	**0.000987 J**	0.000600 U	**0.00684 J**	**0.00938 J**	**187**	**206**	**0.0153 J**	**0.0967 J**	**1.27**	**1.29**	**12.7**	**13.1**	**251**	**269**
FD-PV10mid-Control	Control PV 10	2 - mid	0	10	NS	01/10/19	**0.0374**	**0.0337**	**0.00184 J**	0.000858 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00707 J**	**0.0106 J**	**189**	**191**	0.0120 UJ	**0.0902 J**	**1.31**	**1.31**	**12.5**	**13.0**	**252**	**255**
FD-PV10out-Control	Control PV 10	3 - outlet	0	10	NS	01/08/19	**0.0358**	**0.0350**	**0.00187 J**	**0.00565 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00654**	**0.00889**	**170**	**206**	0.0120 U	**0.0698 J**	**1.25**	**1.32**	**12.6**	**13.2**	**226**	**274**
FD-PV10inlet-30-35-40	30% PV 10	1- inlet	30	10	NS	01/09/19	**0.0358**	**0.0318**	**0.00154 J**	0.000924 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00706**	**0.00936**	**185**	**186**	**0.0131 J**	**0.0893 J**	**1.17**	**1.21**	**12.6**	**13.1**	**251**	**236**
FD-PV10mid-30	30% PV 10	2 - mid	30	10	NS	01/10/19	0.000400 U	0.000400 U	**0.000528 J**	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 UJ	**0.00370 J**	**174**	**205**	**0.859**	**0.111 J**	**0.925**	**1.00**	**13.3**	**13.6**	**242**	**277**
FD-PV10out-30	30% PV 10	3 - outlet	30	10	NS	01/08/19	0.000400 U	0.000400 U	**0.000496 J**	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 UJ	**0.00331 J**	**169**	**198**	**0.0574 J**	**0.108 J**	**0.941**	**0.990**	**13.3**	**13.4**	**225**	**270**
FD-PV10inlet-30-35-40	35% PV 10	1- inlet	35	10	NS	01/09/19	**0.0358**	**0.0318**	**0.00154 J**	0.000924 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00706**	**0.00936**	**185**	**186**	**0.0131 J**	**0.0893 J**	**1.17**	**1.21**	**12.6**	**13.1**	**251**	**236**
FD-PV10mid-35	35% PV 10	2 - mid	35	10	NS	01/10/19	0.000400 U	0.000400 U	**0.000473 J**	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 UJ	**0.00345 J**	**185**	**195**	**1.21**	**0.167 J**	**0.995**	**1.09**	**12.6**	**13.2**	**255**	**263**
FD-PV10out-35	35% PV 10	3 - outlet	35	10	NS	01/08/19	0.000400 U	0.000400 U	**0.000490 J**	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 UJ	**0.00274 J**	**169**	**211**	**0.0671 J**	**0.108 J**	**1.08**	**1.11**	**13.3**	**13.0**	**237**	**279**
FD-PV10inlet-30-35-40	40% PV 10	1- inlet	40	10	NS	01/09/19	**0.0358**	**0.0318**	**0.00154 J**	0.000924 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00706**	**0.00936**	**185**	**186**	**0.0131 J**	**0.0893 J**	**1.17**	**1.21**	**12.6**	**13.1**	**251**	**236**
FD-PV10mid-40	40% PV 10	2 - mid	40	10	NS	01/10/19	0.000400 U	0.000400 U	**0.000515 J**	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 UJ	**0.00389 J**	**190**	**189**	**0.507**	**0.165 J**	**1.04**	**1.19**	**12.6**	**14.0**	**265**	**252**
FD-PV10out-40 (DUP)	40% PV 10	3 - outlet	40	10	NS	01/09/19	0.000400 U	0.000400 U	0.000463 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 UJ	**0.00483 J**	**215**	**197**	**0.0172 J**	**0.302 J**	**1.22**	**1.14**	**13.7**	**13.8**	**287**	**268**
FD-PV10out-40	40% PV 10	3 - outlet	40	10	NS	01/08/19	0.000400 U	0.000400 U	**0.000531 J**	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 UJ	**0.00329 J**	**187**	**195**	**0.0179 J**	**0.129 J**	**1.15**	**1.10**	**13.6**	**13.0**	**251**	**262**
FD-PV15inlet-Control	Control PV 15	1- inlet	0	15	NS	01/22/19	**0.0354**	**0.0392**	**0.00107 J**	**0.00135 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00606**	**0.00686**	**185**	**223**	0.0120 U	0.0120 U	**1.20**	**1.22**	**11.9**	**13.8**	**254**	**290**
FD-PV15mid-Control	Control PV 15	2 - mid	0	15	NS	01/23/19	**0.0372**	**0.0381**	**0.00142 J**	**0.00149 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00574**	**0.00609**	**190**	**217**	**0.0121 J**	0.0120 U	**1.28**	**1.21**	**11.7**	**13.5**	**255**	**286**
FD-PV15out-Control	Control PV 15	3 - outlet	0	15	NS	01/22/19	**0.0337**	**0.0380**	**0.00186 J**	**0.00172 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00587**	**0.00561**	**193**	**207**	0.0120 U	0.0120 U	**1.18**	**1.21**	**12.0**	**13.2**	**263**	**290**
FD-PV15inlet-30-35-40	30% PV 15	1- inlet	30	15	NS	01/22/19	**0.0366**	**0.0387**	**0.00108 J**	**0.00128 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00685**	**0.00654**	**188**	**198**	0.0120 U	0.0120 U	**1.17**	**1.16**	**11.8**	**12.9**	**257**	**268**
FD-PV15mid-30	30% PV 15	2 - mid	30	15	NS	01/23/19	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00165 J**	0.00110 U	**174**	**204**	**0.711**	0.0120 U	**0.802**	**0.814**	**10.5**	**13.0**	**248**	**270**
FD-PV15out-30	30% PV 15	3 - outlet	30	15	NS	01/22/19	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**182**	**199**	**0.0542 J**	0.0120 U	**0.845**	**0.814**	**12.2**	**13.5**	**264**	**275**
FD-PV15inlet-30-35-40	35% PV 15	1- inlet	35	15	NS	01/22/19	**0.0366**	**0.0387**	**0.00108 J**	**0.00128 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00685**	**0.00654**	**188**	**198**	0.0120 U	0.0120 U	**1.17**	**1.16**	**11.8**	**12.9**	**257**	**268**
FD-PV15mid-35	35% PV 15	2 - mid	35	15	NS	01/23/19	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**185**	**193**	**0.716**	0.0120 U	**0.973**	**0.978**	**12.2**	**12.8**	**264**	**263**
FD-PV15out-35	35% PV 15	3 - outlet	35	15	NS	01/22/19	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**187**	**201**	**0.145 J**	0.0120 U	**0.994**	**1.04**	**12.3**	**13.4**	**263**	**277**
FD-PV15inlet-30-35-40	40% PV 15	1- inlet	40	15	NS	01/22/19	**0.0366**	**0.0387**	**0.00108 J**	**0.00128 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00685**	**0.00654**	**188**	**198**	0.0120 U	0.0120 U	**1.17**	**1.16**	**11.8**	**12.9**	**257**	**268**
FD-PV15mid-40	40% PV 15	2 - mid	40	15	NS	01/23/19	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**182**	**199**	**0.304**	0.0120 U	**1.00**	**0.973**	**11.8**	**12.6**	**257**	**266**
FD-PV15out-40	40% PV 15	3 - outlet	40	15	NS	01/22/19	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**179**	**192**	**0.0180 J**	0.0120 U	**0.946**	**0.954**	**11.6**	**13.2**	**256**	**265**
FD-PV20inlet-Control	Control PV 20	1- inlet	0	20	NS	2/6/2019	**0.0372**	**0.0353**	**0.00126 J**	**0.00115 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00753**	**0.00594**	**224**	**199**	0.0120 U	0.0120 U	**1.31**	**1.20**	**13.6**	**12.2**	**305**	**267**
FD-PV20mid-Control	Control PV 20	2 - mid	0	20	NS	2/7/2019	**0.0361**	**0.0340**	**0.00129 J**	**0.00115 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00640**	**0.00524**	**200**	**207**	**0.0143 J**	0.0120 U	**1.28**	**1.25**	**13.1**	**12.2**	**276**	**264**
FD-PV20Out-Control	Control PV 20	3 - outlet	0	20	2/4/2019	2/6/2019	**0.0367**	**0.0362**	**0.00130 J**	**0.00130 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00631**	**0.00480**	**214**	**204**	0.0120 U	**0.0132 J**	**1.32**	**1.18**	**13.6**	**13.0**	**290**	**271**
FD-PV20inlet-30-35-40	30% PV 20	1- inlet	30	20	NS	2/6/2019	**0.0356**	**0.0342**	**0.00120 J**	**0.00120 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00714**	**0.00538**	**206**	**212**	0.0120 U	0.0120 U	**1.24**	**1.19**	**13.5**	**12.5**	**285**	**270**
FD-PV20mid-30	30% PV 20	2 - mid	30	20	NS	2/7/2019	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**206**	**188**	**0.781**	0.0120 U	**0.850**	**0.807**	**13.9**	**13.0**	**286**	**246**
FD-PV20Out-30	30% PV 20	3 - outlet	30	20	2/4/2019	2/6/2019	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**202**	**197**	**0.0975 J**	**0.0496 J**	**0.826**	**0.814**	**13.5**	**13.0**	**289**	**278**
FD-PV20out-30-DUP	30%PV 20	3 - outlet	30	20	NS	2/5/2019	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**208**	**202**	**0.0853 J**	0.0120 U	**0.815**	**0.785**	**13.4**	**12.7**	**291**	**279**
FD-PV20inlet-30-35-40	35% PV10	1- inlet	35	20	NS	2/6/2019	**0.0356**	**0.0342**	**0.00120 J**	**0.00120 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00714**	**0.00538**	**206**	**212**	0.0120 U	0.0120 U	**1.24**	**1.19**	**13.5**	**12.5**	**285**	**270**
FD-PV20mid-35	35% PV 20	2 - mid	35	20	NS	2/7/2019	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**205**	**202**	**0.572**	**0.0844 J**	**1.04**	**0.989**	**13.8**	**12.6**	**295**	**273**
FD-PV20Out-35	35% PV 20	3 - outlet	35	20	2/4/2019	2/6/2019	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**205**	**194**	**0.192 J**	**0.0450 J**	**1.07**	**0.980**	**13.9**	**12.8**	**291**	**264**
FD-PV20inlet-30-35-40	40% PV20	1- inlet	40	20	NS	2/6/2019	**0.0356**	**0.0342**	**0.00120 J**	**0.00120 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00714**	**0.00538**	**206**	**212**	0.0120 U	0.0120 U	**1.24**	**1.19**	**13.5**	**12.5**	**285**	**270**
FD-PV20mid-40	40% PV 20	2 - mid	40	20	NS	2/7/2019	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**198**	**198**	**0.530**	0.0120 U	**1.12**	**1.08**	**13.6**	**13.0**	**287**	**261**
FD-PV20Out-40	40% PV 20	3 - outlet	40	20	2/4/2019	2/6/2019	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**202**	**201**	**0.0378 J**	**0.0181 J**	**1.11**	**1.04**	**14.5**	**13.0**	**288**	**277**

							ICP-MS Total and Dissolved Metals by EPA Method SW6020A										ICP-MS Total and Dissolved Metals by EPA Method SW6020A									
							Total Antimony (mg/L)	Dissolved Antimony (mg/L)	Total Arsenic (mg/L)	Dissolved Arsenic (mg/L)	Total Cadmium (mg/L)	Dissolved Cadmium (mg/L)	Total Lead (mg/L)	Dissolved Lead (mg/L)	Total Selenium (mg/L)	Dissolved Selenium (mg/L)	Total Calcium (mg/L)	Dissolved Calcium (mg/L)	Total Iron (mg/L)	Dissolved Iron (mg/L)	Total Magnesium (mg/L)	Dissolved Magnesium (mg/L)	Total Potassium (mg/L)	Dissolved Potassium (mg/L)	Total Sodium (mg/L)	Dissolved Sodium (mg/L)
[GW]GW_{ing} PCL[1]							0.006	0.006	0.01	0.01	0.005	0.005	0.015	0.015	0.05	0.05	--	--	--	--	--	--	--	--	--	--
[SW] SW PCL (based on Tier 1 Contact Recreation Water PCL)							0.199	0.199	0.0285	0.0285	0.149	0.149	0.015	0.015	4.13	4.13	--	--	--	--	--	--	--	--	--	--
[SW]SW PCL (based on chronic aquatic life criteria)							2.2	--	--	0.15	--	0.000256	--	0.00268	0.005	--	--	--	--	--	--	--	--	--	--	--
Dilution Factor for Perennial Streams							0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	--	--	--	--	--	--	--	--	--	--
[SW]GW PCL (with dilution factor of 0.15, based on chronic aquatic life criteria)[2,4]							14.7	--	--	1.00	--	0.0017	--	0.0179	0.0333	--	--	--	--	--	--	--	--	--	--	--
[SW]GW PCL (with dilution factor of 0.15, based on contact recreation)[4]							1.33	1.33	0.19	0.19	0.99	0.99	0.10	0.10	27.5	27.5	--	--	--	--	--	--	--	--	--	--
Critical PCL[2]							0.006	0.006	0.01	0.01	0.005	0.0017	0.015	0.015	0.0333	0.050	--	--	--	--	--	--	--	--	--	--
MQL[5]							0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	--	--	--	--	--	--	--	--	--	--
Sample	**Sample Column and Pore Volume**	**Sample Location**	**Column**	**PV**	**Date of Geochemistry Sample**	**Date of Metals Sample**	**Total Antimony (mg/L)**	**Dissolved Antimony (mg/L)**	**Total Arsenic (mg/L)**	**Dissolved Arsenic (mg/L)**	**Total Cadmium (mg/L)**	**Dissolved Cadmium (mg/L)**	**Total Lead (mg/L)**	**Dissolved Lead (mg/L)**	**Total Selenium (mg/L)**	**Dissolved Selenium (mg/L)**	**Total Calcium (mg/L)**	**Dissolved Calcium (mg/L)**	**Total Iron (mg/L)**	**Dissolved Iron (mg/L)**	**Total Magnesium (mg/L)**	**Dissolved Magnesium (mg/L)**	**Total Potassium (mg/L)**	**Dissolved Potassium (mg/L)**	**Total Sodium (mg/L)**	**Dissolved Sodium (mg/L)**
FD-PV25inlet-control	Control PV 25	1- inlet	0	25	NS	2/14/2019	**0.0333**	**0.0358**	0.00130 U	**0.00122 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00610**	**0.00698**	**211**	**200**	0.0120 U	0.0120 U	**1.14**	**1.20**	**12.3**	**13.0**	**288**	**261**
FD-PV25mid-control	Control PV 25	2 - mid	0	25	NS	2/15/2019	**0.0350**	**0.0355**	0.00125 U	**0.000990 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00588**	**0.00590**	**182**	**188**	0.0120 U	0.0120 U	**1.24**	**1.24**	**13.4**	**13.3**	**256**	**251**
FD-PV25out-control	Control PV 25	3 - outlet	0	25	NS	2/14/2019	**0.0350**	**0.0342**	0.00113 U	**0.00117 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00568**	**0.00564**	**200**	**203**	0.0120 U	0.0120 U	**1.20**	**1.17**	**12.5**	**12.5**	**275**	**271**
FD-PV25inlet-30-35-40	30% PV 25	1- inlet	30	25	NS	2/14/2019	**0.0360**	**0.0359**	0.00130 U	**0.00128 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00694**	**0.00662**	**203**	**195**	0.0120 U	0.0120 U	**1.19**	**1.17**	**12.8**	**12.9**	**272**	**252**
FD-PV25mid-30	30% PV 25	2 - mid	30	25	NS	2/15/2019	0.000400 U	0.000400 U	0.000457 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	**0.00121 J**	**172**	**179**	**0.402**	**0.0638 J**	**0.841**	**0.861**	**12.7**	**12.8**	**251**	**244**
FD-PV25out-30	30% PV 25	3 - outlet	30	25	NS	2/14/2019	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**192**	**213**	**0.0362 J**	**0.0159 J**	**0.862**	**0.857**	**13.3**	**13.3**	**271**	**286**
FD-PV25inlet-30-35-40	35% PV 25	1- inlet	35	25	NS	2/14/2019	**0.0360**	**0.0359**	0.00130 U	**0.00128 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00694**	**0.00662**	**203**	**195**	0.0120 U	0.0120 U	**1.19**	**1.17**	**12.8**	**12.9**	**272**	**252**
FD-PV25mid-35	35% PV 25	2 - mid	35	25	NS	2/15/2019	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**194**	**193**	**0.771**	**0.209**	**0.999**	**0.965**	**12.5**	**12.7**	**279**	**260**
FD-PV25out-35	35% PV 25	3 - outlet	35	25	NS	2/14/2019	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**186**	**188**	**0.209**	0.0120 U	**1.03**	**1.01**	**13.2**	**13.3**	**267**	**258**
FD-PV25inlet-30-35-40	40% PV 25	1- inlet	40	25	NS	2/14/2019	**0.0360**	**0.0359**	0.00130 U	**0.00128 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00694**	**0.00662**	**203**	**195**	0.0120 U	0.0120 U	**1.19**	**1.17**	**12.8**	**12.9**	**272**	**252**
FD-PV25mid-40	40% PV 25	2 - mid	40	25	NS	2/15/2019	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**222**	**195**	**0.334**	**0.0252 J**	**1.10**	**1.10**	**12.7**	**13.2**	**302**	**261**
FD-PV25out-40	40% PV 25	3 - outlet	40	25	NS	2/14/2019	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**190**	**201**	**0.0473 J**	0.0120 U	**1.07**	**1.09**	**13.8**	**13.4**	**272**	**272**
FD-PV30inlet-control	Control PV 30	1- inlet	0	30	NS	02/27/2019	**0.0340**	**0.0338**	**0.00122 J**	0.000777 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00669**	**0.00674**	**200**	**201**	0.0120 U	0.0120 U	**1.16**	**1.19**	**12.1**	**12.6**	**261**	**262**
FD-PV30mid-control	Control PV 30	2 - mid	0	30	NS	02/28/2019	**0.0336**	**0.0328**	**0.00101 J**	0.000708 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00554**	**0.00571**	**202**	**200**	0.0120 U	0.0120 U	**1.11**	**1.12**	**12.0**	**12.5**	**264**	**265**
FD-PV30out-control	Control PV 30	3 - outlet	0	30	NS	02/27/2019	**0.0315**	**0.0336**	**0.00101 J**	0.000824 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00550**	**0.00650**	**202**	**215**	0.0120 U	0.0120 U	**1.14**	**1.16**	**11.6**	**12.6**	**261**	**327**
FD-PV30inlet-30-35-40	30% PV 30	1- inlet	30	30	NS	02/27/2019	**0.0329**	**0.0333**	**0.00111 J**	0.000761 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00561**	**0.00578**	**199**	**210**	0.0120 U	0.0120 U	**1.16**	**1.17**	**11.8**	**12.9**	**259**	**273**
FD-PV30mid-30	30% PV 30	2 - mid	30	30	NS	02/28/2019	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**195**	**196**	**0.398**	**0.0478 J**	**0.888**	**0.950**	**12.0**	**13.1**	**262**	**269**
FD-PV30out-30	30% PV 30	3 - outlet	30	30	NS	02/27/2019	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.0791 J**	0.0120 U	**0.925**	**0.923**	**12.2**	**12.9**	**263**	**268**
FD-PV30inlet-30-35-40	35% PV 30	1- inlet	35	30	NS	02/27/2019	**0.0329**	**0.0333**	**0.00111 J**	0.000761 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00561**	**0.00578**	**199**	**210**	0.0120 U	0.0120 U	**1.16**	**1.17**	**11.8**	**12.9**	**259**	**273**
FD-PV30mid-35	35% PV 30	2 - mid	35	30	NS	02/28/2019	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**190**	**194**	**1.01 J**	**0.125 J**	**0.915**	**0.934**	**11.6**	**12.5**	**260**	**261**
FD-PV30mid-35-DUP	35% PV 30	2 - mid	35	30	NS	03/01/2019	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**190**	**197**	**0.666 J**	**0.249**	**0.934**	**0.943**	**11.7**	**12.3**	**256**	**261**
FD-PV30out-35	35% PV 30	3 - outlet	35	30	NS	02/27/2019	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**186**	**196**	**0.306**	**0.138 J**	**0.967**	**1.00**	**12.0**	**12.9**	**255**	**266**
FD-PV30inlet-30-35-40	40% PV 30	1- inlet	40	30	NS	02/27/2019	**0.0329**	**0.0333**	**0.00111 J**	0.000761 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00561**	**0.00578**	**199**	**210**	0.0120 U	0.0120 U	**1.16**	**1.17**	**11.8**	**12.9**	**259**	**273**
FD-PV30mid-40	40% PV 30	2 - mid	40	30	NS	02/28/2019	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**200**	**203**	**0.513**	**0.0143 J**	**1.06**	**1.05**	**12.5**	**12.7**	**269**	**275**
FD-PV30out-40	40% PV 30	3 - outlet	40	30	NS	02/27/2019	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**192**	**193**	**0.0769 J**	0.0120 U	**1.03**	**1.02**	**12.1**	**12.7**	**260**	**266**
FD-PV35inlet-control	Control PV 35	1- inlet	0	35	NS	03/11/2019	**0.0345**	**0.0350**	**0.00130 J**	**0.00138 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00694**	**0.00710**	**184**	**204**	0.0120 U	0.0120 U	**1.12**	**1.14**	**11.0**	**12.2**	**246**	**261**
FD-PV35mid-control	Control PV 35	2 - mid	0	35	NS	03/12/2019	**0.0344**	**0.0339**	**0.00103 J**	**0.00105 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00663**	**0.00642**	**186**	**199**	**0.0143 J**	0.0120 U	**1.16**	**1.17**	**11.4**	**11.8**	**252**	**254**
FD-PV35out-control	Control PV 35	3 - outlet	0	35	NS	03/11/2019	**0.0340**	**0.0337**	**0.00107 J**	**0.00113 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00586**	**0.00676**	**183**	**197**	0.0120 U	0.0120 U	**1.19**	**1.21**	**11.4**	**11.9**	**252**	**257**
FD-PV35inlet-30-35-40	30% PV 35	1- inlet	30	35	NS	03/11/2019	**0.0350**	**0.0338**	**0.00144 J**	**0.00151 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00698**	**0.00742**	**193**	**200**	0.0120 U	0.0120 U	**1.12**	**1.11**	**11.5**	**12.2**	**253**	**258**
FD-PV35mid-30	30% PV 35	2 - mid	30	35	NS	03/12/2019	0.000549 U	0.000400 U	**0.000500 J**	**0.000551 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**185**	**190**	**0.494**	**0.0860 J**	**0.984**	**1.00**	**11.4**	**11.8**	**251**	**250**
FD-PV35out-30	30% PV 35	3 - outlet	30	35	NS	03/11/2019	0.000414 U	0.000400 U	**0.000458 J**	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**171**	**193**	**0.0856 J**	**0.0196 J**	**0.983**	**0.993**	**11.0**	**12.0**	**241**	**255**
FD-PV35inlet-30-35-40	35% PV 35	1- inlet	35	35	NS	03/11/2019	**0.0350**	**0.0338**	**0.00144 J**	**0.00151 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00698**	**0.00742**	**193**	**200**	0.0120 U	0.0120 U	**1.12**	**1.11**	**11.5**	**12.2**	**253**	**258**
FD-PV35mid-35	35% PV 35	2 - mid	35	35	NS	03/12/2019	0.000441 U	0.000400 U	0.000400 U	**0.000474 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**181**	**199**	**1.14**	**0.152 J**	**0.986**	**0.993**	**11.4**	**12.5**	**249**	**267**
FD-PV35out-35	35% PV 35	3 - outlet	35	35	NS	03/11/2019	0.000400 U	0.000400 U	0.000400 U	**0.000407 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**178**	**198**	**0.416**	**0.148 J**	**1.02**	**1.07**	**11.3**	**12.4**	**253**	**264**
FD-PV35inlet-30-35-40	40% PV 35	1- inlet	40	35	NS	03/11/2019	**0.0350**	**0.0338**	**0.00144 J**	**0.00151 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00698**	**0.00742**	**193**	**200**	0.0120 U	0.0120 U	**1.12**	**1.11**	**11.5**	**12.2**	**253**	**258**
FD-PV35mid-40	40% PV 35	2 - mid	40	35	NS	03/12/2019	0.000400 U	0.000400 U	**0.000482 J**	**0.000540 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**184**	**198**	**0.311**	**0.0250 J**	**1.49**	**1.58**	**11.5**	**12.3**	**256**	**264**
FD-PV35out-40	40% PV 35	3 - outlet	40	35	NS	03/11/2019	0.000400 U	0.000400 U	0.000400 U	**0.000442 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	**0.00112 J**	**184**	**193**	**0.0940 J**	**0.0201 J**	**1.47**	**1.52**	**11.9**	**12.2**	**264**	**259**
FD-PV40inlet-control-DUP	Control PV 40	1- inlet	0	40	NS	03/27/2019	**0.0352**	**0.0335**	**0.00123 J**	**0.00121 J**	0.000200 U	0.000200 U	**0.000823 J**	0.000600 U	0.00824 U	0.00868 U	**210**	**192**	**0.0136 J**	0.0120 U	**1.26**	**1.33**	**12.8**	**12.8**	**270**	**251**
FD-PV40inlet-control	Control PV 40	1- inlet	0	40	NS	03/27/2019	**0.0342**	**0.0334**	**0.00148 J**	**0.00136 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00775 U	0.00861 U	**187**	**195**	**0.0141 J**	0.0120 U	**1.19**	**1.26**	**12.1**	**12.4**	**242**	**251**
FD-PV40mid-control	Control PV 40	2 - mid	0	40	NS	03/27/2019	**0.0359**	**0.0335**	**0.000949 J**	**0.000629 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00701 U	0.00531 U	**180**	**200**	0.0120 U	0.0120 U	**1.34**	**1.36**	**12.7**	**12.9**	**236**	**264**
FD-PV40out-control	Control PV 40	3 - outlet	0	40	03/25/2019	03/26/2019	**0.0371**	**0.0339**	**0.000766 J**	**0.000684 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00663 U	0.00906 U	**219**	**202**	0.0120 U	0.0120 U	**1.43**	**1.45**	**13.1**	**13.5**	**279**	**261**
FD-PV40inlet-30-35-40	30% PV 40	1- inlet	30	40	NS	03/27/2019	**0.0370**	**0.0324**	**0.00146 J**	**0.00104 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00738 U	0.00452 U	**203**	**189**	0.0120 U	0.0120 U	**1.27**	**1.24**	**12.8**	**12.5**	**264**	**247**
FD-PV40mid-30	30% PV 40	2 - mid	30	40	NS	03/27/2019	0.000583 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00130 U	0.00156 U	**174**	**185**	**0.558**	**0.101 J**	**1.14**	**1.12**	**12.9**	**12.7**	**230**	**252**
FD-PV40out-30	30% PV 40	3 - outlet	30	40	03/25/2019	03/26/2019	0.000468 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00118 U	0.00110 U	**189**	**193**	**0.115 J**	0.0120 U	**1.12**	**1.17**	**12.4**	**12.7**	**258**	**266**
FD-PV40inlet-30-35-40	35% PV 40	1- inlet	35	40	NS	03/27/2019	**0.0370**	**0.0324**	**0.00146 J**	**0.00104 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00738 U	0.00452 U	**203**	**189**	0.0120 U	0.0120 U	**1.27**	**1.24**	**12.8**	**12.5**	**264**	**247**
FD-PV40mid-35	35% PV 40	2 - mid	35	40	NS	03/27/2019	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**196**	**192**	**1.74**	**0.158 J**	**1.19**	**1.19**	**13.0**	**12.7**	**263**	**263**
FD-PV40out-35	35% PV 40	3 - outlet	35	40	03/25/2019	03/26/2019	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00144 U	0.00112 U	**192**	**193**	**0.439**	**0.202**	**1.21**	**1.27**	**12.8**	**13.1**	**259**	**266**
FD-PV40inlet-30-35-40	40% PV 40	1- inlet	40	40	NS	03/27/2019	**0.0370**	**0.0324**	**0.00146 J**	**0.00104 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00738 U	0.00452 U	**203**	**189**	0.0120 U	0.0120 U	**1.27**	**1.24**	**12.8**	**12.5**	**264**	**247**
FD-PV40mid-40	40% PV 40	2 - mid	40	40	NS	03/27/2019	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00110 U	**195**	**194**	**0.403**	**0.0412 J**	**1.26**	**1.27**	**13.1**	**13.1**	**263**	**262**
FD-PV40out-40	40% PV 40	3 - outlet	40	40	03/25/2019	03/26/2019	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00110 U	0.00113 U	**185**	**186**	**0.124 J**	**0.0264 J**	**1.23**	**1.33**	**12.4**	**13.2**	**254**	**252**

Table 4
French Drain Column Study Analytical Results
Appendix 3.7 Permeable Reactive Barrier Column Studies Summary
Exide Frisco Recycling Center Response Action Plan

							Anions by E300.0			Hardness, Total as CaCO3 By SM2340B	Total Dissolved Solids by SM2540C	Alkalinity by SM2320B			Physical Chemistry Parameters					
							Chloride (mg/L)	Sulfate (mg/L)	Nitrate/Nitrite (as N) (mg/L)	Hardness (As CaCO3) (mg/L)	Total Dissolved Solids (Residue, Filterable) (mg/L)	Alkalinity, Bicarbonate (as $CaCO_3$) (mg/L)	Alkalinity, Carbonate (as $CaCO_3$) (mg/L)	Alkalinity, Total (as $CaCO_3$) (mg/L)	Temperature (ºC)	pH	Specific Conductivity (µS/cm)	Redox Potential (mV)	Dissolved Oxygen (ppm)	Total Dissolved Solids (g/L)
[GW]GW_{Ing} PCL[1]							--	--	--	--	--	--	--	--	--	--	--	--	--	--
[SW] SW PCL (based on Tier 1 Contact Recreation Water PCL)							--	--	--	--	--	--	--	--	--	--	--	--	--	--
[SW]SW PCL (based on chronic aquatic life criteria)							--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dilution Factor for Perennial Streams							--	--	--	--	--	--	--	--	--	--	--	--	--	--
[SW]GW PCL (with dilution factor of 0.15, based on chronic aquatic life criteria)[2,4]							--	--	--	--	--	--	--	--	--	--	--	--	--	--
[SW]GW PCL (with dilution factor of 0.15, based on contact recreation)[4]							--	--	--	--	--	--	--	--	--	--	--	--	--	--
Critical PCL[2]							See note 7	See note 7	See note 7	--	--	See note 7	See note 7	See note 7	--	--	--	--	--	--
MQL[5]							0.500	5.00	0.200	--	--	5.00	5.00	5.00	--	--	--	--	--	--
Sample	**Sample Column and Pore Volume**	**Sample Location**	**Column**	**PV**	**Date of Geochemistry Sample**	**Date of Metals Sample**	**Chloride (mg/L)**	**Sulfate (mg/L)**	**Nitrate/Nitrite (as N) (mg/L)**	**Hardness (As CaCO3) (mg/L)**	**Total Dissolved Solids (Residue, Filterable) (mg/L)**	**Alkalinity, Bicarbonate (as $CaCO_3$) (mg/L)**	**Alkalinity, Carbonate (as $CaCO_3$) (mg/L)**	**Alkalinity, Total (as $CaCO_3$) (mg/L)**	**Temperature (ºC)**	**pH**	**Specific Conductivity (µS/cm)**	**Redox Potential (mV)**	**Dissolved Oxygen (ppm)**	**Total Dissolved Solids (g/L)**
French Drain (Field)	Field 1		-1	0	11/05/18	11/05/18	**28.0**	**710**	0.0300 U	**491**	**1,090**	5.00 U	**34.3**	**37.7**	17.77	9.40	1,400	195.7	9.42*	NM
French Drain (Field)	Field 2		-1	0	12/03/18	12/03/18	**28.2**	**964**	**1.47**	NA	NA	NA	NA	NA	15.56	9.54	1,569	220.1	7.94	NM
FD-T0-Control	Control PV 0	1- inlet	0	0	12/13/18	12/13/18	**26.8**	**991**	**2.00**	**492**	**1,460**	5.00 U	**22.2**	**26.9**	15.00	10.59	1,983	15.8	6.25	0.573
FD-T0-30-35-40	30% PV 0	1- inlet	30	0	12/13/18	12/13/18	**27.2**	**929**	**2.08**	**577**	**1,470**	5.00 U	**22.6**	**27.5**	12.00	10.60	1,923	19.4	6.82	0.573
FD-T0-30-35-40	35% PV 0	1- inlet	35	0	12/13/18	12/13/18	**27.2**	**929**	**2.08**	**577**	**1,470**	5.00 U	**22.6**	**27.5**	12.00	10.60	1,923	19.4	6.82	0.573
FD-T0-30-35-40	40% PV 0	1- inlet	40	0	12/13/18	12/13/18	**27.2**	**929**	**2.08**	**577**	**1,470**	5.00 U	**22.6**	**27.5**	12.00	10.60	1,923	19.4	6.82	0.573
FD-PV5inlet-Control	Control PV 5	1- inlet	0	5	NS	12/28/18	NS	NS	NS	**481**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV5mid-Control	Control PV 5	2 - mid	0	5	NS	12/28/18	NS	NS	NS	**517**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV5out-Control	Control PV 5	3 - outlet	0	5	12/26/18	12/27/18	**28.3**	**926**	0.0300 UJ	**470**	**1,470**	**28.0**	5.00 U	**28.0**	18.74	6.06	1,956	180.0	6.52	1.278
FD-PV5inlet-30-35-40	30% PV 5	1- inlet	30	5	NS	12/28/18	NS	NS	NS	**471**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV5mid-30	30% PV 5	2 - mid	30	5	NS	12/28/18	NS	NS	NS	**441**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV5out-30	30% PV 5	3 - outlet	30	5	12/26/18	12/27/18	**24.9**	**703**	0.0780 UJ	**486**	**1,430**	**13.1**	5.00 U	**13.1**	18.19	6.27	1,995	174.0	5.66	1.299
FD-PV5inlet-30-35-40	35% PV 5	1- inlet	35	5	NS	12/28/18	NS	NS	NS	**471**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV5mid-35	35% PV 5	2 - mid	35	5	NS	12/28/18	NS	NS	NS	**491**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV5out-35	35% PV 5	3 - outlet	35	5	12/26/18	12/27/18	**28.3**	**812**	0.0300 UJ	**491**	**1,460**	**15.9**	5.00 U	**15.9**	18.62	6.47	2,036	166.1	5.32	1.325
FD-PV5inlet-30-35-40	40% PV 5	1- inlet	40	5	NS	12/28/18	NS	NS	NS	**471**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV5mid-40	40% PV 5	2 - mid	40	5	NS	12/28/18	NS	NS	NS	**436**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV5out-40	40% PV 5	3 - outlet	40	5	12/26/18	12/27/18	**27.6**	**828**	0.0300 UJ	**431**	**1,450**	**11.8**	5.00 U	**11.8**	18.38	6.53	2,093	160.2	5.89	1.361
FD-PV10inlet-Control	Control PV 10	1- inlet	0	10	NS	01/09/19	NS	NS	NS	**472**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV10mid-Control	Control PV 10	2 - mid	0	10	NS	01/10/19	NS	NS	NS	**477**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV10out-Control	Control PV 10	3 - outlet	0	10	NS	01/08/19	NS	NS	NS	**430**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV10inlet-30-35-40	30% PV 10	1- inlet	30	10	NS	01/09/19	NS	NS	NS	**467**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV10mid-30	30% PV 10	2 - mid	30	10	NS	01/10/19	NS	NS	NS	**438**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV10out-30	30% PV 10	3 - outlet	30	10	NS	01/08/19	NS	NS	NS	**426**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV10inlet-30-35-40	35% PV 10	1- inlet	35	10	NS	01/09/19	NS	NS	NS	**467**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV10mid-35	35% PV 10	2 - mid	35	10	NS	01/10/19	NS	NS	NS	**466**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV10out-35	35% PV 10	3 - outlet	35	10	NS	01/08/19	NS	NS	NS	**426**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV10inlet-30-35-40	40% PV 10	1- inlet	40	10	NS	01/09/19	NS	NS	NS	**467**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV10mid-40	40% PV 10	2 - mid	40	10	NS	01/10/19	NS	NS	NS	**479**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV10out-40 (DUP)	40% PV 10	3 - outlet	40	10	NS	01/09/19	NS	NS	NS	**542**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV10out-40	40% PV 10	3 - outlet	40	10	NS	01/08/19	NS	NS	NS	**472**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV15inlet-Control	Control PV 15	1- inlet	0	15	NS	01/22/19	NS	NS	NS	**467**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV15mid-Control	Control PV 15	2 - mid	0	15	NS	01/23/19	NS	NS	NS	**480**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV15out-Control	Control PV 15	3 - outlet	0	15	NS	01/22/19	NS	NS	NS	**487**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV15inlet-30-35-40	30% PV 15	1- inlet	30	15	NS	01/22/19	NS	NS	NS	**474**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV15mid-30	30% PV 15	2 - mid	30	15	NS	01/23/19	NS	NS	NS	**438**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV15out-30	30% PV 15	3 - outlet	30	15	NS	01/22/19	NS	NS	NS	**458**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV15inlet-30-35-40	35% PV 15	1- inlet	35	15	NS	01/22/19	NS	NS	NS	**474**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV15mid-35	35% PV 15	2 - mid	35	15	NS	01/23/19	NS	NS	NS	**466**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV15out-35	35% PV 15	3 - outlet	35	15	NS	01/22/19	NS	NS	NS	**471**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV15inlet-30-35-40	40% PV 15	1- inlet	40	15	NS	01/22/19	NS	NS	NS	**474**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV15mid-40	40% PV 15	2 - mid	40	15	NS	01/23/19	NS	NS	NS	**459**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV15out-40	40% PV 15	3 - outlet	40	15	NS	01/22/19	NS	NS	NS	**451**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV20inlet-Control	Control PV 20	1- inlet	0	20	NS	2/6/2019	NS	NS	NS	**565**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV20mid-Control	Control PV 20	2 - mid	0	20	NS	2/7/2019	NS	NS	NS	**505**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV20Out-Control	Control PV 20	3 - outlet	0	20	2/4/2019	2/6/2019	**28.4**	**968**	0.0300 UJL	**540**	**1,540**	**24.7**	5.00 U	**24.7**	18.57	6.79	2,168	120.2	5.34	1.41
FD-PV20inlet-30-35-40	30% PV 20	1- inlet	30	20	NS	2/6/2019	NS	NS	NS	**519**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV20mid-30	30% PV 20	2 - mid	30	20	NS	2/7/2019	NS	NS	NS	**518**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV20Out-30	30% PV 20	3 - outlet	30	20	2/4/2019	2/6/2019	**27.9**	**951**	0.0300 UJL	**508**	**1,440**	**15.4**	5.00 U	**15.4**	19.06	6.46	2,182	133.1	6.07	1.419
FD-PV20out-30-DUP	30%PV 20	3 - outlet	30	20	NS	2/5/2019	NS	NS	NS	**523**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV20inlet-30-35-40	35% PV10	1- inlet	35	20	NS	2/6/2019	NS	NS	NS	**519**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV20mid-35	35% PV 20	2 - mid	35	20	NS	2/7/2019	NS	NS	NS	**516**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV20Out-35	35% PV 20	3 - outlet	35	20	2/4/2019	2/6/2019	**27.9**	**970**	0.0300 UJL	**516**	**1,430**	**15.0**	5.00 U	**15.0**	18.34	6.67	2,164	127.7	4.85	1.407
FD-PV20inlet-30-35-40	40% PV20	1- inlet	40	20	NS	2/6/2019	NS	NS	NS	**519**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV20mid-40	40% PV 20	2 - mid	40	20	NS	2/7/2019	NS	NS	NS	**499**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV20Out-40	40% PV 20	3 - outlet	40	20	2/4/2019	2/6/2019	**27.3**	**963**	0.0300 UJL	**509**	**1,440**	**20.4**	5.00 U	**20.4**	19.20	6.65	2,169	124.2	4.87	1.41

Table 4
French Drain Column Study Analytical Results
Appendix 3.7 Permeable Reactive Barrier Column Studies Summary
Exide Frisco Recycling Center Response Action Plan

							Anions by E300.0			Hardness, Total as CaCO3 By SM2340B	Total Dissolved Solids by SM2540C	Alkalinity by SM2320B			Physical Chemistry Parameters					
							Chloride (mg/L)	Sulfate (mg/L)	Nitrate/Nitrite (as N) (mg/L)	Hardness (As CaCO3) (mg/L)	Total Dissolved Solids (Residue, Filterable) (mg/L)	Alkalinity, Bicarbonate (as $CaCO_3$) (mg/L)	Alkalinity, Carbonate (as $CaCO_3$) (mg/L)	Alkalinity, Total (as $CaCO_3$) (mg/L)	Temperature (ºC)	pH	Specific Conductivity (µS/cm)	Redox Potential (mV)	Dissolved Oxygen (ppm)	Total Dissolved Solids (g/L)
[GW]GW_{Ing} PCL[1]							--	--	--	--	--	--	--	--	--	--	--	--	--	--
[SW] SW PCL (based on Tier 1 Contact Recreation Water PCL)							--	--	--	--	--	--	--	--	--	--	--	--	--	--
[SW]SW PCL (based on chronic aquatic life criteria)							--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dilution Factor for Perennial Streams							--	--	--	--	--	--	--	--	--	--	--	--	--	--
[SW]GW PCL (with dilution factor of 0.15, based on chronic aquatic life criteria)[2,4]							--	--	--	--	--	--	--	--	--	--	--	--	--	--
[SW]GW PCL (with dilution factor of 0.15, based on contact recreation)[4]							--	--	--	--	--	--	--	--	--	--	--	--	--	--
Critical PCL[2]							See note 7	See note 7	See note 7	--	--	See note 7	See note 7	See note 7	--	--	--	--	--	--
MQL[5]							0.500	5.00	0.200	--	--	5.00	5.00	5.00	--	--	--	--	--	--
Sample	**Sample Column and Pore Volume**	**Sample Location**	**Column**	**PV**	**Date of Geochemistry Sample**	**Date of Metals Sample**	**Chloride (mg/L)**	**Sulfate (mg/L)**	**Nitrate/Nitrite (as N) (mg/L)**	**Hardness (As CaCO3) (mg/L)**	**Total Dissolved Solids (Residue, Filterable) (mg/L)**	**Alkalinity, Bicarbonate (as $CaCO_3$) (mg/L)**	**Alkalinity, Carbonate (as $CaCO_3$) (mg/L)**	**Alkalinity, Total (as $CaCO_3$) (mg/L)**	**Temperature (ºC)**	**pH**	**Specific Conductivity (µS/cm)**	**Redox Potential (mV)**	**Dissolved Oxygen (ppm)**	**Total Dissolved Solids (g/L)**
FD-PV25inlet-control	Control PV 25	1- inlet	0	25	NS	2/14/2019	NS	NS	NS	**532**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV25mid-control	Control PV 25	2 - mid	0	25	NS	2/15/2019	NS	NS	NS	**460**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV25out-control	Control PV 25	3 - outlet	0	25	NS	2/14/2019	NS	NS	NS	**504**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV25inlet-30-35-40	30% PV 25	1- inlet	30	25	NS	2/14/2019	NS	NS	NS	**512**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV25mid-30	30% PV 25	2 - mid	30	25	NS	2/15/2019	NS	NS	NS	**433**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV25out-30	30% PV 25	3 - outlet	30	25	NS	2/14/2019	NS	NS	NS	**483**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV25inlet-30-35-40	35% PV 25	1- inlet	35	25	NS	2/14/2019	NS	NS	NS	**512**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV25mid-35	35% PV 25	2 - mid	35	25	NS	2/15/2019	NS	NS	NS	**489**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV25out-35	35% PV 25	3 - outlet	35	25	NS	2/14/2019	NS	NS	NS	**469**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV25inlet-30-35-40	40% PV 25	1- inlet	40	25	NS	2/14/2019	NS	NS	NS	**512**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV25mid-40	40% PV 25	2 - mid	40	25	NS	2/15/2019	NS	NS	NS	**559**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV25out-40	40% PV 25	3 - outlet	40	25	NS	2/14/2019	NS	NS	NS	**479**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV30inlet-control	Control PV 30	1- inlet	0	30	NS	02/27/2019	NS	NS	NS	**504**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV30mid-control	Control PV 30	2 - mid	0	30	NS	02/28/2019	NS	NS	NS	**509**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV30out-control	Control PV 30	3 - outlet	0	30	NS	02/27/2019	NS	NS	NS	**509**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV30inlet-30-35-40	30% PV 30	1- inlet	30	30	NS	02/27/2019	NS	NS	NS	**502**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV30mid-30	30% PV 30	2 - mid	30	30	NS	02/28/2019	NS	NS	NS	**491**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV30out-30	30% PV 30	3 - outlet	30	30	NS	02/27/2019	NS	NS	NS	**481**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV30inlet-30-35-40	35% PV 30	1- inlet	35	30	NS	02/27/2019	NS	NS	NS	**502**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV30mid-35	35% PV 30	2 - mid	35	30	NS	02/28/2019	NS	NS	NS	**478**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV30mid-35-DUP	35% PV 30	2 - mid	35	30	NS	03/01/2019	NS	NS	NS	**478**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV30out-35	35% PV 30	3 - outlet	35	30	NS	02/27/2019	NS	NS	NS	**468**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV30inlet-30-35-40	40% PV 30	1- inlet	40	30	NS	02/27/2019	NS	NS	NS	**502**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV30mid-40	40% PV 30	2 - mid	40	30	NS	02/28/2019	NS	NS	NS	**504**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV30out-40	40% PV 30	3 - outlet	40	30	NS	02/27/2019	NS	NS	NS	**484**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV35inlet-control	Control PV 35	1- inlet	0	35	NS	03/11/2019	NS	NS	NS	**464**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV35mid-control	Control PV 35	2 - mid	0	35	NS	03/12/2019	NS	NS	NS	**469**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV35out-control	Control PV 35	3 - outlet	0	35	NS	03/11/2019	NS	NS	NS	**462**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV35inlet-30-35-40	30% PV 35	1- inlet	30	35	NS	03/11/2019	NS	NS	NS	**487**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV35mid-30	30% PV 35	2 - mid	30	35	NS	03/12/2019	NS	NS	NS	**466**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV35out-30	30% PV 35	3 - outlet	30	35	NS	03/11/2019	NS	NS	NS	**431**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV35inlet-30-35-40	35% PV 35	1- inlet	35	35	NS	03/11/2019	NS	NS	NS	**487**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV35mid-35	35% PV 35	2 - mid	35	35	NS	03/12/2019	NS	NS	NS	**456**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV35out-35	35% PV 35	3 - outlet	35	35	NS	03/11/2019	NS	NS	NS	**449**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV35inlet-30-35-40	40% PV 35	1- inlet	40	35	NS	03/11/2019	NS	NS	NS	**487**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV35mid-40	40% PV 35	2 - mid	40	35	NS	03/12/2019	NS	NS	NS	**466**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV35out-40	40% PV 35	3 - outlet	40	35	NS	03/11/2019	NS	NS	NS	**466**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV40inlet-control-DUP	Control PV 40	1- inlet	0	40	NS	03/27/2019	NS	NS	NS	**530**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV40inlet-control	Control PV 40	1- inlet	0	40	NS	03/27/2019	NS	NS	NS	**472**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV40mid-control	Control PV 40	2 - mid	0	40	NS	03/27/2019	NS	NS	NS	**455**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV40out-control	Control PV 40	3 - outlet	0	40	03/25/2019	03/26/2019	**27.8**	**941**	**1.15 JL**	**553**	**1,430**	**26.0**	5.00 U	**26.0**	19.45	6.51	1,832	29.4	5.67	1.191
FD-PV40inlet-30-35-40	30% PV 40	1- inlet	30	40	NS	03/27/2019	NS	NS	NS	**512**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV40mid-30	30% PV 40	2 - mid	30	40	NS	03/27/2019	NS	NS	NS	**439**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV40out-30	30% PV 40	3 - outlet	30	40	03/25/2019	03/26/2019	**25.9**	**931**	0.150 UJL	**477**	**1,430**	**14.5**	5.00 U	**14.5**	19.11	7.02	1,811	10.6	5.17	1.177
FD-PV40inlet-30-35-40	35% PV 40	1- inlet	35	40	NS	03/27/2019	NS	NS	NS	**512**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV40mid-35	35% PV 40	2 - mid	35	40	NS	03/27/2019	NS	NS	NS	**494**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV40out-35	35% PV 40	3 - outlet	35	40	03/25/2019	03/26/2019	**26.5**	**969**	0.150 UJL	**484**	**1,410**	**12.3**	5.00 U	**12.3**	19.54	7.02	1,811	2.7	5.24	1.178
FD-PV40inlet-30-35-40	40% PV 40	1- inlet	40	40	NS	03/27/2019	NS	NS	NS	**512**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV40mid-40	40% PV 40	2 - mid	40	40	NS	03/27/2019	NS	NS	NS	**492**	NS	NS	NS	NS	NM	NM	NM	NM	NM	NM
FD-PV40out-40	40% PV 40	3 - outlet	40	40	03/25/2019	03/26/2019	**26.1**	**917**	0.150 UJL	**467**	**1,430**	**13.2**	5.00 U	**13.2**	19.13	7.22	1,810	-3.3	6.23	1.176

Table 5
New Source Feed Column Study Analytical Results
Appendix 3.7 Permeable Reactive Barrier Column Studies Summary
Exide Frisco Recycling Center Response Action Plan

						ICP-MS Total and Dissolved Metals by EPA Method SW6020A											
						Total Antimony (mg/L)	**Dissolved Antimony (mg/L)**	**Total Arsenic (mg/L)**	**Dissolved Arsenic (mg/L)**	**Total Cadmium (mg/L)**	**Dissolved Cadmium (mg/L)**	**Total Lead (mg/L)**	**Dissolved Lead (mg/L)**	**Total Selenium (mg/L)**	**Dissolved Selenium (mg/L)**	**Total Iron (mg/L)**	**Dissolved Iron (mg/L)**
[GW]GW_{Ing} PCL[1]						0.006	0.006	0.01	0.01	0.005	0.005	0.015	0.015	0.05	0.05	--	--
[SW] SW PCL (based on Tier 1 Contact Recreation Water PCL)						0.199	0.199	0.0285	0.0285	0.149	0.149	0.015	0.015	4.13	4.13	--	--
[SW]SW PCL (based on chronic aquatic life criteria)						2.2	--	--	0.15	--	0.000256	--	0.00268	0.005	--	--	--
Dilution Factor for Perennial Streams						0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	--	--
[SW]GW PCL (with dilution factor of 0.15, based on chronic aquatic life criteria)[2,4]						14.7	--	--	1.00	--	0.0017	--	0.0179	0.0333	--	--	--
[SW]GW PCL (with dilution factor of 0.15, based on contact recreation)[4]						1.33	1.33	0.19	0.19	0.99	0.99	0.10	0.10	27.5	27.5	--	--
Critical PCL[2]						0.006	0.006	0.01	0.01	0.005	0.0017	0.015	0.015	0.0333	0.050	--	--
MQL[5]						0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	--	--
Sample	**Sample Column**	**Sample Location**	**Column ID**	**PV**	**Date of Metals Sample**	**Total Antimony (mg/L)**	**Dissolved Antimony (mg/L)**	**Total Arsenic (mg/L)**	**Dissolved Arsenic (mg/L)**	**Total Cadmium (mg/L)**	**Dissolved Cadmium (mg/L)**	**Total Lead (mg/L)**	**Dissolved Lead (mg/L)**	**Total Selenium (mg/L)**	**Dissolved Selenium (mg/L)**	**Total Iron (mg/L)**	**Dissolved Iron (mg/L)**
NSF	Preliminary		-1	0	03/26/19	**0.0143**	**0.0156**	**0.0318**	**0.0184**	**0.0018 J**	**0.00165 J**	**0.000983 J**	0.000600 U	**0.00360**	**0.00527**	**2.88**	**1.84**
NSF-T0-30MW11	DGW-MW-11	1- inlet	11	45	04/08/19	**0.166**	**0.139**	**0.302**	**0.275**	**0.0703**	**0.0683**	**1.35**	**0.524**	**1.89**	**1.91**	**4.04**	**0.402**
NSF-T0-controlFD	Control	1- inlet	0	46	04/08/19	**0.214**	**0.198**	**0.301**	**0.270**	**0.0718**	**0.0769**	**1.39**	**0.890**	**1.91**	**1.90**	**2.00**	0.0120 U
NSF-T0-30FD	FD	1- inlet	FD	46	04/08/19	**0.109**	**0.109**	**0.297**	**0.275**	**0.0692**	**0.0711**	**1.31**	**0.882**	**1.92**	**1.92**	**1.79**	**0.319**
NSF-T0-30MW3	DGW-MW-3	1- inlet	3	53	04/08/19	**0.138**	**0.126**	**0.302**	**0.275**	**0.0699**	**0.0698**	**1.30**	**0.596**	**1.91**	**1.95**	**3.78**	**0.288**
NSF-PV55inlet-30MW11	DGW-MW-11	1- inlet	11	55	04/16/19	**0.213**	**0.138**	**0.248**	**0.046**	**0.0723**	**0.0645**	**1.33**	**0.116**	**2.18**	**1.81**	**5.31**	0.0120 U
NSF-PV55mid-30MW11	DGW-MW-11	2- mid	11	55	04/16/19	**0.000993 J**	**0.000456 J**	**0.000402 J**	0.000400 U	0.000200 U	0.000200 U	**0.000672 J**	0.000600 U	**0.345**	**0.319**	**31.0**	**3.38**
NSF-PV55out-30MW11	DGW-MW-11	3- out	11	55	04/16/19	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00508 U	**0.00394**	**4.56**	0.0120 U
NSF-PV56inlet-controlFD	Control	1- inlet	0	56	04/16/19	**0.227**	**0.210**	**0.248**	**0.170**	**0.0742**	**0.0668**	**0.986**	**0.410**	**2.27**	**1.89**	**1.50**	0.0120 U
NSF-PV56mid-controlFD	Control	2- mid	0	56	04/16/19	**0.160**	**0.183**	**0.174**	**0.163**	**0.0671**	**0.0628**	**0.00538**	**0.00115 J**	**2.14**	**1.85**	**0.128 J**	0.0120 U
NSF-PV56out-controlFD	Control	3- out	0	56	04/16/19	**0.153**	**0.180**	**0.171**	**0.161**	**0.0686**	**0.0630**	**0.00195 J**	0.000600 U	**2.13**	**1.80**	**0.0780 J**	0.0120 U
NSF-PV56inlet-30FD	FD	1- inlet	FD	56	04/16/19	**0.114**	**0.124**	**0.173**	**0.119**	**0.0647**	**0.0636**	**0.741**	**0.351**	**2.14**	**1.79**	**1.12**	0.0120 U
NSF-PV56mid-30FD	FD	2- mid	FD	56	04/16/19	**0.00249**	**0.00232**	**0.000494 J**	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.120**	**0.139**	**7.16**	0.0120 U
NSF-PV56out-30FD	FD	3- out	FD	56	04/16/19	0.000400 U	0.000400 U	**0.000524 J**	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00203**	**0.00248**	**4.23**	0.0120 U
NSF-PV63inlet-30MW3	DGW-MW-3	1- inlet	3	63	04/16/19	**0.127**	**0.117**	**0.133**	**0.0743**	**0.0637**	**0.0623**	**0.637**	**0.164**	**2.13**	**1.83**	**1.91**	0.0120 U
NSF-PV63mid-30MW3	DGW-MW-3	2- mid	3	63	04/16/19	**0.00284**	**0.00304**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.247**	**0.294**	**6.86**	**0.0531 J**
NSF-PV63out-30MW3	DGW-MW-3	3- out	3	63	04/16/19	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.0237**	**0.0256**	**3.23**	0.0120 U
NSF-PV65inlet-30MW11	DGW-MW-11	1- inlet	11	65	04/26/19	**0.0480**	**0.0537**	**0.300**	**0.285**	**0.0692**	**0.0685**	**1.12**	**0.852**	**2.08**	**2.28**	**0.141 J**	0.0120 U
NSF-PV65inlet-30MW11-DUP	DGW-MW-11	1- inlet	11	65	04/26/19	**0.0476**	**0.0491**	**0.293**	**0.304**	**0.0682**	**0.0653**	**1.13**	**0.971**	**2.04**	**2.07**	**0.159 J**	0.0120 U
NSF-PV65mid-30MW11	DGW-MW-11	2- mid	11	65	04/26/19	**0.00116 J**	**0.000944 J**	**0.000424 J**	**0.000410 J**	0.000200 U	0.000200 U	**0.000614 J**	0.000600 U	**0.0200**	**0.0177**	**2.75**	0.0120 U
NSF-PV65out-30MW11	DGW-MW-11	3- out	11	65	04/26/19	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	0.00187 UJ	0.00110 U	**2.68**	0.0120 U
NSF-PV66inlet-controlFD	Control	1- inlet	0	66	04/26/19	**0.0448**	**0.0462**	**0.279**	**0.250**	**0.0693**	**0.0604**	**1.30**	**0.0970**	**1.92**	**1.62**	**1.90**	0.0120 U
NSF-PV66mid-controlFD	Control	2- mid	0	66	04/26/19	**0.0450**	**0.0500**	**0.186**	**0.209**	**0.0476**	**0.0519**	**0.00819**	**0.00223**	**1.83**	**1.79**	**0.0275 J**	0.0120 U
NSF-PV66out-controlFD	Control	3- out	0	66	04/26/19	**0.0397**	**0.0477**	**0.188**	**0.224**	**0.0471**	**0.0519**	**0.00514**	**0.00152 J**	**1.89**	**2.13**	**0.0178 J**	0.0120 U
NSF-PV66inlet-30FD-DUP	FD	1- inlet	FD	66	04/26/19	**0.0567**	**0.0549**	**0.323**	**0.301**	**0.0640**	**0.0668**	**1.50**	**0.740**	**2.02**	**1.97**	**0.908**	0.0120 U
NSF-PV66inlet-30FD	FD	1- inlet	FD	66	04/26/19	**0.0518**	**0.0548**	**0.287**	**0.299**	**0.0622**	**0.0661**	**1.07**	**0.745**	**1.88**	**1.72**	**0.378**	0.0120 U
NSF-PV66mid-30FD	FD	2- mid	FD	66	04/26/19	**0.00931**	**0.00912**	**0.000632 J**	0.000400 U	0.000200 U	0.000200 U	**0.000817 J**	0.000600 U	**0.521**	**0.561**	**4.52**	0.0120 U
NSF-PV66out-30DFD	FD	3- out	FD	66	04/26/19	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00477**	**0.00559**	**4.69**	0.0120 U
NSF-PV73inlet-30MW3	DGW-MW-3	1- inlet	3	73	04/26/19	**0.0524**	**0.0575**	**0.285**	**0.316**	**0.0656**	**0.0693**	**1.02**	**0.420**	**1.98**	**1.77**	**0.722**	0.0120 U
NSF-PV73mid-30MW3	DGW-MW-3	2- mid	3	73	04/26/19	**0.00828**	**0.00836**	0.000400 U	0.000400 U	0.000200 U	0.000200 U	**0.000610 J**	0.000600 U	**0.686**	**0.781**	**3.92**	**0.0186 J**
NSF-PV73out-30MW3	DGW-MW-3	3- out	3	73	04/26/19	**0.000620 J**	0.000400 U	0.000400 U	0.000400 U	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.0657**	**0.0629**	**2.99**	0.0120 U

Table 5
New Source Feed Column Study Analytical Results
Appendix 3.7 Permeable Reactive Barrier Column Studies Summary
Exide Frisco Recycling Center Response Action Plan

						ICP-MS Total and Dissolved Metals by EPA Method SW6020A											
						Total Antimony (mg/L)	Dissolved Antimony (mg/L)	Total Arsenic (mg/L)	Dissolved Arsenic (mg/L)	Total Cadmium (mg/L)	Dissolved Cadmium (mg/L)	Total Lead (mg/L)	Dissolved Lead (mg/L)	Total Selenium (mg/L)	Dissolved Selenium (mg/L)	Total Iron (mg/L)	Dissolved Iron (mg/L)
[GW]GW_{Ing} PCL[1]						0.006	0.006	0.01	0.01	0.005	0.005	0.015	0.015	0.05	0.05	--	--
[SW] SW PCL (based on Tier 1 Contact Recreation Water PCL)						0.199	0.199	0.0285	0.0285	0.149	0.149	0.015	0.015	4.13	4.13	--	--
[SW]SW PCL (based on chronic aquatic life criteria)						2.2	--	--	0.15	--	0.000256	--	0.00268	0.005	--	--	--
Dilution Factor for Perennial Streams						0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	--	--
[SW]GW PCL (with dilution factor of 0.15, based on chronic aquatic life criteria)[2,4]						14.7	--	--	1.00	--	0.0017	--	0.0179	0.0333	--	--	--
[SW]GW PCL (with dilution factor of 0.15, based on contact recreation)[4]						1.33	1.33	0.19	0.19	0.99	0.99	0.10	0.10	27.5	27.5	--	--
Critical PCL[2]						0.006	0.006	0.01	0.01	0.005	0.0017	0.015	0.015	0.0333	0.050	--	--
MQL[5]						0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	--	--
NSF-PV75inlet-30MW11	DGW-MW-11	1- inlet	11	75	05/03/19	**0.121**	**0.117**	**0.227**	**0.207**	**0.0574**	**0.0509**	**0.553**	**0.0245**	**2.20**	**2.17**	**0.889**	0.0120 U
NSF-PV75mid-30MW11	DGW-MW-11	2- mid	11	75	05/03/19	**0.00257**	**0.00232**	0.000400 U	**0.000889 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00371**	0.00375 U	**2.36**	**0.180 J**
NSF-PV75out-30MW11	DGW-MW-11	3- out	11	75	05/03/19	0.000567 U	**0.000430 J**	0.000400 U	**0.000472 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00151 J**	0.00160 U	**2.57**	**0.0234 J**
NSF-PV76inlet-controlFD	Control	1- inlet	0	76	05/03/19	**0.0945**	**0.0945**	**0.271**	**0.259**	**0.0609**	**0.0510**	**0.536**	**0.212**	**2.24**	**2.20**	**0.229**	0.0120 U
NSF-PV76mid-controlFD	Control	2- mid	0	76	05/03/19	**0.0802**	**0.0845**	**0.247**	**0.246**	**0.0530**	**0.0464**	**0.0280**	**0.00360**	**2.10**	**2.25**	**0.0343 J**	0.0120 U
NSF-PV76out-controlFD	Control	3- out	0	76	05/03/19	**0.0808**	**0.0891**	**0.253**	**0.265**	**0.0538**	**0.0479**	**0.0127**	**0.00190 J**	**2.22**	**2.15**	**0.0228 J**	0.0120 U
NSF-PV76inlet-30FD	FD	1- inlet	FD	76	05/03/19	**0.107**	**0.0824**	**0.245**	**0.143**	**0.0593**	**0.0418**	**0.922**	**0.0159**	**2.27**	**2.25**	**2.52**	0.0120 U
NSF-PV76mid-30FD	FD	2- mid	FD	76	05/03/19	**0.00545**	**0.00458**	0.000733 U	**0.000878 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.650**	**0.631**	**6.90**	**1.10**
NSF-PV76out-30FD	FD	3- out	FD	76	05/03/19	**0.000438 J**	0.000400 U	0.000633 U	**0.000501 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.00598**	0.00607 U	**4.74**	0.0120 U
NSF-PV83inlet-30MW3	DGW-MW-3	1- inlet	3	83	05/03/19	**0.190**	**0.163**	**0.265**	**0.237**	**0.0650**	**0.0578**	**1.39**	**0.140**	**2.18**	**2.20**	**1.15**	0.0120 U
NSF-PV83mid-30MW3	DGW-MW-3	2- mid	3	83	05/03/19	**0.0345**	**0.0329**	0.000511 U	**0.000872 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.963**	**0.955**	**4.37**	**0.947**
NSF-PV83out-30MW3	DGW-MW-3	3- out	3	83	05/03/19	**0.00296**	**0.00253**	0.000400 U	**0.000682 J**	0.000200 U	0.000200 U	0.000600 U	0.000600 U	**0.127**	**0.134**	**3.52**	**0.0123 J**
NSF-PV83inlet-30MW11	DGW-MW-11	1- inlet	11	83	05/09/19	**0.0796**	**0.0876**	**0.286**	**0.298**	**0.0627**	**0.0635**	**1.43**	**0.773**	**2.17**	**1.70**	**0.623 J**	0.0120 U
NSF-PV83mid-30MW-11	DGW-MW-11	2- mid	11	83	05/09/19	**0.00296 J**	**0.00266**	0.00200 U	**0.000481 J**	0.00100 U	0.000200 U	0.00300 U	0.000600 U	0.00550 UJ	**0.00232 J**	**5.47**	**1.53**
NSF-PV83out-30MW11	DGW-MW-11	3- out	11	83	05/09/19	0.00200 U	0.000400 U	0.00200 U	0.000400 U	0.00100 U	0.000200 U	0.00300 U	0.000600 U	0.00550 UJ	**0.00180 J**	**4.85**	**0.0608 J**
NSF-PV84inlet-controlFD	Control	1- inlet	0	84	05/09/19	**0.0860**	**0.0917**	**0.0807**	**0.0839**	**0.0669**	**0.0650**	**1.30**	**0.863**	**2.23**	**2.11**	**0.552 J**	0.0120 U
NSF-PV84inlet-controlFD-DUP	Control	1- inlet	0	84	05/09/19	**0.0893**	**0.0857**	**0.0870**	**0.0776**	**0.0671**	**0.0678**	**1.35**	**0.896**	**2.32**	**1.95**	**0.624 J**	0.0120 U
NSF-PV84mid-controlFD	Control	2- mid	0	84	05/09/19	**0.0722**	**0.0834**	**0.0847**	**0.0932**	**0.0566**	**0.0596**	**0.0217**	**0.0181**	**2.14**	**1.95**	0.0600 U	0.0120 U
NSF-PV84out-controlFD	Control	3- out	0	84	05/09/19	**0.0748**	**0.0754**	**0.0955**	**0.0937**	**0.0604**	**0.0606**	0.00300 UJ	**0.000744 J**	**2.38**	**2.00**	**0.107 J**	0.0120 U
NSF-PV84inlet-30FD	FD	1- inlet	FD	84	05/09/19	**0.149**	**0.140**	**0.316**	**0.265**	**0.0715**	**0.0596**	**2.36**	**0.272**	**2.33**	**2.25**	**1.36**	0.0120 U
NSF-PV84mid-30FD	FD	2- mid	FD	84	05/09/19	0.00200 U	**0.00146 J**	0.00200 U	0.000400 U	0.00100 U	0.000200 U	0.00300 U	0.000600 U	**0.664**	**0.753**	**7.90**	**1.58**
NSF-PV84out-30FD	FD	3- out	FD	84	05/09/19	0.00200 U	0.000400 U	0.00200 U	0.000400 U	0.00100 U	0.000200 U	0.00300 U	0.000600 U	0.00550 U	**0.00507**	**4.55**	0.0120 U
NSF-PV91inlet-30MW3	DGW-MW-3	1- inlet	3	91	05/09/19	**0.106**	**0.0877 JL**	**0.304**	**0.285**	**0.0774**	**0.0614**	**2.36**	**0.418**	**2.19**	**2.15**	**1.46**	0.0120 U
NSF-PV91mid-30MW3	DGW-MW-3	2- mid	3	91	05/09/19	**0.0285**	**0.0291**	0.00200 U	0.000400 U	0.00100 U	0.000200 U	0.00300 U	0.000600 U	**1.02**	**1.17**	**8.31**	**2.96**
NSF-PV91out-30MW3	DGW-MW-3	3- out	3	91	05/09/19	**0.00410 J**	**0.00401**	0.00200 U	0.000400 U	0.00100 U	0.000200 U	0.00300 U	0.000600 U	**0.218**	**0.269**	**7.03**	**0.224**

Table 5
New Source Feed Column Study Analytical Results
Appendix 3.7 Permeable Reactive Barrier Column Studies Summary
Exide Frisco Recycling Center Response Action Plan

						Physical Chemistry Parameters					
						Temperature (ºC)	pH	Specific Conductivity (µS/cm)	Redox Potential (mV)	Dissolved Oxygen (ppm)	Total Dissolved Solids (g/L)
[GW]GW_{Ing} PCL[1]						--	--	--	--	--	--
[SW] SW PCL (based on Tier 1 Contact Recreation Water PCL)						--	--	--	--	--	--
[SW]SW PCL (based on chronic aquatic life criteria)						--	--	--	--	--	--
Dilution Factor for Perennial Streams						--	--	--	--	--	--
[SW]GW PCL (with dilution factor of 0.15, based on chronic aquatic life criteria)[2,4]						--	--	--	--	--	--
[SW]GW PCL (with dilution factor of 0.15, based on contact recreation)[4]						--	--	--	--	--	--
Critical PCL[2]						--	--	--	--	--	--
MQL[5]						--	--	--	--	--	--
Sample	**Sample Column**	**Sample Location**	**Column ID**	**PV**	**Date of Metals Sample**	**Temperature (ºC)**	**pH**	**Specific Conductivity (µS/cm)**	**Redox Potential (mV)**	**Dissolved Oxygen (ppm)**	**Total Dissolved Solids (g/L)**
NSF	Preliminary		-1	0	03/26/19	NM	NM	NM	NM	NM	NM
NSF-T0-30MW11	DGW-MW-11	1- inlet	11	45	04/08/19	15.4	6.35	3,916	-16.6	6.32	2.37
NSF-T0-controlFD	Control	1- inlet	0	46	04/08/19	15.7	6.48	3,935	-15.1	6.64	2.268
NSF-T0-30FD	FD	1- inlet	FD	46	04/08/19	15.5	6.45	3,940	-16.3	6.39	2.427
NSF-T0-30MW3	DGW-MW-3	1- inlet	3	53	04/08/19	15.4	6.46	3,917	-17.5	6.49	2.442
NSF-PV55inlet-30MW11	DGW-MW-11	1- inlet	11	55	04/16/19	NM	NM	NM	NM	NM	NM
NSF-PV55mid-30MW11	DGW-MW-11	2- mid	11	55	04/16/19	NM	NM	NM	NM	NM	NM
NSF-PV55out-30MW11	DGW-MW-11	3- out	11	55	04/16/19	12.78	8.26	3,281	-115.4	10.6	2.13
NSF-PV56inlet-controlFD	Control	1- inlet	0	56	04/16/19	NM	NM	NM	NM	NM	NM
NSF-PV56mid-controlFD	Control	2- mid	0	56	04/16/19	NM	NM	NM	NM	NM	NM
NSF-PV56out-controlFD	Control	3- out	0	56	04/16/19	12.99	7.24	3,580	2.4	10.66	2.326
NSF-PV56inlet-30FD	FD	1- inlet	FD	56	04/16/19	NM	NM	NM	NM	NM	NM
NSF-PV56mid-30FD	FD	2- mid	FD	56	04/16/19	NM	NM	NM	NM	NM	NM
NSF-PV56out-30FD	FD	3- out	FD	56	04/16/19	14.12	8.24	3,528	-82.8	10.62	2.294
NSF-PV63inlet-30MW3	DGW-MW-3	1- inlet	3	63	04/16/19	NM	NM	NM	NM	NM	NM
NSF-PV63mid-30MW3	DGW-MW-3	2- mid	3	63	04/16/19	NM	NM	NM	NM	NM	NM
NSF-PV63out-30MW3	DGW-MW-3	3- out	3	63	04/16/19	12.27	8.37	3,363	-102	9.30	2.187
NSF-PV65inlet-30MW11	DGW-MW-11	1- inlet	11	65	04/26/19	NM	NM	NM	NM	NM	NM
NSF-PV65inlet-30MW11-DUP	DGW-MW-11	1- inlet	11	65	04/26/19	NM	NM	NM	NM	NM	NM
NSF-PV65mid-30MW11	DGW-MW-11	2- mid	11	65	04/26/19	NM	NM	NM	NM	NM	NM
NSF-PV65out-30MW11	DGW-MW-11	3- out	11	65	04/26/19	20.34	7.74	3,339	61.7	4.62	2.17
NSF-PV66inlet-controlFD	Control	1- inlet	0	66	04/26/19	NM	NM	NM	NM	NM	NM
NSF-PV66mid-controlFD	Control	2- mid	0	66	04/26/19	NM	NM	NM	NM	NM	NM
NSF-PV66out-controlFD	Control	3- out	0	66	04/26/19	20.48	7.78	3,645	78.4	5.17	2.369
NSF-PV66inlet-30FD-DUP	FD	1- inlet	FD	66	04/26/19	NM	NM	NM	NM	NM	NM
NSF-PV66inlet-30FD	FD	1- inlet	FD	66	04/26/19	NM	NM	NM	NM	NM	NM
NSF-PV66mid-30FD	FD	2- mid	FD	66	04/26/19	NM	NM	NM	NM	NM	NM
NSF-PV66out-30DFD	FD	3- out	FD	66	04/26/19	20.32	7.67	3,246	59	4.52	2.115
NSF-PV73inlet-30MW3	DGW-MW-3	1- inlet	3	73	04/26/19	NM	NM	NM	NM	NM	NM
NSF-PV73mid-30MW3	DGW-MW-3	2- mid	3	73	04/26/19	NM	NM	NM	NM	NM	NM
NSF-PV73out-30MW3	DGW-MW-3	3- out	3	73	04/26/19	20.26	7.92	3,488	65.4	4.78	2.269

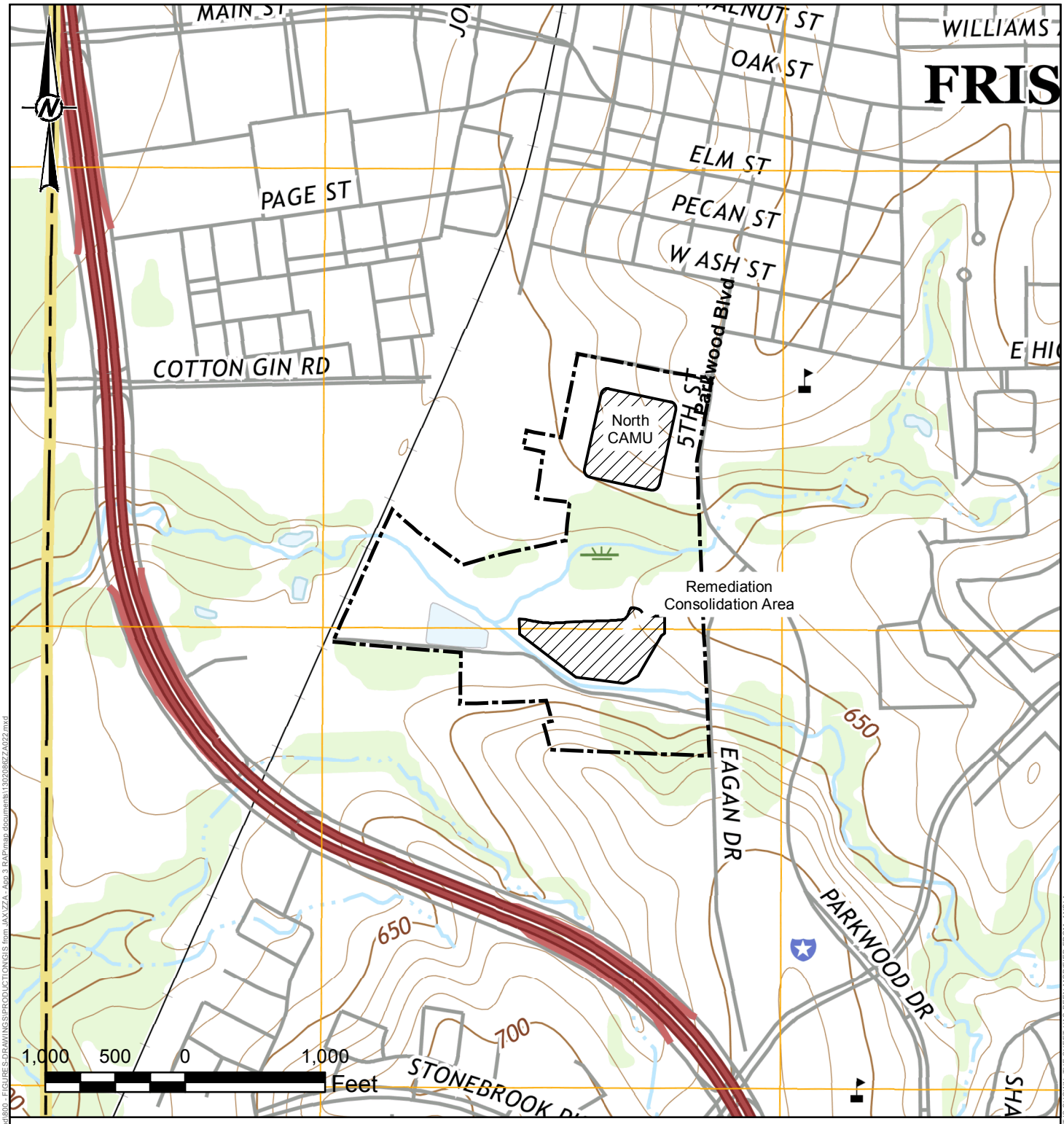
Table 5
New Source Feed Column Study Analytical Results
Appendix 3.7 Permeable Reactive Barrier Column Studies Summary
Exide Frisco Recycling Center Response Action Plan

						Physical Chemistry Parameters					
						Temperature (ºC)	pH	Specific Conductivity (µS/cm)	Redox Potential (mV)	Dissolved Oxygen (ppm)	Total Dissolved Solids (g/L)
[GW]GW_{Ing} PCL[1]						--	--	--	--	--	--
[SW] SW PCL (based on Tier 1 Contact Recreation Water PCL)						--	--	--	--	--	--
[SW]SW PCL (based on chronic aquatic life criteria)						--	--	--	--	--	--
Dilution Factor for Perennial Streams						--	--	--	--	--	--
[SW]GW PCL (with dilution factor of 0.15, based on chronic aquatic life criteria)[2,4]						--	--	--	--	--	--
[SW]GW PCL (with dilution factor of 0.15, based on contact recreation)[4]						--	--	--	--	--	--
Critical PCL[2]						--	--	--	--	--	--
MQL[5]						--	--	--	--	--	--
NSF-PV75inlet-30MW11	DGW-MW-11	1- inlet	11	75	05/03/19	NM	NM	NM	NM	NM	NM
NSF-PV75mid-30MW11	DGW-MW-11	2- mid	11	75	05/03/19	NM	NM	NM	NM	NM	NM
NSF-PV75out-30MW11	DGW-MW-11	3- out	11	75	05/03/19	20.5	7.5	3,884	82.7	6.4	2.52
NSF-PV76inlet-controlFD	Control	1- inlet	0	76	05/03/19	NM	NM	NM	NM	NM	NM
NSF-PV76mid-controlFD	Control	2- mid	0	76	05/03/19	NM	NM	NM	NM	NM	NM
NSF-PV76out-controlFD	Control	3- out	0	76	05/03/19	20.8	7.8	4,009	78.2	7.0	2.61
NSF-PV76inlet-30FD	FD	1- inlet	FD	76	05/03/19	NM	NM	NM	NM	NM	NM
NSF-PV76mid-30FD	FD	2- mid	FD	76	05/03/19	NM	NM	NM	NM	NM	NM
NSF-PV76out-30FD	FD	3- out	FD	76	05/03/19	20.4	7.5	3,818	78.9	5.7	2.48
NSF-PV83inlet-30MW3	DGW-MW-3	1- inlet	3	83	05/03/19	NM	NM	NM	NM	NM	NM
NSF-PV83mid-30MW3	DGW-MW-3	2- mid	3	83	05/03/19	NM	NM	NM	NM	NM	NM
NSF-PV83out-30MW3	DGW-MW-3	3- out	3	83	05/03/19	20.6	7.6	3,883	76.8	6.3	2.52
NSF-PV83inlet-30MW11	DGW-MW-11	1- inlet	11	83	05/09/19	NM	NM	NM	NM	NM	NM
NSF-PV83mid-30MW-11	DGW-MW-11	2- mid	11	83	05/09/19	NM	NM	NM	NM	NM	NM
NSF-PV83out-30MW11	DGW-MW-11	3- out	11	83	05/09/19	10.8	7.7	3,760	25.6	5.9	3.36
NSF-PV84inlet-controlFD	Control	1- inlet	0	84	05/09/19	NM	NM	NM	NM	NM	NM
NSF-PV84inlet-controlFD-DUP	Control	1- inlet	0	84	05/09/19	NM	NM	NM	NM	NM	NM
NSF-PV84mid-controlFD	Control	2- mid	0	84	05/09/19	NM	NM	NM	NM	NM	NM
NSF-PV84out-controlFD	Control	3- out	0	84	05/09/19	12.2	8.1	4,724	28.4	6.2	4.04
NSF-PV84inlet-30FD	FD	1- inlet	FD	84	05/09/19	NM	NM	NM	NM	NM	NM
NSF-PV84mid-30FD	FD	2- mid	FD	84	05/09/19	NM	NM	NM	NM	NM	NM
NSF-PV84out-30FD	FD	3- out	FD	84	05/09/19	11.6	7.6	3,375	23.2	5.8	2.95
NSF-PV91inlet-30MW3	DGW-MW-3	1- inlet	3	91	05/09/19	NM	NM	NM	NM	NM	NM
NSF-PV91mid-30MW3	DGW-MW-3	2- mid	3	91	05/09/19	NM	NM	NM	NM	NM	NM
NSF-PV91out-30MW3	DGW-MW-3	3- out	3	91	05/09/19	10.6	7.7	3,697	28.6	3.9	3.32

Notes:
Detected analytes are bolded.
Green highlight indicates analyte exceeds Critical PCL.
ºC - degrees Celcius
mg/L - milligrams per liter
g/L - grams per liter
ppm - parts per million
µS/cm - microsiemens per centimeter
mV - millivolts
NS - Not Sampled
NM - Not measured
NA - Not Analyzed
J - Analyte concentration estimated
H - Analyzed outside of holding time
U - Analyte not detected above method quantitation limit (MQL). Value shown is the sample detection limit (SDL).
L - Bias likely low.
* Field parameters measured in milligrams per liter.
-- Indicates PCL not available.
(1) Samples for dissolved analysis field filtered with a 0.45 micron filter.
(2) ^{SW}GW PCL set to ^{SW}SW RBEL based on chronic aquatic life criteria for monitoring wells along Stewart Creek assuming ecological criteria (perennial streams) assuming use of a 0.15 dilution factor. Per TRRP-24, specific aquatic life criteria for arsenic, cadmium and lead apply to dissolved rather than total concentrations since the dissolved phase represents the bioavailable form. Also per TRRP-24, the SWGW PCL applies to monitoring wells where there is a potential to discharge to surface water. Arsenic, cadmium, and lead RBELs based on hardness value of 106 mg/L for Segment 0823. Chronic aquatic life criteria updated by TCEQ in January 2017.
(3) Critical PCLs are minimum of the April 2018 TRRP commercial-industrial Tier 1 $^{GW}GW_{Ing}$ and $^{Air}GW_{Inh\text{-}V}$ PCLs, or applicable ^{SW}GW PCLs.
(4) For purposes of this assessment, all groundwater wells were considered a potential point of discharge where the ^{SW}GW PCL for may apply (assuming a dilution factor of 0.15)
(5) MQL values shown are based on 2018 data. No MQL values exceeded applicable PCLs.
(6) Direct Human Contact Recreation Water Tier 1 PCL (last updated March 2006) used to evaluate exposure to constituents of concern (COCs) through the accidental ingestion of surface water and dermal contact. When no value was listed (lead), the drinking water standards were used.
(7) These constituents were included for design considerations only and are not COCs at the Site.
(8) ^{SW}GW PCL (SW RBEL based on chronic aquatic life criteria, no dilution factor) added for reference purposes.
See report text for additional discussion on critical PCLs.

Prepared by: BCW 01/17/2019
Updated by: MH 02/07/2019, 03/05/2019; BCW 04/02/2019; EPW 04/16/2019; BCW 04/30/2019; TJG 05/15/2019; EPW 05/20/2019
Checked by: EPW 02/09/2019, 03/14/2019, 04/02/2019; TJG 04/17/2019; EPW 05/16/2019; BEF 05/20/2019
Reviewed by: AMF/THR 05/30/2019

Figures



LEGEND

- Corrective Action Management
- Former Operating Plant Property Boundary

REFERENCE

1. BASEMAP - USGS DIGITAL RASTER GRAPHIC FRISCO, TX 2016, UNITED STATES GEOLOGICAL SURVEY GEOPDF 2016

STATE OF TEXAS
ANNE M FAETH-BOYD
GEOLOGY
12300
LICENSED
PROFESSIONAL GEOSCIENTIST

CLIENT
EXIDE TECHNOLOGIES

PROJECT
PERMEABLE REACTIVE BARRIER WALL COLUMN STUDY

TITLE
SITE LOCATION MAP

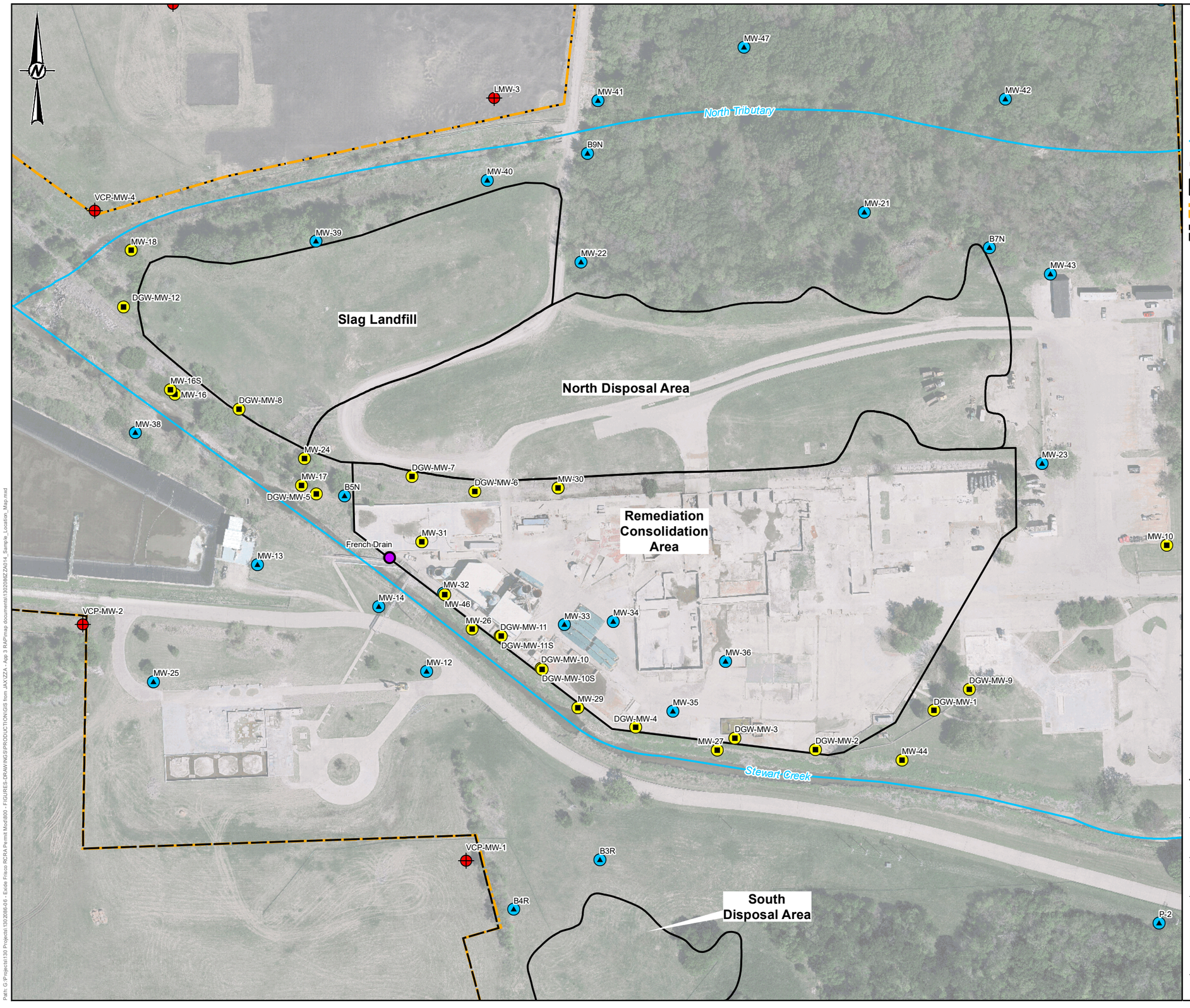
CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-30
PREPARED	EFT
DESIGN	JWT
REVIEW	EPW
APPROVED	AMF

PROJECT No.	CONTROL	Rev.	FIGURE
13-02086-06	1302086ZZA022.mxd	0	1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI A

Path: \\STL-V-FS1\Common\Projects\130 Projects\1302086-06 - Exide Frisco RCRA Permit Mod\900_FIGURES\DRAWINGS\PRODUCTION\GIS from JAX\ZA - App 3 RAP\map documents\1302086ZZA022.mxd



LEGEND

- DGW-PDI Monitoring Wells
- Additional FOP Monitoring Wells
- Other Off-Site Monitoring Wells
- French Drain
- Surface Water Centerline
- Proposed Flood Wall
- Disposal Area
- Former Operating Plant Property Boundary
- Former Undeveloped Buffer Property

STATE OF TEXAS
ANNE M FAETH-BOYD
GEOLOGY
12300
LICENSED
PROFESSIONAL GEOSCIENTIST

150 75 0 150
Feet

REFERENCE

1. SITE FEATURES - GOLDER, 2014
2. AERIAL IMAGERY - PROVIDED BY DALLAS AERIAL SURVEY, DATED APRIL, 2017.

CLIENT
EXIDE TECHNOLOGIES

PROJECT
PERMEABLE REACTIVE BARRIER WALL COLUMN STUDY

TITLE
SAMPLE LOCATION MAP

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-30
PREPARED	SJRS
DESIGN	EPW
REVIEW	EPW
APPROVED	AMF/THR

PROJECT No. 13-02086-06 | CONTROL 1302086ZZA014 | Rev. 0 | FIGURE **2**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI B

Path: G:\Projects\130 Projects\1302086-06 - Exide Frisco RCRA Permit Mod\800 - FIGURES-DRAWINGS\PRODUCTION\GIS from JAX\ZZA - App J RAP\map documents\1302086ZZA014_Sample_Location_Map.mxd

APPENDIX A

Groundwater Collection Forms

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide DGW PDI Resample Event **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 90°F Weather Sunny

SAMPLE INFORMATION

Sample Lcoation DGW-MW-1 Sample No. DGW-MW-1

Sample Date 08/01/18 Time 1550 Sample By E. White

Sample Method Peristaltic Pump Sample Type Grab

Begin Purge @ 1525 @ 300 mL/min

Water Level Before Purging: 11.81 FT BTOC TD: 33.17 FT BTOC

Well Volume: 21.36 FT x 0.163 gal/FT = 3.48 gallons

Volume Water Removed Before Sampling: 2.0 gallons

Water Level Before Sampling: 12.04 FT BTOC

Water Level After Sampling: 12.04 FT BTOC

Appearance of Sample: Clear, no odor

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	1530	1535	1540	1545	1550
Volume Discharge	gals	0.4	0.8	1.2	1.6	2.0
pH	Standard	6.79	6.76	6.59	6.58	6.57
Spec. Cond.	mS/cm	3.567	3.436	2.478	2.305	2.281
Turbidity	NTU	25.0	15.6	5.78	2.61	1.92
Temperature	°C	21.74	21.72	21.79	21.79	21.83
Dissolved Oxygen	mg/l	0.49	0.31	0.24	0.21	0.21
Redox Potential	+/- mV	-79.7	-80.7	-62.6	-55.1	-48.5
Pump Rate	mL/min	300	300	300	300	300
Water Level	FT BTOC	12.01	12.06	12.06	12.04	12.04

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	No	HNO_3
2	Dissolved Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	Yes (0.45 µm)	HNO_3
3				
5				
6				
7				
8				

REMARKS: tubing left in well

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE | Stainless Steel | Teflon

[Peristaltic Pump] | Submersible Pump | Hand Pump

Air-Lift Pump | Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide DGW PDI Resample Event **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 90s Weather Sunny

SAMPLE INFORMATION

Sample Lcoation DGW-MW-2 Sample No. DGW-MW-2

Sample Date 8/02/18 Time 1420 Sample By B. Works

Sample Method Peristaltic Pump Sample Type Grab

Starts purge @ 1400

Water Level Before Purging: 6.94 FT BTOC TD: 19.91 FT BTOC

Well Volume: 12.97 FT x 0.163 gal/FT = 2.11 gallons

Volume Water Removed Before Sampling: 1.06 gallons

Water Level Before Sampling: 7.09 FT BTOC

Water Level After Sampling: 7.09 FT BTOC

Appearance of Sample: Clear

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	1405	1410	1415	1420	
Volume Discharge	~~gals~~ Liters	1.0	2.0	3.0	4.0	
pH	Standard	6.42	6.41	6.44	6.47	
Spec. Cond.	mS/cm	2.920	2.918	2896	2.875	
Turbidity	NTU	10.3	3.65	2.73	2.23	
Temperature	°C	26.18	26.22	26.14	25.95	
Dissolved Oxygen	mg/l	0.75	0.31	0.18	0.18	
Redox Potential	+/- mV	25.7	12.4	6.0	6.47	
Pump Rate	mL/min	200	200	200	200	
Water Level	FT BTOC	7.09	7.09	7.09	7.09	

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	NO	HNO_3
2	Dissolved Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	Yes (0.45 µm)	HNO_3
3				
5				
6				
7				
8				

REMARKS: Tubing left in well

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE | Stainless Steel | Teflon

Peristaltic Pump | Submersible Pump | Hand Pump

Air-Lift Pump | Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide DGW PDI Resample Event **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 90s Weather Sunny

SAMPLE INFORMATION

Sample Lcoation DGW-MW-3 Sample No. DGW-MW-3

Sample Date 8/02/18 Time 1202 Sample By B. Clarks

Sample Method Peristaltic Pump Sample Type Grab

Water Level Before Purging: 6.03 FT BTOC TD: 19.80 FT BTOC

Well Volume: 13.77 FT x 0.163 gal/FT = 2.24 gallons

Volume Water Removed Before Sampling: 2.11 gallons

Water Level Before Sampling: 6.90 FT BTOC

Water Level After Sampling: 6.99 FT BTOC

Appearance of Sample: Clear

start & purge @ 1122

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	1127 1132	1137 1142	1147 1152	1157 1202	
Volume Discharge	~~gals~~ Liters	1.0 2.0	3.0 4.0	5.0 6.0	7.0 8.0	
pH	Standard	4.70 4.57	4.70 5.97	6.39 6.48	6.53 6.54	
Spec. Cond.	mS/cm	4.759 4.770	4.745 2.814	2.091 1.884	1.756 1.758	
Turbidity	NTU	30.2 21.4	13.3 6.31	6.03 5.74	5.45 6.07	
Temperature	°C	25.23 26.33	26.94 26.79	26.81 26.97	26.78 26.80	
Dissolved Oxygen	mg/l	0.09 0.21	0.16 0.14	0.12 0.12	0.12 0.10	
Redox Potential	+/- mV	110.0 107.2	106.0 31.0	-16.5 -36.6	-44.5 -49.9	
Pump Rate	mL/min	200 200	200 200	200 200	200 200	
Water Level	FT BTOC	6.35 6.51	6.61 6.74	6.82 6.86	6.88 6.90	

Sample

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	NO	HNO_3
2	Dissolved Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	Yes (0.45 µm)	HNO_3
3				
5				
6				
7				
8				

REMARKS: Tubing left in well.

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE | Stainless Steel | Teflon

[Peristaltic Pump] | Submersible Pump | Hand Pump

Air-Lift Pump | Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide DGW PDI Resample Event **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 90s Weather Sunny

SAMPLE INFORMATION

Sample Lcoation DGW-MW-4 Sample No. DGW-MW-4

Sample Date 8/01/18 Time 1023 Sample By B. Works

Sample Method Peristaltic Pump Sample Type Grab

starts @ purge @ 0958

Water Level Before Purging: 4.45 FT BTOC TD: 19.74 FT BTOC

Well Volume: 15.29 FT x 0.163 gal/FT = 2.49 gallons

Volume Water Removed Before Sampling: 1.32 gallons

Water Level Before Sampling: 4.52 FT BTOC

Water Level After Sampling: 4.52 FT BTOC

Appearance of Sample: clear

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	1003 1008	1013 1018	1023		
Volume Discharge	~~gals~~ Liters	1.0 2.0	3.0 4.0	5.0		
pH	Standard	6.39 6.49	6.53 6.55	6.56		
Spec. Cond.	mS/cm	2.865 2.590	2.493 2.480	2.476		
Turbidity	NTU	4.45 4.57	2.79 1.49	1.28		
Temperature	°C	25.52 25.48	25.29 25.46	25.07		
Dissolved Oxygen	mg/l	0.62 0.34	0.24 0.18	0.15		
Redox Potential	+/- mV	1.0 -4.6	-7.7 -10.3	-13.2		
Pump Rate	mL/min	200 200	200 200	200		
Water Level	FT BTOC	4.52 4.52	4.52 4.52	4.52		

Sample

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	NO	HNO_3
2	Dissolved Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	Yes (0.45 µm)	HNO_3
3				
5				
6				
7				
8				

REMARKS: None

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE | Stainless Steel | Teflon

Peristaltic Pump | Submersible Pump | Hand Pump

Air-Lift Pump | Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide DGW PDI Resample Event **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 90s Weather Sunny

SAMPLE INFORMATION

Sample Lcoation DGW-MW-5 Sample No. DGW-MW-5

Sample Date 8/01/18 Time 1500 Sample By B. Workes

Sample Method Peristaltic Pump Sample Type Grab

Start purge @ 1415

Water Level Before Purging: 10.05 FT BTOC TD: 23.25 FT BTOC

Well Volume: 13.20 FT x 0.163 gal/FT = 2.15 gallons

Volume Water Removed Before Sampling: 2.36 gallons

Water Level Before Sampling: 10.16 FT BTOC

Water Level After Sampling: 10.16 FT BTOC

Appearance of Sample: Clear

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	1420 1425	1430 1435	1440 1445	1450 1455	1500
Volume Discharge	gals	1.0 2.0	3.0 4.0	5.0 6.0	7.0 8.0	9.0
pH	Standard	6.35 6.38	6.35 6.36	6.37 6.43	6.48 6.49	6.52
Spec. Cond.	mS/cm	4.158 3.913	3.718 3.663	3.648 3.642	3.638 3.639	3.640
Turbidity	NTU	56.5 51.9	39.9 29.8	26.2 19.8	14.0 10.6	9.86
Temperature	°C	23.26 23.74	23.66 23.25	23.59 23.66	23.81 23.75	24.08
Dissolved Oxygen	mg/l	1.61 0.25	0.19 0.23	0.19 0.27	0.18 0.14	0.15
Redox Potential	+/- mV	-11.0 -29.3	-33.3 -32.5	-33.2 -34.4	-35.6 -35.6	-36.4
Pump Rate	mL/min	200 200	200 200	200 200	200 200	200
Water Level	FT BTOC	10.12 10.16	10.16 10.16	10.16 10.16	10.16 10.16	10.16

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	N/O	HNO_3
2	Dissolved Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	Yes (0.45 µm)	HNO_3
3				
5				
6				
7				
8				

REMARKS: Arrive. BW Tubing left in well.

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE | Stainless Steel | Teflon

[Peristaltic Pump] | Submersible Pump | Hand Pump

Air-Lift Pump | Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide DGW PDI Resample Event **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 90s Weather Sunny

SAMPLE INFORMATION

Sample Lcoation DGW-MW-6 Sample No. DGW-MW-6

Sample Date 8/01/18 Time 1655 Sample By B. Weeks

Sample Method Peristaltic Pump Sample Type Grab

Start Purge @ 1630

Water Level Before Purging: 14.47 FT BTOC TD: 32.77 FT BTOC

Well Volume: 18.3 FT x 0.163 gal/FT = 2.98 gallons

Volume Water Removed Before Sampling: 1.32 gallons

Water Level Before Sampling: 14.94 FT BTOC

Water Level After Sampling: 14.94 FT BTOC

Appearance of Sample: Clear

FIELD MEASUREMENTS

Sample

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	1635 1640	1645	1650	1655		
Volume Discharge	~~gals~~ Liters	1.0 2.0	3.0	4.0	5.0		
pH	Standard	6.24 6.24	6.25	6.26	6.29		
Spec. Cond.	mS/cm	4.054 4.038	4.050	4.039	4.005		
Turbidity	NTU	17.7 13.3	10.8	10.6	8.99		
Temperature	°C	24.38 24.67	24.13	23.57	23.62		
Dissolved Oxygen	mg/l	0.58 0.27	0.20	0.13	0.16		
Redox Potential	+/- mV	43.6 36.6	32.5	29.9	19.6		
Pump Rate	mL/min	200 200	200	200	200		
Water Level	FT BTOC	14.94 14.94	14.94	14.94	14.94		

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	NO	HNO_3
2	Dissolved Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	Yes (0.45 µm)	HNO_3
3				
5				
6				
7				
8				

REMARKS: Tubing left in well.

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE | Stainless Steel | Teflon

Peristaltic Pump | Submersible Pump | Hand Pump

Air-Lift Pump | Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide DGW PDI Resample Event **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 90°F Weather Sunny

SAMPLE INFORMATION

Sample Lcoation DGW-MW-7 Sample No. DGW-MW-7

Sample Date 08/01/18 Time 1645 Sample By E. White

Sample Method Peristaltic Pump Sample Type Grab

Begin purge @1625@

Water Level Before Purging: 14.66 FT BTOC TD: 33.02 FT BTOC

Well Volume: 18.36 FT x 0.163 gal/FT = 2.99 gallons

Volume Water Removed Before Sampling: 1.2 gallons

Water Level Before Sampling: 14.69 FT BTOC

Water Level After Sampling: 14.69 FT BTOC

Appearance of Sample: Clear, no odor

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	1630	1635	1640		1645
Volume Discharge	gals	0.3	0.6	0.9		1.2
pH	Standard	6.95	6.97	6.97		6.96
Spec. Cond.	mS/cm	4.907	4.882	4.897		4.896
Turbidity	NTU	20.2	7.69	4.35		4.13
Temperature	°C	23.34	23.20	23.33		23.78
Dissolved Oxygen	mg/l	0.59	0.41	0.40		0.45
Redox Potential	+/- mV	-123.0	-122.2	-123.5		-112.3
Pump Rate	mL/min	250	250	250		250
Water Level	FT BTOC	14.69	14.70	14.70		14.69

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	No	HNO_3
2	Dissolved Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	Yes (0.45 µm)	HNO_3
3				
5				
6				
7				
8				

REMARKS: tubing left in well

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE | Stainless Steel | Teflon

Peristaltic Pump | Submersible Pump | Hand Pump

Air-Lift Pump | Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide DGW PDI Resample Event **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 90s Weather Sunny

SAMPLE INFORMATION

Sample Lcoation DGW-MW-8 Sample No. DGW-MW-8

Sample Date 8/02/18 Time 1310 Sample By B. Works

Sample Method Peristaltic Pump Sample Type Grab

start purge @ 1230

Water Level Before Purging: 25.22 FT BTOC TD: 34.6 FT BTOC

Well Volume: 9.38 FT x 0.163 gal/FT = 1.53 gallons

Volume Water Removed Before Sampling: 3.9 gallons

Water Level Before Sampling: 27.69 FT BTOC

Water Level After Sampling: 27.09 FT BTOC

Appearance of Sample: Clear

FIELD MEASUREMENTS

sample

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	1240	1250	1300	1305	1310	
Volume Discharge	~~gals~~ L.Bags	2.0	5.0	8.0	9.5	11.0	
pH	Standard	6.31	6.36	6.40	6.40	6.40	
Spec. Cond.	mS/cm	5.116	4.761	4.777	4.721	4.181	
Turbidity	NTU	388	86.7	22.2	13.4	6.97	
Temperature	°C	25.19	22.44	23.33	22.69	22.62	
Dissolved Oxygen	mg/l	0.75	0.31	0.14	0.09	0.09	
Redox Potential	+/- mV	46.1	28.4	13.7	13.8	13.2	
Pump Rate	mL/min	200	300	300	300	300	
Water Level	FT BTOC	25.78	27.18	27.22	27.53	27.69	

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	NO	HNO_3
2	Dissolved Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	Yes (0.45 µm)	HNO_3
3				
5				
6				
7				
8				

REMARKS: Had to pull peristaltic tubing to put pump down. → No tubing left in well. EB-1 Collected @ 1330.

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE / Stainless Steel / Teflon

Peristaltic Pump ✓ / Submersible Pump / Hand Pump

Air-Lift Pump / Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide DGW PDI Resample Event **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 90s Weather Sunny

SAMPLE INFORMATION

Sample Lcoation DGW-MW-9 Sample No. DGW-MW-9

Sample Date 8/01/18 Time 1555 Sample By B. Works

Sample Method Peristaltic Pump Sample Type Grab

Water Level Before Purging: 17.39 FT BTOC TD: 27.76 FT BTOC

Well Volume: 10.37 FT x 0.163 gal/FT = 1.69 gallons

Volume Water Removed Before Sampling: 1.58 gallons

Water Level Before Sampling: 17.66 FT BTOC

Water Level After Sampling: 17.66 FT BTOC

Appearance of Sample: Clear

Start purge @ 1525

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	1530	1535	1540	1545	1550	1555	
Volume Discharge	~~gals~~ Liters	1.0	2.0	3.0	4.0	5.0	6.0	
pH	Standard	6.36	6.21	6.26	6.27	6.23	6.22	
Spec. Cond.	mS/cm	5.190	5.482	5.533	5.353	5.421	5.490	
Turbidity	NTU	28.4	12.1	14.2	13.9	5.31	4.61	
Temperature	°C	23.23	23.60	24.42	23.61	23.20	23.55	
Dissolved Oxygen	mg/l	1.91	0.41	0.54	0.54	0.44	0.31	
Redox Potential	+/- mV	14.2	6.6	-2.9	-2.9	-1.2	-3.4	
Pump Rate	mL/min	200	200	200	200	200	200	
Water Level	FT BTOC	17.65	17.65	17.66	17.66	17.66	17.66	

Sample

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	NO	HNO_3
2	Dissolved Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	Yes (0.45 µm)	HNO_3
3				
5				
6				
7				
8				

REMARKS: ~~None~~ BW Tubing left in well

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE | Stainless Steel | Teflon

Peristaltic Pump | Submersible Pump | Hand Pump

Air-Lift Pump | Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide DGW PDI Resample Event **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 90s Weather Sunny

SAMPLE INFORMATION

Sample Lcoation DGW-MW-10S Sample No. DGW-MW-10S

Sample Date 08/01/18 Time 1120 Sample By B. Works

Sample Method Peristaltic Pump Sample Type Grab

Start purge @ 1057

Water Level Before Purging: 2.91 FT BTOC TD: 7.96 FT BTOC

Well Volume: 5.05 FT x 0.163 gal/FT = 0.82 gallons

Volume Water Removed Before Sampling: 1.32 gallons

Water Level Before Sampling: 5.66 FT BTOC

Water Level After Sampling: 6.01 FT BTOC

Appearance of Sample: Clear

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	1100 1105	1110 1115	1120		
Volume Discharge	~~gals~~ Liters	1.0 2.0	3.0 4.0	5.0		
pH	Standard	6.90 6.89	6.91 6.93	6.93		
Spec. Cond.	mS/cm	8.950 8.652	8.570 8.679	8.955		
Turbidity	NTU	3.27 4.59	4.74 4.58	4.76		
Temperature	°C	30.21 31.06	31.43 31.44	30.88		
Dissolved Oxygen	mg/l	0.73 0.17	0.14 0.20	0.21		
Redox Potential	+/- mV	-51.5 -50.4	-54.1 -61.3	-67.2		
Pump Rate	mL/min	200 200	200 200	200		
Water Level	FT BTOC	3.50 4.01	4.69 5.04	5.66		

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	NO	HNO_3
2	Dissolved Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	Yes (0.45 µm)	HNO_3
3				
5				
6				
7				
8				

REMARKS: ~~None~~ BU Tubing left in well.

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE | Stainless Steel | Teflon

Peristaltic Pump | Submersible Pump | Hand Pump

Air-Lift Pump | Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide DGW PDI Resample Event **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 90s Weather Sunny

SAMPLE INFORMATION

Sample Lcoation DGW-MW-10 Sample No. DGW-MW-10

Sample Date 8/01/18 Time 1757 Sample By B. Works

Sample Method Peristaltic Pump Sample Type Grab

start pump @ 1737

Water Level Before Purging: 3.59 FT BTOC TD: 20.46 FT BTOC

Well Volume: 16.87 FT x 0.163 gal/FT = 2.75 gallons

Volume Water Removed Before Sampling: 1.06 gallons

Water Level Before Sampling: 3.92 FT BTOC

Water Level After Sampling: 3.92 FT BTOC

Appearance of Sample: Clear

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	1742 1747	1752 1757			
Volume Discharge	~~gals~~ Liters	1.0 2.0	3.0 4.0			
pH	Standard	6.35 6.38	6.41 6.42			
Spec. Cond.	mS/cm	5.260 4.870	4.752 4.771			
Turbidity	NTU	4.37 1.54	1.67 1.54			
Temperature	°C	25.27 24.71	24.76 24.58			
Dissolved Oxygen	mg/l	3.66 0.31	0.15 0.19			
Redox Potential	+/- mV	20.0 -1.1	-7.3 -10.7			
Pump Rate	mL/min	200 200	200 200			
Water Level	FT BTOC	3.82 3.90	3.91 3.92			

Sample

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	NO	HNO_3
2	Dissolved Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	Yes (0.45 µm)	HNO_3
3				
5				
6				
7				
8				

REMARKS: Tubing left in well.

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE | Stainless Steel | Teflon

[Peristaltic Pump] | Submersible Pump | Hand Pump

Air-Lift Pump | Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide DGW PDI Resample Event **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 90s Weather Sunny

SAMPLE INFORMATION

Sample Lcoation DGW-MW-11S Sample No. DGW-MW-11S

Sample Date 8/01/18 Time 1205 Sample By B. Works

Sample Method Peristaltic Pump Sample Type Grab

Start pump @ 1145

Water Level Before Purging: 2.13 FT BTOC TD: 7.58 FT BTOC

Well Volume: 5.45 FT x 0.163 gal/FT = 0.88 gallons

Volume Water Removed Before Sampling: 1.10 gallons

Water Level Before Sampling: 4.68 FT BTOC

Water Level After Sampling: 5.04 FT BTOC

Appearance of Sample: Clear

FIELD MEASUREMENTS

Sample

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	1150	1155	1200	1205			
Volume Discharge	~~gals~~ Liters	1.0	2.0	3.0	4.0			
pH	Standard	6.74	6.76	6.78	6.79			
Spec. Cond.	mS/cm	10.39	10.28	10.10	10.29			
Turbidity	NTU	1.76	1.91	0.98	0.72			
Temperature	°C	29.45	30.50	30.40	30.54			
Dissolved Oxygen	mg/l	0.52	0.18	0.19	0.15			
Redox Potential	+/- mV	50.6	40.6	35.7	31.4			
Pump Rate	mL/min	200	200	200	200			
Water Level	FT BTOC	2.80	3.59	4.14	4.68			

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	No	HNO_3
2	Dissolved Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	Yes (0.45 µm)	HNO_3
3				
5				
6				
7				
8				

REMARKS: ~~Hard~~ BW Tubing left in hole.

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE | Stainless Steel | Teflon

[Peristaltic Pump] | Submersible Pump | Hand Pump

Air-Lift Pump | Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide DGW PDI Resample Event **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 90's Weather Sunny

SAMPLE INFORMATION

Sample Lcoation DGW-MW-11 Sample No. DGW-MW-11

Sample Date 8/02/18 Time 1527 Sample By B. Works

Sample Method Peristaltic Pump Sample Type Grab

start purge @ 1442

Water Level Before Purging: 6.50 FT BTOC TD: 17.93 FT BTOC

Well Volume: 11.43 FT x 0.163 gal/FT = 1.86 gallons

Volume Water Removed Before Sampling: 2.38 gallons

Water Level Before Sampling: 10.47 FT BTOC

Water Level After Sampling: 10.55 FT BTOC

Appearance of Sample: Clear

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	1447	1452	1457	1502	1507	1512	1517	1522	1527
Volume Discharge	~~gals~~ 1.0 gals	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0
pH	Standard	6.22	6.21	6.24	6.25	6.25	6.24	6.20	6.20	6.22
Spec. Cond.	mS/cm	9.582	9.543	9.493	9.459	9.476	9.437	9.354	9.335	9.373
Turbidity	NTU	33.1	27.6	20.1	16.5	13.3	12.0	11.1	10.6	9.89
Temperature	°C	23.54	24.40	24.99	26.96	27.96	27.73	24.43	25.63	24.94
Dissolved Oxygen	mg/l	0.69	0.36	0.21	0.23	0.23	0.35	0.34	0.38	0.33
Redox Potential	+/- mV	62.9	50.6	45.1	41.0	38.9	37.1	38.6	38.6	38.3
Pump Rate	mL/min	200	200	200	200	200	200	200	200	200
Water Level	FT BTOC	6.69	8.54	9.09	9.13	9.21	9.41	9.81	10.28	10.47

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	NO	HNO_3
2	Dissolved Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	Yes (0.45 µm)	HNO_3
3				
5				
6				
7				
8				

REMARKS: Tubing left in well.

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE Stainless Steel Teflon

[Peristaltic Pump] Submersible Pump Hand Pump

Air-Lift Pump Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide DGW PDI Resample Event **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 75°F Weather Sunny

SAMPLE INFORMATION

Sample Lcoation MW-10 Sample No. MW-10

Sample Date 08/01/18 Time 1005 Sample By E. White

Sample Method Peristaltic Pump Sample Type Grab

Begin Purge @0945 @300 mL/min

Water Level Before Purging: 8.15 FT BTOC TD: 17.12 FT BTOC

Well Volume: 8.97 FT x 0.653 gal/FT = 5.86 gallons

Volume Water Removed Before Sampling: 1.6 gallons

Water Level Before Sampling: 9.66 FT BTOC

Water Level After Sampling: 9.90 FT BTOC

Appearance of Sample: clear, no odor

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	0950	0955	1000		1005
Volume Discharge	gals	0.4	0.8	1.2		1.6
pH	Standard	6.41	6.46	6.49		6.50
Spec. Cond.	mS/cm	1.816	1.810	1.802		1.812
Turbidity	NTU	5.80	4.74	4.60		3.81
Temperature	°C	23.07	23.34	23.42		23.72
Dissolved Oxygen	mg/l	0.67	0.34	0.31		0.26
Redox Potential	+/- mV	50.4	51.0	56.2		59.8
Pump Rate	mL/min	300	300	300		300
Water Level	FT BTOC	8.95	9.34	9.51		9.66

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	NO	HNO_3
2	Dissolved Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	Yes (0.45 µm)	HNO_3
3				
5				
6				
7				
8				

REMARKS: Tubing replaced, left in well

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE | Stainless Steel | Teflon

[Peristaltic Pump] | Submersible Pump | Hand Pump

Air-Lift Pump | Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide DGW PDI Resample Event **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 80s Weather Mostly Sunny

SAMPLE INFORMATION

Sample Location MW-27 Sample No. MW-27

Sample Date 8/02/18 Time 0825 Sample By B. Works

Sample Method Peristaltic Pump Sample Type Grab

start pump @ 0755

Water Level Before Purging: 6.62 FT BTOC TD: 17.38 FT BTOC

Well Volume: 10.76 FT x 0.163 gal/FT = 1.75 gallons

Volume Water Removed Before Sampling: 1.58 gallons

Water Level Before Sampling: 9.89 FT BTOC

Water Level After Sampling: 10.02 FT BTOC

Appearance of Sample: Clear

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	0800	0805	0810	0815	0820	0825	
Volume Discharge	~~gals~~ liters	1.0	2.0	3.0	4.0	5.0	6.0	
pH	Standard	5.22	5.37	5.73	6.22	6.27	6.36	
Spec. Cond.	mS/cm	3.501	3.496	3.439	3.223	2.923	2.665	
Turbidity	NTU	12.5	10.9	6.17	9.15	8.15	6.62	
Temperature	°C	21.92	22.19	22.31	22.54	22.66	22.82	
Dissolved Oxygen	mg/l	1.29	0.51	0.38	0.22	0.24	0.26	
Redox Potential	+/- mV	148.3	119.0	89.9	26.0	10.4	-1.7	
Pump Rate	mL/min	200	200	200	200	200	200	
Water Level	FT BTOC	7.96	8.29	8.62	9.12	9.32	9.89	

Sample

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	NO	HNO_3
2	Dissolved Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	Yes (0.45 µm)	HNO_3
3				
5				
6				
7				
8				

REMARKS: Tubing left in well.

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE | Stainless Steel | Teflon

Peristaltic Pump | Submersible Pump | Hand Pump

Air-Lift Pump | Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide DGW PDI Resample Event **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 90s Weather Sunny

SAMPLE INFORMATION

Sample Lcoation MW-30 Sample No. MW-30

Sample Date 8/02/18 Time 1040 Sample By B. Marks

Sample Method Peristaltic Pump Sample Type Grab

start purge @ 1015

Water Level Before Purging: 12.30 FT BTOC TD: 32.35 FT BTOC

Well Volume: 20.05 FT x 0.163 gal/FT = 3.27 gallons

Volume Water Removed Before Sampling: 1.32 gallons

Water Level Before Sampling: 12.37 FT BTOC

Water Level After Sampling: 12.37 FT BTOC

Appearance of Sample: Clear

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	1020	1025	1030	1035	1040	Sample
Volume Discharge	~~gals~~ Liters	1.0	2.0	3.0	4.0	5.0	
pH	Standard	6.62	6.55	6.62	6.68	6.69	
Spec. Cond.	mS/cm	1.038	1.670	2.070	2.190	2.196	
Turbidity	NTU	29.2	6.74	4.58	4.54	4.00	
Temperature	°C	23.17	23.42	23.40	23.50	23.60	
Dissolved Oxygen	mg/l	0.97	0.27	0.62	0.30	0.26	
Redox Potential	+/- mV	-49.4	-63.3	-71.0	-77.5	-78.4	
Pump Rate	mL/min	200	200	200	200	200	
Water Level	FT BTOC	12.37	12.37	12.37	12.37	12.37	

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	NO	HNO_3
2	Dissolved Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	Yes (0.45 µm)	HNO_3
3				
5				
6				
7				
8				

REMARKS: Replaced old tubing → new tubing left in well.

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE | Stainless Steel | Teflon

Peristaltic Pump | Submersible Pump | Hand Pump

Air-Lift Pump | Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide DGW PDI Resample Event **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 90s Weather Sunny

SAMPLE INFORMATION

Sample Lcoation MW-31 Sample No. MW-31

Sample Date 8/02/18 Time 0950 Sample By B. Works

Sample Method Peristaltic Pump Sample Type Grab

Water Level Before Purging: 11.04 FT BTOC TD: 23.56 FT BTOC

Well Volume: 12.52 FT x 0.163 gal/FT = 2.04 gallons

Volume Water Removed Before Sampling: 2.91 gallons

Water Level Before Sampling: 11.51 FT BTOC

Water Level After Sampling: 11.51 FT BTOC

Appearance of Sample: Clear

Start Purge @ 0855

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	0900	0905	0910	0915	0920	0925	0930	0940	0950
Volume Discharge	~~gals~~ Liters	1.0	2.0	3.0	4.0	5.0	6.0	7.0	9.0	11.0
pH	Standard	6.47	6.47	6.49	6.49	6.51	6.50	6.52	6.51	6.52
Spec. Cond.	mS/cm	3.633	3.674	3.674	3.564	3.489	3.397	3.300	3.180	3.037
Turbidity	NTU	49.3	33.7	31.9	24.3	25.2	24.3	22.3	17.8	9.11
Temperature	°C	24.04	24.56	24.29	24.14	24.10	24.12	24.26	24.15	24.26
Dissolved Oxygen	mg/l	1.26	0.44	0.45	0.01	0.05	0.11	0.33	0.16	0.21
Redox Potential	+/- mV	80.4	56.5	37.8	30.1	25.5	22.8	19.2	21.0	19.9
Pump Rate	mL/min	200	200	200	200	200	200	200	200	200
Water Level	FT BTOC	11.51	11.51	11.51	11.51	11.51	11.51	11.51	11.51	11.51

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	NO	HNO_3
2	Dissolved Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	Yes (0.45 µm)	HNO_3
3				
5				
6				
7				
8				

REMARKS: Replaced tubing - new tubing left in well.

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE | Stainless Steel | Teflon

Peristaltic Pump | Submersible Pump | Hand Pump

Air-Lift Pump | Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide DGW PDI Resample Event **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 90°F Weather Sunny

SAMPLE INFORMATION

Sample Lcoation MW-46 Sample No. MW-46 / DUP-03

Sample Date 08/01/18 Time 1840 Sample By E. White

Sample Method Peristaltic Pump Sample Type Grab

Begin Purge 1735@ 250 mL/min

Water Level Before Purging: 5.16 FT BTOC TD: 19.78 FT BTOC

Well Volume: 14.62 FT x 0.163 gal/FT = 2.38 gallons

Volume Water Removed Before Sampling: 3.0 gallons

Water Level Before Sampling: 9.82 FT BTOC

Water Level After Sampling: 9.82 FT BTOC

Appearance of Sample: Clear (very small fines), no odor

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement		Measurement		Measurement ~~Sample~~	
Time	hhmm	1740	1745	1750	1755	1800	1805	1810	1815
Volume Discharge	gals	0.3	0.6	0.9	1.2	1.4	1.6	1.8	2.0
pH	Standard	5.65	5.64	5.60	5.57	5.58	5.58	5.59	5.60
Spec. Cond.	mS/cm	6.130	5.974	5.777	5.760	5.738	5.817	5.932	5.998
Turbidity	NTU	69.4	66.6	47.4	50.1	52.5	41.6	30.3	24.8
Temperature	°C	25.66	26.10	25.79	25.74	25.42	25.17	25.19	24.88
Dissolved Oxygen	mg/l	0.23	0.19	0.21	0.20	0.18	0.20	0.20	0.20
Redox Potential	+/- mV	19.6	24.2	31.9	33.8	35.3	34.7	34.6	33.8
Pump Rate	mL/min	250	250	250	200	200	200	200	200
Water Level	FT BTOC	7.41	8.11	8.65	9.48	9.81	9.82	9.82	9.82

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	No	HNO_3
2	Dissolved Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	Yes (0.45 µm)	HNO_3
3				
5				
6				
7				
8				

REMARKS: tubing left in well; DUP-03 collected

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE Stainless Steel Teflon

Peristaltic Pump Submersible Pump Hand Pump

Air-Lift Pump Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide DGW PDI Resample Event **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 90°F Weather Sunny

SAMPLE INFORMATION

Sample Lcoation MW-46 Sample No. MW-46

Sample Date 08/01/18 Time 1840 Sample By

Sample Method Peristaltic Pump Sample Type Grab

Water Level Before Purging: FT BTOC TD: FT BTOC

Well Volume: FT x 0.163 gal/FT = gallons

Volume Water Removed Before Sampling: gallons

Water Level Before Sampling: FT BTOC

Water Level After Sampling: FT BTOC

Appearance of Sample:

see Pg #1

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	1820	1825	1830	1835	1840
Volume Discharge	gals	2.2	2.4	2.6	2.8	3.0
pH	Standard	5.62	5.64	5.67	5.68	5.71
Spec. Cond.	mS/cm	6.056	6.106	6.158	6.168	6.177
Turbidity	NTU	20.6	16.2	13.6	11.8	9.59
Temperature	°C	24.81	24.86	24.65	24.53	24.38
Dissolved Oxygen	mg/l	0.21	0.22	0.22	0.24	0.26
Redox Potential	+/- mV	32.9	32.8	31.6	31.7	32.2
Pump Rate	mL/min	200	200	200	200	200
Water Level	FT BTOC	9.82	9.81	9.81	9.82	9.82

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Total Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	No	HNO_3
2	Dissolved Metals (Sb, As, Cd, Pb, and Se)	60 mL Poly	Yes (0.45 µm)	HNO_3
3				
5				
6				
7				
8				

REMARKS: DUP-03 collected

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE | Stainless Steel | Teflon

Peristaltic Pump | Submersible Pump | Hand Pump

Air-Lift Pump | Other

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide PRB Column Studies **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 75° Weather Sunny

SAMPLE INFORMATION

Sample Location French Drain Sample No. French Drain

Sample Date 11/5/18 - 11/6/18 Time 1648/0840 Sample By ~~E. White~~ B. Works

Sample Method Peristaltic Pump Sample Type Grab

Begin Purge @ 1645 Water Level Before Purging: Not Applicable TD: Not Applicable

300 mL/min Well Volume: Not Applicable

@ 1647 Volume Water Removed Before Sampling: 0.5 ~~gallons~~ Liters

Water Level Before Sampling: Not Applicable

Water Level After Sampling: Not Applicable

Appearance of Sample: clear

FIELD MEASUREMENTS

Parameter	Units	11/5/18 Measurement	11/6/18 Measurement	Measurement	Measurement	Sample
Time	hhmm	1648	0840			
Volume Discharge	~~gals~~ Liters	0.5	1.0			
pH	Standard	9.92	9.40			
Spec. Cond.	mS/cm	1.311	1.400			
Turbidity	NTU	1.00	1.82			
Temperature	°C	21.40	17.77			
Dissolved Oxygen	mg/l	9.89	9.42			
Redox Potential	+/- mV	82.2	196.7			
Pump Rate	mL/min	300	300			
Water Level	FT BTOC	NA	NA			

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Column Studies	50 x 1L Amber	No	Ice
2	Total Metals (sb, as, cd, fe, pb, se)	1 x 60mL poly	NO	HNO_3
3	Dissolved Metals (sb, as, cd, fe, pb, se)	1 x 60mL poly	Yes (0.45)	HNO_3
5	Major Anions/Alkalinity	1 x 250 mL poly	NO	Ice
6	Major Cations			
7	Total Hardness			
8	TDS			

REMARKS: Sampled on 11/5/18, column studies amber liters collected on 11/6/18.

NA = Not applicable

Finish sampling @ 1057.

SAMPLING METHODS:

Bailer: PVC/PE, Stainless Steel, Teflon

Peristaltic Pump, Submersible Pump, Hand Pump

Air-Lift Pump, Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide PRB Column Studies **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 70s Weather cloudy

SAMPLE INFORMATION

Sample Location MW-46 Sample No. MW-46

Sample Date 11/16/18 Time 1500 Sample By ~~E. White~~ B. Works

Sample Method Peristaltic Pump Sample Type Grab

Begin Purge @ 1325 Water Level Before Purging: 4.92 FT BTOC TD: 19.53 FT BTOC

300 mL/min @ 1327 Well Volume: 14.61 FT x 0.163 gal/FT = 2.38 gallons

Volume Water Removed Before Sampling: 25.5 ~~gallons~~ liters

Water Level Before Sampling: 9.76 FT BTOC

Water Level After Sampling: 9.76 FT BTOC

Appearance of Sample: clear

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	1330 1345	1350 1400	1410 1420	1430 1440	1450 1500
Volume Discharge	~~gals~~ liters	1.5 3.0	4.5 7.5	10.5 12.5	16.5 19.5	22.5 25.5
pH	Standard	5.40 5.37	5.30 5.28	5.27 5.23	5.30 5.43	5.48 5.53
Spec. Cond.	mS/cm	5.537 5.620	5.643 5.663	5.681 5.720	5.750 5.770	5.808 5.859
Turbidity	NTU	203 192	193 200	140 87.4	48.1 23.6	12.9 7.72
Temperature	°C	23.71 23.72	23.59 23.44	23.39 23.38	23.40 23.39	23.48 23.58
Dissolved Oxygen	mg/l	11.37 3.38	2.91 1.98	2.25 1.77	2.08 1.72	2.32 3.51
Redox Potential	+/- mV	88.7 53.5	57.0 60.5	63.7 70.7	72.3 70.0	71.2 63.8
Pump Rate	mL/min	300 300	300 300	300 300	300 300	300 300
Water Level	FT BTOC	6.30 6.98	7.72 8.69	9.55 9.76	9.76 9.76	9.76 9.76

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Column Studies	50 x 1L Amber	No	Ice
2	Total Metals (sb, as, cd, fe, pb, se)	1 x 60mL poly	NO	HNO_3
3	Dissolved Metals (sb, as, cd, fe, pb, se)	1 x 60mL poly	Yes (0.45)	HNO_3
5	Major Anions/Alkalinity	1 x 250 mL poly	NO	Ice
6	Major Cations			
7	Total Hardness			
8	TDS			

REMARKS: * stop purging @ 1333 due to problems with tubing, restart @ 1340

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE | Stainless Steel | Teflon

[Peristaltic Pump] | Submersible Pump | Hand Pump

Air-Lift Pump | Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide PRB Column Studies **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 73° Weather Sunny

SAMPLE INFORMATION

Sample Location DGW-MW-3 Sample No. DGW-MW-3

Sample Date 11/6/2018 Time 1315 Sample By ~~E. White~~ BW B. Works

Sample Method Peristaltic Pump Sample Type Grab

Begin Purge @ 1235 Water Level Before Purging: 4.46 FT BTOC TD: 19.78 FT BTOC

300 mL/min Well Volume: 15.32 FT x 0.163 gal/FT = 2.49 gallons

@ 1238 Volume Water Removed Before Sampling: 12.0 ~~gallons~~ Liters

Water Level Before Sampling: 5.87 FT BTOC

Water Level After Sampling: 7.12 FT BTOC End @ 1631

Appearance of Sample: Clear

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	1240	1245 1250	1255 1300	1305 1310	1315
Volume Discharge	~~gals~~ Liters	1.5	3.0 4.5	6.0 7.5	9.0 10.5	12.0
pH	Standard	4.75	5.37 6.23	6.55 6.59	6.61 6.62	6.63
Spec. Cond.	mS/cm	4.569	3.745 1.871	1.519 1.505	1.507 1.509	1.504
Turbidity	NTU	10.0	7.52 6.06	6.16 5.64	5.37 5.23	4.88
Temperature	°C	25.33	25.37 26.70	25.55 25.46	25.57 25.53	25.48
Dissolved Oxygen	mg/l	7.80	7.79 7.18	5.97 5.72	5.12 4.90	3.89
Redox Potential	+/- mV	126.6	65.3 -22.9	-43.6 -40.2	-25.2 -22.8	2.9
Pump Rate	mL/min	300	300 300	300 300	300 300	300
Water Level	FT BTOC	4.85	4.98 5.28	5.54 5.64	5.76 5.86	5.87

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Column Studies 56	~~50~~ 60 x 1L Amber	No	Ice
2	Total Metals (sb, as, cd, fe, pb, se)	1 x 60mL poly	NO	HNO_3
3	Dissolved Metals (sb, as, cd, fe, pb, se)	1 x 60mL poly	Yes (0.45)	HNO_3
5	Major Anions/Alkalinity	1 x 250 mL poly	NO	Ice
6	Major Cations			
7	Total Hardness			
8	TDS			

REMARKS: Replaced old tubing, left new tubing in well.

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE | Stainless Steel | Teflon

Peristaltic Pump | Submersible Pump | Hand Pump

Air-Lift Pump | Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide PRB Column Studies **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 50s Weather Sunny

SAMPLE INFORMATION

Sample Location French Drain Sample No. French Drain

Sample Date 12/03/18 Time 1355 Sample By E. White/J. Engel

Sample Method Peristaltic Pump Sample Type Grab

Begin Purge @ mL/min @ 1352

Water Level Before Purging: Not Applicable TD: Not Applicable

Well Volume: Not Applicable

Volume Water Removed Before Sampling: ~0.25-0.50 gallons

Water Level Before Sampling: Not Applicable

Water Level After Sampling: Not Applicable

Appearance of Sample: clear, odorless

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm					1355
Volume Discharge	gals					~0.25-0.50
pH	Standard					9.54
Spec. Cond.	mS/cm					1.569
Turbidity	NTU					1.28
Temperature	°C					15.56
Dissolved Oxygen	mg/l					7.94
Redox Potential	+/- mV					220.1
Pump Rate	mL/min					~250
Water Level	FT BTOC					NA

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Column Studies	x 1L Amber	No	Ice
2	Total Metals (sb, as, cd, fe, pb, se)	1 x 60mL poly		HNO_3
3	Dissolved Metals (sb, as, cd, fe, pb, se)	1 x 60mL poly	Yes (0.45)	HNO_3
5	Major Anions/Alkalinity	1 x 250 mL poly	No	Ice
6	Major Cations	Same as above	No	Ice
7	Total Hardness	Same as above	No	Ice
8	TDS	Same as above	No	Ice

REMARKS: Purged for 5 minutes before sampled. End sample 1601.

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE, Stainless Steel, Teflon

Peristaltic Pump, Submersible Pump, Hand Pump

Air-Lift Pump, Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide PRB Column Studies **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 42°F Weather Overcast

SAMPLE INFORMATION

Sample Location DGW-MW-11 Sample No. DGW-MW-11

Sample Date 12/07/18 Time 1750 Sample By E. White/ J. Engel

Sample Method Peristaltic Pump Sample Type Grab

Begin Purge @ 200 mL/min @ 1715

Water Level Before Purging: ~~Not Applicable~~ EW 5.34 TD: ~~Not Applicable~~ EW 17.75 FT BTOC

Well Volume: ~~Not Applicable~~ 12.41 FT × 0.163 = 2.02 gal

Volume Water Removed Before Sampling: 1.4 gallons

Water Level Before Sampling: ~~Not Applicable~~ 10.75 FT BTOC

Water Level After Sampling: ~~Not Applicable~~ 10.70 FT BTOC

Appearance of Sample: slightly cloudy, no odor

12/04/18 - column study sa
WL: 8.19' BTOC
Sample time: 0915
12/05/18 - WL: 13.30
Sample time: 0900
12/06/18 - WL: 13.91
Sample time: 0930

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	1720	1725 1730	1735 1740	1745	1750	
Volume Discharge	gals	0.2	0.4 0.6	0.8 1.0	1.2	1.4	
pH	Standard	6.29	6.26 6.25	6.25 6.23	6.25	6.25	
Spec. Cond.	mS/cm	3.059	8.143 8.152	8.194 8.235	8.273	8.308	
Turbidity	NTU	44.5	41.2 40.1	42.0 41.5	39.3	38.3	
Temperature	°C	19.74	20.11 20.16	20.57 20.59	20.77	20.90	
Dissolved Oxygen	mg/l	0.52	0.31 0.30	0.25 0.24	0.20	0.19	
Redox Potential	+/- mV	74.9	84.7 87.3	91.4 95.6	97.6	99.3	
Pump Rate	mL/min	200	200 200	200 200	200	200	
Water Level	FT BTOC	7.20	8.05 8.90	8.98 9.21	9.40	10.75	

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Column Studies	x 1L Amber	No	Ice
2	Total Metals (sb, as, cd, fe, pb, se)	1 x 60mL poly	NO (10)	HNO_3
3	Dissolved Metals (sb, as, cd, fe, pb, se)	1 x 60mL poly	Yes (0.45)	HNO_3
5	Major Anions/Alkalinity	1 x 250 mL poly	No	Ice
6	Major Cations	Same as above	No	Ice
7	Total Hardness	Same as above	No	Ice
8	TDS	Same as above	No	Ice

REMARKS: ~~composite sample of 3 perched wells (MW-32, MW-33, MW-34)~~ Total metal sample not filtered per PM; Analytical spl collected 12/04/18, column study spl collected 12/04/18 @ START: 091 DRY: 094 12/05/18 @ START: 085 DRY: 1010 START: 0930 DRY: 1027

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE Stainless Steel Teflon

Peristaltic Pump Submersible Pump Hand Pump

Air-Lift Pump Other_____

12/07/18 WL: 14.82 FT BTOC Start: 0815 DRY: 0900 75L

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide PRB Column Studies **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 46 °F Weather cloudy

SAMPLE INFORMATION

Sample Location ~~MW-46-11S~~ DGW-MW-11S Sample No. ~~MW-46-11S~~ DGW-MW-11S

Sample Date 12/03/18 Time 1750 Sample By E. White/J. Engel

Sample Method Peristaltic Pump Sample Type Grab

Begin Purge @ 200 mL/min @ 17.20

Water Level Before Purging: 2.16 FT BTOC TD: 7.36 FT BTOC

Well Volume: 5.2 FT x 0.163 gal/FT = 0.848 gallons

Volume Water Removed Before Sampling: 0.4 gallons

Water Level Before Sampling: 2.16 FT BTOC

Water Level After Sampling: 5.81 FT BTOC

Appearance of Sample: clear, odorless

12/04/18 - column study sa
WL: 5.78' BTOC
Sample time: 1100
12/05/18
WL: 7.08' BTOC

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	1725	1730	1735	1740	1745	1750
Volume Discharge	L ~~gals~~	0.25	0.50	0.75	1.0	1.25	1.50
pH	Standard	6.86	6.89	6.91	6.91	6.93	6.93
Spec. Cond.	mS/cm	10.57	10.55	10.53	10.56	10.59	10.58
Turbidity	NTU	35.4	28.1	10.3	4.56	3.45	4.00
Temperature	°C	18.08	17.95	17.90	17.86	17.90	18.02
Dissolved Oxygen	mg/l	8.34	2.86	1.75	1.65	1.67	1.64
Redox Potential	+/- mV	213.2	216.5	219.0	221.1	220.0	222.4
Pump Rate	mL/min	~200	~200	~200	200	200	200
Water Level	FT BTOC	3.25	3.65	4.16	4.67	5.07	5.44

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Column Studies	x 1L Amber	No	Ice
2	Total Metals (sb, as, cd, fe, pb, se)	1 x 60mL poly	NO	HNO_3
3	Dissolved Metals (sb, as, cd, fe, pb, se)	1 x 60mL poly	Yes (0.45)	HNO_3
5	Major Anions/Alkalinity	1 x 250 mL poly	No	Ice
6	Major Cations	Same as above	No	Ice
7	Total Hardness	Same as above	No	Ice
8	TDS	Same as above	No	Ice

REMARKS: Analytical sample collected 12/03/18, column study sample collected 12/04/18 @ 1055 START 1118 DRY
12/05/18: START 1017, DRY: 1020,

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE Stainless Steel Teflon

Peristaltic Pump Submersible Pump Hand Pump

Air-Lift Pump Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide PRB Column Studies **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 50s Weather Sunny

SAMPLE INFORMATION

Sample Location MW-46 Sample No. MW-46

Sample Date 12/03/18 Time 1520 Sample By E. White/J. Engel

Sample Method Peristaltic Pump Sample Type Grab

Begin Purge @ 200 mL/min @ 1425

Water Level Before Purging: 4.32 FT BTOC TD: 19.37 FT BTOC

Well Volume: 15.05 FT x 0.163 gal/FT = 2.45 gallons

Volume Water Removed Before Sampling: 3.4 gallons

Water Level Before Sampling: 9.82 FT BTOC

Water Level After Sampling: 9.82 FT BTOC

Appearance of Sample: Clear, no odor

12/04/18 Column study sample
WL: 4.61' BTOC
sample time: 1325
12/05/18
WL: 4.70' BTOC
sample time: 1035

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement		Measurement		Measurement		Sample	
Time	hhmm	1430	1435	1440	1445	1455	1505	1510	1515	1520
Volume Discharge	gals	0.25	0.5	0.8	1.1	1.8	2.3	2.6	3.0	3.4
pH	Standard	5.605	5.56	5.45	5.42	5.39	5.46	5.48	5.53	5.56
Spec. Cond.	mS/cm	5.182	5.154	5.125	5.144	5.154	5.217	5.274	5.318	5.352
Turbidity	NTU	47.6	61.1	85.2	74.9	50.7	19.3	16.3	12.3	9.95
Temperature	°C	20.75	20.48	20.11	20.26	20.112	19.94	20.20	20.20	20.35
Dissolved Oxygen	mg/l	0.87	0.44	0.37	0.25	0.22	0.19	0.19	0.18	0.17
Redox Potential	+/- mV	44.7	47.8	50.8	52.4	56.2	53.6	53.2	53.2	53.0
Pump Rate	mL/min	250	250	200	200	200	200	200	200	200
Water Level	FT BTOC	6.69	7.83	8.50	9.22	9.84	9.82	9.82	9.82	9.82

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Column Studies	10 x 1L Amber	No	Ice
2	Total Metals (sb, as, cd, fe, pb, se)	1 x 60mL poly	No	HNO_3
3	Dissolved Metals (sb, as, cd, fe, pb, se)	1 x 60mL poly	Yes (0.45)	HNO_3
5	Major Anions/Alkalinity	1 x 250 mL poly	No	Ice
6	Major Cations	Same as above	No	Ice
7	Total Hardness	Same as above	No	Ice
8	TDS	Same as above	No	Ice

REMARKS: DUP-01 collected; Analytical sample collected 12/03/18, column study sample collected 12/
12/05/18 START: 1032, sample complete 1440
START: 1320
DRY: 153

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE, Stainless Steel, Teflon

Peristaltic Pump, Submersible Pump, Hand Pump

Air-Lift Pump, Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide PRB Column Studies **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 45°F Weather Sunny

SAMPLE INFORMATION

Sample Location MW-30 Sample No. MW-30

Sample Date 12/03/18 Time 1650 Sample By E. White/ J. Engel

Sample Method Peristaltic Pump Sample Type Grab

Begin Purge @ 1600

300 mL/min @

Water Level Before Purging: ~~Not Applicable~~ FW 10.72 FT BTOC TD: ~~Not Applicable~~ FW 32.14 FT BTOC

Well Volume: ~~Not Applicable~~ FW 21.42 FT x 0.163 = 3.42 gal

Volume Water Removed Before Sampling: 3.5 gallons

Water Level Before Sampling: ~~Not Applicable~~ FW 10.77 FT BTOC

Water Level After Sampling: ~~Not Applicable~~ FW 10.77 FT BTOC

Appearance of Sample: Clear, no odor

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Sample	
Time	hhmm	1605	1610 1615	1620 1625	1630 1635	1640 1645	1650
Volume Discharge	gals	0.3	0.6 0.9	1.2 1.6	2.0 2.4	2.8 3.2	3.5
pH	Standard	6.67	6.68 6.68	6.68 6.68	6.67 6.67	6.67 6.66	6.66
Spec. Cond.	mS/cm	1.522	1.678 1.739	1.791 1.851	1.917 1.980	2.040 2.066	2.117
Turbidity	NTU	70.1	43.8 35.1	28.5 22.7	17.0 15.4	15.1 11.3	9.72
Temperature	°C	22.20	22.18 22.12	21.99 22.05	22.10 22.04	21.85 21.76	21.61
Dissolved Oxygen	mg/l	0.44	0.24 0.20	0.17 0.12	0.12 0.07	2.50 2.70	1.79
Redox Potential	+/- mV	-86.3	-86.2 -80.6	-85.3 -85.0	-86.2 -78.7	-80.5 -78.4	-81.2
Pump Rate	mL/min	300	300 300	300 300	300 300	300 300	300
Water Level	FT BTOC	10.77	10.77 10.77	10.77 10.77	10.77 10.77	10.77 10.77	10.77

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Column Studies	x 1L Amber	No	Ice
2	Total Metals (sb, as, cd, fe, pb, se)	1 x 60mL poly	NO	HNO_3
3	Dissolved Metals (sb, as, cd, fe, pb, se)	1 x 60mL poly	Yes (0.45)	HNO_3
5	Major Anions/Alkalinity	1 x 250 mL poly	No	Ice
6	Major Cations	Same as above	No	Ice
7	Total Hardness	Same as above	No	Ice
8	TDS	Same as above	No	Ice

REMARKS: Sample collected only

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE Stainless Steel Teflon

Peristaltic Pump Submersible Pump Hand Pump

Air-Lift Pump Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide PRB Column Studies **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 40s Weather Sunny

SAMPLE INFORMATION

Sample Location ~~DGW-MW-11S~~ EW MW-32 Sample No. ~~DGW-MW-11S~~ EW MW-32

Sample Date 12/05/18 Time 0910 Sample By E. White/ J. Engel

Sample Method Peristaltic Pump Sample Type Grab

Begin Purge @ 150 mL/min @ 1124

Water Level Before Purging: ~~Not Applicable~~ EW 2.70 FT BTOC TD: ~~Not Applicable~~ EW 4.87 FT BTOC

Well Volume: ~~Not Applicable~~ 2.17 FT x 0.163 = 0.35 gallons

Volume Water Removed Before Sampling: 0.60 gallons

Water Level Before Sampling: ~~Not Applicable~~ 4.31 FT BTOC

Water Level After Sampling: ~~Not Applicable~~ DRY

Appearance of Sample: Clear

Water Level 12/05/18 4.31 FT BTOC

FIELD MEASUREMENTS

DRY

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	1129	1134	1139		0910
Volume Discharge	gals	0.15	0.4	0.55		
pH	Standard	6.93	7.01	7.04		
Spec. Cond.	mS/cm	8.511	8.475	8.527		
Turbidity	NTU	15.5	14.1	14.7		
Temperature	°C	15.87	15.72	15.90		
Dissolved Oxygen	mg/l	11.25	3.34	2.24		
Redox Potential	+/- mV	98.6	21.8	-10.7		
Pump Rate	mL/min	150	150	150		
Water Level	FT BTOC	3.63	4.21	4.45		

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Column Studies	x 1L Amber	No	Ice
2	Total Metals (~~sb, as, cd, fe, pb, se~~)	1 x 60mL poly		HNO_3
3	Dissolved Metals (sb, as, cd, ~~fe, pb, se~~)	1 x 60mL poly	Yes (0.45)	HNO_3
5	Major Anions/Alkalinity	~~1 x 250 mL poly~~	No	Ice
6	Major Cations	Same as above	No	Ice
7	Total Hardness	Same as above	No	Ice
8	TDS	Same as above	No	Ice

REMARKS: DRY at 1143, ~0.60 gal removed; insufficient volume for sample

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE, Stainless Steel, Teflon

Peristaltic Pump, Submersible Pump, Hand Pump

Air-Lift Pump, Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide PRB Column Studies **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature — Weather —

SAMPLE INFORMATION

Sample Location MW-3033 Sample No. MW-3033

Sample Date — Time — Sample By E. White/ J. Engel

Sample Method Peristaltic Pump Sample Type Grab

Begin Purge @ 1330

150 mL/min

Water Level Before Purging: ~~Not Applicable~~ FW 0.95 FT BTOC TD: ~~Not Applicable~~ FW 4.71 FT BTOC

Well Volume: ~~Not Applicable~~ AW 3.76 FT × 0.163 = 0.61 gallons

Volume Water Removed Before Sampling: ~~gallons~~ FW NA

Water Level Before Sampling: ~~Not Applicable~~ NA

Water Level After Sampling: ~~Not Applicable~~ NA

Appearance of Sample: NA

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement		Measurement		Sample	
Time	hhmm	1335	1340	1340	1345	1350	1355	1400	1405
Volume Discharge	gals	0.20	0.40	0.60	0.80	1.0	1.2	1.4	1.6
pH	Standard	7.16	7.04	7.151	6.99	6.98	6.95	6.94	6.94
Spec. Cond.	mS/cm	4.324	4.281	4.274	4.268	4.207	4.330	4.374	4.364
Turbidity	NTU	102	81.6	51.2	27.4	30.2	23.6	17.7	9.18
Temperature	°C	16.75	16.79	16.89	17.18	16.94	17.17	17.40	17.34
Dissolved Oxygen	mg/l	4.45	2.81	2.02	1.63	1.77	1.57	2.34	2.31
Redox Potential	+/- mV	84.2	65.2	45.9	31.1	10.2	-3.9	-14.6	-14.3
Pump Rate	mL/min	150	150	150	150	150	150	150	150
Water Level	FT BTOC	2.60	2.68	2.71	2.80	3.11	3.42	3.90	4.11

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Column Studies	x 1L Amber	No	Ice
2	Total Metals (~~sb~~, as, cd, fe, pb, se)	1 x 60mL poly	/	HNO_3
3	Dissolved Metals (sb, as, cd, fe, pb, se)	1 x 60mL poly	Yes (0.45)	HNO_3
5	Major Anions/Alkalinity	1 x 250 mL poly	No	Ice
6	Major Cations	Same as above	No	Ice
7	Total Hardness	Same as above	No	Ice
8	TDS	Same as above	No	Ice

REMARKS: DRY at 1409, ~1.8 gallons removed; not sampled per PM

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE, Stainless Steel, Teflon

[Peristaltic Pump], Submersible Pump, Hand Pump

Air-Lift Pump, Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide PRB Column Studies **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature — Weather —

SAMPLE INFORMATION

Sample Location ~~French Drain~~ EW MW-34 Sample No. ~~French Drain~~ EW MW-34

Sample Date — Time — Sample By E. White/J. Engel

Sample Method Peristaltic Pump Sample Type Grab

Begin Purge @ 1415

150 mL/min

Water Level Before Purging: ~~Not Applicable~~ EW 3.08 FT BTOC TD: ~~Not Applicable~~ EW 4.78 FT BTOC

Well Volume: ~~Not Applicable~~ EW 1.7 FT x 0.163 = 0.277 gallons

Volume Water Removed Before Sampling: ~~gallons~~ NA

Water Level Before Sampling: ~~Not Applicable~~ EW NA

Water Level After Sampling: ~~Not Applicable~~ EW NA

Appearance of Sample: NA

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	~~Sample~~ DRY
Time	hhmm	1420	1425	1430	1435	
Volume Discharge	gals	0.2	0.3	0.5	0.6	
pH	Standard	7.30	7.31	7.29	7.28	
Spec. Cond.	mS/cm	5.930	5.945	5.966	6.027	
Turbidity	NTU	9.01	5.47	4.56	3.15	
Temperature	°C	18.24	18.20	18.27	18.63	
Dissolved Oxygen	mg/l	1.03	0.93	1.06	1.60	
Redox Potential	+/- mV	59.3	50.3	43.6	37.6	
Pump Rate	mL/min	150	150	150	150	
Water Level	FT BTOC	3.61	3.88	4.11	4.35	

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Column Studies	x 1L Amber	No	Ice
2	Total Metals (sb, as, cd, fe, pb, se)	1 x 60mL poly	✓	HNO_3
3	Dissolved Metals (sb, as, cd, fe, pb, se)	1 x 60mL poly	Yes (0.45)	HNO_3
5	Major Anions/Alkalinity	1 x 250 mL poly	No	Ice
6	Major Cations	Same as above	No	Ice
7	Total Hardness	Same as above	No	Ice
8	TDS	Same as above	No	Ice

REMARKS: DRY at 1438 ~0.7 gallons removed; not sampled per PM

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE — Stainless Steel — Teflon

[Peristaltic Pump] — Submersible Pump — Hand Pump

Air-Lift Pump — Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide ~~RAP Drilling~~ column studies **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 35°F Weather Cloudy / Rain

SAMPLE INFORMATION

Sample Location DGW-MW-11 Sample No. DGW-MW-11

Sample Date 01/02/18 Time 1715 Sample By E. White

Sample Method Peristaltic Pump Sample Type Grab

1640 @ 200 mL/min

Water Level Before Purging: 5.45 FT BTOC TD: 17.76 FT BTOC

Well Volume: 12.31 FT x 0.653 gal/FT = 2.01 gallons

Volume Water Removed Before Sampling: 1.4 gallons

Water Level Before Sampling: 10.70 FT BTOC

Water Level After Sampling: 13.70 FT BTOC

Appearance of Sample: light cloudy brown/yellow

01/03/19 @ 0755
WL: 11.70 FT BTOC
Sample start: 0755
Pause at 0880 (8L filled)
WL @ 1045 = 13.28 FT BTOC
Sample start: 1045
DRY: 1150 (12L filled)
↳ total

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement		Sample	
Time	hhmm	1645	1650	1655	1700	1705	1710	1715
Volume Discharge	gals	0.2	0.4	0.6	0.8	1.0	1.2	1.4
pH	Standard	6.02	6.10	6.10	6.09	6.08	6.12	6.11
Spec. Cond.	mS/cm	8.964	9.020	9.024	9.047	9.059	9.083	9.102
Turbidity	NTU	294	228	184	142	98.4	73.5	52.0
Temperature	°C	18.66	18.74	18.74	18.71	18.60	18.60	18.70
Dissolved Oxygen	mg/l	0.84	0.79	0.61	0.59	0.51	0.44	0.43
Redox Potential	+/- mV	253.3	244.9	226.7	211.7	196.8	185.1	178.2
Pump Rate	mL/min	200	200	200	200	200	200	200
Water Level	FT BTOC	7.12	8.10	9.01	9.68	10.26	10.71	10.70

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	column studies	X 1L amber	NO	Ice
2	Total Metals	1x60mL plastic	NO	Ice, HNO_3
3	Dissolved Metals	1x60mL plastic	Yes (0.45)	Ice, HNO_3
5				
6				
7				
8				

REMARKS: Analytical metals samples collected on 01/02/19, total metals not field filtered; 8 carboys filled on 01/02/19, pause sampling (lunch) at 1800, WL = 13.70 FT BTOC

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE Stainless Steel Teflon

[Peristaltic Pump] Submersible Pump Hand Pump

Air-Lift Pump Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide PRB Column Studies **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 45° F Weather Sunny

SAMPLE INFORMATION

Sample Location DGW-MW-11 Sample No. DGW-MW-11

Sample Date 01/23/19 Time 1650 Sample By E. White

Sample Method Peristaltic Pump Sample Type Grab

Begin Purge @ 200 mL/min @ 1525

Water Level Before Purging: 5.07 FT BTOC TD: 17.74 FT BTOC

Well Volume: 12.67 FT x 0.163 gal/FT = 2.06 gallons

Volume Water Removed Before Sampling: 3.7 gallons

Water Level Before Sampling: 13.32 FT BTOC

Water Level After Sampling: 16.30 FT BTOC

Appearance of Sample: Mostly Clear

FIELD MEASUREMENTS

Parameter	Units	Measurement		Measurement		Measurement		Measurement		Sample ↘	
Time	hhmm	1540	1550	1600	1610	1620	1630	1635	1640	1645	1650
Volume Discharge	gals	0.4	0.9	1.3	1.8	2.2	2.7	2.9	3.2	3.4	3.7
pH	Standard	6.06	6.06	6.09	6.15	6.21	6.27	6.29	6.29	6.31	6.31
Spec. Cond.	mS/cm	7.119	7.060	6.974	7.251	7.319	7.414	7.435	7.420	7.321	7.347
Turbidity	NTU	202	102	91.0	48.1	28.6	21.8	15.8	14.1	13.3	9.31
Temperature	°C	18.27	17.49	17.09	17.71	17.92	17.71	17.77	17.71	17.17	17.42
Dissolved Oxygen	mg/l	3.65	4.01	3.55	1.14	1.07	0.97	0.92	1.00	1.01	0.96
Redox Potential	+/- mV	237.4	225.5	221.1	206.9	199.8	192.0	187.0	185.9	182.0	176.4
Pump Rate	mL/min	200	200	200	200	200	200	200	200	200	200
Water Level	FT BTOC	9.41	10.05	10.24	10.72	11.32	12.06	12.42	12.65	13.00	13.32

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Column Studies	6 x 1 L Amber	No	Ice
2				
3				
4				

REMARKS: Flow cell leaking, begin readings at 1540; sample complete at 1758 (163L total for column study); tubing removed from hole.

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE Stainless Steel Teflon

[Peristaltic Pump] Submersible Pump Hand Pump

Air-Lift Pump Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide – Column Studies **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 70°F Weather Overcast

SAMPLE INFORMATION

Sample Location DGW-MW-3 Sample No. DGW-MW-3

Sample Date 03/08/19 Time 0950 Sample By P. Spudic

Sample Method Peristaltic Pump Sample Type Grab

Water Level Before Purging: 5.04 FT BTOC TD: 19.78* FT BTOC

*as measured 11/2018

Well Volume: 14.74 FT x 0.163 gal/FT = 2.41 gallons

Volume Water Removed Before Sampling: 2.0 gallons

Water Level Before Sampling: 6.65 FT BTOC

Water Level After Sampling: Not Measured ~~FT BTOC~~ EW

Appearance of Sample: Clear

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	0930	0935	0940	0945	0950
Volume Discharge	gals	0.4	0.8	1.2	1.6	2.0
pH	Standard	5.98	6.51	6.57	6.61	6.64
Spec. Cond.	mS/cm	1.977	1.287	1.268	1.214	1.202
Turbidity	NTU	20.3	6.64	5.15	2.84	1.91
Temperature	°C	19.51	19.10	18.90	18.75	18.81
Dissolved Oxygen	mg/l					
Redox Potential	+/- mV					
Pump Rate	mL/min	300	300	300	300	300
Water Level	FT BTOC	5.56	5.90	6.22	6.42	6.65

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Column Studies	24 x 1L amber	No	Ice
2				
3				
5				
6				
7				
8				

REMARKS: None

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE, Stainless Steel, Teflon

Peristaltic Pump, Submersible Pump, Hand Pump

Air-Lift Pump, Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide - Column Study **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 65°F Weather Partly Cloudy

SAMPLE INFORMATION

Sample Location DGW-MW-11 Sample No. DGW-MW-11

Sample Date 03/08/19 Time 1120 Sample By J. Brayton

Sample Method Peristaltic Pump Sample Type Grab

Start Purge @ 1055

Water Level Before Purging: 5.67 FT BTOC TD: 12.90 FT BTOC

Well Volume: 7.23 FT x 0.163 gal/FT = 1.17 gallons

Volume Water Removed Before Sampling: 2.0 gallons

Water Level Before Sampling: 9.17 FT BTOC

Water Level After Sampling: 9.96 FT BTOC

Appearance of Sample: Clear

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	1100	1105	1115		1120
Volume Discharge	gals	—	—	—		2.0
pH	Standard	6.75	6.79	6.77		6.74
Spec. Cond.	mS/cm	1.672	1.709	1.649		1.599
Turbidity	NTU	—	—	—		—
Temperature	°C	20.8	20.7	20.6		20.3
Dissolved Oxygen	mg/l	4.13	2.88	3.06		3.09
Redox Potential	+/- mV	205	233	227		234
Pump Rate	mL/min	250	200	200		200
Water Level	FT BTOC	7.02	7.87	9.17		9.96

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Column Studies	4 x 1L ambers	No	Ice
2				
3				
5				
6				
7				
8				

REMARKS: None

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE, Stainless Steel, Teflon

[Peristaltic Pump], Submersible Pump, Hand Pump

Air-Lift Pump, Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 70's Weather Sunny w/ Clouds

SAMPLE INFORMATION

Sample Location French Drain Sample No. French Drain

Sample Date 3/19/19 Time _____ Sample By PBS

Sample Method Peristaltic Pump Sample Type Grab

11:35 Water Level Before Purging: N/A FT BTOC TD: N/A FT BTOC

Well Volume: ~~FT x 0.163 gal/FT =~~ gallons N/A

Volume Water Removed Before Sampling: _____ gallons

Water Level Before Sampling: _____ FT BTOC

Water Level After Sampling: _____ FT BTOC

Appearance of Sample: Clear, odorless

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm					11:40
Volume Discharge	gals					0.25
pH	Standard					9.83
Spec. Cond.	mS/cm					1.372
Turbidity	NTU					3.81
Temperature	°C					14.4
Dissolved Oxygen	mg/l					—
Redox Potential	+/- mV					—
Pump Rate	mL/min					200
Water Level	FT BTOC					N/A

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Column Studies	24 x 1L Amb	NO	ICE
2				
3				
5				
6				
7				
8				

REMARKS: NONE

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE | Stainless Steel | Teflon

Peristaltic Pump | Submersible Pump | Hand Pump

Air-Lift Pump | Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 70's Weather Overcast

SAMPLE INFORMATION

Sample Location DGW-MW-3 Sample No. DGW-MW-3

Sample Date 3/2011 Time 10:40 Sample By PBS

Sample Method Peristaltic Pump Sample Type Grab

10:15

Water Level Before Purging: 4.87' FT BTOC TD: 19.77 FT BTOC

Well Volume: 14.9 FT x 0.163 gal/FT = 2.429 gallons

Volume Water Removed Before Sampling: 1.0 gallons

Water Level Before Sampling: 6.91 FT BTOC

Water Level After Sampling: 8.36 FT BTOC

Appearance of Sample: clear / odorless

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	10:20	10:25	10:30	10:35	10:40
Volume Discharge	gals	0.2	0.4	0.6	0.8	1.0
pH	Standard	6.96	6.94	6.93	6.95	6.95
Spec. Cond.	mS/cm	1.16	1.15	1.14	1.15	1.14
Turbidity	NTU	1.12	1.06	0.82	1.01	0.96
Temperature	°C	18.1	17.9	17.7	17.8	17.7
Dissolved Oxygen	mg/l	—	—	—	—	—
Redox Potential	+/- mV	—	—	—	—	—
Pump Rate	mL/min	200	200	200	200	200
Water Level	FT BTOC	5.17	5.61	5.98	6.37	6.91

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Column Studies	1 L AMBX	NO	N/A
2				
3				
5				
6				
7				
8				

REMARKS: NONE

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE Stainless Steel Teflon

[Peristaltic Pump] Submersible Pump Hand Pump

Air-Lift Pump Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide Project No. : 130-2086-06

WEATHER CONDITIONS

Temperature 80's Weather Sunny

SAMPLE INFORMATION

Sample Location DGW-MW-11 Sample No. DGW-MW-11

Sample Date 3/21/19 Time 15:25 Sample By PBS

Sample Method Peristaltic Pump Sample Type Grab

Water Level Before Purging: 8.25 FT BTOC TD: 17.74 FT BTOC

Well Volume: 9.49 FT x 0.163 gal/FT = 1.547 gallons

Volume Water Removed Before Sampling: 1.0 gallons

Water Level Before Sampling: 10.89 FT BTOC

Water Level After Sampling: 14.65 FT BTOC

Appearance of Sample: Clear/Odorless

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	15:05	15:10	15:15	15:20	15:25
Volume Discharge	gals	0.2	0.4	0.6	0.8	1.0
pH	Standard	6.21	6.19	6.18	6.18	6.18
Spec. Cond.	mS/cm	8.74	8.72	8.72	8.71	8.71
Turbidity	NTU	49.2	46.3	48.2	51.6	44.7
Temperature	°C	19.4	19.5	19.3	19.3	19.2
Dissolved Oxygen	mg/l	—	—	—	—	—
Redox Potential	+/- mV	—	—	—	—	—
Pump Rate	mL/min	200	200	200	200	200
Water Level	FT BTOC	8.75	9.39	9.86	10.21	10.64

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Column Studies	1L AMB * 4	NO	N/A
2				
3				
5				
6				
7				
8				

REMARKS: NONE

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE Stainless Steel Teflon

[Peristaltic Pump] Submersible Pump Hand Pump

Air-Lift Pump Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 60's Weather Sunny w/ clouds

SAMPLE INFORMATION

Sample Location DGW-MW-11 Sample No. DGW-MW-11

Sample Date 3/19/19 Time 9:40 Sample By PBS

Sample Method Peristaltic Pump Sample Type Grab

Start: 9:15

Water Level Before Purging: 6.39 FT BTOC TD: 17.74 FT BTOC

Well Volume: 11.35 FT x 0.163 gal/FT = 1.85 gallons

Volume Water Removed Before Sampling: 1.0 gallons

Water Level Before Sampling: 10.21 FT BTOC

Water Level After Sampling: DRY FT BTOC

Appearance of Sample: Clear/odorless

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	9:20	9:25	9:30	9:35	9:40
Volume Discharge	gals	0.2	0.4	0.6	0.8	1.0
pH	Standard	6.16	6.15	6.15	6.16	6.16
Spec. Cond.	mS/cm	8.69	8.68	8.66	8.67	8.67
Turbidity	NTU	103	90.2	89.4	52.3	49.1
Temperature	°C	18.2	18.0	18.0	17.8	17.9
Dissolved Oxygen	mg/l	—	—	—	—	—
Redox Potential	+/- mV	—	—	—	—	—
Pump Rate	mL/min	200	200	200	200	200
Water Level	FT BTOC	7.44	8.25	8.96	9.46	9.91

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Column Studies	1 L X	NO	N/A
2				
3				
5				
6				
7				
8				

REMARKS: NONE

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE, Stainless Steel, Teflon

Peristaltic Pump, Submersible Pump, Hand Pump

Air-Lift Pump, Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide PRB Column Studies **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 75°F Weather Sunny w/ Clouds

SAMPLE INFORMATION

Sample Location DGW-MW-3 Sample No. DGW-MW-3

Sample Date 4/23/19 Time 9:45 Sample By ~~E. White~~ Payne Spudis

Sample Method Peristaltic Pump Sample Type Grab

Begin Purge @ 200 mL/min @ 9:20

Water Level Before Purging: 4.93 FT BTOC TD: 19.77 FT BTOC

Well Volume: 14.84 FT x 0.163 gal/FT = 2.42 gallons

Volume Water Removed Before Sampling: 1.25 gallons

Water Level Before Sampling: 5.52 FT BTOC

Water Level After Sampling: 5.98 FT BTOC

Appearance of Sample: Slightly cloudy

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	9:25	9:30	9:35	9:40	9:45
Volume Discharge	gals	0.25	0.5	0.75	1.0	1.25
pH	Standard	6.93	6.93	6.93	6.94	6.95
Spec. Cond.	mS/cm	2.611	1,124	1.087	1.076	1.085
Turbidity	NTU	31.6	24.8	18.1	12.6	13.4
Temperature	°C	19.1	18.9	19.0	19.0	19.0
Dissolved Oxygen	mg/l	0.39	0.48	0.19	0.21	0.24
Redox Potential	+/- mV	71.2	-35.9	-30.1	-29.6	-20.1
Pump Rate	mL/min	200	200	200	200	200
Water Level	FT BTOC	5.08	5.19	5.31	5.42	5.50

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Column Study Analysis	~~750~~ x 1L Amber	No	Ice
2				
3	NFE			
5				
6				
7				
8				

REMARKS: NONE

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE, Stainless Steel, Teflon

Peristaltic Pump, Submersible Pump, Hand Pump

Air-Lift Pump, Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exide PRB Column Studies **Project No. :** 130-2086-06

WEATHER CONDITIONS

Temperature 75°F Weather Sunny w/ Clouds

SAMPLE INFORMATION

Sample Location French Drain Sample No. French Drain

Sample Date 4/23/19 Time 11:00 Sample By ~~E. White~~ Payne Spurlc

Sample Method Peristaltic Pump Sample Type Grab

Begin Purge @ mL/min @ 10:50

Water Level Before Purging: Not Applicable TD: Not Applicable

Well Volume: Not Applicable

Volume Water Removed Before Sampling: 0.5 gallons

Water Level Before Sampling: Not Applicable

Water Level After Sampling: Not Applicable

Appearance of Sample: Clear

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm				10:55	11:00
Volume Discharge	gals				.25	0.5
pH	Standard				10.24	10.16
Spec. Cond.	mS/cm				2.41	1.63
Turbidity	NTU				5.18	4.12
Temperature	°C				22.3	22.3
Dissolved Oxygen	mg/l				6.12	5.87
Redox Potential	+/- mV				-15.1	-17.0
Pump Rate	mL/min				200	200
Water Level	FT BTOC				—	—

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	Column Study Analysis	~~5~~ 50 x 1L Amber	No	Ice
2				
3	NFE			
5				
6				
7				
8				

REMARKS: NONE

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE, Stainless Steel, Teflon

Peristaltic Pump, Submersible Pump, Hand Pump

Air-Lift Pump, Other

APPENDIX B

Data Usability Summaries and Analytical Laboratory Data

DATA USABILITY SUMMARY
ALS WORK ORDERS: HS18080140
HS18080215

ROJECT NO: 130-2086-06 **CLIENT:** Exide Technologies

SAMPLE DATES: August 1-2, 2018

LABORATORY: ALS Group

WORK ORDERS: HS18080140; HS18080215

INTENDED USE: Proposed Column Studies Work Plan

SITE: Exide Recycling Center, 7471 5th Street, Frisco, TX

TESTS/METHODS

- SW-846 6020A - Inductively Coupled Plasma-Mass Spectrometry (ICP/MS)

SAMPLES

Seventeen water and one equipment blank samples were collected for the analyses of antimony, arsenic, cadmium, lead, and selenium. See Table 1 for the sample list.

Golder completed a review of the above chemical analysis data for conformance with the requirements of the Texas Risk Reduction Program (TRRP) guidance document, Review and Reporting of COC Concentration Data (RGG-366/TRRP-13 Revised May 2010) and for adherence to project objectives. The results of the review are discussed in this data usability summary (DUS). Golder completed the review using the following laboratory and project submittals:

- Laboratory reportable data as defined in TRRP-13;
- Laboratory review checklists (LRC) with the associated exception reports;
- Laboratory Electronic Data Deliverable (EDD); and
- Project field notes from the sampling event.

The review of the reportable data included the quality control (QC) parameters listed below, as required per TRRP-13, using the applicable analytical method and project requirements:

- Data Completeness
- Chain-of-Custody Procedures

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- Sample Condition - Holding Time, Preservation, and Containers
- Field Procedures
- Results Reporting Procedures
- Field and Laboratory Blanks
- Laboratory Control Spike (LCS)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries
- Field Duplicate Precision
- Detectability Check Sample (DCS)

Additionally, Golder used the LRC to evaluate the following QC parameters:

- Method Quantitation Limits (MQLs)
- Method Detection Limits (MDLs) and Sample Detection Limits (SDLs)
- Instrument Tuning, Calibration, and Performance
- Internal Standards

Criteria used for this data usability review are as follows:

- Precision: ±MQL difference or 30% relative percent difference (RPD) for laboratory duplicates and ± 2x MQL difference (if either result is less than 5x MQL) or 30% RPD for field duplicates as recommended in TRRP-13
- Accuracy: 70-130% spike recovery (and not less than 30% or data is rejected) as recommended in TRRP-13

If an item was found outside of the review criteria, the reviewer applied a data qualifier and bias code to the results for the affected samples in accordance with TRRP-13.

LABORATORY CERTIFICATION

At the time the laboratory data were generated for this project, the laboratory was NELAC accredited under the Texas Laboratory Accreditation Program (TLAP Certification T104704231) for the matrices, methods and parameters of analysis requested on the chain-of-custody forms.

USABILITY SUMMARY

Data are usable for the intended purpose. A list of all qualified results and definitions of the qualifier and bias codes are given in Table 2.

Reviewer: Carol Lovett 8/13/2018

QUALITY CONTROL PARAMETERS AND OUTCOMES

Data Completeness

The laboratory data package contains necessary data (i.e., the laboratory reportable data per TRRP-13) and the EDD contains sample results in acceptable format.

Chain-of-Custody

Proper sample custody procedures were used, which confirms that the integrity of the samples was maintained. The information on the custody records is complete and agrees with that in the field notes and laboratory reports.

Sample Condition

Samples were collected in appropriate containers, properly preserved in the field, and prepared and analyzed within the holding times as required in the analytical method.

Field Procedures

The samples were collected and placed immediately into laboratory supplied containers and then into a cooler with ice for overnight delivery to the laboratory.

According to the Work Plan, groundwater samples with turbidity greater than 10 NTU would be field filtered with a 10-micron filter for analyses of total metals. For dissolved metals, samples would be field filtered with a 0.45-micron filter. According to the Groundwater Sample Collection Forms, samples were filtered appropriately.

The dissolved metals concentrations were slightly above the total metal concentration in samples analyzed for arsenic, cadmium, lead, and selenium (Table 3). However in these cases, the difference between dissolved and total did not exceed the analytical method error (i.e., + 2x MQL difference (if either result is less than 5x MQL) or 30% RPD). No data were qualified due to dissolved metals concentrations exceeding total metals concentrations.

Results Reporting Procedures

Water results are reported in milligrams/liter (mg/L). Non-detects are reported using the SDL as specified per TRRP and detects between the SDL and MQL are reported with a laboratory J-flag. The concentration reported for detects between the SDL and MQL is below the calibration range and thus is considered estimated.

Field and Laboratory Blanks

One equipment blank was collected. Antimony (total) was detected in the equipment blank. Blank results are presented in Table 4 and qualified results are presented in Table 2.

No analytes were detected in laboratory method and continuing calibration blanks.

Laboratory Control Sample

The LCS recoveries (%R) are within the TRRP-13 recommended criteria of 70 -130 %R.

Matrix Spike Recovery

The laboratory prepared one MS/MSD samples with each analytical batch. Non-project data were not evaluated. The MS/MSD recoveries were within the TRRP-13 recommended criteria of 70 – 130%R. Precision was within

the TRRP-13 recommended criteria of 30 RPD. The post-digestate spike recovery was within the TRRP-13 recommended criteria of 70 – 130%R. The serial dilution percent difference was within method criteria of 10% difference.

Field Duplicate Precision

One field duplicate was collected with these samples. Field duplicate results are presented in Table 5 and are acceptable.

Instrument Tuning and Performance

According to the LRC, instrument tuning and interference check sample results met method requirements.

Instrument Calibration

According to the LRC, initial and continuing calibration data met method requirements for all reported results, which indicates the instruments were properly calibrated to measure analyte concentrations.

Internal Standards

According to the LRC, internal standard areas were acceptable.

TABLE 1
CROSS REFERENCE OF FIELD SAMPLE IDENTIFICATIONS AND LABORATORY IDENTIFICATIONS

Lab Sample Identification	Field Sample Identification	Sample Date	Total/Dissolved Metals	Comments
HS18080140-01	DGW-MW-4	8/1/2018	✓	Total metals MS/MSD
HS18080140-02	DGW-MW-10S	8/1/2018	✓	
HS18080140-03	DGW-MW-11S	8/1/2018	✓	
HS18080140-04	DGW-MW-5	8/1/2018	✓	
HS18080140-05	DGW-MW-1	8/1/2018	✓	
HS18080140-06	DGW-MW-9	8/1/2018	✓	
HS18080140-07	DGW-MW-7	8/1/2018	✓	
HS18080140-08	DGW-MW-6	8/1/2018	✓	
HS18080140-09	DGW-MW-10S	8/1/2018	✓	
HS18080140-10	MW-46	8/1/2018	✓	
HS18080140-11	DUP-03	8/1/2018	✓	Field duplicate of MW-46
HS18080215-01	MW-27	8/2/2018	✓	
HS18080215-02	MW-31	8/2/2018	✓	Dissolved metals MS/MSD
HS18080215-03	MW-30	8/2/2018	✓	
HS18080215-04	MW-3	8/2/2018	✓	
HS18080215-05	MW-8	8/2/2018	✓	
HS18080215-06	MW-2	8/2/2018	✓	
HS18080215-07	MW-11	8/2/2018	✓	Total metals MS/MSD
HS18080215-08	EB-1	8/2/2018	✓	Equipment blank

MS/MSD - Matrix spike/matrix spike duplicate

TABLE 2 - QUALIFIED DATA

Lab Sample ID	Field Sample ID	Analyte	Result	Units	Qualifier	Explanation
HS18080215-03	MW-30	Antimony, total	0.00466	mg/L	U	Analyte detected in quality control blank
HS18080215-07	DGW-MW-11	Antimony, total	0.000853	mg/L	U	Analyte detected in quality control blank
HS18080215-02	MW-31	Antimony, total	0.000448	mg/L	U	Analyte detected in quality control blank

Notes:
ID - Identification
U - Not detected; the analyte was detected <5x the level in an associated blank and is not detected at the reported sample concentration.
mg/L - milligrams per liter

TABLE 3 - TOTAL VERSUS DISSOLVED COMPARISON

Sample	Analyte	Total Concentration	Dissolved Concentration	Precision (RPD)	Qualification
DGW-MW-4	Arsenic	0.00616	0.00632	2.6	None; less than 30 RPD
DGW-MW-4	Lead	< 0.000600	0.000943	NA	None; less than 2 times the MQL
DGW-MW-10S	Selenium	0.00215	0.00224	4.1	None; less than 30 RPD
DGW-MW-5	Arsenic	0.00400	0.00415	3.7	None; less than 30 RPD
DGW-MW-1	Arsenic	0.00785	0.00692	12.6	None; less than 30 RPD
DGW-MW-9	Arsenic	0.00415	0.00395	4.9	None; less than 30 RPD
DGW-MW-7	Arsenic	0.0281	0.0267	5.1	None; less than 30 RPD
DGW-MW-7	Selenium	< 0.00110	0.0013	NA	None; less than 2 times the MQL
DGW-MW-10	Arsenic	0.0186	0.0174	6.7	None; less than 30 RPD
MW-46	Cadmium	0.000776	0.00074	4.7	None; less than 30 RPD
DUP-03	Selenium	0.00158	0.00136	15	None; less than 30 RPD
MW-31	Selenium	< 0.00110	0.00121	NA	None; less than 2 times the MQL
DGW-MW-2	Arsenic	0.0141	0.0152	7.5	None; less than 30 RPD
DGW-MW-11	Arsenic	0.00196	0.00213	8.3	None; less than 30 RPD
DGW-MW-11	Cadmium	0.00592	0.00607	2.5	None; less than 30 RPD
DGW-MW-11	Selenium	< 0.00110	0.0014	NA	None; less than 2 times the MQL

Notes:

mg/L - milligrams per liter

TABLE 4 - BLANK DETECTIONS

Lab Sample ID	Analyte	Result	Qualified Concentration	Units	Explanation
EB-1	Antimony, total	0.00122	0.00610	mg/L	Qualify associated samples as nondetect (U)

Notes:
ID - Identification
mg/L - milligrams per liter

TABLE 5 - FIELD DUPLICATE PRECISION CALCULATIONS

Duplicate and Parent Sample Field Identification	Analyte	Sample Result	Duplicate Result	RPD[a]	Accept or Reject	Qualifier Added
MW-46/DUP-03	Arsenic, total	0.00514	0.00486	5.6	A	NA
	Cadmium, total	0.000740	0.000868	16	A	NA
	Lead, total	0.000876	0.000912	4.0	A	NA
	Selenium, total	0.00134	0.00136	1.5	A	NA
	Arsenic, dissolved	0.00481	0.00478	0.63	A	NA
	Cadmium, dissolved	0.000776	0.000741	4.6	A	NA
	Selenium, dissolved	0.00163	0.00158	3.1	A	NA

Notes:

[a] Relative Percent Difference (RPD) = ((SR - DR)*200)/(SR + DR), where SR is the sample result and DR is the duplicate result.

A - Acceptable Data

The RPD test (<30%) applies if both results are greater than 5x MQL. Otherwise, the absolute difference test (< 2x MQL) applies.

DATA USABILITY SUMMARY

PROJECT NO: 130-2086-06 **CLIENT:** Exide Technologies

SAMPLE DATES: November 5, 2018 to January 17, 2019

LABORATORY: ALS Group (Houston, Texas)

WORK ORDERS: HS18110259; HS18110338, HS18111408, HS18120067, HS18120545, HS18120828, HS18121345, HS18121346, HS18121347, HS18121348, HS18121350, HS18121485, HS19010061, HS19010105, HS19010551, HS19010552, HS19010553, HS19010554, HS19010555, HS19010556, HS19010557, HS1901558, HS1901559, HS19010624, HS19010655, HS19010657, HS19010658, HS19011284, HS19011286

INTENDED USE: Column Study

SITE: Exide Recycling Center, 7471 5th Street, Frisco, TX

TESTS/METHODS

- EPA 300.0 – Anions
- Standard Methods (SM) 2320B - Alkalinity
- SM 2340B – Hardness, Total as $CaCO_3$
- SM 2540C – Total Dissolved Solids (TDS)
- SW-846 6020A - Inductively Coupled Plasma-Mass Spectrometry (ICP/MS)

SAMPLES

Table 1 lists the field and laboratory identification and analyses requested for 210 aqueous samples.

Golder completed a review of the analytical data for conformance with the requirements of the Texas Risk Reduction Program (TRRP) guidance document, Review and Reporting of COC Concentration Data (RGG-366/TRRP-13 Revised May 2010) and for adherence to project objectives. The results of the review are discussed in this data usability summary (DUS). Golder completed the review using the following submittals:

- Laboratory reportable data as defined in TRRP-13;
- Laboratory review checklists (LRC) with the associated exception reports; and
- Laboratory Electronic Data Deliverable (EDD).

The review of the reportable data included the quality control (QC) parameters listed below, as required per TRRP-13, using the applicable analytical method requirements:

- Data Completeness
- Chain-of-Custody Procedures
- Sample Condition - Holding Time, Preservation, and Containers
- Field Procedures
- Results Reporting Procedures – Total versus dissolved metals comparison and Detectability Check Sample (DCS)
- Field and Laboratory Blanks
- Laboratory Control Spike (LCS)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries
- Field Duplicate and Treatability Study Replicate Precision

Additionally, Golder used the LRC to evaluate the following QC parameters:

- Method Quantitation Limits (MQLs)
- Method Detection Limits (MDLs) and Sample Detection Limits (SDLs)
- Instrument Tuning, Calibration, and Performance
- Internal Standards

Criteria used for this data usability review are as follows:

- Precision: ±MQL difference or 30% relative percent difference (RPD) for laboratory duplicates or laboratory replicates; and ± 2x MQL difference (if either result is less than 5x MQL) for field duplicates as recommended in TRRP-13
- Accuracy: 70-130% spike recovery (and not less than 30% or data is rejected) as recommended in TRRP-13

If an item was found outside of the review criteria, the reviewer applied a data qualifier and bias code to the results for the affected samples in accordance with TRRP-13. Table 2 lists the qualified data, qualifiers, and reason for qualification.

LABORATORY CERTIFICATION

At the time the laboratory data were generated for this project, the laboratory was NELAC accredited under the Texas Laboratory Accreditation Program (TLAP Certification T104704231) for the matrices, methods and parameters of analysis requested on the chain-of-custody forms.

USABILITY SUMMARY

Data are usable for the intended purpose. A list of all qualified results and definitions of the qualifier and bias codes are given in Table 2.

Reviewer: Brenda Basile 2/7/2019

QUALITY CONTROL PARAMETERS AND OUTCOMES

Data Completeness

The laboratory data package contains necessary data (i.e., the laboratory reportable data per TRRP-13) and the EDD contains sample results in acceptable format.

Chain-of-Custody

Proper sample custody procedures were used, which confirms that the integrity of the samples was maintained. The information on the custody records is complete and, other than the exceptions discussed below agrees with that in the field notes and laboratory reports. Samples collected on December 17, 2018 were labeled as “MW11” while the chain-of-custody listed “NW11”. Samples were logged in as “MW11” per the labels and testing protocol.

Sample Condition

Samples were collected in appropriate containers and properly preserved. Samples for metals analyses were received at temperatures greater than 6°C; temperature preservation is not required for metals analyses. Other than the nitrate analyses for samples 2018-11-27-GW-MW3-T0-Control and 2018-11-27-GW-MW-3-T0-30-35-40, samples were prepared and analyzed within the holding times required by the analytical method. The nitrate data for these two samples are qualified as estimate (J) as shown in Table 2.

Field Procedures

The samples were collected and placed immediately into laboratory supplied containers and then into a cooler for overnight delivery to the laboratory.

Results Reporting Procedures

Water results are reported in milligrams/liter (mg/L). Non-detects are reported using the SDL as specified per TRRP and detects between the SDL and MQL are reported with a laboratory J-flag. The concentration reported for detects between the SDL and MQL is below the calibration range and thus is considered estimated. Results for the DCS are included in the laboratory data packages.

The dissolved metals concentrations were slightly above the total metals concentrations in some samples as shown on Table 3. Data are qualified as listed in Tables 2 and 3.

Field and Laboratory Blanks

No field blanks were collected.

Analytes detected in laboratory method and continuing calibration blanks which were detected in the associated field samples at concentrations within five times the blank concentration are listed in Table 4. Calcium, magnesium, potassium, and sodium were frequently detected in calibration blanks at concentrations considerably lower than the associated sample concentrations. Since these detections do not result in qualified data, they are not listed in Table 4. Data are qualified if the sample concentration is within five times the blank concentration. Data are qualified as listed in Tables 2 and 4.

Laboratory Control Sample

The LCS recoveries (%R) are within the TRRP-13 recommended criteria of 70 -130 %R.

Matrix Spike Recovery

Non-project MS/MSD data were not evaluated. MS/MSD recoveries outside the TRRP-13 recommended criteria of 70 – 130%R are listed in Table 5. Precision was within the TRRP-13 recommended criteria of 30 RPD. Post-digestate spike (PDS) recoveries outside the TRRP-13 recommended criteria of 70 – 130%R are listed in Table 5. The serial dilution percent differences were within method criteria of 10% difference. Data are qualified as shown in Tables 2 and 5.

Field Duplicate and Treatability Study Replicate Precision

Field duplicates are those samples collected at the same sample location, date and time, split in the field, and submitted to the analytical laboratory as unique samples. Laboratory replicates are those samples collected from the treatability study using the same field sample, treatment conditions, and submitted to the analytical laboratory as unique samples. Laboratory duplicates are internal analytical laboratory samples split in the analytical laboratory for two separate analyses. Field duplicate precision and treatability study replicate precision is summarized in Table 6. Field duplicate precision is acceptable. Replicate precision outside the TRRP-13 recommended criteria of 30 RPD or ± the MQL are qualified as estimated (J). Data are qualified as shown in Tables 2 and 6.

Instrument Tuning and Performance

According to the LRC, instrument tuning and interference check sample results met method requirements.

Instrument Calibration

According to the LRC, initial and continuing calibration data met method requirements for all reported results, which indicates the instruments were properly calibrated to measure analyte concentrations.

Internal Standards

According to the LRC, internal standard areas were acceptable for ICP/MS analyses.

TABLE 1
CROSS REFERENCE OF FIELD SAMPLE IDENTIFICATIONS AND LABORATORY IDENTIFICATIONS

Field Sample ID	Lab Sample ID	Sample Date	Total Metals	Dissolved Metals	Anions	Total Dissolved Solids	Alkalinity or Hardness	Comments
DGW-MW-3	HS18110259-01	11/5/18	✓	✓	✓	✓	✓	TDS laboratory duplicate
French Drain	HS18110259-02	11/5/18	✓	✓	✓	✓	✓	
MW-46	HS18110338-01	11/6/18	✓	✓	✓		✓	TDS laboratory duplicate; Total and dissolved metals MS/MSD
2018-11-27-GW-MW3-T0-CONTROL	HS18111408-01	11/27/18	✓		✓	✓	✓	
2018-11-27-GW-MW3-T0-30-35-40	HS18111408-02	11/27/18	✓		✓	✓	✓	
French Drain	HS18120067-01	12/3/18	✓	✓	✓			Anion, dissolved metals MS/MSD
MW-46	HS18120067-02	12/3/18	✓	✓	✓			
DGW-MW-11	HS18120067-03	12/3/18	✓	✓	✓			
DGW-MW-11S	HS18120067-04	12/3/18	✓	✓	✓			
MW-30	HS18120067-05	12/3/18	✓	✓	✓			
DUP-01	HS18120067-06	12/3/18	✓	✓	✓			Field duplicate of MW-46
2018-12-10-DGW-MW3-PV5out-Control	HS18120545-01	12/10/18			✓	✓	✓	Anion MS/MSD; TDS laboratory duplicate
2018-12-10-DGW-MW3-PV5out-30	HS18120545-02	12/10/18			✓	✓	✓	
2018-12-10-DGW-MW3-PV5out-35	HS18120545-03	12/10/18			✓	✓	✓	
2018-12-10-DGW-MW3-PV5out-40	HS18120545-04	12/10/18			✓	✓	✓	
20181213-FD-T0-Control	HS18120828-01	12/13/18			✓	✓	✓	
20181213-FD-T0-30-35-40	HS18120828-02	12/13/18			✓	✓	✓	
2018-12-17-DGW-MW11-T0-30-35-40-D	HS18121345-01	12/17/18		✓				Metals MS/MSD
2018-12-17-DGW-MW11-T0-30-35-40-T	HS18121345-02	12/17/18	✓				✓	Metals MS/MSD
2018-12-17-DGW-MW11-T0-Control-D	HS18121345-03	12/17/18		✓				
2018-12-17-DGW-MW11-T0-Control-T	HS18121345-04	12/17/18	✓				✓	
20181211-DGW-MW3-PV5out-ControlD	HS18121346-01	12/11/18		✓				
20181211-DGW-MW3-PV5out-30D	HS18121346-02	12/11/18		✓				
20181211-DGW-MW3-PV5out-35D	HS18121346-03	12/11/18		✓				
20181211-DGW-MW3-PV5out-40D	HS18121346-04	12/11/18		✓				
20181214-DGW-MW3-PV5mid-ControlD	HS18121346-05	12/11/18		✓				
20181214-DGW-MW3-PV5mid-30D	HS18121346-06	12/11/18		✓				
20181214-DGW-MW3-PV5mid-35D	HS18121346-07	12/11/18		✓				
20181214-DGW-MW3-PV5mid-40D	HS18121346-08	12/11/18		✓				
20181214-DGW-MW3-PV5inlet-ControlD	HS18121346-09	12/11/18		✓				
20181214-DGW-MW3-PV5inlet-30-35-40D	HS18121346-10	12/11/18		✓				
20181211-DGW-MW3-PV5out-ControlT	HS18121347-01	12/11/18	✓				✓	
20181211-DGW-MW3-PV5out-30T	HS18121347-02	12/11/18	✓				✓	
20181211-DGW-MW3-PV5out-35T	HS18121347-03	12/11/18	✓				✓	
20181211-DGW-MW3-PV5out-40T	HS18121347-04	12/11/18	✓				✓	
20181211-DGW-MW3-PV5mid-ControlT	HS18121347-05	12/11/18	✓				✓	
20181211-DGW-MW3-PV5mid-30T	HS18121347-06	12/11/18	✓				✓	
20181211-DGW-MW3-PV5mid-35T	HS18121347-07	12/11/18	✓				✓	
20181211-DGW-MW3-PV5mid-40T	HS18121347-08	12/11/18	✓				✓	
20181211-DGW-MW3-PV5inlet-ControlT	HS18121347-09	12/11/18	✓				✓	
20181211-DGW-MW3-PV5inlet-30-35-40T	HS18121347-10	12/11/18	✓				✓	

TABLE 1
CROSS REFERENCE OF FIELD SAMPLE IDENTIFICATIONS AND LABORATORY IDENTIFICATIONS

Field Sample ID	Lab Sample ID	Sample Date	Total Metals	Dissolved Metals	Anions	Total Dissolved Solids	Alkalinity or Hardness	Comments
2018-11-27-DGW-MW3-T0-ControlD	HS18121348-01	11/27/18		✓				
2018-11-27-DGW-MW3-T0-30-35-40D	HS18121348-02	11/27/18		✓				
20181213-FD-T0-ControlT	HS18121350-01	12/13/18	✓				✓	
201812131-FD-T0-30-35-40T	HS18121350-02	12/13/18	✓				✓	
20181213-FD-T0-ControlD	HS18121350-03	12/13/18		✓				
20181213-FD-T0-30-35-40D	HS18121350-04	12/13/18		✓				
2018-12-26-FD-PV5out-30	HS18121485-01	12/26/18			✓	✓	✓	
2018-12-26-FD-PV5out-35	HS18121485-02	12/26/18			✓	✓	✓	
2018-12-26-FD-PV5out-40	HS18121485-03	12/26/18			✓	✓	✓	TDS laboratory duplicate
2018-12-26-FD-PV5out-CONTROL	HS18121485-04	12/26/18			✓	✓	✓	
2019-01-02-DGW-MW11-PV5out-30	HS19010061-01	1/2/19			✓	✓	✓	
2019-01-02-DGW-MW11-PV5out-35	HS19010061-02	1/2/19			✓	✓	✓	
2019-01-02-DGW-MW11-PV5out-40	HS19010061-03	1/2/19			✓	✓	✓	
2019-01-02-DGW-MW11-PV5out-Control	HS19010061-04	1/2/19			✓	✓	✓	Anion MS/MSD
DGW-MW-11	HS19010105-01	1/2/19	✓	✓				Totals metals MS/MSD
20181220-DGW-MW3-PV10out-ControlT	HS19010551-01	12/20/2018	✓				✓	Metals MS/MSD
20181220-DGW-MW3-PV10out-30T	HS19010551-02	12/20/2018	✓				✓	
20181220-DGW-MW3-PV10out-35T	HS19010551-03	12/20/2018	✓				✓	
20181220-DGW-MW3-PV10out-40T	HS19010551-04	12/20/2018	✓				✓	
20181220-DGW-MW3-PV10inlet-ControlT	HS19010551-05	12/20/2018	✓				✓	
20181220-DGW-MW3-PV10inlet-30-35-40T	HS19010551-06	12/20/2018	✓				✓	
20181221-DGW-MW3-PV10mid-ControlT	HS19010551-07	12/21/2018	✓				✓	
20181221-DGW-MW3-PV10mid-30T	HS19010551-08	12/21/2018	✓				✓	
20181221-DGW-MW3-PV10mid-35T	HS19010551-09	12/21/2018	✓				✓	
20181221-DGW-MW3-PV10mid-40T	HS19010551-10	12/21/2018	✓				✓	
20181220-DGW-MW3-PV10out-ControlD	HS19010552-01	12/20/18		✓				Metals MS/MSD
20181220-DGW-MW3-PV10out-30D	HS19010552-02	12/20/18		✓				
20181220-DGW-MW3-PV10out-35D	HS19010552-03	12/20/18		✓				
20181220-DGW-MW3-PV10out-40D	HS19010552-04	12/20/18		✓				
20181220-DGW-MW3-PV10inlet-ControlD	HS19010552-05	12/20/18		✓				
20181220-DGW-MW3-PV10inlet-30-35-40D	HS19010552-06	12/20/18		✓				
20181221-DGW-MW3-PV10mid-ControlD	HS19010552-07	12/21/18		✓				
20181221-DGW-MW3-PV10mid-30D	HS19010552-08	12/21/18		✓				
20181221-DGW-MW3-PV10mid-35D	HS19010552-09	12/21/18		✓				
20181221-DGW-MW3-PV10mid-40D	HS19010552-10	12/21/18		✓				
20190103-DGW-MW3-PV15out-ControlT	HS19010553-01	1/3/19	✓				✓	
20190103-DGW-MW3-PV15out-30T	HS19010553-02	1/3/19	✓				✓	
20190103-DGW-MW3-PV15out-35T	HS19010553-03	1/3/19	✓				✓	
20190103-DGW-MW3-PV15out-40T	HS19010553-04	1/3/19	✓				✓	
20190104-DGW-MW3-PV15inlet-ControlT	HS19010553-05	1/4/19	✓				✓	
20190104-DGW-MW3-PV15inlet-30-35-40T	HS19010553-06	1/4/19	✓				✓	

TABLE 1
CROSS REFERENCE OF FIELD SAMPLE IDENTIFICATIONS AND LABORATORY IDENTIFICATIONS

Field Sample ID	Lab Sample ID	Sample Date	Total Metals	Dissolved Metals	Anions	Total Dissolved Solids	Alkalinity or Hardness	Comments
20190104-DGW-MW3-PV15mid-ControlT	HS19010553-07	1/4/19	✓				✓	
20190104-DGW-MW3-PV15mid-30T	HS19010553-08	1/4/19	✓				✓	
20190104-DGW-MW3-PV15inlet-35T	HS19010553-09	1/4/19	✓				✓	
20190104-DGW-MW3-PV15inlet-40T	HS19010553-10	1/4/19	✓				✓	
20190103-DGW-MW3-PV15out-ControlD	HS19010554-01	1/3/19		✓				
20190103-DGW-MW3-PV15out-30D	HS19010554-02	1/3/19		✓				
20190103-DGW-MW3-PV15out-35D	HS19010554-03	1/3/19		✓				
20190103-DGW-MW3-PV15out-40D	HS19010554-04	1/3/19		✓				
20190104-DGW-MW3-PV15inlet-ControlD	HS19010554-05	1/4/19		✓				
20190104-DGW-MW3-PV15inlet-30-35-40D	HS19010554-06	1/4/19		✓				
20190104-DGW-MW3-PV15mid-ControlD	HS19010554-07	1/4/19		✓				
20190103-DGW-MW3-PV15mid-30D	HS19010554-08	1/4/19		✓				
20190103-DGW-MW3-PV15mid-35D	HS19010554-09	1/4/19		✓				
20190103-DGW-MW3-PV15mid-40D	HS19010554-10	1/4/19		✓				
20190102-DGW-MW3-PV15out-40T-Dup	HS19010555-01	1/2/19	✓				✓	Metals MS/MSD; Replicate of 20190103-DGW-MW3-PV15out-40T
20190102-DGW-MW3-PV15out-35T-Dup	HS19010555-02	1/2/19	✓				✓	Replicate of 20190103-DGW-MW3-PV15out-35T
20190102-DGW-MW3-PV15out-30T-Dup	HS19010555-03	1/2/19	✓				✓	Replicate of 20190103-DGW-MW3-PV15out-30T
20190102-DGW-MW3-PV15out-ControlT-Dup	HS19010555-04	1/2/19	✓				✓	Replicate of 20190103-DGW-MW3-PV15out-ControlT
20190103-DGW-MW11-PV5out-ControlT	HS19010556-01	1/3/19	✓				✓	Metals MS/MSD
20190103-DGW-MW11-PV5out-30T	HS19010556-02	1/3/19	✓				✓	
20190103-DGW-MW11-PV5out-35T	HS19010556-03	1/3/19	✓				✓	
20190103-DGW-MW11-PV5out-40T	HS19010556-04	1/3/19	✓				✓	
20190103-DGW-MW11-PV5inlet-ControlT	HS19010556-05	1/4/19	✓				✓	
20190103-DGW-MW11-PV5inlet-30-35-40T	HS19010556-06	1/4/19	✓				✓	
20190103-DGW-MW11-PV5mid-ControlT	HS19010556-07	1/4/19	✓				✓	
20190103-DGW-MW11-PV5out-30T	HS19010556-08	1/4/19	✓				✓	
20190103-DGW-MW11-PV5out-35T	HS19010556-09	1/4/19	✓				✓	
20190103-DGW-MW11-PV5out-40T	HS19010556-10	1/4/19	✓				✓	
20190103-DGW-MW11-PV5out-ControlD	HS19010557-01	1/2/19		✓				Metals MS/MSD
20190103-DGW-MW11-PV5out-30D	HS19010557-02	1/3/19		✓				
20190103-DGW-MW11-PV5out-35D	HS19010557-03	1/3/19		✓				
20190103-DGW-MW11-PV5out-40D	HS19010557-04	1/3/19		✓				
20190103-DGW-MW11-PV5inlet-ControlD	HS19010557-05	1/3/19		✓				
20190103-DGW-MW11-PV5out-30-35-40D	HS19010557-06	1/4/19		✓				
20190103-DGW-MW11-PV5mid-ControlD	HS19010557-07	1/4/19		✓				
20190103-DGW-MW11-PV5out-30D	HS19010557-08	1/4/19		✓				
20190103-DGW-MW11-PV5out-35D	HS19010557-09	1/4/19		✓				
20190103-DGW-MW11-PV5out-40D	HS19010557-10	1/4/19		✓				
20181227-FD-PV5out-ControlT	HS19010558-01	12/27/2018	✓				✓	
20181227-FD-PV5out-30T	HS19010558-02	12/27/2018	✓				✓	
20181227-FD-PV5out-35T	HS19010558-03	12/27/2018	✓				✓	

TABLE 1
CROSS REFERENCE OF FIELD SAMPLE IDENTIFICATIONS AND LABORATORY IDENTIFICATIONS

Field Sample ID	Lab Sample ID	Sample Date	Total Metals	Dissolved Metals	Anions	Total Dissolved Solids	Alkalinity or Hardness	Comments
20181227-FD-PV5out-40T	HS19010558-04	12/27/2018	✓				✓	
20181228-FD-PV5inlet-ControlT	HS19010558-05	12/28/2018	✓				✓	
20181228-FD-PV5inlet-30-35-40T	HS19010558-06	12/28/2018	✓				✓	
20181228-FD-PV5mid-ControlT	HS19010558-07	12/28/2018	✓				✓	
20181228-FD-PV5mid-30T	HS19010558-08	12/28/2018	✓				✓	
20181228-FD-PV5mid-35T	HS19010558-09	12/28/2018	✓				✓	
20181228-FD-PV5mid-40T	HS19010558-10	12/28/2018	✓				✓	
20181227-FD-PV5out-ControlD	HS19010559-01	12/27/2018		✓				
20181227-FD-PV5out-30D	HS19010559-02	12/27/2018		✓				
20181227-FD-PV5out-35D	HS19010559-03	12/27/2018		✓				
20181227-FD-PV5out-40D	HS19010559-04	12/27/2018		✓				
20181228-FD-PV5inlet-ControlD	HS19010559-05	12/28/2018		✓				
20181228-FD-PV5inlet-30-35-40D	HS19010559-06	12/28/2018		✓				
20181228-FD-PV5mid-ControlD	HS19010559-07	12/28/2018		✓				
20181228-FD-PV5mid-30D	HS19010559-08	12/28/2018		✓				
20181228-FD-PV5mid-35D	HS19010559-09	12/28/2018		✓				
20181228-FD-PV5mid-40D	HS19010559-10	12/28/2018		✓				
20190114-DGW-MW3-PV20out-Control	HS19010624-01	01/14/2019			✓	✓	✓	
20190114-DGW-MW3-PV20out-30	HS19010624-02	01/14/2019			✓	✓	✓	
20190114-DGW-MW3-PV20out-35	HS19010624-03	01/14/2019			✓	✓	✓	
20190114-DGW-MW3-PV20out-40	HS19010624-04	01/14/2019			✓	✓	✓	
20190108-FD-PV10out-controlD	HS19010655-01	01/08/2019		✓				Metals MS/MSD
20190108-FD-PV10out-30D	HS19010655-02	01/08/2019		✓				
20190108-FD-PV10out-35D	HS19010655-03	01/08/2019		✓				
20190108-FD-PV10out-40D	HS19010655-04	01/08/2019		✓				
20190109-FD-PV10inlet-controlD	HS19010655-05	01/09/2019		✓				
20190109-FD-PV10inlet-30-35-40D	HS19010655-06	01/09/2019		✓				
20190110-FD-PV10mid-controlD	HS19010655-07	01/10/2019		✓				
20190110-FD-PV10mid-30D	HS19010655-08	01/10/2019		✓				
20190110-FD-PV10mid-35D	HS19010655-09	01/10/2019		✓				
20190110-FD-PV10mid-40D	HS19010655-10	01/10/2019		✓				
20190108-FD-PV10out-controlT	HS19010657-01	01/08/2019	✓				✓	
20190108-FD-PV10out-30T	HS19010657-02	01/08/2019	✓				✓	
20190108-FD-PV10out-35T	HS19010657-03	01/08/2019	✓				✓	
20190108-FD-PV10out-40T	HS19010657-04	01/08/2019	✓				✓	
20190109-FD-PV10inlet-controlT	HS19010657-05	01/09/2019	✓				✓	
20190109-FD-PV10inlet-30-35-40T	HS19010657-06	01/09/2019	✓				✓	
20190110-FD-PV10mid-controlT	HS19010657-07	01/10/2019	✓				✓	
20190110-FD-PV10mid-30T	HS19010657-08	01/10/2019	✓				✓	
20190110-FD-PV10mid-35T	HS19010657-09	01/10/2019	✓				✓	
20190110-FD-PV10mid-40T	HS19010657-10	01/10/2019	✓				✓	

TABLE 1
CROSS REFERENCE OF FIELD SAMPLE IDENTIFICATIONS AND LABORATORY IDENTIFICATIONS

Field Sample ID	Lab Sample ID	Sample Date	Total Metals	Dissolved Metals	Anions	Total Dissolved Solids	Alkalinity or Hardness	Comments
20190109-FD-PV10out-40T-DUP	HS19010658-01	01/09/2019	✓				✓	Replicate of 20190108-FD-PV10out-40T
20190109-FD-PV10out-40D-DUP	HS19010658-02	01/09/2019		✓				Replicate of 20190108-FD-PV10out-40D
20190111-DGW-MW11-PV10out-controlT	HS19011284-01	01/11/2019	✓				✓	
20190111-DGW-MW11-PV10out-30T	HS19011284-02	01/11/2019	✓				✓	
20190111-DGW-MW11-PV10out-35T	HS19011284-03	01/11/2019	✓				✓	Metals MS/MSD
20190111-DGW-MW11-PV10out-40T	HS19011284-04	01/11/2019	✓				✓	
20190111-DGW-MW11-PV10inlet-controlT	HS19011284-05	01/11/2019	✓				✓	
20190111-DGW-MW11-PV10inlet-30-35-40T	HS19011284-06	01/11/2019	✓				✓	
20190112-DGW-MW11-PV10mid-controlT	HS19011284-07	01/12/2019	✓				✓	
20190112-DGW-MW11-PV10mid-30T	HS19011284-08	01/12/2019	✓				✓	
20190112-DGW-MW11-PV10mid-35T	HS19011284-09	01/12/2019	✓				✓	
20190112-DGW-MW11-PV10mid-40T	HS19011284-10	01/12/2019	✓				✓	
20190111-DGW-MW11-PV10inlet-30-35-40T-DUP	HS19011284-11	01/11/2019	✓				✓	Replicate of 20190111-DGW-MW11-PV10inlet-30-35-40T
20190115-DGW-MW3-PV20out-controlT	HS19011284-12	01/15/2019	✓				✓	
20190115-DGW-MW3-PV20out-30T	HS19011284-13	01/15/2019	✓				✓	
20190115-DGW-MW3-PV20out-35T	HS19011284-14	01/15/2019	✓				✓	
20190115-DGW-MW3-PV20out-40T	HS19011284-15	01/15/2019	✓				✓	
20190117-DGW-MW3-PV20inlet-controlT	HS19011284-16	01/17/2019	✓				✓	
20190117-DGW-MW3-PV20inlet-30-35-40T	HS19011284-17	01/17/2019	✓				✓	
20190116-DGW-MW3-PV20mid-controlT	HS19011284-18	01/16/2019	✓				✓	
20190117-DGW-MW3-PV20mid-30T	HS19011284-19	01/17/2019	✓				✓	
20190116-DGW-MW3-PV20mid-35T	HS19011284-20	01/16/2019	✓				✓	
20190116-DGW-MW3-PV20mid-40T	HS19011284-21	01/16/2019	✓				✓	
20190117-DGW-MW3-PV20mid-35T-DUP	HS19011284-22	01/16/2019	✓				✓	Replicate of 20190116-DGW-MW3-PV20mid-35T
20190111-DGW-MW11-PV10out-controlD	HS19011286-01	01/11/2019		✓				
20190111-DGW-MW11-PV10out30D	HS19011286-02	01/11/2019		✓				
20190111-DGW-MW11-PV10out-35D	HS19011286-03	01/11/2019		✓				
20190111-DGW-MW11-PV10out-40D	HS19011286-04	01/11/2019		✓				
20190111-DGW-MW11-PV10inlet-controlD	HS19011286-05	01/11/2019		✓				
20190111-DGW-MW11-PV10inlet-30-35-40D	HS19011286-06	01/11/2019		✓				
20190112-DGW-MW11-PV10mid-controlD	HS19011286-07	01/12/2019		✓				
20190112-DGW-MW11-PV10mid-30D	HS19011286-08	01/12/2019		✓				
20190112-DGW-MW11-PV10mid-35D	HS19011286-09	01/12/2019		✓				
20190112-DGW-MW11-PV10mid-40D	HS19011286-10	01/12/2019		✓				
20190111-DGW-MW11-PV10inlet-30-35-40D-DUP	HS19011286-11	01/11/2019		✓				Replicate of 20190111-DGW-MW11-PV10inlet-30-35-40D
20190115-DGW-MW3-PV20out-controlD	HS19011286-12	01/15/2019		✓				
20190115-DGW-MW3-PV20out-30D	HS19011286-13	01/15/2019		✓				
20190115-DGW-MW3-PV20out-35D	HS19011286-14	01/15/2019		✓				
20190115-DGW-MW3-PV20out-40D	HS19011286-15	01/15/2019		✓				
20190117-DGW-MW3-PV20inlet-controlD	HS19011286-16	01/17/2019		✓				
20190117-DGW-MW3-PV20inlet-30-35-40D	HS19011286-17	01/17/2019		✓				Metals MS/MSD
20190116-DGW-MW3-PV20mid-controlD	HS19011286-18	01/16/2019		✓				
20190117-DGW-MW3-PV20mid-30D	HS19011286-19	01/17/2019		✓				
20190116-DGW-MW3-PV20mid-35D	HS19011286-20	01/16/2019		✓				
20190116-DGW-MW3-PV20mid-40D	HS19011286-21	01/16/2019		✓				
20190117-DGW-MW3-PV20mid-35D-DUP	HS19011286-22	01/16/2019		✓				Replicate of 20190116-DGW-MW3-PV20mid-35D

TABLE 2 - QUALIFIED DATA

Field Sample ID	Lab Sample ID	Analyte	Result	Units	Qualifier	Explanation
French Drain	HS18110259-02	Iron, dissolved	0.117	mg/L	U	Analyte detected in laboratory blank
French Drain	HS18110259-02	Arsenic, dissolved	0.00263	mg/L	U	Analyte detected in laboratory blank
French Drain	HS18110259-02	Arsenic, total	0.00215	mg/L	U	Analyte detected in laboratory blank
French Drain	HS18110259-02	Selenium, total	0.00473	mg/L	J	Total/Dissolved concentration differences greater than 30 RPD
French Drain	HS18110259-02	Selenium, dissolved	0.00760	mg/L	J	Total/Dissolved concentration differences greater than 30 RPD
2018-11-27-GW-MW3-T0-CONTROL	HS18111408-01	Nitrogen, Nitrate	0.0770	mg/L	UJ	Analysis exceeded holding time; analyte detected in laboratory blank
2018-11-27-GW-MW3-T0-30-35-40	HS18111408-02	Nitrogen, Nitrate	0.0770	mg/L	UJ	Analysis exceeded holding time; analyte detected in laboratory blank
DGW-MW-11	HS18120067-03	Antimony, dissolved	0.000686	mg/L	U	Analyte detected in laboratory blank
DGW-MW-11S	HS18120067-04	Antimony, dissolved	0.00101	mg/L	U	Analyte detected in laboratory blank
2018-12-17-DGW-MW11-T0-30-35-40-D	HS18121345-01	Potassium, dissolved	21.2	mg/L	JL	Post-digestate spike recovery below quality control limits
2018-12-17-DGW-MW11-T0-30-35-40-D	HS18121345-01	Selenium, dissolved	0.00111	mg/L	U	Analyte detected in laboratory blank
2018-12-17-DGW-MW11-T0-Control-D	HS18121345-03	Selenium, dissolved	0.00235	mg/L	U	Analyte detected in laboratory blank
2018-12-17-DGW-MW11-T0-30-35-40-D	HS18121345-01	Lead, dissolved	0.00190	mg/L	J	Total/Dissolved concentration differences greater than 30 RPD
2018-12-17-DGW-MW11-T0-30-35-40-T	HS18121345-02	Lead, total	0.0362	mg/L	J	Total/Dissolved concentration differences greater than 30 RPD
20181211-DGW-MW3-PV5out-ControlD	HS18121346-01	Selenium, dissolved	0.00160	mg/L	U	Analyte detected in laboratory blank
20181211-DGW-MW3-PV5out-30D	HS18121346-02	Selenium, dissolved	0.00128	mg/L	U	Analyte detected in laboratory blank
20181211-DGW-MW3-PV5out-40D	HS18121346-04	Iron, dissolved	0.0126	mg/L	U	Analyte detected in laboratory blank
20181211-DGW-MW3-PV5out-40D	HS18121346-04	Selenium, dissolved	0.00111	mg/L	U	Analyte detected in laboratory blank
20181214-DGW-MW3-PV5mid-ControlD	HS18121346-05	Iron, dissolved	0.0155	mg/L	U	Analyte detected in laboratory blank
20181214-DGW-MW3-PV5mid-ControlD	HS18121346-05	Selenium, dissolved	0.00228	mg/L	U	Analyte detected in laboratory blank
20181214-DGW-MW3-PV5mid-30D	HS18121346-06	Selenium, dissolved	0.00154	mg/L	U	Analyte detected in laboratory blank
20181214-DGW-MW3-PV5mid-35D	HS18121346-07	Iron, dissolved	0.0146	mg/L	U	Analyte detected in laboratory blank
20181214-DGW-MW3-PV5mid-35D	HS18121346-07	Selenium, dissolved	0.00131	mg/L	U	Analyte detected in laboratory blank
20181214-DGW-MW3-PV5mid-40D	HS18121346-08	Selenium, dissolved	0.00111	mg/L	U	Analyte detected in laboratory blank
2018-12-26-FD-PV5out-30	HS18120485-01	Nitrogen, Nitrate	0.0780	mg/L	UJ	Analysis exceeded holding time; analyte detected in laboratory blank
2018-12-26-FD-PV5out-35	HS18120485-02	Nitrogen, Nitrate	0.0300	mg/L	UJ	Analyte detected in laboratory blank
2018-12-26-FD-PV5out-40	HS18120485-03	Nitrogen, Nitrate	0.0300	mg/L	UJ	Analyte detected in laboratory blank
2018-12-26-FD-PV5out-CONTROL	HS18120485-04	Nitrogen, Nitrate	0.0300	mg/L	UJ	Analyte detected in laboratory blank
20181220-DGW-MW3-PV10out-ControlT	HS19010551-01	Antimony	0.00055	mg/L	U	Analyte detected in laboratory blank
20181220-DGW-MW3-PV10out-30T	HS19010551-02	Antimony	0.00306	mg/L	U	Analyte detected in laboratory blank
20181221-DGW-MW3-PV10mid-40T	HS19010551-10	Antimony	0.000553	mg/L	U	Analyte detected in laboratory blank
20181220-DGW-MW3-PV10out-30T	HS19010551-02	Iron	0.0371	mg/L	U	Analyte detected in laboratory blank
20181220-DGW-MW3-PV10out-35T	HS19010551-03	Iron	0.0245	mg/L	U	Analyte detected in laboratory blank
20181220-DGW-MW3-PV10out-40T	HS19010551-04	Iron	0.0237	mg/L	U	Analyte detected in laboratory blank
20181220-DGW-MW3-PV10out-ControlD	HS19010552-01	Antimony, dissolved	0.000427	mg/L	U	Analyte detected in laboratory blank
20181220-DGW-MW3-PV10out-30D	HS19010552-02	Antimony, dissolved	0.000491	mg/L	U	Analyte detected in laboratory blank
20181221-DGW-MW3-PV10mid-40D	HS19010552-10	Antimony, dissolved	0.000626	mg/L	U	Analyte detected in laboratory blank
20190103-DGW-MW3-PV15out-35T	HS19010553-03	Iron	0.0503	mg/L	U	Analyte detected in laboratory blank
20190103-DGW-MW3-PV15out-40T	HS19010553-04	Iron	0.0214	mg/L	U	Analyte detected in laboratory blank
20190103-DGW-MW3-PV15out-30D	HS19010554-02	Antimony, dissolved	0.000418	mg/L	U	Analyte detected in laboratory blank
20190103-DGW-MW3-PV15mid-30D	HS19010554-08	Antimony, dissolved	0.00106	mg/L	U	Analyte detected in laboratory blank
20190103-DGW-MW11-PV5out-ControlT	HS19010556-01	Antimony	0.000661	mg/L	U	Analyte detected in laboratory blank
20190103-DGW-MW11-PV5out-30T	HS19010556-02	Antimony	0.000943	mg/L	U	Analyte detected in laboratory blank
20190103-DGW-MW11-PV5inlet-ControlT	HS19010556-05	Antimony	0.000882	mg/L	U	Analyte detected in laboratory blank
20190103-DGW-MW11-PV5mid-ControlT	HS19010556-07	Antimony	0.000436	mg/L	U	Analyte detected in laboratory blank
20190103-DGW-MW11-PV5mid-40T	HS19010556-10	Antimony	0.000511	mg/L	U	Analyte detected in laboratory blank
20190103-DGW-MW11-PV5out-ControlD	HS19010557-01	Antimony	0.000719	mg/L	U	Analyte detected in laboratory blank
20181228-FD-PV5mid-30T	HS19010558-08	Antimony	0.000428	mg/L	U	Analyte detected in laboratory blank
20181227-FD-PV5out-ControlT	HS19010558-01	Selenium	0.00593	mg/L	U	Analyte detected in laboratory blank
20181228-FD-PV5inlet-30-35-40T	HS19010558-06	Selenium	0.00653	mg/L	U	Analyte detected in laboratory blank
20181228-FD-PV5mid-ControlT	HS19010558-07	Selenium	0.00646	mg/L	U	Analyte detected in laboratory blank
20181228-FD-PV5mid-35T	HS19010558-09	Selenium	0.00119	mg/L	U	Analyte detected in laboratory blank
20181227-FD-PV5out-ControlD	HS19010559-01	Iron	0.0226	mg/L	U	Analyte detected in laboratory blank

TABLE 2 - QUALIFIED DATA

Field Sample ID	Lab Sample ID	Analyte	Result	Units	Qualifier	Explanation
20181227-FD-PV5out-30D	HS19010559-02	Iron	0.0762	mg/L	U	Analyte detected in laboratory blank
20181227-FD-PV5out-40D	HS19010559-04	Iron	0.0883	mg/L	U	Analyte detected in laboratory blank
20181228-FD-PV5inlet-ControlD	HS19010559-05	Iron	0.0752	mg/L	U	Analyte detected in laboratory blank
20181228-FD-PV5inlet-30-35-40D	HS19010559-06	Iron	0.0588	mg/L	U	Analyte detected in laboratory blank
20181228-FD-PV5mid-ControlD	HS19010559-07	Iron	0.0522	mg/L	U	Analyte detected in laboratory blank
20181228-FD-PV5mid-30D	HS19010559-08	Iron	0.0498	mg/L	U	Analyte detected in laboratory blank
20181228-FD-PV5mid-35D	HS19010559-09	Iron	0.0339	mg/L	U	Analyte detected in laboratory blank
20181228-FD-PV5mid-40D	HS19010559-10	Iron	0.0163	mg/L	U	Analyte detected in laboratory blank
20181227-FD-PV5out-ControlD	HS19010559-01	Selenium	0.00615	mg/L	U	Analyte detected in laboratory blank
20181228-FD-PV5inlet-ControlD	HS19010559-05	Selenium	0.00633	mg/L	U	Analyte detected in laboratory blank
20181228-FD-PV5inlet-30-35-40D	HS19010559-06	Selenium	0.00609	mg/L	U	Analyte detected in laboratory blank
20181228-FD-PV5mid-ControlD	HS19010559-07	Selenium	0.00600	mg/L	U	Analyte detected in laboratory blank
20181228-FD-PV5mid-30D	HS19010559-08	Antimony	0.000432	mg/L	U	Analyte detected in laboratory blank
20190109-FD-PV10inlet-controlD	HS19010655-05	Arsenic	0.000879	mg/L	U	Analyte detected in laboratory blank
20190109-FD-PV10inlet-30-35-40D	HS19010655-06	Arsenic	0.000924	mg/L	U	Analyte detected in laboratory blank
20190110-FD-PV10mid-controlD	HS19010655-07	Arsenic	0.000858	mg/L	U	Analyte detected in laboratory blank
20190108-FD-PV10out-controlT	HS19010657-01	Arsenic, total	0.00565	mg/L	J	Total/Dissolved concentration differences greater than 30 RPD
20190108-FD-PV10out-controlD	HS19010655-01	Arsenic, dissolved	0.00187	mg/L	J	Total/Dissolved concentration differences greater than 30 RPD
20190108-FD-PV10out-30T	HS19010657-02	Selenium, total	0.00110	mg/L	UJ	Total/Dissolved concentration differences greater than 30 RPD
20190108-FD-PV10out-30D	HS19010655-02	Selenium, dissolved	0.00331	mg/L	J	Total/Dissolved concentration differences greater than 30 RPD
20190108-FD-PV10out-35T	HS19010657-03	Selenium, total	0.00110	mg/L	UJ	Total/Dissolved concentration differences greater than 30 RPD
20190108-FD-PV10out-35D	HS19010655-03	Selenium, dissolved	0.00274	mg/L	J	Total/Dissolved concentration differences greater than 30 RPD
20190108-FD-PV10out-40T	HS19010657-04	Selenium, total	0.00110	mg/L	UJ	Total/Dissolved concentration differences greater than 30 RPD
20190108-FD-PV10out-40D	HS19010655-04	Selenium, dissolved	0.00329	mg/L	J	Total/Dissolved concentration differences greater than 30 RPD
20190109-FD-PV10inlet-controlT	HS19010657-05	Selenium, total	0.00684	mg/L	J	Total/Dissolved concentration differences greater than 30 RPD
20190109-FD-PV10inlet-controlD	HS19010657-05	Selenium, dissolved	0.00938	mg/L	J	Total/Dissolved concentration differences greater than 30 RPD
20190110-FD-PV10mid-controlT	HS19010657-07	Iron, total	0.0120	mg/L	UJ	Total/Dissolved concentration differences greater than 30 RPD
20190110-FD-PV10mid-controlT	HS19010657-07	Selenium, total	0.00707	mg/L	J	Total/Dissolved concentration differences greater than 30 RPD
20190110-FD-PV10mid-controlD	HS19010655-07	Iron, dissolved	0.0902	mg/L	J	Total/Dissolved concentration differences greater than 30 RPD
20190110-FD-PV10mid-controlD	HS19010655-07	Selenium, dissolved	0.0106	mg/L	J	Total/Dissolved concentration differences greater than 30 RPD
20190110-FD-PV10mid-30T	HS19010657-08	Selenium, total	0.00110	mg/L	UJ	Total/Dissolved concentration differences greater than 30 RPD
20190110-FD-PV10mid-30D	HS19010655-08	Selenium, dissolved	0.00370	mg/L	J	Total/Dissolved concentration differences greater than 30 RPD
20190110-FD-PV10mid-35T	HS19010657-09	Selenium, total	0.00110	mg/L	UJ	Total/Dissolved concentration differences greater than 30 RPD
20190110-FD-PV10mid-35D	HS19010655-09	Selenium, dissolved	0.00345	mg/L	J	Total/Dissolved concentration differences greater than 30 RPD
20190110-FD-PV10mid-40T	HS19010657-10	Selenium, total	0.00110	mg/L	UJ	Total/Dissolved concentration differences greater than 30 RPD
20190110-FD-PV10mid-40D	HS19010655-10	Selenium, dissolved	0.00389	mg/L	J	Total/Dissolved concentration differences greater than 30 RPD
20190109-FD-PV10out-40T-DUP	HS19010658-01	Arsenic	0.000463	mg/L	U	Analyte detected in laboratory blank
20190109-FD-PV10out-40T-DUP	HS19010658-01	Iron, total	0.0172	mg/L	J	Total/Dissolved concentration differences greater than 30 RPD
20190109-FD-PV10out-40T-DUP	HS19010658-01	Selenium, total	0.00110	mg/L	UJ	Total/Dissolved concentration differences greater than 30 RPD
20190109-FD-PV10out-40D-DUP	HS19010658-02	Iron, total	0.302	mg/L	J	Total/Dissolved concentration differences greater than 30 RPD
20190109-FD-PV10out-40D-DUP	HS19010658-02	Selenium, total	0.00483	mg/L	J	Total/Dissolved concentration differences greater than 30 RPD
20190111-DGW-MW11-PV10inlet-30-35-40T	HS19011284-06	Calcium	512	mg/L	J	Treatability study duplicate precision exceeds 30 RPD
20190111-DGW-MW11-PV10inlet-30-35-40T-DUP	HS19011284-11	Calcium	376	mg/L	J	Treatability study duplicate precision exceeds 30 RPD
20190115-DGW-MW3-PV20out-controlT	HS19011284-12	Arsenic	0.000993	mg/L	U	Analyte detected in laboratory blank
20190116-DGW-MW3-PV20mid-controlD	HS19011286-18	Antimony	0.000701	mg/L	U	Analyte detected in laboratory blank
20190117-DGW-MW3-PV20mid-30D	HS19011286-19	Antimony	0.000437	mg/L	U	Analyte detected in laboratory blank

Notes:

J - Estimated data; data are qualified do to exceedance of one or more quality control criteria. The reported sample concentration is the approximate concentration of the analyte in the sample.
L - Potential low bias
U - Analyte not detected at associated concentration (column labeled as "Result".
mg/L - milligrams per liter

TABLE 3 - TOTAL VERSUS DISSOLVED COMPARISON

Sample	Analyte	Total Concentration	Dissolved Concentration	Precision (RPD)	Qualification
DGW-MW-3 (Nov 2018)	Antimony	< 0.000400	0.00218	140	Acceptable (MQL)
DGW-MW-3 (Nov 2018)	Calcium	112	114	1.8	Acceptable
DGW-MW-3 (Nov 2018)	Iron	17.9	18.2	1.7	Acceptable
DGW-MW-3 (Nov 2018)	Potassium	2.29	2.39	4.3	Acceptable
French Drain (Nov 2018)	Magnesium	1.66	1.7	2.4	Acceptable
French Drain (Nov 2018)	Selenium	0.00473	0.0076	47	J
French Drain (Nov 2018)	Sodium	127	130	2.3	Acceptable
MW-46 (Nov 2018)	Cadmium	0.000791	0.000969	20	Acceptable
MW-46 (Nov 2018)	Iron	66.6	76.1	13	Acceptable
MW-46 (Nov 2018)	Magnesium	231	241	4.2	Acceptable
MW-46 (Nov 2018)	Potassium	4.62	6.01	26	Acceptable
French Drain (Dec 2018)	Potassium	13.2	13.8	4.4	Acceptable
MW-46 (Dec 2018)	Calcium	499	556	11	Acceptable
MW-46 (Dec 2018)	Magnesium	216	240	11	Acceptable
MW-46 (Dec 2018)	Sodium	625	687	9.5	Acceptable
DGW-MW-11 (Dec 2018)	Calcium	459	474	3.2	Acceptable
DGW-MW-11 (Dec 2018)	Magnesium	246	267	8.2	Acceptable
DGW-MW-11 (Dec 2018)	Sodium	1710	1860	8.4	Acceptable
DGW-MW-11S (Dec 2018)	Antimony	0.000632	0.00101 U	46	Acceptable (MQL)
DGW-MW-11S (Dec 2018)	Cadmium	0.000964	0.00101	4.7	Acceptable
DGW-MW-11S (Dec 2018)	Calcium	415	493	17	Acceptable
DGW-MW-11S (Dec 2018)	Lead	< 0.000300	0.00439	38	Acceptable (MQL)
DGW-MW-11S (Dec 2018)	Potassium	2.41	2.49	3.3	Acceptable
DGW-MW-11S (Dec 2018)	Sodium	2100	2390	13	Acceptable
MW-30 (Dec 2018)	Calcium	329	335	1.8	Acceptable
MW-30 (Dec 2018)	Sodium	159	163	2.5	Acceptable
DUP-01 (Dec 2018)	Arsenic	0.00188	0.00193	2.6	Acceptable
DUP-01 (Dec 2018)	Cadmium	0.000759	0.000894	16	Acceptable
DUP-01 (Dec 2018)	Calcium	532	568	6.5	Acceptable
DUP-01 (Dec 2018)	Iron	61.0	66.0	7.9	Acceptable
DUP-01 (Dec 2018)	Magnesium	227	249	9.2	Acceptable
DUP-01 (Dec 2018)	Sodium	663	690	4.0	Acceptable
2018-12-17-DGW-MW11-T0-30-35-40-D/T	Iron	17.9	21.1	16	Acceptable
2018-12-17-DGW-MW11-T0-30-35-40-D/T	Lead	0.0019	0.0362	180	J
20181211-DGW-MW3-PV5out-30D/T	Sodium	194	210	7.9	Acceptable
20181211-DGW-MW3-PV5out-35D/T	Sodium	195	209	6.9	Acceptable
20181211-DGW-MW3-PV5mid-ControlT/D	Sodium	203	208	2.4	Acceptable
20181211-DGW-MW3-PV5mid-35T/D	Sodium	201	212	5.3	Acceptable
20181211-DGW-MW3-PV5inlet-ControlT/D	Calcium	113	115	1.8	Acceptable
20181211-DGW-MW3-PV5inlet-ControlT	Sodium	199	221	10	Acceptable
2018-11-27-DGW-MW3-T0-ControlD/T	Sodium	188	196	4.2	Acceptable
2018-11-27-DGW-MW3-T0-30-35-40D/T	Magnesium	21.6	23.2	7.1	Acceptable
2018-11-27-DGW-MW3-T0-30-35-40D/T	Potassium	2.1	2.27	7.8	Acceptable
2018-11-27-DGW-MW3-T0-30-35-40D/T	Selenium	0.00110	0.00265	83	Acceptable (MQL)
20181213-FD-T0-ControlT	Antimony	0.0328	0.0351	6.8	Acceptable
20181213-FD-T0-ControlT	Calcium	195	209	6.9	Acceptable
20181213-FD-T0-ControlT	Sodium	259	270	4.2	Acceptable
20181220-DGW-MW3-PV10out-ControlT	Calcium	107	116	8.1	Acceptable
20181220-DGW-MW3-PV10out-ControlT	Potassium	2.11	2.17	2.8	Acceptable
20181220-DGW-MW3-PV10out-30T	Calcium	10.1	11.9	16	Acceptable
20181220-DGW-MW3-PV10out-35T	Calcium	9.44	12.3	26	Acceptable
20181220-DGW-MW3-PV10out-35T	Magnesium	15.3	16.1	5.1	Acceptable
20181220-DGW-MW3-PV10out-35T	Potassium	2.29	2.36	3.0	Acceptable
20181220-DGW-MW3-PV10out-40T	Calcium	9.03	10.9	19	Acceptable
20181220-DGW-MW3-PV10out-40T	Magnesium	15	15.5	3.3	Acceptable
20181220-DGW-MW3-PV10inlet-ControlT	Calcium	108	111	2.7	Acceptable
20181220-DGW-MW3-PV10inlet-30-35-40T	Calcium	110	126	14	Acceptable
20181220-DGW-MW3-PV10inlet-30-35-40T	Magnesium	22.7	23.6	3.9	Acceptable
20181220-DGW-MW3-PV10inlet-30-35-40T	Potassium	2.47	2.58	4.4	Acceptable
20181221-DGW-MW3-PV10mid-ControlT	Calcium	104	115	10	Acceptable
20181221-DGW-MW3-PV10mid-ControlT	Magnesium	20	21.1	5.4	Acceptable
20181221-DGW-MW3-PV10mid-ControlT	Potassium	1.88	2.1	11	Acceptable
20181221-DGW-MW3-PV10mid-30T	Calcium	14.2	17	18	Acceptable
20181221-DGW-MW3-PV10mid-30T	Potassium	2.31	2.39	3.4	Acceptable
20181221-DGW-MW3-PV10mid-35T	Calcium	14.7	16.8	13	Acceptable
20181221-DGW-MW3-PV10mid-40T	Calcium	13.5	16.4	19	Acceptable
20181221-DGW-MW3-PV10mid-40T	Magnesium	17.9	18.4	2.8	Acceptable

TABLE 3 - TOTAL VERSUS DISSOLVED COMPARISON

Sample	Analyte	Total Concentration	Dissolved Concentration	Precision (RPD)	Qualification
20181221-DGW-MW3-PV10mid-40T	Potassium	2.58	2.74	6.0	Acceptable
20190103-DGW-MW3-PV15out-ControlT	Calcium	107	117	8.9	Acceptable
20190103-DGW-MW3-PV15out-ControlT	Magnesium	20.2	21.6	6.7	Acceptable
20190103-DGW-MW3-PV15out-ControlT	Potassium	2.01	2.1	4.4	Acceptable
20190103-DGW-MW3-PV15out-30T	Calcium	7.05	8.38	17	Acceptable
20190103-DGW-MW3-PV15out-30T	Magnesium	14.3	14.6	2.1	Acceptable
20190103-DGW-MW3-PV15out-30T	Potassium	1.88	1.99	5.7	Acceptable
20190103-DGW-MW3-PV15out-35T	Calcium	5.99	8.38	33	Acceptable
20190103-DGW-MW3-PV15out-35T	Magnesium	11.3	14.6	25	Acceptable
20190103-DGW-MW3-PV15out-35T	Potassium	1.84	1.99	7.8	Acceptable
20190103-DGW-MW3-PV15out-40T	Calcium	6.89	7.87	13	Acceptable
20190103-DGW-MW3-PV15out-40T	Potassium	1.89	1.95	3.1	Acceptable
20190104-DGW-MW3-PV15inlet-ControlT	Calcium	108	111	2.7	Acceptable
20190104-DGW-MW3-PV15inlet-ControlT	Magnesium	20.1	20.5	2.0	Acceptable
20190104-DGW-MW3-PV15inlet-30-35-40T	Calcium	105	108	2.8	Acceptable
20190104-DGW-MW3-PV15inlet-30-35-40T	Potassium	2.13	2.22	4.1	Acceptable
20190104-DGW-MW3-PV15mid-ControlT	Calcium	106	117	10	Acceptable
20190104-DGW-MW3-PV15mid-ControlT	Magnesium	20.7	21.8	5.2	Acceptable
20190104-DGW-MW3-PV15mid-ControlT	Potassium	1.97	2.16	9.2	Acceptable
20190104-DGW-MW3-PV15mid-30T	Calcium	10.3	13.5	27	Acceptable
20190104-DGW-MW3-PV15mid-30T	Magnesium	16.1	18.1	12	Acceptable
20190104-DGW-MW3-PV15mid-30T	Potassium	1.9	2.24	16	Acceptable
20190104-DGW-MW3-PV15inlet-35T	Calcium	9.46	11.8	22	Acceptable
20190104-DGW-MW3-PV15inlet-35T	Magnesium	15.1	15.9	5.2	Acceptable
20190104-DGW-MW3-PV15inlet-35T	Potassium	1.87	2.01	7.2	Acceptable
20190104-DGW-MW3-PV15inlet-40T	Calcium	9	11.2	22	Acceptable
20190104-DGW-MW3-PV15inlet-40T	Magnesium	15	15.8	5.2	Acceptable
20190104-DGW-MW3-PV15inlet-40T	Potassium	1.84	2.01	8.8	Acceptable
20190104-DGW-MW3-PV15inlet-40T	Sodium	179	198	10	Acceptable
20190103-DGW-MW11-PV5out-ControlT	Cadmium	0.00902	0.00974	7.7	Acceptable
20190103-DGW-MW11-PV5out-ControlT	Calcium	423	497	16	Acceptable
20190103-DGW-MW11-PV5out-ControlT	Magnesium	317	338	6.4	Acceptable
20190103-DGW-MW11-PV5out-30T	Calcium	263	285	8.0	Acceptable
20190103-DGW-MW11-PV5out-30T	Potassium	18.3	19	3.8	Acceptable
20190103-DGW-MW11-PV5out-35T	Calcium	257	286	11	Acceptable
20190103-DGW-MW11-PV5out-35T	Potassium	17.9	20.1	12	Acceptable
20190103-DGW-MW11-PV5out-35T	Sodium	1700	1860	9.0	Acceptable
20190103-DGW-MW11-PV5out-40T	Potassium	17.3	18.9	8.8	Acceptable
20190103-DGW-MW11-PV5out-40T	Sodium	1740	1880	7.7	Acceptable
20190103-DGW-MW11-PV5inlet-ControlT	Potassium	20.4	22.5	10	Acceptable
20190103-DGW-MW11-PV5inlet-ControlT	Sodium	1530	1650	7.5	Acceptable
20190103-DGW-MW11-PV5inlet-30-35-40T	Calcium	442	512	15	Acceptable
20190103-DGW-MW11-PV5inlet-30-35-40T	Potassium	18.1	19.4	6.9	Acceptable
20190103-DGW-MW11-PV5inlet-30-35-40T	Sodium	1730	1910	9.9	Acceptable
20190103-DGW-MW11-PV5mid-ControlT	Calcium	474	487	2.7	Acceptable
20190103-DGW-MW11-PV5mid-ControlT	Potassium	21.2	22.3	5.1	Acceptable
20190103-DGW-MW11-PV5mid-ControlT	Sodium	1470	1720	16	Acceptable
20190103-DGW-MW11-PV5out-30T	Potassium	18	18.6	3.3	Acceptable
20190103-DGW-MW11-PV5out-30T	Sodium	1690	1890	11	Acceptable
20190103-DGW-MW11-PV5out-35T	Calcium	269	278	3.3	Acceptable
20190103-DGW-MW11-PV5out-35T	Potassium	18.1	18.3	1.1	Acceptable
20190103-DGW-MW11-PV5out-35T	Sodium	1660	1890	13	Acceptable
20190103-DGW-MW11-PV5out-40T	Calcium	267	277	3.7	Acceptable
20190103-DGW-MW11-PV5out-40T	Potassium	17.7	18.3	3.3	Acceptable
20190103-DGW-MW11-PV5out-40T	Sodium	1680	1910	13	Acceptable
20181227-FD-PV5out-ControlT	Antimony	0.031	0.0319	2.9	Acceptable
20181227-FD-PV5out-ControlT	Calcium	186	196	5.2	Acceptable
20181227-FD-PV5out-ControlT	Magnesium	1.27	1.41	10	Acceptable
20181227-FD-PV5out-ControlT	Potassium	11.3	11.5	1.8	Acceptable
20181227-FD-PV5out-ControlT	Sodium	241	257	6.4	Acceptable
20181227-FD-PV5out-30T	Magnesium	0.99	1.08	8.7	Acceptable
20181227-FD-PV5out-30T	Potassium	11.2	12.3	9.4	Acceptable
20181227-FD-PV5out-30T	Sodium	235	248	5.4	Acceptable
20181227-FD-PV5out-35T	Iron	0.165	0.255	43	Acceptable (MQL)
20181227-FD-PV5out-35T	Magnesium	1.07	1.14	6.3	Acceptable
20181227-FD-PV5out-35T	Potassium	11.5	11.9	3.4	Acceptable
20181227-FD-PV5out-35T	Sodium	239	251	4.9	Acceptable
20181227-FD-PV5out-40T	Calcium	171	184	7.3	Acceptable
20181227-FD-PV5out-40T	Magnesium	0.984	1.07	8.4	Acceptable

TABLE 3 - TOTAL VERSUS DISSOLVED COMPARISON

Sample	Analyte	Total Concentration	Dissolved Concentration	Precision (RPD)	Qualification
20181227-FD-PV5out-40T	Potassium	10.9	11.9	8.8	Acceptable
20181227-FD-PV5out-40T	Sodium	240	253	5.3	Acceptable
20181228-FD-PV5inlet-ControlT	Magnesium	1.09	1.21	10	Acceptable
20181228-FD-PV5inlet-ControlT	Potassium	11.3	11.7	3.5	Acceptable
20181228-FD-PV5inlet-30-35-40T	Magnesium	1.04	1.12	7.4	Acceptable
20181228-FD-PV5inlet-30-35-40T	Potassium	11.8	12.4	5.0	Acceptable
20181228-FD-PV5inlet-30-35-40T	Sodium	231	234	1.3	Acceptable
20181228-FD-PV5mid-ControlT	Magnesium	1.25	1.36	8.4	Acceptable
20181228-FD-PV5mid-ControlT	Potassium	11.2	11.6	3.5	Acceptable
20181228-FD-PV5mid-ControlT	Sodium	248	251	1.2	Acceptable
20181228-FD-PV5mid-30T	Calcium	175	182	3.9	Acceptable
20181228-FD-PV5mid-30T	Magnesium	0.959	1.03	7.1	Acceptable
20181228-FD-PV5mid-30T	Potassium	10.8	11.3	4.5	Acceptable
20181228-FD-PV5mid-35T	Magnesium	1.03	1.07	3.8	Acceptable
20181228-FD-PV5mid-40T	Calcium	173	183	5.6	Acceptable
20181228-FD-PV5mid-40T	Magnesium	0.983	1.14	15	Acceptable
20181228-FD-PV5mid-40T	Potassium	10.7	11.4	6.3	Acceptable
20181228-FD-PV5mid-40T	Sodium	231	248	7.1	Acceptable
20190108-FD-PV10out-controlT	Arsenic	0.00187	0.00565	101	J
20190108-FD-PV10out-controlT	Calcium	170	206	19	Acceptable
20190108-FD-PV10out-controlT	Magnesium	1.25	1.32	5.4	Acceptable
20190108-FD-PV10out-controlT	Potassium	12.6	13.2	4.7	Acceptable
20190108-FD-PV10out-controlT	Selenium	0.00654	0.00889	30	Acceptable
20190108-FD-PV10out-controlT	Sodium	226	274	19	Acceptable
20190108-FD-PV10out-30T	Calcium	169	198	16	Acceptable
20190108-FD-PV10out-30T	Magnesium	0.941	0.99	5.1	Acceptable
20190108-FD-PV10out-30T	Selenium	< 0.00110	0.00331	100	J
20190108-FD-PV10out-30T	Sodium	225	270	18	Acceptable
20190108-FD-PV10out-35T	Calcium	169	211	22	Acceptable
20190108-FD-PV10out-35T	Magnesium	1.08	1.11	2.7	Acceptable
20190108-FD-PV10out-35T	Selenium	< 0.00110	0.00274	85.0	J
20190108-FD-PV10out-35T	Sodium	237	279	16	Acceptable
20190108-FD-PV10out-40T	Calcium	187	195	4.2	Acceptable
20190108-FD-PV10out-40T	Sodium	251	262	4.3	Acceptable
20190108-FD-PV10out-40T	Selenium	< 0.00110	0.00329	100	J
20190109-FD-PV10inlet-controlT	Calcium	187	206	9.7	Acceptable
20190109-FD-PV10inlet-controlT	Magnesium	1.27	1.29	1.6	Acceptable
20190109-FD-PV10inlet-controlT	Potassium	12.7	13.1	3.1	Acceptable
20190109-FD-PV10inlet-controlT	Selenium	0.00684	0.00938	31	J
20190109-FD-PV10inlet-controlT	Sodium	251	269	6.9	Acceptable
20190109-FD-PV10inlet-30-35-40T	Magnesium	1.17	1.21	3.4	Acceptable
20190109-FD-PV10inlet-30-35-40T	Potassium	12.6	13.1	3.9	Acceptable
20190109-FD-PV10inlet-30-35-40T	Selenium	0.00706	0.00936	28	Acceptable
20190110-FD-PV10mid-controlT	Calcium	189	191	1.1	Acceptable
20190110-FD-PV10mid-controlT	Iron	< 0.0120	0.0902	153	J
20190110-FD-PV10mid-controlT	Potassium	12.5	13	3.9	Acceptable
20190110-FD-PV10mid-controlT	Selenium	0.00707	0.0106	40	J
20190110-FD-PV10mid-controlT	Sodium	252	255	1.2	Acceptable
20190110-FD-PV10mid-30T	Calcium	174	205	16	Acceptable
20190110-FD-PV10mid-30T	Magnesium	0.925	1	7.8	Acceptable
20190110-FD-PV10mid-30T	Potassium	13.3	13.6	2.2	Acceptable
20190110-FD-PV10mid-30T	Selenium	< 0.00110	0.0037	108	J
20190110-FD-PV10mid-30T	Sodium	242	277	13	Acceptable
20190110-FD-PV10mid-35T	Calcium	185	195	5.3	Acceptable
20190110-FD-PV10mid-35T	Magnesium	0.995	1.09	9.1	Acceptable
20190110-FD-PV10mid-35T	Potassium	12.6	13.2	4.7	Acceptable
20190110-FD-PV10mid-35T	Selenium	< 0.00110	0.00345	103	J
20190110-FD-PV10mid-35T	Sodium	255	263	3.1	Acceptable
20190110-FD-PV10mid-40T	Magnesium	1.04	1.19	13	Acceptable
20190110-FD-PV10mid-40T	Potassium	12.6	14	11	Acceptable
20190110-FD-PV10mid-40T	Selenium	< 0.00110	0.00389	112	J
20190109-FD-PV10out-40T-DUP	Iron	0.0172	0.302	178	J
20190109-FD-PV10out-40T-DUP	Selenium	< 0.0011	0.00483	126	J
20190111-DGW-MW11-PV10out-controlD	Cadmium	0.00912	0.0107	16	Acceptable
20190111-DGW-MW11-PV10inlet-controlD	Cadmium	0.00857	0.00972	13	Acceptable
20190112-DGW-MW11-PV10mid-30T	Calcium	345	404	16	Acceptable
20190112-DGW-MW11-PV10mid-30T	Magnesium	270	285	5.4	Acceptable
20190112-DGW-MW11-PV10mid-30T	Potassium	18.8	21.4	13	Acceptable
20190112-DGW-MW11-PV10mid-30T	Sodium	1420	1500	5.5	Acceptable

TABLE 3 - TOTAL VERSUS DISSOLVED COMPARISON

Sample	Analyte	Total Concentration	Dissolved Concentration	Precision (RPD)	Qualification
20190112-DGW-MW11-PV10mid-35T	Calcium	320	379	17	Acceptable
20190112-DGW-MW11-PV10mid-35T	Magnesium	242	275	13	Acceptable
20190112-DGW-MW11-PV10mid-35T	Potassium	18.2	20.6	12	Acceptable
20190112-DGW-MW11-PV10mid-35T	Sodium	1300	1470	12	Acceptable
20190112-DGW-MW11-PV10mid-40T	Calcium	309	356	14	Acceptable
20190112-DGW-MW11-PV10mid-40T	Magnesium	232	258.0	11	Acceptable
20190112-DGW-MW11-PV10mid-40T	Potassium	18.6	18.9	1.6	Acceptable
20190112-DGW-MW11-PV10mid-40T	Sodium	1270	1370	7.6	Acceptable
190111-DGW-MW11-PV10inlet-30-35-40T-D	Calcium	376	462	21	Acceptable
190111-DGW-MW11-PV10inlet-30-35-40T-D	Iron	16	20	22	Acceptable
190111-DGW-MW11-PV10inlet-30-35-40T-D	Magnesium	242	289	18	Acceptable
190111-DGW-MW11-PV10inlet-30-35-40T-D	Potassium	17.4	20.7	17	Acceptable
190111-DGW-MW11-PV10inlet-30-35-40T-D	Sodium	1280	1520	17	Acceptable
20190115-DGW-MW3-PV20out-controlT	Calcium	92.2	100	8.1	Acceptable
20190115-DGW-MW3-PV20out-controlT	Magnesium	17.6	18.5	5.0	Acceptable
20190115-DGW-MW3-PV20out-controlT	Potassium	1.99	2.29	14	Acceptable
20190115-DGW-MW3-PV20out-30T	Calcium	6.61	7.4	11	Acceptable
20190115-DGW-MW3-PV20out-30T	Magnesium	13.7	17.2	23	Acceptable
20190115-DGW-MW3-PV20out-30T	Potassium	2.03	2.18	7.1	Acceptable
20190115-DGW-MW3-PV20out-35T	Calcium	6.18	6.26	1.3	Acceptable
20190115-DGW-MW3-PV20out-35T	Magnesium	10.5	14.0	29	Acceptable
20190115-DGW-MW3-PV20out-35T	Potassium	1.99	2.09	4.9	Acceptable
20190115-DGW-MW3-PV20out-35T	Sodium	167	172	2.9	Acceptable
20190115-DGW-MW3-PV20out-40T	Calcium	5.88	5.94	1.0	Acceptable
20190115-DGW-MW3-PV20out-40T	Magnesium	10.9	13.8	23	Acceptable
20190115-DGW-MW3-PV20out-40T	Sodium	174	148	16	Acceptable
20190117-DGW-MW3-PV20inlet-controlT	Potassium	1.85	2.16	15	Acceptable
20190117-DGW-MW3-PV20inlet-30-35-40T	Calcium	100	119	17	Acceptable
20190117-DGW-MW3-PV20inlet-30-35-40T	Magnesium	18.4	21.2	14	Acceptable
20190117-DGW-MW3-PV20inlet-30-35-40T	Potassium	1.83	1.96	6.9	Acceptable
20190117-DGW-MW3-PV20inlet-30-35-40T	Sodium	177	238	29	Acceptable
20190116-DGW-MW3-PV20mid-controlT	Calcium	90.1	101	11	Acceptable
20190116-DGW-MW3-PV20mid-controlT	Magnesium	16.4	19.6	18	Acceptable
20190116-DGW-MW3-PV20mid-controlT	Potassium	2.03	2.18	7.1	Acceptable
20190116-DGW-MW3-PV20mid-controlT	Sodium	158	181	14	Acceptable
20190117-DGW-MW3-PV20mid-30T	Calcium	9.12	9.59	5.0	Acceptable
20190117-DGW-MW3-PV20mid-30T	Magnesium	14.5	16.2	11	Acceptable
20190117-DGW-MW3-PV20mid-30T	Potassium	2.00	2.35	16	Acceptable
20190117-DGW-MW3-PV20mid-30T	Sodium	181	198	9.0	Acceptable
20190116-DGW-MW3-PV20mid-35T	Magnesium	13.9	14.5	4.2	Acceptable
20190116-DGW-MW3-PV20mid-35T	Potassium	1.89	2.11	11	Acceptable
20190116-DGW-MW3-PV20mid-35T	Sodium	180	181	0.6	Acceptable
20190116-DGW-MW3-PV20mid-40T	Calcium	8.54	8.74	2.3	Acceptable
20190116-DGW-MW3-PV20mid-40T	Magnesium	13.8	15.4	11	Acceptable
20190116-DGW-MW3-PV20mid-40T	Potassium	1.95	2.18	11	Acceptable
20190116-DGW-MW3-PV20mid-40T	Sodium	186	198	6.3	Acceptable
20190117-DGW-MW3-PV20mid-35T-DUP	Magnesium	13.6	15.2	11	Acceptable
20190117-DGW-MW3-PV20mid-35T-DUP	Potassium	2.00	2.12	5.8	Acceptable
20190117-DGW-MW3-PV20mid-35T-DUP	Sodium	182	190	4.3	Acceptable

Notes:
mg/L - milligrams per liter
RPD - relative percent difference
J - Estimated data; the analyte was detected and identified but one or more quality control criteria were not met.

TABLE 4 - BLANK DETECTIONS

Lab Sample ID	Analyte	Result	Qualified Concentration	Units	Explanation
ICPMS04_326956 CCB1 11/7 1240	Arsenic	-0.000546	0.00273	mg/L	U: French Drain (totals) HS18110259
ICPMS04_330548 CCB2 1/7 1334	Iron, dissolved	0.01727	0.086	mg/L	U: detections HS18121346-04, -05, -07
ICPMS04_330548 CCB2 1/7 1334	Selenium, dissolved	0.001325	0.0066	mg/L	U: detections HS18121345-01, 03; HS18121346-01, -02, -04, -05, -06, -07, -08
ICPMS04_331185 CCB11 1/17 1854	Antimony	0.001321	0.0066	mg/L	U: antimony detections in HS19010556-01, -02, -05, -07, -10
ICPMS04_331185 CCB13 1/17 2021	Antimony	0.000965	0.0048	mg/L	U: antimony detections in HS19010558-08
ICPMS04_331185 CCB13 1/17 2021	Selenium	0.001313	0.0066	mg/L	U: selenium detections in HS19010558-01, -06, -07, -09
ICPMS04_331185 CCB15 1/17 2057	Antimony	0.001226	0.0061	mg/L	U: antimony detections in HS19010557-01
ICPMS04_331185 CCB7 1/17 1613	Antimony	0.001653	0.0083	mg/L	U: antimony detections in HS19010551-01, -02, -10
ICPMS04_331185 CCB7 1/17 1613	Iron	0.02134	0.1067	mg/L	U: iron detections in HS19010551-02, -03, -04
ICPMS04_331185 CCB8 1/17 1645	Iron	0.01688	0.0844	mg/L	U: iron detections in HS19010553-03, -04
ICPMS04_331384 CCB1 1/21 1224	Antimony	0.000493	0.0025	mg/L	U: antimony detections in HS19010559-08
ICPMS04_331384 CCB1 1/21 1224	Iron	0.01804	0.0902	mg/L	U: iron detections in HS19010559-01, -02, -04, -05, -06, -07, -08, -09, -10
ICPMS04_331384 CCB1 1/21 1224	Selenium	0.00137	0.0069	mg/L	U: selenium detections in HS19010559-01, -05, -06, -07
ICPMS05_328542 CCB26 12/4 2343	Antimony, dissolved	0.000535	0.0027	mg/L	U: detections in HS18120067-03, -04
ICPMS05_331226 CCB6 1/17 1815	Antimony	0.00128	0.0064	mg/L	U: detections in HS19010552-01, -02, -10
ICPMS05_331226 CCB8 1/17 1846	Antimony	0.001165	0.0058	mg/L	U: detections in HS19010554-02, -08
ICPMS05_331390 CCB18 1/21 2239	Antimony	0.001086	0.0054	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS05_331390 CCB18 1/21 2239	Arsenic	0.000903	0.0045	mg/L	U: arsenic detections in HS19010655-05, -06, -07
ICPMS05_331390 CCB19 1/21 2317	Arsenic	0.004846	0.0242	mg/L	U: arsenic detections in HS19010658-01
ICPMS05_331929 CCB1 1/30 1246	Antimony	0.00111	0.0056	mg/L	U: antimony detections in HS19011286-18, -19
ICPMS05_332031 CCB3 1/31 1449	Arsenic	-0.000759	0.0038	mg/L	U: arsenic detections in HS19011284-12
ICS3K2_328424 CCB4	Nitrogen, Nitrate	0.072	0.360	mg/L	U: detections in HS18111408-01, -02
ICS3K2_330134 CCB3	Nitrogen, Nitrate	0.078	0.390	mg/L	U: 2018-12-26-FD-PV5out-30
MBLK-134313	Arsenic, dissolved	0.0008	0.0040	mg/L	U: French Drain (dissolved) HS18110259
MBLK-134313	Iron, dissolved	0.03383	0.1692	mg/L	U: French Drain (dissolved) HS18110259
MBLK-136804	Arsenic	0.000934	0.0047	mg/L	U: arsenic detections in HS19010655-05, -06, -07

Notes:
U - Not detected; the analyte was detected <5x the level in an associated blank and is not detected above the reported sample concentration.
mg/L - milligrams per liter

TABLE 5 - PRECISION AND ACCURACY

Sample	Analyte	Spike Recovery (%R)	Spike Duplicate Recovery (%R)	Precision	Qualification
2018-12-10-DGW-MW3-PV5out-40	Sulfate	54.5	-8.64	2.74	None; sample concentration greater than 4x spike concentration
2018-12-17-DGW-MW11-T0-30-35-40-D	Calcium, dissolved	-325	-654	3.75	None; sample concentration greater than 4x spike concentration
2018-12-17-DGW-MW11-T0-30-35-40-D	Magnesium, dissolved	-260	-249	0.182	None; sample concentration greater than 4x spike concentration
2018-12-17-DGW-MW11-T0-30-35-40-D	Potassium, dissolved	76.1	54.6	4.39	None; sample concentration greater than 4x spike concentration
2018-12-17-DGW-MW11-T0-30-35-40-D	Sodium, dissolved	-968	-864	0.357	None; sample concentration greater than 4x spike concentration
2018-12-17-DGW-MW11-T0-30-35-40-D	Potassium, dissolved (PDS)	60.7	NA	NA	JL
2018-12-17-DGW-MW11-T0-30-35-40-T	Calcium, total	-92	234	3.33	None; sample concentration greater than 4x spike concentration
2018-12-17-DGW-MW11-T0-30-35-40-T	Magnesium, total	188	312	1.95	None; sample concentration greater than 4x spike concentration
2018-12-17-DGW-MW11-T0-30-35-40-T	Sodium, total	746	1600	2.65	None; sample concentration greater than 4x spike concentration
20181220-DGW-MW3-PV10out-ControlD	Calcium	34.3	159	5.19	None; sample concentration greater than 4x spike concentration
20181220-DGW-MW3-PV10out-ControlD	Sodium	13.8	157	3.66	None; sample concentration greater than 4x spike concentration
20181220-DGW-MW3-PV10out-ControlD	Calcium (PDS)	64.4	NA	NA	None; sample concentration greater than 4x spike concentration
20181220-DGW-MW3-PV10out-ControlT	Calcium	115	59.6	2.51	None; average is greater than 70%R
20181220-DGW-MW3-PV10out-ControlT	Sodium	-77	118	5.02	None; sample concentration greater than 4x spike concentration
20190102-DGW-MW3-PV15out-40T-Dup	Sodium	-27.6	15.4	1.1	None; sample concentration greater than 4x spike concentration
20190103-DGW-MW11-PV5out-ControlD	Calcium	-51.9	-117	0.69	None; sample concentration greater than 4x spike concentration
20190103-DGW-MW11-PV5out-ControlD	Magnesium	-56.9	140	3.33	None; sample concentration greater than 4x spike concentration
20190103-DGW-MW11-PV5out-ControlD	Sodium	0	0	0	None; sample analyzed at x100 dilution; LCS, PDS, and SD acceptable
20190103-DGW-MW11-PV5out-ControlT	Calcium	409	-26.6	4.63	None; sample concentration greater than 4x spike concentration
20190103-DGW-MW11-PV5out-ControlT	Magnesium	-6.51	-48.7	0.711	None; sample concentration greater than 4x spike concentration
20190103-DGW-MW11-PV5out-ControlT	Sodium	0	0	0	None; sample analyzed at x50 dilution; LCS, PDS and SD acceptable
20190108-FD-PV10out-controlD	Calcium	217	215	0.0425	None; sample concentration greater than 4x spike concentration
20190108-FD-PV10out-controlD	Sodium	331	294	0.629	None; sample concentration greater than 4x spike concentration
French Drain (Dec 2018)	Calcium, dissolved	-80.2	-209	3.01	None; sample concentration greater than 4x spike concentration
French Drain (Dec 2018)	Sodium, dissolved	220	-142	6.81	None; sample concentration greater than 4x spike concentration
MW-46 (Nov 2018)	Calcium, dissolved	-351	21.3	3.65	None; sample concentration greater than 4x spike concentration
MW-46 (Nov 2018)	Iron, dissolved	-2.94	14	9.28	None; sample concentration greater than 4x spike concentration
MW-46 (Nov 2018)	Magnesium, dissolved	-170	126	6.18	None; sample concentration greater than 4x spike concentration
MW-46 (Nov 2018)	Sodium, dissolved	-410	215	5.2	None; sample concentration greater than 4x spike concentration
MW-46 (Nov 2018)	Iron, dissolved (PDS)	57.3	NA	NA	None; sample concentration greater than 4x spike concentration
MW-46 (Nov 2018)	Magnesium, dissolved (PDS)	-31.5	NA	NA	None; sample concentration greater than 4x spike concentration
MW-46 (Nov 2018)	Sodium, dissolved (PDS)	68.5	NA	NA	None; sample concentration greater than 4x spike concentration
MW-46 (Nov 2018)	Calcium, total	723	457	2.4	None; sample concentration greater than 4x spike concentration
MW-46 (Nov 2018)	Iron, total	133	129	0.263	None; sample concentration greater than 4x spike concentration
MW-46 (Nov 2018)	Magnesium, total	176	162	0.293	None; sample concentration greater than 4x spike concentration
MW-46 (Nov 2018)	Sodium, total	390	325	0.505	None; sample concentration greater than 4x spike concentration
MW-46 (Nov 2018)	Calcium, total (PDS)	49.9	NA	NA	None; sample concentration greater than 4x spike concentration

Notes:
JL - Estimated data; data are qualified do to exceedance of one or more quality control criteria. Potential low bias.
LCS - Laboratory control sample
mg/L - milligrams per liter
PDS - Post-digestate spike
NA - Not applicable
SD - Serial dilution
%R - percent recovery

TABLE 6 - DUPLICATE PRECISION CALCULATIONS

Duplicate and Parent Sample Field Identification	Analyte	Sample Result	Duplicate Result	RPD[a]	Accept or Reject	Qualifier Added
MW-46 / DUP-01 (December 2018)	Arsenic, total	0.00228	0.00188 J	19	A	NA
	Cadmium, total	0.000959 J	0.000759 J	23	A	NA
	Calcium, total	499	532	6.4	A	NA
	Iron, total	67.5	61.0	10	A	NA
	Magnesium, total	216	227	5.0	A	NA
	Potassium, total	4.93	4.75	3.7	A	NA
	Sodium, total	625	663	5.9	A	NA
	Arsenic, dissolved	0.00176 J	0.00193 J	9.2	A	NA
	Cadmium, dissolved	0.00090 J	0.000894 J	0.67	A	NA
	Calcium, dissolved	556	568	2.1	A	NA
	Iron, dissolved	65.3	66.0	1.1	A	NA
	Magnesium, dissolved	240	249	3.7	A	NA
	Potassium, dissolved	5.75	4.77	19	A	NA
	Sodium, dissolved	687	690	0.44	A	NA
	Chloride	506	498	1.6	A	NA
	Sulfate	2920	2850	2.4	A	NA
	Nitrogen, Nitrate	0.060 U	0.149 J	85	A (MQL)	NA
20190103-DGW-MW3-PV15out-ControlT / 20190103-DGW-MW3-PV15out-ControlT-Dup	Hardness (as CaCO3)	348	372	6.7	A	NA
	Arsenic	0.00177 J	0.0017 J	4.0	A	NA
	Calcium	107	114	6.3	A	NA
	Iron	0.146 J	0.0977 J	40	A	NA
	Magnesium	20.2	21.3	5.3	A	NA
	Sodium	205	194	5.5	A	NA
20190103-DGW-MW3-PV15out-30T / 20190103-DGW-MW3-PV15out-30T-Dup	Hardness (as CaCO3)	76.5	85.7	11	A	NA
	Calcium	7.05	9.08	25	A	NA
	Iron	0.108 J	0.047 J	79	A	NA
	Magnesium	14.3	15.3	6.8	A	NA
	Potassium	1.88	2.13	12	A	NA
	Sodium	204	168	19	A	NA
20190103-DGW-MW3-PV15out-35T / 20190103-DGW-MW3-PV15out-35T-Dup	Hardness (as CaCO3)	61.5	70.1	13	A	NA
	Calcium	5.99	7.80	26	A	NA
	Iron	0.0503 J	0.0222 J	78	A	NA
	Magnesium	11.3	12.3	8.5	A	NA
	Potassium	1.84	2.07	12	A	NA
	Sodium	200	176	13	A	NA
20190103-DGW-MW3-PV15out-40T / 20190103-DGW-MW3-PV15out-40T-Dup	Hardness (as CaCO3)	69.9	74.1	5.8	A	NA
	Calcium	6.89	8.25	18	A	NA
	Magnesium	12.8	13	1.6	A	NA
	Potassium	1.89	2.02	6.6	A	NA
	Sodium	205	192	6.5	A	NA
20190108-FD-PV10out-40T / 220190109-FD-PV10out-40T-Dup	Hardness (as CaCO3)	472	542	14	A	NA
	Calcium	187	215	14	A	NA
	Iron	0.0179 J	0.0172 J	4.0	A	NA
	Magnesium	1.15	1.22	5.9	A	NA
	Potassium	13.6	13.7	0.73	A	NA
	Sodium	251	287	13	A	NA
20190108-FD-PV10out-40D / 220190109-FD-PV10out-40D-Dup	Calcium	195	197	1.0	A	NA
	Iron	0.129 J	0.302	80	A (MQL)	NA
	Magnesium	1.1	1.14	3.6	A	NA
	Potassium	13	13.8	6.0	A	NA
	Selenium	0.00329	0.00483	38	A (MQL)	NA
	Sodium	262	268	2.3	A	NA

TABLE 6 - DUPLICATE PRECISION CALCULATIONS

Duplicate and Parent Sample Field Identification	Analyte	Sample Result	Duplicate Result	RPD[a]	Accept or Reject	Qualifier Added
20190111-DGW-MW11-PV10inlet-30-35-40T / 20190111-DGW-MW11-PV10inlet-30-35-40T-Dup	Hardness (as CaCO3)	2570	1940	28	A	NA
	Cadmium	0.00956 J	0.00954 J	0.21	A	NA
	Calcium	512	376	31	J	NA
	Iron	20.5	16	25	A	NA
	Lead	0.00513 J	0.00575 J	11	A	NA
	Magnesium	313	242	26	A	NA
	Potassium	22.7	17.4	26	A	NA
	Sodium	1630	1280	24	A	NA
20190116-DGW-MW3-PV20mid-35T/ 20190116-DGW-MW3-PV20mid-35T-Dup	Hardness (as CaCO3)	80	78.8	1.5	A	NA
	Calcium	9.11	9.14	0.33	A	NA
	Iron	0.448	0.193 J	80	A (MQL)	NA
	Magnesium	13.9	13.6	2.2	A	NA
	Potassium	1.89	2	5.7	A	NA
	Sodium	180	182	1.1	A	NA
20190111-DGW-MW11-PV10inlet-30-35-40D / 20190111-DGW-MW11-PV10inlet-30-35-40D-Dup	Cadmium	0.00876 J	0.00963 J	9.5	A	NA
	Calcium	370	462	22	A	NA
	Iron	20.5	20	2.5	A	NA
	Magnesium	229	289	23	A	NA
	Potassium	17.2	20.7	18	A	NA
	Sodium	1220	1520	22	A	NA
20190116-DGW-MW3-PV20mid-35D/ 20190116-DGW-MW3-PV20mid-35D-Dup	Arsenic	0.0004 U	0.000463 J	15	A	NA
	Calcium	9.0	8.88	1.3	A	NA
	Magnesium	14.5	15.2	4.7	A	NA
	Potassium	2.11	2.12	0.47	A	NA
	Sodium	182	190	4.3	A	NA

Notes:

[a] Relative Percent Difference (RPD) = ((SR - DR)*200)/(SR + DR), where SR is the sample result and DR is the duplicate result. The RPD test (<30%) applies if both results are greater than 5x MQL. Otherwise, the absolute difference test (< 2x MQL) applies.

A - Acceptable Data

J - Estimated

MQL - Method quanitation limit

NA - Not applicable

U - Not detected

DATA USABILITY SUMMARY

PROJECT NO: 130-2086-06 **CLIENT:** Exide Technologies

SAMPLE DATES: January 22, 2019 through February 19, 2019

LABORATORY: ALS Group (Houston, Texas)

WORK ORDERS: HS19020256; HS19020798; HS19020802; HS19021248; HS19021249; HS19021252

INTENDED USE: Column Study

SITE: Exide Recycling Center, 7471 5th Street, Frisco, TX

TESTS/METHODS

- EPA 300.0 – Anions
- Standard Methods (SM) 2320B - Alkalinity
- SM 2340B – Hardness, Total as $CaCO_3$
- SM 2540C – Total Dissolved Solids (TDS)
- SW-846 6020A - Inductively Coupled Plasma-Mass Spectrometry (ICP/MS)

SAMPLES

Table 1 lists the field and laboratory identification and analyses requested for 174 aqueous samples.

Golder completed a review of the analytical data for conformance with the requirements of the Texas Risk Reduction Program (TRRP) guidance document, Review and Reporting of COC Concentration Data (RGG-366/TRRP-13 Revised May 2010) and for adherence to project objectives. The results of the review are discussed in this data usability summary (DUS). Golder completed the review using the following submittals:

- Laboratory reportable data as defined in TRRP-13;
- Laboratory review checklists (LRC) with the associated exception reports; and
- Laboratory Electronic Data Deliverable (EDD).

The review of the reportable data included the quality control (QC) parameters listed below, as required per TRRP-13, using the applicable analytical method requirements:

- Data Completeness
- Chain-of-Custody Procedures
- Sample Condition - Holding Time, Preservation, and Containers

- Field Procedures
- Results Reporting Procedures – Total versus dissolved metals comparison and Detectability Check Sample (DCS)
- Field and Laboratory Blanks
- Laboratory Control Spike (LCS)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries
- Field Duplicate and Treatability Study Replicate Precision

Additionally, Golder used the LRC to evaluate the following QC parameters:

- Method Quantitation Limits (MQLs)
- Method Detection Limits (MDLs) and Sample Detection Limits (SDLs)
- Instrument Tuning, Calibration, and Performance
- Internal Standards

Criteria used for this data usability review are as follows:

- Precision: ±MQL difference or 30% relative percent difference (RPD) for laboratory duplicates or laboratory replicates; and ± 2x MQL difference (if either result is less than 5x MQL) for field duplicates as recommended in TRRP-13
- Accuracy: 70-130% spike recovery (and not less than 30% or data is rejected) as recommended in TRRP-13

If an item was found outside of the review criteria, the reviewer applied a data qualifier and bias code to the results for the affected samples in accordance with TRRP-13. Table 2 lists the qualified data, qualifiers, and reason for qualification.

LABORATORY CERTIFICATION

At the time the laboratory data were generated for this project, the laboratory was NELAC accredited under the Texas Laboratory Accreditation Program (TLAP Certification T104704231) for the matrices, methods and parameters of analysis requested on the chain-of-custody forms.

USABILITY SUMMARY

Data are usable for the intended purpose. A list of all qualified results and definitions of the qualifier and bias codes are given in Table 2.

Reviewer: Carol Lovett 3/21/2019

QUALITY CONTROL PARAMETERS AND OUTCOMES

Data Completeness

The laboratory data package contains necessary data (i.e., the laboratory reportable data per TRRP-13) and the EDD contains sample results in acceptable format.

Chain-of-Custody

Proper sample custody procedures were used, which confirms that the integrity of the samples was maintained. The information on the custody records is complete and, other than the exceptions discussed below agrees with that in the field notes and laboratory reports.

Sample Condition

Samples were collected in appropriate containers and properly preserved. Samples for metals analyses were received at temperatures greater than 6°C; temperature preservation is not required for metals analyses. Most samples were prepared and analyzed within the holding times required by the analytical methods. All samples for nitrate were analyzed past the holding times and are presented in Table 3. Data are qualified as listed in Tables 2 and 3.

Field Procedures

The samples were collected and placed immediately into laboratory supplied containers and then into a cooler for overnight delivery to the laboratory.

Results Reporting Procedures

Water results are reported in milligrams/liter (mg/L). Non-detects are reported using the SDL as specified per TRRP and detects between the SDL and MQL are reported with a laboratory J-flag. The concentration reported for detects between the SDL and MQL is below the calibration range and thus is considered estimated. Results for the DCS are included in the laboratory data packages.

The dissolved metals concentrations were slightly above the total metals concentrations in some samples as shown in Table 4. Data are qualified as listed in Tables 2 and 4.

Field and Laboratory Blanks

No field blanks were collected.

Analytes detected in laboratory method and continuing calibration blanks which were detected in the associated field samples at concentrations within five times the blank concentration are listed in Table 5. Calcium, magnesium, potassium, and sodium were frequently detected in the blanks at concentrations considerably lower than the associated sample concentrations. Since these detections do not result in qualified data, they are not listed in Table 5. Data are qualified if the sample concentration are within five times the blank concentration. Data are qualified as listed in Tables 2 and 5.

Laboratory Control Sample

The LCS recoveries (%R) are within the TRRP-13 recommended criteria of 70 -130 %R.

Matrix Spike Recovery

Non-project MS/MSD data were not evaluated. MS/MSD recoveries outside the TRRP-13 recommended criteria of 70 – 130%R are listed in Table 5. Precision was within the TRRP-13 recommended criteria of 30 RPD. Post-digestate spike (PDS) recoveries outside the TRRP-13 recommended criteria of 70 – 130%R are listed in Table 6. The serial dilution percent differences were within method criteria of 10% difference. Data are qualified as shown in Tables 2 and 6.

Field Duplicate and Treatability Study Replicate Precision

Field duplicates are those samples collected at the same sample location, date and time, split in the field, and submitted to the analytical laboratory as unique samples. Laboratory replicates are those samples collected from the treatability study using the same field sample, treatment conditions, and submitted to the analytical laboratory as unique samples. Laboratory duplicates are internal analytical laboratory samples split in the analytical laboratory for two separate analyses. Treatability study replicate precision and filed duplicate precision is summarized in Table 7. Replicate precision outside the TRRP-13 recommended criteria of 30 RPD or ± the MQL are qualified as estimated (J). Data are qualified as shown in Tables 2 and 7.

Instrument Tuning and Performance

According to the LRC, instrument tuning and interference check sample results met method requirements.

Instrument Calibration

According to the LRC, initial and continuing calibration data met method requirements for all reported results, which indicates the instruments were properly calibrated to measure analyte concentrations.

Internal Standards

According to the LRC, internal standard areas were acceptable for ICP/MS analyses.

TABLE 1
CROSS REFERENCE OF FIELD SAMPLE IDENTIFICATIONS AND LABORATORY IDENTIFICATIONS

Field Sample ID	Lab Sample ID	Sample Date	Total Metals	Dissolved Metals	Anions	Total Dissolved Solids	Alkalinity or Hardness	Comments
20190204-FD-PV20Out-Control	HS19020256-01	02/04/2019			✓	✓	✓	
20190204-FD-PV20Out-30	HS19020256-02	02/04/2019			✓	✓	✓	
20190204-FD-PV20Out-35	HS19020256-03	02/04/2019			✓	✓	✓	Anions MS/MSD
20190204-FD-PV20Out-40	HS19020256-04	02/04/2019			✓	✓	✓	
20190204-DGW-MW11-PV20out-control	HS19020256-05	02/04/2019			✓	✓	✓	
20190204-DGW-MW11-PV20out-30	HS19020256-06	02/04/2019			✓	✓	✓	
20190204-DGW-MW11-PV20out-35	HS19020256-07	02/04/2019			✓	✓	✓	
20190204-DGW-MW11-PV20out-40	HS19020256-08	02/04/2019			✓	✓	✓	
20190122-DGW-MW11-PV15out-controlD	HS19020256-09	01/22/2019		✓				Metals MS/MSD
20190122-DGW-MW11-PV15out-30D	HS19020256-10	01/22/2019		✓				
20190122-DGW-MW11-PV15out-35D	HS19020256-11	01/22/2019		✓				
20190122-DGW-MW11-PV15out-40D	HS19020256-12	01/22/2019		✓				
20190122-DGW-MW11-PV15inlet-controlD	HS19020256-13	01/22/2019		✓				
20190122-DGW-MW11-PV15inlet-30-35-40D	HS19020256-14	01/22/2019		✓				
20190123-DGW-MW11-PV15mid-controlD	HS19020256-15	01/23/2019		✓				
20190123-DGW-MW11-PV15mid-30D	HS19020256-16	01/23/2019		✓				
20190123-DGW-MW11-PV15mid-35D	HS19020256-17	01/23/2019		✓				
20190123-DGW-MW11-PV15mid-40D	HS19020256-18	01/23/2019		✓				
20190122-DGW-MW11-PV15out-controlT	HS19020256-19	01/22/2019	✓				✓	Metals MS/MSD
20190122-DGW-MW11-PV15out-30T	HS19020256-20	01/22/2019	✓				✓	
20190122-DGW-MW11-PV15out-35T	HS19020256-21	01/22/2019	✓				✓	
20190122-DGW-MW11-PV15out-40T	HS19020256-22	01/22/2019	✓				✓	
20190122-DGW-MW11-PV15inlet-controlT	HS19020256-23	01/22/2019	✓				✓	
20190122-DGW-MW11-PV15inlet-30-35-40T	HS19020256-24	01/22/2019	✓				✓	
20190123-DGW-MW11-PV15mid-controlT	HS19020256-25	01/23/2019	✓				✓	
20190123-DGW-MW11-PV15mid-30T	HS19020256-26	01/23/2019	✓				✓	
20190123-DGW-MW11-PV15mid-35T	HS19020256-27	01/23/2019	✓				✓	
20190123-DGW-MW11-PV15mid-40T	HS19020256-28	01/23/2019	✓				✓	
20190122-FD-PV15out-controlD	HS19020256-29	01/22/2019		✓				
20190122-FD-PV15out-30D	HS19020256-30	01/22/2019		✓				
20190122-FD-PV15out-35D	HS19020256-31	01/22/2019		✓				
20190122-FD-PV15out-40D	HS19020256-32	01/22/2019		✓				
20190122-FD-PV15inlet-controlD	HS19020256-33	01/22/2019		✓				
20190122-FD-PV15inlet-30-35-40D	HS19020256-34	01/22/2019		✓				
20190123-FD-PV15mid-controlD	HS19020256-35	01/23/2019		✓				
20190123-FD-PV15mid-30D	HS19020256-36	01/23/2019		✓				
20190123-FD-PV15mid-35D	HS19020256-37	01/23/2019		✓				
20190123-FD-PV15mid-40D	HS19020256-38	01/23/2019		✓				
20190122-FD-PV15out-controlT	HS19020256-39	01/22/2019	✓				✓	

TABLE 1
CROSS REFERENCE OF FIELD SAMPLE IDENTIFICATIONS AND LABORATORY IDENTIFICATIONS

Field Sample ID	Lab Sample ID	Sample Date	Total Metals	Dissolved Metals	Anions	Total Dissolved Solids	Alkalinity or Hardness	Comments
20190122-FD-PV15out-30T	HS19020256-40	01/22/2019	✓				✓	
20190122-FD-PV15out-35T	HS19020256-41	01/22/2019	✓				✓	
20190122-FD-PV15out-40T	HS19020256-42	01/22/2019	✓				✓	
20190122-FD-PV15inlet-controlT	HS19020256-43	01/22/2019	✓				✓	
20190122-FD-PV15inlet-30-35-40T	HS19020256-44	01/22/2019	✓				✓	
20190123-FD-PV15mid-controlT	HS19020256-45	01/23/2019	✓				✓	
20190123-FD-PV15mid-30T	HS19020256-46	01/23/2019	✓				✓	
20190123-FD-PV15mid-35T	HS19020256-47	01/23/2019	✓				✓	
20190123-FD-PV15mid-40T	HS19020256-48	01/23/2019	✓				✓	
20190129-DGW-MW3-PV25out-controlD	HS19020256-49	01/29/2019		✓				
20190129-DGW-MW3-PV25out-30D	HS19020256-50	01/29/2019		✓				
20190129-DGW-MW3-PV25out-35D	HS19020256-51	01/29/2019		✓				
20190129-DGW-MW3-PV25out-40D	HS19020256-52	01/29/2019		✓				
20190129-DGW-MW3-PV25inlet-controlD	HS19020256-53	01/29/2019		✓				
20190129-DGW-MW3-PV25inlet-30-35-40D	HS19020256-54	01/29/2019		✓				
20190130-DGW-MW3-PV25mid-controlD	HS19020256-55	01/30/2019		✓				
20190130-DGW-MW3-PV25mid-30D	HS19020256-56	01/30/2019		✓				
20190130-DGW-MW3-PV25mid-35D	HS19020256-57	01/30/2019		✓				
20190130-DGW-MW3-PV25mid-40D	HS19020256-58	01/30/2019		✓				
20190129-DGW-MW3-PV25out-controlT	HS19020256-59	01/29/2019	✓				✓	Metals MS/MSD
20190129-DGW-MW3-PV25out-30T	HS19020256-60	01/29/2019	✓				✓	
20190129-DGW-MW3-PV25out-35T	HS19020256-61	01/29/2019	✓				✓	
20190129-DGW-MW3-PV25out-40T	HS19020256-62	01/29/2019	✓				✓	
20190129-DGW-MW3-PV25inlet-controlT	HS19020256-63	01/29/2019	✓				✓	
20190129-DGW-MW3-PV25inlet-30-35-40T	HS19020256-64	01/29/2019	✓				✓	
20190130-DGW-MW3-PV25mid-controlT	HS19020256-65	01/30/2019	✓				✓	
20190130-DGW-MW3-PV25mid-30T	HS19020256-66	01/30/2019	✓				✓	
20190130-DGW-MW3-PV25mid-35T	HS19020256-67	01/30/2019	✓				✓	
20190130-DGW-MW3-PV25mid-40T	HS19020256-68	01/30/2019	✓				✓	
20190206-FD-PV20Out-controlD	HS19020798-01	02/06/2019		✓				
20190206-FD-PV20Out-30D	HS19020798-02	02/06/2019		✓				
20190206-FD-PV20Out-35D	HS19020798-03	02/06/2019		✓				
20190206-FD-PV20Out-40D	HS19020798-04	02/06/2019		✓				
20190206-FD-PV20inlet-controlD	HS19020798-05	02/06/2019		✓				
20190206-FD-PV20inlet-30-35-40D	HS19020798-06	02/06/2019		✓				
20190207-FD-PV20mid-controlD	HS19020798-07	02/07/2019		✓				
20190207-FD-PV20mid-30D	HS19020798-08	02/07/2019		✓				
20190207-FD-PV20mid-35D	HS19020798-09	02/07/2019		✓				
20190207-FD-PV20mid-40D	HS19020798-10	02/07/2019		✓				

TABLE 1
CROSS REFERENCE OF FIELD SAMPLE IDENTIFICATIONS AND LABORATORY IDENTIFICATIONS

Field Sample ID	Lab Sample ID	Sample Date	Total Metals	Dissolved Metals	Anions	Total Dissolved Solids	Alkalinity or Hardness	Comments
20190206-FD-PV20Out-controlT	HS19020798-11	02/06/2019	✓				✓	
20190206-FD-PV20Out-30T	HS19020798-12	02/06/2019	✓				✓	
20190206-FD-PV20Out-35T	HS19020798-13	02/06/2019	✓				✓	
20190206-FD-PV20Out-40T	HS19020798-14	02/06/2019	✓				✓	
20190206-FD-PV20inlet-controlT	HS19020798-15	02/06/2019	✓				✓	
20190206-FD-PV20inlet-30-35-40T	HS19020798-16	02/06/2019	✓				✓	
20190207-FD-PV20mid-controlT	HS19020798-17	02/07/2019	✓				✓	
20190207-FD-PV20mid-30T	HS19020798-18	02/07/2019	✓				✓	
20190207-FD-PV20mid-35T	HS19020798-19	02/06/2019	✓				✓	
20190207-FD-PV20mid-40T	HS19020798-20	02/07/2019	✓				✓	
20190206-DGW-MW11-PV20out-controlD	HS19020802-01	02/06/2019		✓				
20190206-DGW-MW11-PV20out-30D	HS19020802-02	02/06/2019		✓				
20190206-DGW-MW11-PV20out-35D	HS19020802-03	02/06/2019		✓				
20190206-DGW-MW11-PV20out-40D	HS19020802-04	02/06/2019		✓				
20190206-DGW-MW11-PV20inlet-controlD	HS19020802-05	02/06/2019		✓				
20190206-DGW-MW11-PV20inlet-30-35-40D	HS19020802-06	02/06/2019		✓				
20190207-DGW-MW11-PV20mid-controlD	HS19020802-07	02/07/2019		✓				
20190207-DGW-MW11-PV20mid-30D	HS19020802-08	02/07/2019		✓				
20190207-DGW-MW11-PV20mid-35D	HS19020802-09	02/07/2019		✓				
20190207-DGW-MW11-PV20mid-40D	HS19020802-10	02/07/2019		✓				
20190206-DGW-MW11-PV20out-controlT	HS19020802-11	02/06/2019	✓				✓	
20190206-DGW-MW11-PV20out-30T	HS19020802-12	02/06/2019	✓				✓	
20190206-DGW-MW11-PV20out-35T	HS19020802-13	02/06/2019	✓				✓	
20190206-DGW-MW11-PV20out-40T	HS19020802-14	02/06/2019	✓				✓	
20190206-DGW-MW11-PV20inlet-controlT	HS19020802-15	02/06/2019	✓				✓	
20190206-DGW-MW11-PV20inlet-30-35-40T	HS19020802-16	02/06/2019	✓				✓	
20190207-DGW-MW11-PV20mid-controlT	HS19020802-17	02/07/2019	✓				✓	
20190207-DGW-MW11-PV20mid-30T	HS19020802-18	02/07/2019	✓				✓	
20190207-DGW-MW11-PV20mid-35T	HS19020802-19	02/07/2019	✓				✓	
20190207-DGW-MW11-PV20mid-40T	HS19020802-20	02/07/2019	✓				✓	
20190208-DGW-MW3-PV30out-controlD	HS19021248-01	02/08/2019		✓				
20190208-DGW-MW3-PV30out-30D	HS19021248-02	02/08/2019		✓				
20190208-DGW-MW3-PV30out-35D	HS19021248-03	02/08/2019		✓				
20190208-DGW-MW3-PV30out-40D	HS19021248-04	02/08/2019		✓				
20190208-DGW-MW3-PV30inlet-controlD	HS19021248-05	02/08/2019		✓				
20190208-DGW-MW3-PV30inlet-30-35-40D	HS19021248-06	02/08/2019		✓				
20190210-DGW-MW3-PV30mid-controlD	HS19021248-07	02/10/2019		✓				
20190210-DGW-MW3-PV30mid-30D	HS19021248-08	02/10/2019		✓				
20190210-DGW-MW3-PV30mid-35D	HS19021248-09	02/10/2019		✓				

TABLE 1
CROSS REFERENCE OF FIELD SAMPLE IDENTIFICATIONS AND LABORATORY IDENTIFICATIONS

Field Sample ID	Lab Sample ID	Sample Date	Total Metals	Dissolved Metals	Anions	Total Dissolved Solids	Alkalinity or Hardness	Comments
20190210-DGW-MW3-PV30mid-40D	HS19021248-10	02/10/2019		✓				
20190208-DGW-MW3-PV30out-controlT	HS19021248-11	02/08/2019	✓				✓	
20190208-DGW-MW3-PV30out-30T	HS19021248-12	02/08/2019	✓				✓	
20190208-DGW-MW3-PV30out-35T	HS19021248-13	02/08/2019	✓				✓	
20190208-DGW-MW3-PV30out-40T	HS19021248-14	02/08/2019	✓				✓	
20190208-DGW-MW3-PV30inlet-controlT	HS19021248-15	02/08/2019	✓				✓	
20190208-DGW-MW3-PV30inlet-30-35-40T	HS19021248-16	02/08/2019	✓				✓	
20190210-DGW-MW3-PV30mid-controlT	HS19021248-17	02/10/2019	✓				✓	
20190210-DGW-MW3-PV30mid-30T	HS19021248-18	02/10/2019	✓				✓	
20190210-DGW-MW3-PV30mid-35T	HS19021248-19	02/10/2019	✓				✓	
20190210-DGW-MW3-PV30mid-40T	HS19021248-20	02/10/2019	✓				✓	
20190208-DGW-MW3-PV30inlet-controlD-DUP	HS19021248-21	02/08/2019		✓				Field duplicate of 20190208-DGW-MW3-PV30inlet-controlD
20190208-DGW-MW3-PV30inlet-controlT-DUP	HS19021248-22	02/08/2019	✓				✓	Field duplicate of 20190208-DGW-MW3-PV30inlet-controlT
20190214-FD-PV25out-controlD	HS19021249-01	02/14/2019		✓				
20190214-FD-PV25out-30D	HS19021249-02	02/14/2019		✓				
20190214-FD-PV25out-35D	HS19021249-03	02/14/2019		✓				
20190214-FD-PV25out-40D	HS19021249-04	02/14/2019		✓				
20190214-FD-PV25inlet-controlD	HS19021249-05	02/14/2019		✓				
20190214-FD-PV25inlet-30-35-40D	HS19021249-06	02/14/2019		✓				
20190215-FD-PV25mid-controlD	HS19021249-07	02/15/2019		✓				
20190215-FD-PV25mid-30D	HS19021249-08	02/15/2019		✓				
20190215-FD-PV25mid-35D	HS19021249-09	02/15/2019		✓				
20190215-FD-PV25mid-40D	HS19021249-10	02/15/2019		✓				
20190214-FD-PV25out-controlT	HS19021249-11	02/14/2019	✓				✓	
20190214-FD-PV25out-30T	HS19021249-12	02/14/2019	✓				✓	
20190214-FD-PV25out-35T	HS19021249-13	02/14/2019	✓				✓	
20190214-FD-PV25out-40T	HS19021249-14	02/14/2019	✓				✓	
20190214-FD-PV25inlet-controlT	HS19021249-15	02/14/2019	✓				✓	
20190214-FD-PV25inlet-30-35-40T	HS19021249-16	02/14/2019	✓				✓	
20190215-FD-PV25mid-controlT	HS19021249-17	02/15/2019	✓				✓	
20190215-FD-PV25mid-30T	HS19021249-18	02/15/2019	✓				✓	
20190215-FD-PV25mid-35T	HS19021249-19	02/15/2019	✓				✓	
20190215-FD-PV25mid-40T	HS19021249-20	02/15/2019	✓				✓	
20190205-FD-PV20out-30D-DUP	HS19021249-21	02/05/2019		✓				
20190205-FD-PV20out-30T-DUP	HS19021249-22	02/05/2019	✓				✓	
20190214-DGW-MW11-PV25out-controlD	HS19021252-01	02/18/2019		✓				
20190214-DGW-MW11-PV25out-30D	HS19021252-02	02/18/2019		✓				
20190218-DGW-MW11-PV25out-35D	HS19021252-03	02/18/2019		✓				
20190218-DGW-MW11-PV25out-40D	HS19021252-04	02/18/2019		✓				

TABLE 1
CROSS REFERENCE OF FIELD SAMPLE IDENTIFICATIONS AND LABORATORY IDENTIFICATIONS

Field Sample ID	Lab Sample ID	Sample Date	Total Metals	Dissolved Metals	Anions	Total Dissolved Solids	Alkalinity or Hardness	Comments
20190219-DGW-MW11-PV25inlet-controlD	HS19021252-05	02/19/2019		✓				
20190219-DGW-MW11-PV25inlet-30-35-40D	HS19021252-06	02/19/2019		✓				
20190219-DGW-MW11-PV25mid-controlD	HS19021252-07	02/19/2019		✓				
20190219-DGW-MW11-PV25mid-30D	HS19021252-08	02/19/2019		✓				
20190219-DGW-MW11-PV25mid-35D	HS19021252-09	02/19/2019		✓				
20190219-DGW-MW11-PV25mid-40D	HS19021252-10	02/19/2019		✓				
20190218-DGW-MW11-PV25out-controlT	HS19021252-11	02/18/2019	✓				✓	
20190218-DGW-MW11-PV25out-30T	HS19021252-12	02/18/2019	✓				✓	
20190218-DGW-MW11-PV25out-35T	HS19021252-13	02/18/2019	✓				✓	
20190218-DGW-MW11-PV25out-40T	HS19021252-14	02/18/2019	✓				✓	
20190219-DGW-MW11-PV25inlet-controlT	HS19021252-15	02/19/2019	✓				✓	
20190219-DGW-MW11-PV25inlet-30-35-40T	HS19021252-16	02/19/2019	✓				✓	
20190219-DGW-MW11-PV25mid-controlT	HS19021252-17	02/19/2019	✓				✓	
20190219-DGW-MW11-PV25mid-30T	HS19021252-18	02/19/2019	✓				✓	
20190219-DGW-MW11-PV25mid-35T	HS19021252-19	02/19/2019	✓				✓	
20190219-DGW-MW11-PV25mid-40T	HS19021252-20	02/19/2019	✓				✓	
20190205-DGW-MW11-PV20out-35D-DUP	HS19021252-21	02/05/2019		✓				Field duplicate of 20190205-DGW-MW11-PV20out-35D
20190205-DGW-MW11-PV20out-35T-DUP	HS19021252-22	02/05/2019	✓				✓	Field duplicate of 20190205-DGW-MW11-PV20out-35T

TABLE 2 - QUALIFIED DATA

Field Sample ID	Lab Sample ID	Analyte	Result	Units	Qualifier	Explanation
20190204-FD-PV20Out-Control	HS19020256-01	Nitrogen, Nitrate (As N)	0.0300	mg/L	UJL	Analysis exceeded holding time
20190204-FD-PV20Out-30	HS19020256-02	Nitrogen, Nitrate (As N)	0.0300	mg/L	UJL	Analysis exceeded holding time
20190204-FD-PV20Out-35	HS19020256-03	Nitrogen, Nitrate (As N)	0.0300	mg/L	UJL	Analysis exceeded holding time
20190204-FD-PV20Out-40	HS19020256-04	Nitrogen, Nitrate (As N)	0.0300	mg/L	UJL	Analysis exceeded holding time
20190204-DGW-MW11-PV20out-control	HS19020256-05	Nitrogen, Nitrate (As N)	0.0300	mg/L	UJL	Analysis exceeded holding time
20190204-DGW-MW11-PV20out-30	HS19020256-06	Nitrogen, Nitrate (As N)	0.0300	mg/L	UJL	Analysis exceeded holding time
20190204-DGW-MW11-PV20out-35	HS19020256-07	Nitrogen, Nitrate (As N)	0.0300	mg/L	UJL	Analysis exceeded holding time
20190204-DGW-MW11-PV20out-40	HS19020256-08	Nitrogen, Nitrate (As N)	0.0300	mg/L	UJL	Analysis exceeded holding time
20190122-DGW-MW11-PV15out-40T	HS19020256-22	Antimony	0.00219	mg/L	U	Analyte detected in laboratory blank
20190208-DGW-MW3-PV30out-controlT	HS19021248-11	Arsenic	0.00228	mg/L	U	Analyte detected in laboratory blank
20190214-FD-PV25out-controlT	HS19021249-11	Arsenic	0.00113	mg/L	U	Analyte detected in laboratory blank
20190214-FD-PV25inlet-controlT	HS19021249-15	Arsenic	0.00130	mg/L	U	Analyte detected in laboratory blank
20190214-FD-PV25inlet-30-35-40T	HS19021249-16	Arsenic	0.00130	mg/L	U	Analyte detected in laboratory blank
20190215-FD-PV25mid-controlT	HS19021249-17	Arsenic	0.00125	mg/L	U	Analyte detected in laboratory blank
20190215-FD-PV25mid-30T	HS19021249-18	Arsenic	0.000457	mg/L	U	Analyte detected in laboratory blank

Notes:

U - Analyte not detected at associated concentration. Value shown is sample detection limit (SDL).
UJL - Not detected/estimated/biased low. Value Shown is SDL.
mg/L - milligrams per liter

TABLE 3 - HOLDING TIMES

Field Sample ID	Analyte	Result	Units	Qualifier	Explanation
20190204-FD-PV20Out-Control	Nitrogen, Nitrate (As N)	0.0300	mg/L	UJL	Analyzed past 48-hour holding time.
20190204-FD-PV20Out-30	Nitrogen, Nitrate (As N)	0.0300	mg/L	UJL	Analyzed past 48-hour holding time.
20190204-FD-PV20Out-35	Nitrogen, Nitrate (As N)	0.0300	mg/L	UJL	Analyzed past 48-hour holding time.
20190204-FD-PV20Out-40	Nitrogen, Nitrate (As N)	0.0300	mg/L	UJL	Analyzed past 48-hour holding time.
20190204-DGW-MW11-PV20out-control	Nitrogen, Nitrate (As N)	0.0300	mg/L	UJL	Analyzed past 48-hour holding time.
20190204-DGW-MW11-PV20out-30	Nitrogen, Nitrate (As N)	0.0300	mg/L	UJL	Analyzed past 48-hour holding time.
20190204-DGW-MW11-PV20out-35	Nitrogen, Nitrate (As N)	0.0300	mg/L	UJL	Analyzed past 48-hour holding time.
20190204-DGW-MW11-PV20out-40	Nitrogen, Nitrate (As N)	0.0300	mg/L	UJL	Analyzed past 48-hour holding time.

UJL - Not detected /estimated/biased low.
mg/L - milligrams per liter

TABLE 4 - TOTAL VERSUS DISSOLVED COMPARISON

Sample	Analyte	Total Concentration (mg/L)	Dissolved Concentration (mg/L)	Precision (RPD)	Qualification
20190122-DGW-MW11-PV15inlet-30-35-40	Cadmium	0.00710	0.00773	8.5	Acceptable
20190122-DGW-MW11-PV15inlet-30-35-40	Calcium	492	519	5.3	Acceptable
20190122-DGW-MW11-PV15inlet-30-35-40	Magnesium	309	323	4.4	Acceptable
20190122-DGW-MW11-PV15inlet-30-35-40	Potassium	20.8	22.0	5.6	Acceptable
20190122-DGW-MW11-PV15inlet-control	Cadmium	0.00943	0.00984	4.3	Acceptable
20190122-DGW-MW11-PV15inlet-control	Calcium	497	509	2.4	Acceptable
20190122-DGW-MW11-PV15inlet-control	Magnesium	313	316	1.0	Acceptable
20190122-DGW-MW11-PV15inlet-control	Potassium	21.7	21.9	0.92	Acceptable
20190122-DGW-MW11-PV15inlet-control	Sodium	1470	1580	7.2	Acceptable
20190122-DGW-MW11-PV15out-35	Magnesium	312	315	1.0	Acceptable
20190122-DGW-MW11-PV15out-40	Calcium	387	424	9.1	Acceptable
20190122-DGW-MW11-PV15out-40	Magnesium	298	322	7.7	Acceptable
20190122-DGW-MW11-PV15out-40	Potassium	20.2	22.5	10.8	Acceptable
20190122-DGW-MW11-PV15out-40	Sodium	1530	1670	8.8	Acceptable
20190122-DGW-MW11-PV15out-control	Sodium	1640	1670	1.8	Acceptable
20190122-FD-PV15inlet-30-35-40	Antimony	0.0366	0.0387	5.6	Acceptable
20190122-FD-PV15inlet-30-35-40	Arsenic	0.00108	0.00128	16.9	Acceptable
20190122-FD-PV15inlet-30-35-40	Calcium	188	198	5.2	Acceptable
20190122-FD-PV15inlet-30-35-40	Potassium	11.8	12.9	8.9	Acceptable
20190122-FD-PV15inlet-30-35-40	Sodium	257	268	4.2	Acceptable
20190122-FD-PV15inlet-control	Antimony	0.0354	0.0392	10.2	Acceptable
20190122-FD-PV15inlet-control	Arsenic	0.00107	0.00135	23.1	Acceptable
20190122-FD-PV15inlet-control	Calcium	185	223	18.6	Acceptable
20190122-FD-PV15inlet-control	Magnesium	1.20	1.22	1.7	Acceptable
20190122-FD-PV15inlet-control	Potassium	11.9	13.8	14.8	Acceptable
20190122-FD-PV15inlet-control	Selenium	0.00606	0.00686	12.4	Acceptable
20190122-FD-PV15inlet-control	Sodium	254	290	13.2	Acceptable
20190122-FD-PV15out-30	Potassium	12.2	13.5	10.1	Acceptable
20190122-FD-PV15out-30	Sodium	264	275	4.1	Acceptable
20190122-FD-PV15out-35	Calcium	187	201	7.2	Acceptable
20190122-FD-PV15out-35	Magnesium	0.994	1.04	4.5	Acceptable
20190122-FD-PV15out-35	Potassium	12.3	13.4	8.6	Acceptable
20190122-FD-PV15out-35	Sodium	263	277	5.2	Acceptable
20190122-FD-PV15out-40	Calcium	179	192	7.0	Acceptable
20190122-FD-PV15out-40	Magnesium	0.946	0.954	0.84	Acceptable
20190122-FD-PV15out-40	Potassium	11.6	13.2	12.9	Acceptable
20190122-FD-PV15out-40	Sodium	256	265	3.5	Acceptable
20190122-FD-PV15out-control	Antimony	0.0337	0.0380	12.0	Acceptable
20190122-FD-PV15out-control	Calcium	193	207	7.0	Acceptable
20190122-FD-PV15out-control	Magnesium	1.18	1.21	2.5	Acceptable
20190122-FD-PV15out-control	Potassium	12.0	13.2	9.5	Acceptable
20190122-FD-PV15out-control	Sodium	263	290	9.8	Acceptable
20190123-DGW-MW11-PV15mid-30	Calcium	398	457	13.8	Acceptable
20190123-DGW-MW11-PV15mid-30	Magnesium	310	347	11.3	Acceptable
20190123-DGW-MW11-PV15mid-30	Potassium	20.4	22.9	11.5	Acceptable
20190123-DGW-MW11-PV15mid-30	Sodium	1670	1680	0.60	Acceptable
20190123-DGW-MW11-PV15mid-35	Calcium	393	459	15.5	Acceptable
20190123-DGW-MW11-PV15mid-35	Magnesium	300	340	12.5	Acceptable
20190123-DGW-MW11-PV15mid-35	Potassium	20.4	24.1	16.6	Acceptable
20190123-DGW-MW11-PV15mid-35	Sodium	1610	1630	1.2	Acceptable
20190123-DGW-MW11-PV15mid-40	Calcium	397	401	1.0	Acceptable
20190123-DGW-MW11-PV15mid-40	Magnesium	304	306	0.66	Acceptable
20190123-DGW-MW11-PV15mid-40	Potassium	20.5	21.4	4.3	Acceptable
20190123-DGW-MW11-PV15mid-40	Sodium	1540	1550	0.65	Acceptable
20190123-DGW-MW11-PV15mid-control	Cadmium	0.00928	0.00983	5.8	Acceptable
20190123-DGW-MW11-PV15mid-control	Calcium	495	581	16.0	Acceptable
20190123-DGW-MW11-PV15mid-control	Magnesium	316	353	11.1	Acceptable
20190123-DGW-MW11-PV15mid-control	Potassium	21.9	24.5	11.2	Acceptable
20190123-FD-PV15mid-30	Calcium	174	204	15.9	Acceptable
20190123-FD-PV15mid-30	Magnesium	0.802	0.814	1.5	Acceptable
20190123-FD-PV15mid-30	Potassium	10.5	13.0	21.3	Acceptable
20190123-FD-PV15mid-30	Sodium	248	270	8.5	Acceptable
0190123-FD-PV15mid-35	Calcium	185	193	4.2	Acceptable
0190123-FD-PV15mid-35	Magnesium	0.973	0.978	0.51	Acceptable
0190123-FD-PV15mid-35	Potassium	12.2	12.8	4.8	Acceptable
20190123-FD-PV15mid-40	Calcium	182	199	8.9	Acceptable
20190123-FD-PV15mid-40	Potassium	11.8	12.6	6.6	Acceptable

TABLE 4 - TOTAL VERSUS DISSOLVED COMPARISON

Sample	Analyte	Total Concentration (mg/L)	Dissolved Concentration (mg/L)	Precision (RPD)	Qualification
20190123-FD-PV15mid-40	Sodium	257	266	3.4	Acceptable
20190123-FD-PV15mid-control	Antimony	0.0372	0.0381	2.4	Acceptable
20190123-FD-PV15mid-control	Arsenic	0.00142	0.00149	4.8	Acceptable
20190123-FD-PV15mid-control	Calcium	190	217	13.3	Acceptable
20190123-FD-PV15mid-control	Magnesium	1.28	1.21	5.6	Acceptable
20190123-FD-PV15mid-control	Potassium	11.7	13.5	14.3	Acceptable
20190123-FD-PV15mid-control	Selenium	0.00574	0.00609	5.9	Acceptable
20190123-FD-PV15mid-control	Sodium	255	286	11.5	Acceptable
20190129-DGW-MW3-PV25inlet-30-35-40	Calcium	118	120	1.7	Acceptable
20190129-DGW-MW3-PV25inlet-30-35-40	Magnesium	20.3	22.0	8.0	Acceptable
20190129-DGW-MW3-PV25inlet-30-35-40	Potassium	2.05	2.13	3.8	Acceptable
20190129-DGW-MW3-PV25inlet-control	Magnesium	20.0	21.4	6.8	Acceptable
20190129-DGW-MW3-PV25inlet-control	Potassium	1.99	2.04	2.5	Acceptable
20190129-DGW-MW3-PV25out-30	Magnesium	15.1	15.5	2.6	Acceptable
20190129-DGW-MW3-PV25out-30	Potassium	2.12	2.25	5.9	Acceptable
20190129-DGW-MW3-PV25out-35	Magnesium	11.5	12.2	5.9	Acceptable
20190129-DGW-MW3-PV25out-35	Potassium	2.09	2.26	7.8	Acceptable
20190129-DGW-MW3-PV25out-40	Magnesium	11.5	11.8	2.6	Acceptable
20190129-DGW-MW3-PV25out-40	Potassium	2.11	2.20	4.2	Acceptable
20190129-DGW-MW3-PV25out-control	Magnesium	20.8	22.1	6.1	Acceptable
20190129-DGW-MW3-PV25out-control	Potassium	2.16	2.15	0.46	Acceptable
20190130-DGW-MW3-PV25mid-30	Calcium	9.55	9.60	0.52	Acceptable
20190130-DGW-MW3-PV25mid-30	Magnesium	16.4	17.6	7.1	Acceptable
20190130-DGW-MW3-PV25mid-30	Potassium	2.09	2.34	11.3	Acceptable
20190130-DGW-MW3-PV25mid-40	Sodium	194	205	5.5	Acceptable
20190130-DGW-MW3-PV25mid-control	Calcium	120	121	0.83	Acceptable
20190130-DGW-MW3-PV25mid-control	Magnesium	20.7	22.1	6.5	Acceptable
20190130-DGW-MW3-PV25mid-control	Potassium	2.05	2.12	3.4	Acceptable
20190130-DGW-MW3-PV25mid-control	Sodium	188	190	1.1	Acceptable
20190206-DGW-MW11-PV20inlet-30-35-40	Sodium	1860	1870	0.54	Acceptable
20190206-DGW-MW11-PV20inlet-control	Antimony	0.000668	0.00423	145	Acceptable (MQL)
20190206-DGW-MW11-PV20inlet-control	Sodium	1970	2010	2.0	Acceptable
20190206-DGW-MW11-PV20out-35	Calcium	370	380	2.7	Acceptable
20190206-DGW-MW11-PV20out-40	Calcium	348	365	4.8	Acceptable
20190206-DGW-MW11-PV20out-40	Magnesium	314	315	0.32	Acceptable
20190206-DGW-MW11-PV20out-control	Cadmium	0.00590	0.00619	4.8	Acceptable
20190206-FD-PV20inlet-30-35-40	Calcium	206	212	2.9	Acceptable
20190206-FD-PV20Out-control	Iron	<0.0120	0.0132	9.5	Acceptable
20190207-DGW-MW11-PV20mid-control	Sodium	1930	2040	5.5	Acceptable
20190207-FD-PV20mid-control	Calcium	200	207	3.4	Acceptable
20190208-DGW-MW3-PV30inlet-control	Sodium	206	207	0.48	Acceptable
20190208-DGW-MW3-PV30inlet-control-DUP	Magnesium	22.3	22.6	1.3	Acceptable
20190208-DGW-MW3-PV30inlet-control-DUP	Potassium	2.13	2.18	2.3	Acceptable
20190208-DGW-MW3-PV30inlet-control-DUP	Sodium	206	211	2.4	Acceptable
20190208-DGW-MW3-PV30out-30	Magnesium	14.9	15.1	1.3	Acceptable
20190208-DGW-MW3-PV30out-30	Potassium	2.32	2.24	3.5	Acceptable (MQL)
20190208-DGW-MW3-PV30out-30	Sodium	216	218	0.92	Acceptable
20190208-DGW-MW3-PV30out-35	Sodium	213	215	0.93	Acceptable
20190208-DGW-MW3-PV30out-control	Sodium	206	212	2.9	Acceptable
20190210-DGW-MW3-PV30mid-30	Sodium	204	208	1.9	Acceptable
20190210-DGW-MW3-PV30mid-35	Lead	<0.000600	0.000776	25.6	Acceptable
20190210-DGW-MW3-PV30mid-35	Sodium	200	209	4.4	Acceptable
20190210-DGW-MW3-PV30mid-control	Sodium	208	212	1.9	Acceptable
20190214-FD-PV25inlet-30-35-40	Potassium	12.8	12.9	0.78	Acceptable
20190214-FD-PV25inlet-control	Antimony	0.0333	0.0358	7.2	Acceptable
20190214-FD-PV25inlet-control	Magnesium	1.14	1.20	5.1	Acceptable
20190214-FD-PV25inlet-control	Potassium	12.3	13.0	5.5	Acceptable
20190214-FD-PV25inlet-control	Selenium	0.00610	0.00698	13.5	Acceptable
20190214-FD-PV25out-30	Calcium	192	213	10.4	Acceptable
20190214-FD-PV25out-30	Sodium	271	286	5.4	Acceptable
20190214-FD-PV25out-35	Potassium	13.2	13.3	0.75	Acceptable
20190214-FD-PV25out-40	Calcium	190	201	5.6	Acceptable
20190214-FD-PV25out-40	Magnesium	1.07	1.09	1.9	Acceptable
20190214-FD-PV25out-control	Arsenic	0.00113	0.00117	3.5	Acceptable
20190214-FD-PV25out-control	Calcium	200	203	1.5	Acceptable
20190215-FD-PV25mid-30	Calcium	172	179	4.0	Acceptable
20190215-FD-PV25mid-30	Magnesium	0.841	0.861	2.4	Acceptable

TABLE 4 - TOTAL VERSUS DISSOLVED COMPARISON

Sample	Analyte	Total Concentration (mg/L)	Dissolved Concentration (mg/L)	Precision (RPD)	Qualification
20190215-FD-PV25mid-30	Potassium	12.7	12.8	0.78	Acceptable
20190215-FD-PV25mid-30	Selenium	<0.00110	0.00121	9.5	Acceptable
20190215-FD-PV25mid-35	Potassium	12.5	12.7	1.6	Acceptable
20190215-FD-PV25mid-40	Potassium	12.7	13.2	3.9	Acceptable
20190215-FD-PV25mid-control	Antimony	0.0350	0.0355	1.4	Acceptable
20190215-FD-PV25mid-control	Calcium	182	188	3.2	Acceptable
20190215-FD-PV25mid-control	Selenium	0.00588	0.00590	0.34	Acceptable
20190218-DGW-MW11-PV25out-35	Potassium	18.8	19.8	5.2	Acceptable
20190218-DGW-MW11-PV25out-35	Sodium	1870	1930	3.2	Acceptable
20190218-DGW-MW11-PV25out-40	Potassium	18.5	18.7	1.1	Acceptable
20190219-DGW-MW11-PV25inlet-30-35-40	Magnesium	279	283	1.4	Acceptable
20190219-DGW-MW11-PV25inlet-30-35-40	Potassium	17.7	18.1	2.2	Acceptable
20190219-DGW-MW11-PV25mid-30	Calcium	338	340	0.59	Acceptable
20190219-DGW-MW11-PV25mid-30	Magnesium	278	291	4.6	Acceptable
20190219-DGW-MW11-PV25mid-30	Potassium	18.6	18.7	0.54	Acceptable
20190219-DGW-MW11-PV25mid-35	Calcium	317	325	2.5	Acceptable
20190219-DGW-MW11-PV25mid-35	Magnesium	278	295	5.9	Acceptable
20190219-DGW-MW11-PV25mid-40	Calcium	275	301	9.0	Acceptable
20190219-DGW-MW11-PV25mid-40	Magnesium	278	290	4.2	Acceptable
20190219-DGW-MW11-PV25mid-40	Potassium	18.8	19.4	3.1	Acceptable
20190219-DGW-MW11-PV25mid-control	Cadmium	0.00506	0.00554	9.1	Acceptable
20190219-DGW-MW11-PV25mid-control	Potassium	18.9	19.1	1.1	Acceptable

Notes:
mg/L - milligrams per liter
RPD - relative percent difference

TABLE 5 - BLANK DETECTIONS

Lab Sample ID	Analyte	Result	Qualified Concentration	Units	Explanation
MBLK-137506	Antimony	0.000482	0.00241	mg/L	U: HS19020256-22
MBLK-138128	Arsenic	0.000743	0.00372	mg/L	U: HS19021248-11; HS19021249-11, -15, -16, -17, -18

Notes:
U - Not detected; the analyte was detected <5x the level in an associated blank and is not detected above the reported sample concentration.
mg/L - milligrams per liter

TABLE 6 - PRECISION AND ACCURACY

Sample	Analyte	Spike Recovery (%R)	Spike Duplicate Recovery (%R)	RPD (%)	Qualification
20190122-DGW-MW11-PV15out-controlT	Calcium	-200	-290	1.55	None; sample concentration greater than 4x spike concentration
20190122-DGW-MW11-PV15out-controlT	Magnesium	60.6	-29.5	1.44	None; sample concentration greater than 4x spike concentration
20190122-DGW-MW11-PV15out-controlT	Potassium	83.7	75.7	1.57	None; sample concentration greater than 4x spike concentration
20190122-DGW-MW11-PV15out-controlT	Sodium	3.15	-228	0.72	None; sample concentration greater than 4x spike concentration
20190122-DGW-MW11-PV15out-controlT	Calcium (PDS)	78.4	NA	NA	None; sample concentration greater than 4x spike concentration
20190129-DGW-MW3-PV25out-controlT	Calcium	25.6	236	8.16	None; sample concentration greater than 4x spike concentration
20190129-DGW-MW3-PV25out-controlT	Magnesium	96.6	114	3.41	None; sample concentration greater than 4x spike concentration
20190129-DGW-MW3-PV25out-controlT	Sodium	30.7	244	5.3	None; sample concentration greater than 4x spike concentration
20190129-DGW-MW3-PV25out-controlT	Calcium (PDS)	50.1	NA	NA	None; sample concentration greater than 4x spike concentration
20190122-DGW-MW11-PV15out-controlD	Calcium, dissolved	599	548	0.485	None; sample concentration greater than 4x spike concentration
20190122-DGW-MW11-PV15out-controlD	Magnesium, dissolved	229	449	3.48	None; sample concentration greater than 4x spike concentration
20190122-DGW-MW11-PV15out-controlD	Potassium, dissolved	124	126	0.411	None; sample concentration greater than 4x spike concentration
20190122-DGW-MW11-PV15out-controlD	Sodium, dissolved	1140	1000	0.417	None; sample concentration greater than 4x spike concentration
20190122-DGW-MW11-PV15out-controlD	Calcium, dissolved	92.1	NA	NA	None; sample concentration greater than 4x spike concentration
20190122-DGW-MW11-PV15out-controlD	Magnesium, dissolved	99.0	NA	NA	None; sample concentration greater than 4x spike concentration
20190204-FD-PV20Out-35	Sulfate	-44.6	-84.6	0.414	None; sample concentration greater than 4x spike concentration

Notes:
%R - percent recovery
NA - Not applicable
PDS - Post-digestate spike
RPD - Relative percent difference

TABLE 7 - DUPLICATE PRECISION CALCULATIONS

Parent Sample and Field Duplicate/Laboratory Replicate Field Identification	Analyte	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD[a]	Accept or Reject	Qualifier Added
20190206-DGW-MW11-PV20out-35D / 20190205-DGW-MW11-PV20out-35D-DUP	Calcium, dissolved	380	356	6.5	A	NA
	Magnesium, dissolved	320	292	9.2	A	NA
	Potassium, dissolved	23.7	21.3	10.7	A	NA
	Sodium, dissolved	1870	1580	16.8	A	NA
20190206-DGW-MW11-PV20out-35T / 20190205-DGW-MW11-PV20out-35T-DUP	Hardness (as CaCO3)	2250	2150	4.5	A	NA
	Calcium	370	368	0.54	A	NA
	Iron	2.20	2.64	18.2	A	NA
	Magnesium	321	300	6.8	A	NA
	Potassium	24.5	22.7	7.6	A	NA
	Sodium	1870	1830	2.2	A	NA
20190208-DGW-MW3-PV30inlet-controlD/20190208-DGW-MW3-PV30inlet-controlD-DUP	Arsenic	0.0107	0.0107	0	A	NA
	Calcium	105	107	1.9	A	NA
	Iron	0.0244	0.0225	8.1	A (MQL)	NA
	Magnesium	21.9	22.6	3.1	A	NA
	Potassium	2.13	2.18	2.3	A	NA
	Sodium	207	211	1.9	A	NA
20190208-DGW-MW3-PV30inlet-controlT/20190208-DGW-MW3-PV30inlet-controlT-DUP	Hardness (As CaCO3)	384	389	1.3	A	NA
	Arsenic	0.0167	0.0162	3.0	A	NA
	Calcium	117	119	1.7	A	NA
	Iron	0.763	0.795	4.1	A	NA
	Magnesium	22.2	22.3	0.4	A	NA
	Potassium	2.18	2.13	2.3	A	NA
	Sodium	206	206	0.0	A	NA

Notes:

[a] Relative Percent Difference (RPD) = ((SR - DR)*200)/(SR + DR), where SR is the sample result and DR is the duplicate result.

The RPD test (<30%) applies if both results are greater than 5x MQL. Otherwise, the absolute difference test (< 2x MQL) applies.

A - Acceptable Data
mg/L - milligrams per liter
MQL - Method quanitation limit
NA - Not applicable

DATA USABILITY SUMMARY

PROJECT NO: 130-2086-06 **CLIENT:** Exide Technologies

SAMPLE DATES: February 25, 2019 to March 27, 2019

LABORATORY: ALS Group (Houston, Texas)

WORK ORDERS: HS19030525; HS19030568, HS19030569, HS19030570, HS19030882, HS19030883, HS19030885, HS19030897, HS19031331, HS19040233, HS19040237

INTENDED USE: Column Study Report

SITE: Exide Recycling Center, 7471 Old 5th Street, Frisco, TX

TESTS/METHODS

- EPA 300.0 – Anions
- Standard Methods (SM) 2320B - Alkalinity
- SM 2340B – Hardness, Total as $CaCO_3$
- SM 2540C – Total Dissolved Solids (TDS)
- SW-846 6020A - Inductively Coupled Plasma-Mass Spectrometry (ICP/MS)

SAMPLES

Table 1 lists the field and laboratory identification and analyses requested for 188 aqueous samples.

Golder completed a review of the analytical data for conformance with the requirements of the Texas Risk Reduction Program (TRRP) guidance document, Review and Reporting of COC Concentration Data (RGG-366/TRRP-13 Revised May 2010) and for adherence to project objectives. The results of the review are discussed in this data usability summary (DUS). Golder completed the review using the following submittals:

- Laboratory reportable data as defined in TRRP-13;
- Laboratory review checklists (LRC) with the associated exception reports; and
- Laboratory Electronic Data Deliverable (EDD).

The review of the reportable data included the quality control (QC) parameters listed below, as required per TRRP-13, using the applicable analytical method requirements:

- Data Completeness
- Chain-of-Custody Procedures

- Sample Condition - Holding Time, Preservation, and Containers
- Field Procedures
- Results Reporting Procedures – Total versus dissolved metals comparison and Detectability Check Sample (DCS)
- Field and Laboratory Blanks
- Laboratory Control Spike (LCS)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries
- Field Duplicate and Treatability Study Replicate Precision

Additionally, Golder used the LRC to evaluate the following QC parameters:

- Method Quantitation Limits (MQLs)
- Method Detection Limits (MDLs) and Sample Detection Limits (SDLs)
- Instrument Tuning, Calibration, and Performance
- Internal Standards

Criteria used for this data usability review are as follows:

- Precision: ±MQL difference or 30% relative percent difference (RPD) for laboratory duplicates or laboratory replicates; and ± 2x MQL difference (if either result is less than 5x MQL) for field duplicates as recommended in TRRP-13
- Accuracy: 70-130% spike recovery (and not less than 30% or data is rejected) as recommended in TRRP-13

If an item was found outside of the review criteria, the reviewer applied a data qualifier and bias code to the results for the affected samples in accordance with TRRP-13. Table 2 lists the qualified data, qualifiers, and reason for qualification.

LABORATORY CERTIFICATION

At the time the laboratory data were generated for this project, the laboratory was NELAC accredited under the Texas Laboratory Accreditation Program (TLAP Certification T104704231) for the matrices, methods and parameters of analysis requested on the chain-of-custody forms.

USABILITY SUMMARY

Data are usable for the intended purpose. A list of all qualified results and definitions of the qualifier and bias codes are given in Table 2.

Reviewer: Samantha DiCenso 4/25/2019

QUALITY CONTROL PARAMETERS AND OUTCOMES

Data Completeness

The laboratory data package contains necessary data (i.e., the laboratory reportable data per TRRP-13) and the EDD contains sample results in acceptable format.

Chain-of-Custody

Proper sample custody procedures were used, which confirms that the integrity of the samples was maintained. The information on the custody records is complete and agrees with that in the field notes and laboratory reports.

Sample Condition

Samples were collected in appropriate containers and properly preserved. Samples for metals analyses were received at temperatures greater than 6°C; temperature preservation is not required for metals analyses. Most samples were prepared and analyzed within the holding times required by the analytical methods. Nitrate-nitrogen data for laboratory report HS19031331 are qualified as estimated "J" due to analysis outside the holding times and are presented in Table 3. Data are qualified as listed in Tables 2 and 3.

Field Procedures

The samples were collected and placed immediately into laboratory supplied containers and then into a cooler for overnight delivery to the laboratory.

Results Reporting Procedures

Water results are reported in milligrams/liter (mg/L). Non-detects are reported using the SDL as specified per TRRP and detects between the SDL and MQL are reported with a laboratory J-flag. The concentration reported for detects between the SDL and MQL is below the calibration range and thus is considered estimated. Results for the DCS are included in the laboratory data packages.

The dissolved metals concentrations were slightly above the total metals concentrations in some samples as shown on Table 4. Data are qualified as listed in Tables 2 through 7.

Field and Laboratory Blanks

No field blanks were collected.

Analytes detected in laboratory method and continuing calibration blanks which were detected in the associated field samples at concentrations within five times the blank concentration are listed in Table 5. Data are qualified if the sample concentration is within five times the blank concentration. Data are qualified as listed in Tables 2 and 5.

Laboratory Control Sample

The LCS recoveries (%R) are within the TRRP-13 recommended criteria of 70 -130 %R.

Matrix Spike Recovery

Non-project MS/MSD data were not evaluated. MS/MSD recoveries outside the TRRP-13 recommended criteria of 70 – 130%R are listed in Table 5. Precision was within the TRRP-13 recommended criteria of 30 RPD. Post-

digestate spike (PDS) recoveries outside the TRRP-13 recommended criteria of 70 – 130%R are listed in Table 5. The serial dilution percent differences were within method criteria of 10% difference. Data are qualified as shown in Tables 2 and 6.

Field Duplicate and Treatability Study Replicate Precision

Field duplicates are those samples collected at the same sample location, date and time, split in the field, and submitted to the analytical laboratory as unique samples. Laboratory replicates are those samples collected from the treatability study using the same field sample, treatment conditions, and submitted to the analytical laboratory as unique samples. Laboratory duplicates are internal analytical laboratory samples split in the analytical laboratory for two separate analyses. No field duplicates were collected. Treatability study replicate precision is summarized in Table 6. Replicate precision outside the TRRP-13 recommended criteria of 30 RPD or ± the MQL are qualified as estimated (J). Data are qualified as shown in Tables 2 and 7.

Instrument Tuning and Performance

According to the LRC, instrument tuning and interference check sample results met method requirements.

Instrument Calibration

According to the LRC, initial and continuing calibration data met method requirements for reported results which indicates the instruments were properly calibrated to measure analyte concentrations.

Internal Standards

According to the LRC, internal standard areas were acceptable for ICP/MS analyses.

TABLE 1
CROSS REFERENCE OF FIELD SAMPLE IDENTIFICATIONS AND LABORATORY IDENTIFICATIONS

Field Sample ID	Lab Sample ID	Sample Date	Total Metals	Dissolved Metals	Anions	Total Dissolved Solids	Alkalinity or Hardness	Comments
20190311-DGW-MW3-PV40out-control	HS19030525-01	3/11/19			✓	✓	✓	
20190311-DGW-MW3-PV40out-30	HS19030525-02	3/11/19			✓	✓	✓	
20190311-DGW-MW3-PV40out-35	HS19030525-03	3/11/19			✓	✓	✓	
20190311-DGW-MW3-PV40out-40	HS19030525-04	3/11/19			✓	✓	✓	
20190225-DGW-MW3-PV35out-controlD	HS19030568-01	2/25/19		✓				Dissolved metals MS/MSD and PDS
20190225-DGW-MW3-PV35out-30D	HS19030568-02	2/25/19		✓				
20190225-DGW-MW3-PV35out-35D	HS19030568-03	2/25/19		✓				
20190225-DGW-MW3-PV35out-40D	HS19030568-04	2/25/19		✓				
20190225-DGW-MW3-PV35inlet-controlD	HS19030568-05	2/25/19		✓				
20190225-DGW-MW3-PV35inlet-30-35-40D	HS19030568-06	2/25/19		✓				
20190226-DGW-MW3-PV35mid-controlD	HS19030568-07	2/26/19		✓				
20190226-DGW-MW3-PV35mid-30D	HS19030568-08	2/26/19		✓				
20190226-DGW-MW3-PV35mid-35D	HS19030568-09	2/26/19		✓				
20190226-DGW-MW3-PV35mid-40D	HS19030568-10	2/26/19		✓				
20190225-DGW-MW3-PV35out-controlT	HS19030568-11	2/25/19	✓				✓	Total metals MS/MSD and PDS
20190225-DGW-MW3-PV35out-30T	HS19030568-12	2/25/19	✓				✓	
20190225-DGW-MW3-PV35out-35T	HS19030568-13	2/25/19	✓				✓	
20190225-DGW-MW3-PV35out-40T	HS19030568-14	2/25/19	✓				✓	
20190225-DGW-MW3-PV35inlet-controlT	HS19030568-15	2/25/19	✓				✓	
20190225-DGW-MW3-PV35inlet-30-35-40T	HS19030568-16	2/25/19	✓				✓	
20190226-DGW-MW3-PV35mid-controlT	HS19030568-17	2/26/19	✓				✓	
20190226-DGW-MW3-PV35mid-30T	HS19030568-18	2/26/19	✓				✓	
20190226-DGW-MW3-PV35mid-35T	HS19030568-19	2/26/19	✓				✓	
20190226-DGW-MW3-PV35mid-40T	HS19030568-20	2/26/19	✓				✓	
20190304-DGW-MW11-PV30out-controlD	HS19030569-01	3/4/19		✓				
20190304-DGW-MW11-PV30out-30D	HS19030569-02	3/4/19		✓				
20190304-DGW-MW11-PV30out-35D	HS19030569-03	3/4/19		✓				
20190304-DGW-MW11-PV30out-40D	HS19030569-04	3/4/19		✓				
20190304-DGW-MW11-PV30inlet-controlD	HS19030569-05	3/4/19		✓				
20190304-DGW-MW11-PV30inlet-30-35-40D	HS19030569-06	3/4/19		✓				
20190305-DGW-MW11-PV30mid-controlD	HS19030569-07	3/5/19		✓				
20190305-DGW-MW11-PV30mid-30D	HS19030569-08	3/5/19		✓				
20190305-DGW-MW11-PV30mid-35D	HS19030569-09	3/5/19		✓				
20190305-DGW-MW11-PV30mid-40D	HS19030569-10	3/5/19		✓				
20190304-DGW-MW11-PV30out-controlT	HS19030569-11	3/4/19	✓				✓	
20190304-DGW-MW11-PV30out-30T	HS19030569-12	3/4/19	✓				✓	
20190304-DGW-MW11-PV30out-35T	HS19030569-13	3/4/19	✓				✓	
20190304-DGW-MW11-PV30out-40T	HS19030569-14	3/4/19	✓				✓	
20190304-DGW-MW11-PV30inlet-controlT	HS19030569-15	3/4/19	✓				✓	
20190304-DGW-MW11-PV30inlet-30-35-40T	HS19030569-16	3/4/19	✓				✓	
20190305-DGW-MW11-PV30mid-controlT	HS19030569-17	3/5/19	✓				✓	
20190305-DGW-MW11-PV30mid-30T	HS19030569-18	3/5/19	✓				✓	
20190305-DGW-MW11-PV30mid-35T	HS19030569-19	3/5/19	✓				✓	
20190305-DGW-MW11-PV30mid-40T	HS19030569-20	3/5/19	✓				✓	Total metals MS/MSD and PDS
20190303-DGW-MW11-PV30out-30D-DUP	HS19030569-21	3/3/19		✓				Dissolved metals MS/MSD, and sample is a duplicate of 20190303-DGW-MW11-PV30out-30D
20190303-DGW-MW11-PV30out-30T-DUP	HS19030569-22	3/3/19	✓				✓	Sample is a duplicate of 20190303-DGW-MW11-PV30out-30T

TABLE 1
CROSS REFERENCE OF FIELD SAMPLE IDENTIFICATIONS AND LABORATORY IDENTIFICATIONS

Field Sample ID	Lab Sample ID	Sample Date	Total Metals	Dissolved Metals	Anions	Total Dissolved Solids	Alkalinity or Hardness	Comments
20190227-FD-PV30out-controlD	HS19030570-01	2/27/19		✓				
20190227-FD-PV30out-30D	HS19030570-02	2/27/19		✓				
20190227-FD-PV30out-35D	HS19030570-03	2/27/19		✓				
20190227-FD-PV30out-40D	HS19030570-04	2/27/19		✓				
20190227-FD-PV30inlet-controlD	HS19030570-05	2/27/19		✓				
20190227-FD-PV30inlet-30-35-40D	HS19030570-06	2/27/19		✓				
20190228-FD-PV30mid-controlD	HS19030570-07	2/28/19		✓				
20190228-FD-PV30mid-30D	HS19030570-08	2/28/19		✓				
20190228-FD-PV30mid-35D	HS19030570-09	2/28/19		✓				
20190228-FD-PV30mid-40D	HS19030570-10	2/28/19		✓				
20190227-FD-PV30out-controlT	HS19030570-11	2/27/19	✓				✓	
20190227-FD-PV30out-30T	HS19030570-12	2/27/19	✓				✓	
20190227-FD-PV30out-35T	HS19030570-13	2/27/19	✓				✓	
20190227-FD-PV30out-40T	HS19030570-14	2/27/19	✓				✓	
20190227-FD-PV30inlet-controlT	HS19030570-15	2/27/19	✓				✓	
20190227-FD-PV30inlet-30-35-40T	HS19030570-16	2/27/19	✓				✓	
20190228-FD-PV30mid-controlT	HS19030570-17	2/28/19	✓				✓	
20190228-FD-PV30mid-30T	HS19030570-18	2/28/19	✓				✓	
20190228-FD-PV30mid-35T	HS19030570-19	2/28/19	✓				✓	
20190228-FD-PV30mid-40T	HS19030570-20	2/28/19	✓				✓	
20190301-FD-PV30mid-35D-DUP	HS19030570-21	3/1/19		✓				Sample is a duplicate of 20190301-FD-PV30mid-35D
20190301-FD-PV30mid-35T-DUP	HS19030570-22	3/1/19	✓				✓	Sample is a duplicate of 20190301-FD-PV30mid-35T
20190312-DGW-MW3-PV40out-controlD	HS19030882-01	3/12/19		✓				
20190312-DGW-MW3-PV40out-30D	HS19030882-02	3/12/19		✓				
20190312-DGW-MW3-PV40out-35D	HS19030882-03	3/12/19		✓				
20190312-DGW-MW3-PV40out-40D	HS19030882-04	3/12/19		✓				
20190313-DGW-MW3-PV40inlet-controlD	HS19030882-05	3/13/19		✓				
20190313-DGW-MW3-PV40inlet-30-35-40D	HS19030882-06	3/13/19		✓				
20190313-DGW-MW3-PV40mid-controlD	HS19030882-07	3/13/19		✓				
20190313-DGW-MW3-PV40mid-30D	HS19030882-08	3/13/19		✓				
20190313-DGW-MW3-PV40mid-35D	HS19030882-09	3/13/19		✓				
20190313-DGW-MW3-PV40mid-40D	HS19030882-10	3/13/19		✓				
20190312-DGW-MW3-PV40out-controlT	HS19030882-11	3/12/19	✓				✓	Total metals MS/MSD and PDS
20190312-DGW-MW3-PV40out-30T	HS19030882-12	3/12/19	✓				✓	
20190312-DGW-MW3-PV40out-35T	HS19030882-13	3/12/19	✓				✓	
20190312-DGW-MW3-PV40out-40T	HS19030882-14	3/12/19	✓				✓	
20190313-DGW-MW3-PV40inlet-controlT	HS19030882-15	3/13/19	✓				✓	
20190313-DGW-MW3-PV40inlet-30-35-40T	HS19030882-16	3/13/19	✓				✓	
20190313-DGW-MW3-PV40mid-controlT	HS19030882-17	3/13/19	✓				✓	
20190313-DGW-MW3-PV40mid-30T	HS19030882-18	3/13/19	✓				✓	
20190313-DGW-MW3-PV40mid-35T	HS19030882-19	3/13/19	✓				✓	
20190313-DGW-MW3-PV40mid-40T	HS19030882-20	3/13/19	✓				✓	
20190313-DGW-MW3-PV40inlet-30-35-40D-DUP	HS19030882-21	3/13/19		✓				Sample is a duplicate of 20190313-DGW-MW3-PV40inlet-30-35-40D
20190313-DGW-MW3-PV40inlet-30-35-40T-DUP	HS19030882-22	3/13/19	✓				✓	Sample is a duplicate of 20190313-DGW-MW3-PV40inlet-30-35-40T

TABLE 1
CROSS REFERENCE OF FIELD SAMPLE IDENTIFICATIONS AND LABORATORY IDENTIFICATIONS

Field Sample ID	Lab Sample ID	Sample Date	Total Metals	Dissolved Metals	Anions	Total Dissolved Solids	Alkalinity or Hardness	Comments
20190314-DGW-MW11-PV35out-controlD	HS19030883-01	3/14/19		✓				Dissolved metals MS/MSD and PDS
20190314-DGW-MW11-PV35out-30D	HS19030883-02	3/14/19		✓				
20190314-DGW-MW11-PV35out-35D	HS19030883-03	3/14/19		✓				
20190314-DGW-MW11-PV35out-40D	HS19030883-04	3/14/19		✓				
20190314-DGW-MW11-PV35inlet-controlD	HS19030883-05	3/14/19		✓				
20190314-DGW-MW11-PV35inlet-30-35-40D	HS19030883-06	3/14/19		✓				
20190315-DGW-MW11-PV35mid-controlD	HS19030883-07	3/15/19		✓				
20190315-DGW-MW11-PV35mid-30D	HS19030883-08	3/15/19		✓				
20190315-DGW-MW11-PV35mid-35D	HS19030883-09	3/15/19		✓				
20190315-DGW-MW11-PV35mid-40D	HS19030883-10	3/15/19		✓				
20190314-DGW-MW11-PV35out-controlT	HS19030883-11	3/14/19	✓				✓	Total metals MS/MSD and PDS
20190314-DGW-MW11-PV35out-30T	HS19030883-12	3/14/19	✓				✓	
20190314-DGW-MW11-PV35out-35T	HS19030883-13	3/14/19	✓				✓	
20190314-DGW-MW11-PV35out-40T	HS19030883-14	3/14/19	✓				✓	
20190314-DGW-MW11-PV35inlet-controlT	HS19030883-15	3/14/19	✓				✓	
20190314-DGW-MW11-PV35inlet-30-35-40T	HS19030883-16	3/14/19	✓				✓	
20190315-DGW-MW11-PV35mid-controlT	HS19030883-17	3/15/19	✓				✓	
20190315-DGW-MW11-PV35mid-30T	HS19030883-18	3/15/19	✓				✓	
20190315-DGW-MW11-PV35mid-35T	HS19030883-19	3/15/19	✓				✓	
20190315-DGW-MW11-PV35mid-40T	HS19030883-20	3/15/19	✓				✓	
20190311-FD-PV35out-controlD	HS19030885-01	3/11/19		✓				
20190311-FD-PV35out-30D	HS19030885-02	3/11/19		✓				
20190311-FD-PV35out-35D	HS19030885-03	3/11/19		✓				
20190311-FD-PV35out-40D	HS19030885-04	3/11/19		✓				
20190311-FD-PV35inlet-controlD	HS19030885-05	3/11/19		✓				
20190311-FD-PV35inlet-30-35-40D	HS19030885-06	3/11/19		✓				
20190312-FD-PV35mid-controlD	HS19030885-07	3/12/19		✓				
20190312-FD-PV35mid-30D	HS19030885-08	3/12/19		✓				
20190312-FD-PV35mid-35D	HS19030885-09	3/12/19		✓				
20190312-FD-PV35mid-40D	HS19030885-10	3/12/19		✓				
20190311-FD-PV35out-controlT	HS19030885-11	3/11/19	✓				✓	
20190311-FD-PV35out-30T	HS19030885-12	3/11/19	✓				✓	
20190311-FD-PV35out-35T	HS19030885-13	3/11/19	✓				✓	
20190311-FD-PV35out-40T	HS19030885-14	3/11/19	✓				✓	
20190311-FD-PV35inlet-controlT	HS19030885-15	3/11/19	✓				✓	
20190311-FD-PV35inlet-30-35-40T	HS19030885-16	3/11/19	✓				✓	
20190312-FD-PV35mid-controlT	HS19030885-17	3/12/19	✓				✓	
20190312-FD-PV35mid-30T	HS19030885-18	3/12/19	✓				✓	
20190312-FD-PV35mid-35T	HS19030885-19	3/12/19	✓				✓	
20190312-FD-PV35mid-40T	HS19030885-20	3/12/19	✓				✓	
20190315-DGW-MW3-T0-control	HS19030897-01	3/15/19						Geochemistry sample placed on hold with lab - not analyzed
20190315-DGW-MW3-T0-controlD	HS19030897-02	3/15/19		✓				
20190315-DGW-MW3-T0-controlT	HS19030897-03	3/15/19	✓				✓	
20190315-DGW-MW3-T0-30-35-40	HS19030897-04	3/15/19						Geochemistry sample placed on hold with lab - not analyzed
20190315-DGW-MW3-T0-30-35-40D	HS19030897-05	3/15/19		✓				
20190315-DGW-MW3-T0-30-35-40T	HS19030897-06	3/15/19	✓				✓	

TABLE 1
CROSS REFERENCE OF FIELD SAMPLE IDENTIFICATIONS AND LABORATORY IDENTIFICATIONS

Field Sample ID	Lab Sample ID	Sample Date	Total Metals	Dissolved Metals	Anions	Total Dissolved Solids	Alkalinity or Hardness	Comments
20190325-FD-PV40out-Control	HS19031331-01	3/25/19			✓	✓	✓	Chloride, Nitrogen Nitrate, Sulfate MS/MSD
20190325-FD-PV40out-30	HS19031331-02	3/25/19			✓	✓	✓	
20190325-FD-PV40out-35	HS19031331-03	3/25/19			✓	✓	✓	
20190325-FD-PV40out-40	HS19031331-04	3/25/19			✓	✓	✓	
20190325-DGW-MW11-PV40out-control	HS19031331-05	3/25/19			✓	✓	✓	
20190325-DGW-MW11-PV40out-30	HS19031331-06	3/25/19			✓	✓	✓	
20190325-DGW-MW11-PV40out-35	HS19031331-07	3/25/19			✓	✓	✓	
20190325-DGW-MW11-PV40out-40	HS19031331-08	3/25/19			✓	✓	✓	
20190326-FD-PV40out-control-D	HS19040233-01	3/26/19		✓				Dissolved metals MS/MSD and PDS
20190326-FD-PV40out-30-D	HS19040233-02	3/26/19		✓				
20190326-FD-PV40out-35-D	HS19040233-03	3/26/19		✓				
20190326-FD-PV40out-40-D	HS19040233-04	3/26/19		✓				
20190327-FD-PV40inlet-control-D	HS19040233-05	3/27/19		✓				
20190327-FD-PV40inlet-30-35-40-D	HS19040233-06	3/27/19		✓				
20190327-FD-PV40mid-control-D	HS19040233-07	3/27/19		✓				
20190327-FD-PV40mid-30-D	HS19040233-08	3/27/19		✓				
20190327-FD-PV40mid-35-D	HS19040233-09	3/27/19		✓				
20190327-FD-PV40mid-40-D	HS19040233-10	3/27/19		✓				
20190326-FD-PV40out-control-T	HS19040233-11	3/26/19	✓				✓	Total metals MS/MSD and PDS
20190326-FD-PV40out-30-T	HS19040233-12	3/26/19	✓				✓	
20190326-FD-PV40out-35-T	HS19040233-13	3/26/19	✓				✓	
20190326-FD-PV40out-40-T	HS19040233-14	3/26/19	✓				✓	
20190327-FD-PV40inlet-control-T	HS19040233-15	3/27/19	✓				✓	
20190327-FD-PV40inlet-30-35-40-T	HS19040233-16	3/27/19	✓				✓	
20190327-FD-PV40mid-control-T	HS19040233-17	3/27/19	✓				✓	
20190327-FD-PV40mid-30-T	HS19040233-18	3/27/19	✓				✓	
20190327-FD-PV40mid-35-T	HS19040233-19	3/27/19	✓				✓	
20190327-FD-PV40mid-40-T	HS19040233-20	3/27/19	✓				✓	
20190327-FD-PV40inlet-control-DUP-D	HS19040233-21	3/27/19		✓				Sample is a duplicate of 20190327-FD-PV40inlet-control-D
20190327-FD-PV40inlet-control-DUP-T	HS19040233-22	3/27/19	✓				✓	Sample is a duplicate of 20190327-FD-PV40inlet-control-T

TABLE 1
CROSS REFERENCE OF FIELD SAMPLE IDENTIFICATIONS AND LABORATORY IDENTIFICATIONS

Field Sample ID	Lab Sample ID	Sample Date	Total Metals	Dissolved Metals	Anions	Total Dissolved Solids	Alkalinity or Hardness	Comments
20190326-DGW-MW11-PV40out-control- D	HS19040237-01	3/26/19		✓				Dissolved metals MS/MSD and PDS
20190326-DGW-MW11-PV40out-30-D	HS19040237-02	3/26/19		✓				
20190326-DGW-MW11-PV40out-35-D	HS19040237-03	3/26/19		✓				
20190326-DGW-MW11-PV40out-40-D	HS19040237-04	3/26/19		✓				
20190327-DGW-MW11-PV40inlet-control-D	HS19040237-05	3/27/19		✓				
20190327-DGW-MW11-PV40inlet-30-35-40-D	HS19040237-06	3/27/19		✓				
20190327-DGW-MW11-PV40mid-control-D	HS19040237-07	3/27/19		✓				
20190327-DGW-MW11-PV40mid-30-D	HS19040237-08	3/27/19		✓				
20190327-DGW-MW11-PV40mid-35-D	HS19040237-09	3/27/19		✓				
20190327-DGW-MW11-PV40mid-40-D	HS19040237-10	3/27/19		✓				
20190326-DGW-MW11-PV40out-control-T	HS19040237-11	3/26/19	✓				✓	
20190326-DGW-MW11-PV40out-30-T	HS19040237-12	3/26/19	✓				✓	
20190326-DGW-MW11-PV40out-35-T	HS19040237-13	3/26/19	✓				✓	
20190326-DGW-MW11-PV40out-40-T	HS19040237-14	3/26/19	✓				✓	
20190327-DGW-MW11-PV40inlet-control-T	HS19040237-15	3/27/19	✓				✓	
20190327-DGW-MW11-PV40inlet-30-35-40-T	HS19040237-16	3/27/19	✓				✓	
20190327-DGW-MW11-PV40mid-control-T	HS19040237-17	3/27/19	✓				✓	
20190327-DGW-MW11-PV40mid-30-T	HS19040237-18	3/27/19	✓				✓	
20190327-DGW-MW11-PV40mid-35-T	HS19040237-19	3/27/19	✓				✓	
20190327-DGW-MW11-PV40mid-40-T	HS19040237-20	3/27/19	✓				✓	
20190327-DGW-MW11-PV40inlet-control-DUP-D	HS19040237-21	3/27/19		✓				Sample is a duplicate of 20190327-DGW-MW11-PV40inlet-control-D
20190327-DGW-MW11-PV40inlet-control-DUP-T	HS19040237-22	3/27/19	✓				✓	Sample is a duplicate of 20190327-DGW-MW11-PV40inlet-control-T

TABLE 2 - QUALIFIED DATA

Field Sample ID	Lab Sample ID	Analyte	Result	Units	Qualifier	Explanation
20190225-DGW-MW3-PV35out-controlD	HS19030568-01	Iron	0.0677	mg/L	U	Analyte detected in laboratory blank
20190225-DGW-MW3-PV35out-30D	HS19030568-02	Antimony	0.00203	mg/L	U	Analyte detected in laboratory blank
20190225-DGW-MW3-PV35out-30D	HS19030568-02	Iron	0.0189	mg/L	U	Analyte detected in laboratory blank
20190225-DGW-MW3-PV35out-35D	HS19030568-03	Antimony	0.000796	mg/L	U	Analyte detected in laboratory blank
20190225-DGW-MW3-PV35out-35D	HS19030568-03	Iron	0.0413	mg/L	U	Analyte detected in laboratory blank
20190225-DGW-MW3-PV35inlet-30-35-40D	HS19030568-06	Iron	0.0766	mg/L	U	Analyte detected in laboratory blank
20190225-DGW-MW3-PV35out-30T	HS19030568-12	Antimony	0.000404	mg/L	U	Analyte detected in laboratory blank
20190225-DGW-MW3-PV35out-30T	HS19030568-12	Iron	0.258	mg/L	U	Analyte detected in laboratory blank
20190225-DGW-MW3-PV35out-35T	HS19030568-13	Iron	0.0592	mg/L	U	Analyte detected in laboratory blank
20190225-DGW-MW3-PV35out-40T	HS19030568-14	Iron	0.0715	mg/L	U	Analyte detected in laboratory blank
20190226-DGW-MW3-PV35mid-controlT	HS19030568-17	Iron	0.220	mg/L	U	Analyte detected in laboratory blank
20190226-DGW-MW3-PV35mid-30T	HS19030568-18	Iron	0.173	mg/L	U	Analyte detected in laboratory blank
20190226-DGW-MW3-PV35mid-35T	HS19030568-19	Iron	0.240	mg/L	U	Analyte detected in laboratory blank
20190226-DGW-MW3-PV35mid-40T	HS19030568-20	Iron	0.218	mg/L	U	Analyte detected in laboratory blank
20190304-DGW-MW11-PV30out-30D	HS19030569-02	Iron, dissolved	0.547	mg/L	J	Duplicate precision exceeds 30 RPD
20190305-DGW-MW11-PV30mid-controlD	HS19030569-07	Antimony	0.00259	mg/L	U	Analyte detected in laboratory blank
20190304-DGW-MW11-PV30out-controlT	HS19030569-11	Antimony	0.00273	mg/L	U	Analyte detected in laboratory blank
20190303-DGW-MW11-PV30out-30D-DUP	HS19030569-21	Iron, dissolved	0.0600	mg/L	UJL	Duplicate precision exceeds 30 RPD
20190227-FD-PV30out-controlD	HS19030570-01	Arsenic	0.000824	mg/L	U	Analyte detected in laboratory blank
20190227-FD-PV30inlet-controlD	HS19030570-05	Arsenic	0.000777	mg/L	U	Analyte detected in laboratory blank
20190227-FD-PV30inlet-30-35-40D	HS19030570-06	Arsenic	0.000761	mg/L	U	Analyte detected in laboratory blank
20190228-FD-PV30mid-controlD	HS19030570-07	Arsenic	0.000708	mg/L	U	Analyte detected in laboratory blank
20190228-FD-PV30mid-35T	HS19030570-19	Iron	1.01	mg/L	J	Duplicate precision exceeds 30 RPD
20190301-FD-PV30mid-35T-DUP	HS19030570-22	Iron	0.666	mg/L	J	Duplicate precision exceeds 30 RPD
20190312-DGW-MW3-PV40out-controlD	HS19030882-01	Antimony	0.000935	mg/L	U	Analyte detected in laboratory blank
20190312-DGW-MW3-PV40out-controlD	HS19030882-01	Iron	0.0342	mg/L	J	Total/Dissolved concentration differences greater than 30 RPD
20190312-DGW-MW3-PV40out-30D	HS19030882-02	Antimony	0.000610	mg/L	U	Analyte detected in laboratory blank
20190312-DGW-MW3-PV40out-35D	HS19030882-03	Antimony	0.000412	mg/L	U	Analyte detected in laboratory blank
20190312-DGW-MW3-PV40out-40D	HS19030882-04	Antimony	0.000456	mg/L	U	Analyte detected in laboratory blank
20190313-DGW-MW3-PV40inlet-controlD	HS19030882-05	Antimony	0.000426	mg/L	U	Analyte detected in laboratory blank
20190313-DGW-MW3-PV40inlet-30-35-40D	HS19030882-06	Antimony	0.000402	mg/L	U	Analyte detected in laboratory blank
20190313-DGW-MW3-PV40mid-40D	HS19030882-10	Antimony	0.000832	mg/L	U	Analyte detected in laboratory blank
20190312-DGW-MW3-PV40out-controlT	HS19030882-11	Iron	0.0909	mg/L	J	Total/Dissolved concentration differences greater than 30 RPD
20190312-DGW-MW3-PV40out-30T	HS19030882-12	Antimony	0.000648	mg/L	U	Analyte detected in laboratory blank
20190312-DGW-MW3-PV40out-35T	HS19030882-13	Antimony	0.000455	mg/L	U	Analyte detected in laboratory blank
20190313-DGW-MW3-PV40inlet-controlT	HS19030882-15	Antimony	0.000524	mg/L	U	Analyte detected in laboratory blank
20190313-DGW-MW3-PV40inlet-30-35-40D-DUP	HS19030882-21	Antimony	0.000616	mg/L	U	Analyte detected in laboratory blank
20190314-DGW-MW11-PV35out-30D	HS19030883-02	Antimony	0.00248	mg/L	U	Analyte detected in laboratory blank
20190314-DGW-MW11-PV35out-controlT	HS19030883-11	Antimony	0.00288	mg/L	U	Analyte detected in laboratory blank
20190314-DGW-MW11-PV35out-30T	HS19030883-12	Antimony	0.00249	mg/L	U	Analyte detected in laboratory blank
20190314-DGW-MW11-PV35inlet-controlT	HS19030883-15	Antimony	0.00214	mg/L	U	Analyte detected in laboratory blank
20190311-FD-PV35out-30T	HS19030885-12	Antimony	0.000414	mg/L	U	Analyte detected in laboratory blank
20190312-FD-PV35mid-30T	HS19030885-18	Antimony	0.000549	mg/L	U	Analyte detected in laboratory blank
20190312-FD-PV35mid-35T	HS19030885-19	Antimony	0.000441	mg/L	U	Analyte detected in laboratory blank
20190315-DGW-MW3-T0-controlD	HS19030897-02	Antimony	0.000487	mg/L	U	Analyte detected in laboratory blank
20190315-DGW-MW3-T0-30-35-40D	HS19030897-05	Antimony	0.000432	mg/L	U	Analyte detected in laboratory blank

TABLE 2 - QUALIFIED DATA

Field Sample ID	Lab Sample ID	Analyte	Result	Units	Qualifier	Explanation
20190325-FD-PV40out-Control	HS19031331-01	Nitrogen, Nitrate (as N)	1.15	mg/L	JL	Analysis exceeded holding time
20190325-FD-PV40out-30	HS19031331-02	Nitrogen, Nitrate (as N)	0.150	mg/L	UJL	Analysis exceeded holding time; analyte not detected
20190325-FD-PV40out-35	HS19031331-03	Nitrogen, Nitrate (as N)	0.150	mg/L	UJL	Analysis exceeded holding time; analyte not detected
20190325-FD-PV40out-40	HS19031331-04	Nitrogen, Nitrate (as N)	0.150	mg/L	UJL	Analysis exceeded holding time; analyte not detected
20190325-DGW-MW11-PV40out-control	HS19031331-05	Nitrogen, Nitrate (as N)	3.00	mg/L	UJL	Analysis exceeded holding time; analyte not detected
20190325-DGW-MW11-PV40out-30	HS19031331-06	Nitrogen, Nitrate (as N)	0.150	mg/L	UJL	Analysis exceeded holding time; analyte not detected
20190325-DGW-MW11-PV40out-35	HS19031331-07	Nitrogen, Nitrate (as N)	0.150	mg/L	UJL	Analysis exceeded holding time; analyte not detected
20190325-DGW-MW11-PV40out-40	HS19031331-08	Nitrogen, Nitrate (as N)	0.150	mg/L	UJL	Analysis exceeded holding time; analyte not detected
20190326-FD-PV40out-control-D	HS19040233-01	Selenium	0.00906	mg/L	U	Analyte detected in laboratory blank
20190326-FD-PV40out-35-D	HS19040233-03	Selenium	0.00112	mg/L	U	Analyte detected in laboratory blank
20190326-FD-PV40out-40-D	HS19040233-04	Selenium	0.00113	mg/L	U	Analyte detected in laboratory blank
20190327-FD-PV40inlet-control-D	HS19040233-05	Selenium	0.00861	mg/L	U	Analyte detected in laboratory blank
20190327-FD-PV40inlet-30-35-40-D	HS19040233-06	Selenium	0.00452	mg/L	U	Analyte detected in laboratory blank
20190327-FD-PV40mid-control-D	HS19040233-07	Selenium	0.00531	mg/L	U	Analyte detected in laboratory blank
20190327-FD-PV40mid-30-D	HS19040233-08	Selenium	0.00156	mg/L	U	Analyte detected in laboratory blank
20190326-FD-PV40out-control-T	HS19040233-11	Selenium	0.00663	mg/L	U	Analyte detected in laboratory blank
20190326-FD-PV40out-30-T	HS19040233-12	Antimony	0.000468	mg/L	U	Analyte detected in laboratory blank
20190326-FD-PV40out-30-T	HS19040233-12	Selenium	0.00118	mg/L	U	Analyte detected in laboratory blank
20190326-FD-PV40out-35-T	HS19040233-13	Selenium	0.00144	mg/L	U	Analyte detected in laboratory blank
20190327-FD-PV40inlet-control-T	HS19040233-15	Selenium	0.00775	mg/L	U	Analyte detected in laboratory blank
20190327-FD-PV40inlet-30-35-40-T	HS19040233-16	Selenium	0.00738	mg/L	U	Analyte detected in laboratory blank
20190327-FD-PV40mid-control-T	HS19040233-17	Selenium	0.00701	mg/L	U	Analyte detected in laboratory blank
20190327-FD-PV40mid-30-T	HS19040233-18	Antimony	0.000583	mg/L	U	Analyte detected in laboratory blank
20190327-FD-PV40mid-30-T	HS19040233-18	Selenium	0.00130	mg/L	U	Analyte detected in laboratory blank
20190327-FD-PV40inlet-control-DUP-D	HS19040233-21	Selenium	0.00868	mg/L	U	Analyte detected in laboratory blank
20190327-FD-PV40inlet-control-DUP-T	HS19040233-22	Selenium	0.00824	mg/L	U	Analyte detected in laboratory blank
20190326-DGW-MW11-PV40out-control- D	HS19040237-01	Antimony	0.00247	mg/L	U	Analyte detected in laboratory blank
20190326-DGW-MW11-PV40out-control- D	HS19040237-01	Selenium	0.00826	mg/L	U	Analyte detected in laboratory blank
20190326-DGW-MW11-PV40out-30-D	HS19040237-02	Antimony	0.00292	mg/L	U	Analyte detected in laboratory blank
20190326-DGW-MW11-PV40out-35-D	HS19040237-03	Selenium	0.00587	mg/L	U	Analyte detected in laboratory blank
20190327-DGW-MW11-PV40mid-control-D	HS19040237-07	Selenium	0.00725	mg/L	U	Analyte detected in laboratory blank
20190327-DGW-MW11-PV40mid-35-D	HS19040237-09	Selenium	0.00743	mg/L	U	Analyte detected in laboratory blank

TABLE 3 - HOLDING TIMES

Field Sample ID	Analyte	Result	Units	Qualifier	Explanation
20190325-FD-PV40out-Control	Nitrogen, Nitrate (as N)	1.15	mg/L	JL	Analyzed past 48-hour holding time
20190325-FD-PV40out-30	Nitrogen, Nitrate (as N)	0.150	mg/L	UJL	Analyzed past 48-hour holding time
20190325-FD-PV40out-35	Nitrogen, Nitrate (as N)	0.150	mg/L	UJL	Analyzed past 48-hour holding time
20190325-FD-PV40out-40	Nitrogen, Nitrate (as N)	0.150	mg/L	UJL	Analyzed past 48-hour holding time
20190325-DGW-MW11-PV40out-control	Nitrogen, Nitrate (as N)	3.00	mg/L	UJL	Analyzed past 48-hour holding time
20190325-DGW-MW11-PV40out-30	Nitrogen, Nitrate (as N)	0.150	mg/L	UJL	Analyzed past 48-hour holding time
20190325-DGW-MW11-PV40out-35	Nitrogen, Nitrate (as N)	0.150	mg/L	UJL	Analyzed past 48-hour holding time
20190325-DGW-MW11-PV40out-40	Nitrogen, Nitrate (as N)	0.150	mg/L	UJL	Analyzed past 48-hour holding time

UJL - Not detected /estimated/biased low.
mg/L - milligrams per liter

TABLE 4 - TOTAL VERSUS DISSOLVED COMPARISON

Sample	Analyte	Total Concentration	Dissolved Concentration	Precision (RPD)	Qualification
DGW-MW3-PV35out-control	Calcium	106	113	6.4	Acceptable
DGW-MW3-PV35out-control	Selenium	0.00111	0.00127	13	Acceptable
DGW-MW3-PV35out-control	Sodium	191	< 198	3.6	Acceptable
DGW-MW3-PV35out-30	Calcium	6.55	6.69	2.1	Acceptable
DGW-MW3-PV35out-30	Potassium	2.10	2.11	0.48	Acceptable
DGW-MW3-PV35out-30	Sodium	194	< 204	5.0	Acceptable
DGW-MW3-PV35out-35	Calcium	6.12	6.24	1.9	Acceptable
DGW-MW3-PV35out-35	Potassium	2.11	2.12	0.47	Acceptable
DGW-MW3-PV35out-35	Sodium	190	< 198	4.1	Acceptable
DGW-MW3-PV35out-40	Calcium	5.50	5.89	6.8	Acceptable
DGW-MW3-PV35out-40	Magnesium	10.5	11.0	4.7	Acceptable
DGW-MW3-PV35out-40	Potassium	2.04	2.15	5.3	Acceptable
DGW-MW3-PV35out-40	Sodium	198	< 199	0.50	Acceptable
DGW-MW3-PV35inlet-control	Calcium	116	121	4.2	Acceptable
DGW-MW3-PV35inlet-control	Potassium	2.06	2.14	3.8	Acceptable
DGW-MW3-PV35inlet-control	Selenium	0.00118	< 0.00110	7.0	Acceptable
DGW-MW3-PV35inlet-control	Sodium	186	< 196	5.2	Acceptable
DGW-MW3-PV35inlet-30-35-40	Calcium	113	120	6.0	Acceptable
DGW-MW3-PV35inlet-30-35-40	Magnesium	21.1	21.4	1.4	Acceptable
DGW-MW3-PV35inlet-30-35-40	Potassium	1.98	2.05	3.5	Acceptable
DGW-MW3-PV35inlet-30-35-40	Selenium	0.00116	0.00119	2.6	Acceptable
DGW-MW3-PV35inlet-30-35-40	Sodium	188.0	< 191	1.6	Acceptable
DGW-MW3-PV35mid-control	Calcium	110	116	5.3	Acceptable
DGW-MW3-PV35mid-control	Magnesium	21.0	21.5	2.4	Acceptable
DGW-MW3-PV35mid-control	Potassium	2.01	2.11	4.9	Acceptable
DGW-MW3-PV35mid-control	Selenium	0.00112	< 0.00110	1.8	Acceptable
DGW-MW3-PV35mid-control	Sodium	195	< 205	5.0	Acceptable
DGW-MW3-PV35mid-30	Calcium	8.16	8.69	6.3	Acceptable
DGW-MW3-PV35mid-30	Magnesium	15.1	15.8	4.5	Acceptable
DGW-MW3-PV35mid-30	Potassium	2.04	2.16	5.7	Acceptable
DGW-MW3-PV35mid-30	Sodium	198	< 202	2.0	Acceptable
DGW-MW3-PV35mid-35	Calcium	8.96	8.97	0.11	Acceptable
DGW-MW3-PV35mid-40	Calcium	7.46	8.92	18	Acceptable
DGW-MW3-PV35mid-40	Magnesium	13.8	15.9	14	Acceptable
DGW-MW3-PV35mid-40	Potassium	2.03	2.42	18	Acceptable
DGW-MW3-PV35mid-40	Sodium	194	< 195	0.51	Acceptable
DGW-MW11-PV30-out-30	Calcium	328	332	1.2	Acceptable
DGW-MW11-PV30-out-30	Magnesium	298	299	0.34	Acceptable
DGW-MW11-PV30-out-30	Potassium	19.0	19.5	2.6	Acceptable
DGW-MW11-PV30-out-30	Sodium	1710	1770	3.4	Acceptable
DGW-MW11-PV30-out-35	Sodium	1720	1750	1.7	Acceptable
DGW-MW11-PV30-out-40	Sodium	1690	1740	2.9	Acceptable
DGW-MW11-PV30inlet-control	Magnesium	280	282	0.71	Acceptable
DGW-MW11-PV30inlet-control	Potassium	15.9	16.2	1.9	Acceptable
DGW-MW11-PV30inlet-30-35-40	Magnesium	286	290	1.4	Acceptable
DGW-MW11-PV30inlet-30-35-40	Potassium	17.8	18.1	1.7	Acceptable
DGW-MW11-PV30inlet-30-35-40	Sodium	1660	1700	2.4	Acceptable
DGW-MW11-PV30mid-control	Cadmium	0.00601	0.00615	2.3	Acceptable
DGW-MW11-PV30mid-control	Sodium	1880	1900	1.1	Acceptable
DGW-MW11-PV30mid-30	Calcium	385	394	2.3	Acceptable
DGW-MW11-PV30mid-30	Magnesium	301	308	2.3	Acceptable
DGW-MW11-PV30mid-30	Potassium	19.0	19.3	1.6	Acceptable
DGW-MW11-PV30mid-30	Sodium	1760	1810	2.8	Acceptable
DGW-MW11-PV30mid-35	Sodium	1690	1710	1.2	Acceptable
DGW-MW11-PV30mid-40	Calcium	315	338	7.0	Acceptable
DGW-MW11-PV30mid-40	Magnesium	266	300	12	Acceptable
DGW-MW11-PV30mid-40	Potassium	18.5	19.3	4.2	Acceptable
DGW-MW11-PV30mid-40	Sodium	1740	1760	1.1	Acceptable
DGW-MW11-PV30out-30-DUP	Magnesium	273	284	3.9	Acceptable
DGW-MW11-PV30out-30-DUP	Sodium	1750	1810	3.4	Acceptable
FD-PV30out-control	Antimony	0.0315	0.0336	6.5	Acceptable
FD-PV30out-control	Arsenic	0.00101 J	< 0.000824	20	Acceptable
FD-PV30out-control	Calcium	202	215	6.2	Acceptable
FD-PV30out-control	Magnesium	1.14	1.16	1.7	Acceptable
FD-PV30out-control	Potassium	11.6	12.6	8.3	Acceptable
FD-PV30out-control	Selenium	0.00550	0.00650	17	Acceptable

TABLE 4 - TOTAL VERSUS DISSOLVED COMPARISON

Sample	Analyte	Total Concentration	Dissolved Concentration	Precision (RPD)	Qualification
FD-PV30out-control	Sodium	261	327	22	Acceptable
FD-PV30out-30	Calcium	191	194	1.6	Acceptable
FD-PV30out-30	Potassium	12.2	12.9	5.6	Acceptable
FD-PV30out-30	Sodium	263	268	1.9	Acceptable
FD-PV30out-35	Calcium	186	196	5.2	Acceptable
FD-PV30out-35	Magnesium	0.967	1.00	3.4	Acceptable
FD-PV30out-35	Potassium	12.0	12.9	7.2	Acceptable
FD-PV30out-35	Sodium	255	266	4.2	Acceptable
FD-PV30out-40	Calcium	192	193	0.52	Acceptable
FD-PV30out-40	Potassium	12.1	12.7	4.8	Acceptable
FD-PV30out-40	Sodium	260	266	2.3	Acceptable
FD-PV30inlet-control	Calcium	200	201	0.50	Acceptable
FD-PV30inlet-control	Magnesium	1.16	1.19	2.6	Acceptable
FD-PV30inlet-control	Potassium	12.1	12.6	4.0	Acceptable
FD-PV30inlet-control	Selenium	0.00669	0.00674	0.74	Acceptable
FD-PV30inlet-control	Sodium	261	262	0.38	Acceptable
FD-PV30inlet-30-35-40	Antimony	0.0329	0.0333	1.2	Acceptable
FD-PV30inlet-30-35-40	Calcium	199	210	5.4	Acceptable
FD-PV30inlet-30-35-40	Magnesium	1.16	1.17	0.86	Acceptable
FD-PV30inlet-30-35-40	Potassium	11.8	12.9	8.9	Acceptable
FD-PV30inlet-30-35-40	Selenium	0.00561	0.00578	3.0	Acceptable
FD-PV30inlet-30-35-40	Sodium	259	273	5.3	Acceptable
FD-PV30mid-control	Magnesium	1.11	1.12	0.90	Acceptable
FD-PV30mid-control	Potassium	12.0	12.5	4.1	Acceptable
FD-PV30mid-control	Selenium	0.00554	0.00571	3.0	Acceptable
FD-PV30mid-control	Sodium	264	265	0.38	Acceptable
FD-PV30mid-30	Calcium	195	196	0.51	Acceptable
FD-PV30mid-30	Magnesium	0.888	0.950	6.7	Acceptable
FD-PV30mid-30	Potassium	12.0	13.1	8.8	Acceptable
FD-PV30mid-30	Sodium	262	269	2.6	Acceptable
FD-PV30mid-35	Calcium	190	< 194	2.1	Acceptable
FD-PV30mid-35	Magnesium	0.915	0.934	2.1	Acceptable
FD-PV30mid-35	Potassium	11.6	12.5	7.5	Acceptable
FD-PV30mid-35	Sodium	260	261	0.38	Acceptable
FD-PV30mid-40	Calcium	200	< 203	1.5	Acceptable
FD-PV30mid-40	Potassium	< 12.5	12.7	1.6	Acceptable
FD-PV30mid-40	Sodium	269	275	2.2	Acceptable
FD-PV30mid-35-DUP	Calcium	190	< 197	3.6	Acceptable
FD-PV30mid-35-DUP	Magnesium	0.934	0.943	1.0	Acceptable
FD-PV30mid-35-DUP	Potassium	< 11.7	12.3	5.0	Acceptable
FD-PV30mid-35-DUP	Sodium	256	261	1.9	Acceptable
DGW-MW3-PV40out-control	Antimony	0.000761 J	< 0.000935 J	21	Acceptable
DGW-MW3-PV40out-control	Calcium	116	120	3.4	Acceptable
DGW-MW3-PV40out-control	Iron	0.0909 J	0.0342 J	91	J
DGW-MW3-PV40out-control	Magnesium	20.6	21.4	3.8	Acceptable
DGW-MW3-PV40out-control	Potassium	2.05	2.09	1.9	Acceptable
DGW-MW3-PV40out-control	Selenium	0.00126 J	0.00161 J	24	Acceptable
DGW-MW3-PV40out-30	Calcium	7.1	7.17	1.0	Acceptable
DGW-MW3-PV40out-35	Calcium	6.59	6.78	2.8	Acceptable
DGW-MW3-PV40out-35	Iron	0.0367 J	0.0404 J	9.6	Acceptable
DGW-MW3-PV40out-35	Magnesium	10.7	10.9	1.9	Acceptable
DGW-MW3-PV40out-40	Calcium	5.67	6.44	13	Acceptable
DGW-MW3-PV40out-40	Iron	0.0350 J	0.0404 J	14	Acceptable
DGW-MW3-PV40out-40	Magnesium	9.86	11.2	13	Acceptable
DGW-MW3-PV40out-40	Potassium	2.00	2.19	9.1	Acceptable
DGW-MW3-PV40inlet-control	Calcium	109	122	11	Acceptable
DGW-MW3-PV40inlet-control	Magnesium	19.9	21.9	9.6	Acceptable
DGW-MW3-PV40inlet-control	Potassium	1.95	2.13	8.8	Acceptable
DGW-MW3-PV40inlet-30-35-40	Calcium	110	120	8.7	Acceptable
DGW-MW3-PV40inlet-30-35-40	Magnesium	19.5	21.5	9.8	Acceptable
DGW-MW3-PV40inlet-30-35-40	Potassium	1.88	2.02	7.2	Acceptable
DGW-MW3-PV40mid-control	Calcium	111	120	7.8	Acceptable
DGW-MW3-PV40mid-control	Magnesium	20.5	22	7.1	Acceptable
DGW-MW3-PV40mid-control	Potassium	1.99	2.12	6.3	Acceptable
DGW-MW3-PV40mid-control	Selenium	0.00123 J	< 0.00110	11	Acceptable

TABLE 4 - TOTAL VERSUS DISSOLVED COMPARISON

Sample	Analyte	Total Concentration	Dissolved Concentration	Precision (RPD)	Qualification
DGW-MW3-PV40mid-30	Calcium	8.51	8.87	4.1	Acceptable
DGW-MW3-PV40mid-30	Magnesium	14.4	14.7	2.1	Acceptable
DGW-MW3-PV40mid-30	Potassium	1.91	1.97	3.1	Acceptable
DGW-MW3-PV40mid-35	Calcium	9.24	9.85	6.4	Acceptable
DGW-MW3-PV40mid-35	Magnesium	13.8	14.8	7.0	Acceptable
DGW-MW3-PV40mid-35	Potassium	1.88	1.98	5.2	Acceptable
DGW-MW3-PV40mid-40	Potassium	2.03	2.05	1.0	Acceptable
DGW-MW3-PV40inlet-30-35-40-DUP	Calcium	109	123	12	Acceptable
DGW-MW3-PV40inlet-30-35-40-DUP	Magnesium	20.7	21.2	2.4	Acceptable
DGW-MW3-PV40inlet-30-35-40-DUP	Potassium	1.95	2.04	4.5	Acceptable
DGW-MW3-PV40inlet-30-35-40-DUP	Selenium	0.00116 J	0.00152 J	27	Acceptable
DGW-MW11-PV35out-control	Cadmium	0.00736	0.00738	0.27	Acceptable
DGW-MW11-PV35out-control	Calcium	438	491	11	Acceptable
DGW-MW11-PV35out-control	Magnesium	256	274	6.8	Acceptable
DGW-MW11-PV35out-control	Potassium	14.4	16.3	12	Acceptable
DGW-MW11-PV35out-control	Sodium	1710	1760	2.9	Acceptable
DGW-MW11-PV35out-30	Calcium	282	312	10	Acceptable
DGW-MW11-PV35out-30	Magnesium	263	278	5.5	Acceptable
DGW-MW11-PV35out-30	Potassium	17.0	18.8	10	Acceptable
DGW-MW11-PV35out-30	Sodium	1650	1740	5.3	Acceptable
DGW-MW11-PV35out-35	Calcium	282	< 294	4.2	Acceptable
DGW-MW11-PV35out-35	Magnesium	262	268	2.3	Acceptable
DGW-MW11-PV35out-35	Potassium	17.1	18.3	6.8	Acceptable
DGW-MW11-PV35out-35	Sodium	1720	1730	0.58	Acceptable
DGW-MW11-PV35out-40	Calcium	260	< 286	9.5	Acceptable
DGW-MW11-PV35out-40	Magnesium	257	271	5.3	Acceptable
DGW-MW11-PV35out-40	Potassium	16.8	18.6	10	Acceptable
DGW-MW11-PV35out-40	Sodium	1740	1810	3.9	Acceptable
DGW-MW11-PV35inlet-control	Calcium	446	482	7.8	Acceptable
DGW-MW11-PV35inlet-control	Lead	0.00324 J	< 0.00300	7.7	Acceptable
DGW-MW11-PV35inlet-control	Magnesium	263	273	3.7	Acceptable
DGW-MW11-PV35inlet-control	Potassium	14.9	16.1	7.7	Acceptable
DGW-MW11-PV35inlet-control	Sodium	1680	1770	5.2	Acceptable
DGW-MW11-PV35inlet-30-35-40	Calcium	452	489	7.9	Acceptable
DGW-MW11-PV35inlet-30-35-40	Magnesium	268	282	5.1	Acceptable
DGW-MW11-PV35inlet-30-35-40	Potassium	16.6	17.9	7.5	Acceptable
DGW-MW11-PV35inlet-30-35-40	Sodium	1620	1690	4.2	Acceptable
DGW-MW11-PV35mid-control	Cadmium	0.00742 J	0.00767 J	3.3	Acceptable
DGW-MW11-PV35mid-control	Calcium	450	489	8.3	Acceptable
DGW-MW11-PV35mid-control	Magnesium	269	276	2.6	Acceptable
DGW-MW11-PV35mid-control	Potassium	15.2	16.1	5.8	Acceptable
DGW-MW11-PV35mid-30	Calcium	349	351	0.57	Acceptable
DGW-MW11-PV35mid-30	Potassium	16.8	17.0	1.2	Acceptable
DGW-MW11-PV35mid-30	Sodium	1750	1760	0.57	Acceptable
DGW-MW11-PV35mid-35	Calcium	331	346	4.4	Acceptable
DGW-MW11-PV35mid-35	Potassium	17.0	17.9	5.2	Acceptable
DGW-MW11-PV35mid-35	Selenium	0.00555 J	< 0.00550	0.90	Acceptable
DGW-MW11-PV35mid-35	Sodium	1540	1810	16	Acceptable
DGW-MW11-PV35mid-40	Calcium	286	312	8.7	Acceptable
DGW-MW11-PV35mid-40	Magnesium	261	278	6.3	Acceptable
DGW-MW11-PV35mid-40	Potassium	17.1	18.1	5.7	Acceptable
DGW-MW11-PV35mid-40	Sodium	1690	1730	2.3	Acceptable
FD-PV35out-control	Arsenic	0.00107 J	0.00113 J	5.5	Acceptable
FD-PV35out-control	Calcium	183	< 197	7.4	Acceptable
FD-PV35out-control	Magnesium	1.19	1.21	1.7	Acceptable
FD-PV35out-control	Potassium	11.4	11.9	4.3	Acceptable
FD-PV35out-control	Selenium	0.00586	0.00676	14	Acceptable
FD-PV35out-30	Calcium	171	< 193	12	Acceptable
FD-PV35out-30	Magnesium	0.983	0.993	1.0	Acceptable
FD-PV35out-30	Potassium	11.0	12.0	8.7	Acceptable
FD-PV35out-35	Arsenic	< 0.000400	0.000407 J	1.7	Acceptable
FD-PV35out-35	Calcium	178	< 198	11	Acceptable
FD-PV35out-35	Magnesium	1.02	1.07	4.8	Acceptable
FD-PV35out-35	Potassium	11.3	12.4	9.3	Acceptable

TABLE 4 - TOTAL VERSUS DISSOLVED COMPARISON

Sample	Analyte	Total Concentration	Dissolved Concentration	Precision (RPD)	Qualification
FD-PV35out-40	Arsenic	< 0.000400	0.000442 J	10	Acceptable
FD-PV35out-40	Calcium	184	< 193	4.8	Acceptable
FD-PV35out-40	Magnesium	1.47	1.52	3.3	Acceptable
FD-PV35out-40	Potassium	11.9	12.2	2.5	Acceptable
FD-PV35out-40	Selenium	< 0.00110	0.00112 J	1.8	Acceptable
FD-PV35inlet-control	Arsenic	0.00130 J	0.00138 J	6.0	Acceptable
FD-PV35inlet-control	Calcium	184	< 204	10	Acceptable
FD-PV35inlet-control	Magnesium	1.12	1.14	1.8	Acceptable
FD-PV35inlet-control	Potassium	11.0	12.2	10	Acceptable
FD-PV35inlet-control	Selenium	0.00694	0.00710	2.3	Acceptable
FD-PV35inlet-30-35-40	Arsenic	0.00144 J	0.00151 J	4.8	Acceptable
FD-PV35inlet-30-35-40	Calcium	193	< 200	3.6	Acceptable
FD-PV35inlet-30-35-40	Potassium	11.5	12.2	5.9	Acceptable
FD-PV35inlet-30-35-40	Selenium	0.00698	0.00742	6.1	Acceptable
FD-PV35mid-control	Arsenic	0.00103 J	0.00105 J	1.9	Acceptable
FD-PV35mid-control	Calcium	186	< 199	6.8	Acceptable
FD-PV35mid-control	Magnesium	1.16	1.17	0.86	Acceptable
FD-PV35mid-control	Potassium	11.4	11.8	3.4	Acceptable
FD-PV35mid-30	Arsenic	0.000500 J	0.000551 J	9.7	Acceptable
FD-PV35mid-30	Calcium	185	< 190	2.7	Acceptable
FD-PV35mid-30	Magnesium	0.984	1.00	1.6	Acceptable
FD-PV35mid-30	Potassium	11.4	11.8	3.4	Acceptable
FD-PV35mid-35	Arsenic	< 0.000400	0.000474 J	17	Acceptable
FD-PV35mid-35	Calcium	181	< 199	9.5	Acceptable
FD-PV35mid-35	Magnesium	0.986	0.993	0.71	Acceptable
FD-PV35mid-35	Potassium	11.4	12.5	9.2	Acceptable
FD-PV35mid-40	Arsenic	0.000482 J	0.000540 J	11	Acceptable
FD-PV35mid-40	Calcium	184	< 198	7.3	Acceptable
FD-PV35mid-40	Magnesium	1.49	1.58	5.9	Acceptable
FD-PV35mid-40	Potassium	11.5	12.3	6.7	Acceptable
DGW-MW-3-T0-control	Calcium	113	120	6.0	Acceptable
DGW-MW-3-T0-control	Magnesium	14.1	14.8	4.8	Acceptable
DGW-MW-3-T0-control	Potassium	1.53	1.54	0.65	Acceptable
DGW-MW-3-T0-30-35-40	Calcium	109	118	7.9	Acceptable
DGW-MW-3-T0-30-35-40	Magnesium	14.0	14.9	6.2	Acceptable
DGW-MW-3-T0-30-35-40	Potassium	1.47	1.48	0.68	Acceptable
FD-PV40out-control	Antimony	< 0.0371	0.0339	9.0	Acceptable
FD-PV40out-control	Magnesium	1.43	1.45	1.4	Acceptable
FD-PV40out-30	Calcium	189	193	2.1	Acceptable
FD-PV40out-30	Magnesium	1.12	1.17	4.4	Acceptable
FD-PV40out-30	Potassium	12.4	< 12.7	2.4	Acceptable
FD-PV40out-30	Sodium	258	266	3.1	Acceptable
FD-PV40out-35	Calcium	192	193	0.52	Acceptable
FD-PV40out-35	Magnesium	1.21	1.27	4.8	Acceptable
FD-PV40out-35	Potassium	12.8	< 13.1	2.3	Acceptable
FD-PV40out-35	Sodium	259	266	2.7	Acceptable
FD-PV40out-40	Calcium	185	186	0.54	Acceptable
FD-PV40out-40	Magnesium	1.23	1.33	7.8	Acceptable
FD-PV40out-40	Potassium	12.4	< 13.2	6.3	Acceptable
FD-PV40inlet-control	Calcium	187	195	4.2	Acceptable
FD-PV40inlet-control	Magnesium	1.19	1.26	5.7	Acceptable
FD-PV40inlet-control	Potassium	12.1	< 12.4	2.5	Acceptable
FD-PV40inlet-control	Sodium	242	251	3.7	Acceptable
FD-PV40mid-control	Calcium	180	200	11	Acceptable
FD-PV40mid-control	Magnesium	1.34	1.36	1.5	Acceptable
FD-PV40mid-control	Potassium	12.7	< 12.9	1.6	Acceptable
FD-PV40mid-control	Sodium	236	264	11	Acceptable
FD-PV40mid-30	Calcium	174	185	6.1	Acceptable
FD-PV40mid-30	Sodium	230	252	9.1	Acceptable
FD-PV40mid-40	Magnesium	1.26	1.27	0.79	Acceptable
FD-PV40inlet-control-DUP	Magnesium	1.26	1.33	5.4	Acceptable
DGW-MW11-PV40out-control	Cadmium	0.00764 J	0.00854 J	11	Acceptable
DGW-MW11-PV40out-control	Calcium	465	500	7.3	Acceptable
DGW-MW11-PV40out-control	Magnesium	274	294	7.0	Acceptable
DGW-MW11-PV40out-control	Potassium	17.5	18.6	6.1	Acceptable
DGW-MW11-PV40out-control	Sodium	1450	1760	19	Acceptable

TABLE 4 - TOTAL VERSUS DISSOLVED COMPARISON

Sample	Analyte	Total Concentration	Dissolved Concentration	Precision (RPD)	Qualification
DGW-MW11-PV40out-30	Calcium	312	313	0.32	Acceptable
DGW-MW11-PV40out-30	Magnesium	277	288	3.9	Acceptable
DGW-MW11-PV40out-30	Potassium	18.2	18.4	1.1	Acceptable
DGW-MW11-PV40out-35	Magnesium	284	285	0.35	Acceptable
DGW-MW11-PV40out-35	Potassium	18.5	18.6	0.54	Acceptable
DGW-MW11-PV40out-40	Calcium	286	305	6.4	Acceptable
DGW-MW11-PV40out-40	Magnesium	283	295	4.2	Acceptable
DGW-MW11-PV40out-40	Potassium	18.4	19.7	6.8	Acceptable
DGW-MW11-PV40out-40	Sodium	1690	1750	3.5	Acceptable
DGW-MW11-PV40inlet-control	Cadmium	0.00646 J	0.00746 J	14	Acceptable
DGW-MW11-PV40inlet-control	Calcium	477	513	7.3	Acceptable
DGW-MW11-PV40inlet-control	Magnesium	280	309	9.8	Acceptable
DGW-MW11-PV40inlet-control	Potassium	18.2	19.5	6.9	Acceptable
DGW-MW11-PV40inlet-control	Sodium	1670	1700	1.8	Acceptable
DGW-MW11-PV40inlet-30-35-40	Magnesium	284	290	2.1	Acceptable
DGW-MW11-PV40mid-40	Magnesium	286	293	2.4	Acceptable

Notes:
mg/L - milligrams per liter
RPD - relative percent difference
J - Estimated data; the analyte was detected and identified but one or more quality control criteria were not met.

TABLE 5 - BLANK DETECTIONS

Lab Sample ID	Analyte	Result	Qualified Concentration	Units	Explanation
ICPMS04_334708 CCB 10 3/18 1921	Antimony	0.00137	0.0069	mg/L	None; analyte not detected
ICPMS04_334708 CCB 10 3/18 1921	Iron	0.01885	0.0943	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS04_334708 CCB 4 3/18 1555	Antimony	0.001688	0.0084	mg/L	None; analyte not detected
ICPMS04_334708 CCB 7 3/18 1748	Sodium	0.06777	0.3389	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS04_334708 CCB 8 3/18 1819	Antimony	0.00141	0.0071	mg/L	None; analyte not detected
ICPMS04_334708 CCB 8 3/18 1819	Sodium	0.0749	0.3745	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS04_334782 CCB 1 3/19 1301	Sodium	0.02144	0.1072	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS04_334782 CCB 2 3/19 1328	Sodium	0.01949	0.0975	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS04_334782 CCB 3 3/19 1354	Sodium	0.01937	0.0969	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS04_334782 CCB 4 3/19 1422	Sodium	0.02073	0.1037	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS04_334782 CCB 5 3/19 1454	Sodium	0.03551	0.1776	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS04_334782 CCB 6 3/19 1523	Sodium	0.02522	0.1261	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS04_334870 CCB 17 3/21 0212	Sodium	0.1427	0.7135	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS04_334969 CCB 10 3/21 1916	Sodium	0.03999	0.2000	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS04_334969 CCB 9 3/21 1849	Sodium	0.05722	0.2861	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS04_335069 CCB 16 3/23 0020	Sodium	0.08272	0.4136	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS04_335069 CCB 17 3/23 0038	Sodium	0.0621	0.3105	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS04_335069 CCB 17 3/23 0038	Sodium	0.0621	0.3105	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS04_335069 CCB 5 3/22 1613	Iron	0.01347	0.0674	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS04_336009 CCB 15 4/5 2333	Potassium	0.02041	0.1021	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS04_336009 CCB 15 4/5 2333	Selenium	0.001375	0.0069	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS04_336009 CCB 16 4/5 2355	Antimony	-0.000646	0.0032	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS04_336009 CCB 16 4/5 2355	Potassium	0.02579	0.1290	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS04_336009 CCB 17 4/6 0011	Antimony	-0.000704	0.0035	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS04_336146 CCB 1 4/8 1344	Sodium	0.01524	0.0762	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS04_336146 CCB 2 4/8 1413	Sodium	0.02231	0.1116	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS05_334713 CCB 11 3/18 1902	Arsenic	-0.000548	0.0027	mg/L	None; analyte not detected
ICPMS05_334713 CCB 11 3/18 1902	Calcium	0.04074	0.2037	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS05_334713 CCB 20 3/19 0203	Potassium	-0.037	0.1850	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS05_334967 CCB 11 3/22 0032	Antimony	0.001406	0.0070	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS05_334967 CCB 11 3/22 0032	Calcium	0.06396	0.3198	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS05_334967 CCB 12 3/22 0100	Calcium	0.06009	0.3005	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS05_334967 CCB 12 3/22 0100	Calcium	0.06009	0.3005	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS05_334967 CCB 12 3/22 0100	Sodium	0.1763	0.8815	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS05_334967 CCB 13 3/22 0127	Calcium	0.05883	0.2942	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS05_334967 CCB 13 3/22 0127	Sodium	0.08531	0.4266	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS05_335065 CCB 1 3/22 1350	Antimony	0.000559	0.0028	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS05_335065 CCB 17 3/23 0013	Sodium	0.2939	1.4695	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS05_335065 CCB 18 3/23 0039	Sodium	0.1573	0.7865	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS05_335065 CCB 2 3/22 1412	Antimony	0.000489	0.0024	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS05_335065 CCB 3 3/22 1449	Sodium	0.04572	0.2286	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS05_335065 CCB 4 3/22 1516	Sodium	0.0358	0.1790	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS05_335168 CCB 1 3/25 1238	Sodium	0.08468	0.4234	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS05_335168 CCB 2 3/25 1306	Sodium	0.1776	0.8880	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS05_336145 CCB 19 4/9 0124	Antimony	0.00058	0.0029	mg/L	None; analyte not detected
ICPMS05_336145 CCB 20 4/9 0150	Antimony	0.000476	0.0024	mg/L	None; analyte not detected
ICPMS05_336145 CCB 8 4/8 1820	Antimony	0.001646	0.0082	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS05_336226 CCB 1 4/9 1253	Sodium	0.01428	0.0714	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPS04_334708 CCB 12 3/18 2015	Iron	0.06309	0.3155	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPS04_334708 CCB 5 3/18 1642	Antimony	0.00153	0.0077	mg/L	None; analyte not detected
ICPS04_334708 CCB 5 3/18 1642	Iron	0.05645	0.2823	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPS04_334708 CCB 6 3/18 1714	Iron	0.05585	0.2793	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPS04_334708 CCB 8 3/18 1819	Sodium	0.0749	0.3745	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPS04_334708 CCB 9 3/18 1849	Sodium	0.0573	0.2865	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPS04_334782 CCB 18 3/19 0108	Antimony	0.000477	0.0024	mg/L	None; analyte not detected
ICPS04_334782 CCB 2 3/19 1328	Sodium	0.01949	0.0975	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPS04_334782 CCB 3 3/19 1354	Sodium	0.01937	0.0969	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPS04_334782 CCB 5 3/19 1454	Sodium	0.03551	0.1776	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPS04_334782 CCB 8 3/19 1726	Arsenic	-0.000462	0.0023	mg/L	None; analyte not detected
ICPS04_334782 CCB 8 3/19 1726	Cadmium	0.000201	0.0010	mg/L	None; analyte not detected
ICPS04_334782 CCB 8 3/19 1726	Calcium	0.06372	0.3186	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPS04_334782 CCB 8 3/19 1726	Iron	0.04073	0.2037	mg/L	None; analyte not detected
ICPS04_334782 CCB 8 3/19 1726	Magnesium	0.01313	0.0657	mg/L	None; analyte concentrations greater than five times the blank concentration
ICS2100_335413	Chloride	0.228	1.1400	mg/L	None; analyte concentrations greater than five times the blank concentration

TABLE 5 - BLANK DETECTIONS

Lab Sample ID	Analyte	Result	Qualified Concentration	Units	Explanation
MBLK-138728	Iron	0.01542	0.07710	mg/L	None; analyte concentrations greater than five times the blank concentration
MBLK-138728	Magnesium	0.01122	0.05610	mg/L	None; analyte concentrations greater than five times the blank concentration
MBLK-138728	Magnesium	0.01122	0.05610	mg/L	None; analyte concentrations greater than five times the blank concentration
MBLK-138728	Sodium	0.05078	0.25390	mg/L	None; analyte concentrations greater than five times the blank concentration
MBLK-138728	Sodium	0.05078	0.25390	mg/L	None; analyte concentrations greater than five times the blank concentration
MBLK-138729	Sodium	0.1303	0.6515	mg/L	None; analyte concentrations greater than five times the blank concentration
MBLK-138729	Sodium	0.1303	0.6515	mg/L	None; analyte concentrations greater than five times the blank concentration
MBLK-138730	Magnesium	0.01201	0.06005	mg/L	None; analyte concentrations greater than five times the blank concentration
MBLK-138730	Magnesium	0.01201	0.06005	mg/L	None; analyte concentrations greater than five times the blank concentration
MBLK-138731	Magnesium	0.01017	0.05085	mg/L	None; analyte concentrations greater than five times the blank concentration
MBLK-138731	Magnesium	0.01017	0.05085	mg/L	None; analyte concentrations greater than five times the blank concentration
MBLK-138731	Sodium	0.1598	0.7990	mg/L	None; analyte concentrations greater than five times the blank concentration
MBLK-138731	Sodium	0.1598	0.7990	mg/L	None; analyte concentrations greater than five times the blank concentration
MBLK-138830	Magnesium	0.01649	0.08245	mg/L	None; analyte concentrations greater than five times the blank concentration
MBLK-138830	Sodium	0.02564	0.12820	mg/L	None; analyte concentrations greater than five times the blank concentration
MBLK-138836	Sodium	0.04928	0.24640	mg/L	None; analyte concentrations greater than five times the blank concentration
MBLK-138836	Sodium	0.04928	0.24640	mg/L	None; analyte concentrations greater than five times the blank concentration
MBLK-138891	Magnesium	0.01039	0.05195	mg/L	None; analyte concentrations greater than five times the blank concentration
MBLK-138891	Magnesium	0.01039	0.05195	mg/L	None; analyte concentrations greater than five times the blank concentration
MBLK-138891	Sodium	0.06281	0.31405	mg/L	None; analyte concentrations greater than five times the blank concentration
MBLK-138891	Sodium	0.06281	0.31405	mg/L	None; analyte concentrations greater than five times the blank concentration
MBLK-138938	Magnesium	0.01005	0.05025	mg/L	None; analyte concentrations greater than five times the blank concentration
MBLK-138938	Magnesium	0.01005	0.05025	mg/L	None; analyte concentrations greater than five times the blank concentration
MBLK-138938	Sodium	0.01569	0.07845	mg/L	None; analyte concentrations greater than five times the blank concentration
MBLK-138938	Sodium	0.01569	0.07845	mg/L	None; analyte concentrations greater than five times the blank concentration
MBLK-139517	Sodium	0.03054	0.15270	mg/L	None; analyte concentrations greater than five times the blank concentration
MBLK-139518	Sodium	0.01453	0.073	mg/L	None; analyte concentrations greater than five times the blank concentration
MBLKF1-139518	Magnesium	0.01033	0.05165	mg/L	None; analyte concentrations greater than five times the blank concentration
MBLKF1-139518	Sodium	0.06118	0.30590	mg/L	None; analyte concentrations greater than five times the blank concentration
MBLKF1-139589	Potassium	0.02414	0.12070	mg/L	None; analyte concentrations greater than five times the blank concentration
MBLKF1-139589	Sodium	0.06463	0.32315	mg/L	None; analyte concentrations greater than five times the blank concentration
MBLKF2-139518	Magnesium	0.0111	0.05550	mg/L	None; analyte concentrations greater than five times the blank concentration
MBLKF2-139518	Sodium	0.02428	0.12140	mg/L	None; analyte concentrations greater than five times the blank concentration

Notes:
U - Not detected; the analyte was detected <5x the level in an associated blank and is not detected above the reported sample concentration.
mg/L - milligrams per liter

TABLE 6 - PRECISION AND ACCURACY

Sample	Analyte	Spike Recovery (%R)	Spike Duplicate Recovery (%R)	Precision	Qualification
20190225-DGW-MW3-PV35-out-controlT	Calcium	45.8	32.1	0.547	None; sample concentration greater than 4x spike concentration
20190225-DGW-MW3-PV35-out-controlT	Sodium	1.57	13.4	0.296	None; sample concentration greater than 4x spike concentration
20190225-DGW-MW3-PV35out-controlD	Sodium	24.9	126	2.49	None; sample concentration greater than 4x spike concentration
20190305-DGW-MW11-PV30mid-40T	Calcium	412	131	4.28	None; sample concentration greater than 4x spike concentration
20190305-DGW-MW11-PV30mid-40T	Magnesium	414	125	5.17	None; sample concentration greater than 4x spike concentration
20190305-DGW-MW11-PV30mid-40T	Sodium	1540	107	4.55	None; sample concentration greater than 4x spike concentration
20190303-DGW-MW11-PV30-out-30D-DUP	Calcium	50.2	-30.6	1.33	None; sample concentration greater than 4x spike concentration
20190303-DGW-MW11-PV30-out-30D-DUP	Magnesium	336	302	0.578	None; sample concentration greater than 4x spike concentration
20190303-DGW-MW11-PV30-out-30D-DUP	Sodium	1530	1490	0.0913	None; sample concentration greater than 4x spike concentration
20190312-DGW-MW3-PV40out-controlT	Calcium	97.4	56.3	1.72	None; sample concentration greater than 4x spike concentration
20190312-DGW-MW3-PV40out-controlT	Sodium	-6.26	-9.44	0.0845	None; sample concentration greater than 4x spike concentration
20190312-DGW-MW3-PV40out-controlT	Calcium (PDS)	47.3	NA	NA	None; sample concentration greater than 4x spike concentration
20190314-DGW-MW11-PV35out-controlD	Calcium	281	242	0.392	None; sample concentration greater than 4x spike concentration
20190314-DGW-MW11-PV35out-controlD	Calcium (PDS)	139	NA	NA	None; sample concentration greater than 4x spike concentration
20190314-DGW-MW11-PV35out-controlD	Magnesium	212	223	0.192	None; sample concentration greater than 4x spike concentration
20190314-DGW-MW11-PV35out-controlD	Magnesium (PDS)	131	NA	NA	None; sample concentration greater than 4x spike concentration
20190314-DGW-MW11-PV35out-controlD	Sodium	704	1250	1.53	None; sample concentration greater than 4x spike concentration
20190314-DGW-MW11-PV35out-controlT	Calcium	534	536	0.026	None; sample concentration greater than 4x spike concentration
20190314-DGW-MW11-PV35out-controlT	Magnesium	249	306	1.05	None; sample concentration greater than 4x spike concentration
20190314-DGW-MW11-PV35out-controlT	Sodium	1400	1090	0.951	None; sample concentration greater than 4x spike concentration
20190325-FD-PV40out-control	Sulfate	-99.3	-48.8	1.06	None; sample concentration greater than 4x spike concentration
20190326-FD-PV40out-control-T	Calcium	181	-52.8	5.4	None; sample concentration greater than 4x spike concentration
20190326-FD-PV40out-control-T	Sodium	93.5	-293	7.38	None; sample concentration greater than 4x spike concentration
20190326-FD-PV40out-control-D	Calcium	-5.13	59.7	1.47	None; sample concentration greater than 4x spike concentration
20190326-FD-PV40out-control-D	Sodium	-3.61	166	3.21	None; sample concentration greater than 4x spike concentration
2019-0326-DGW-MW11-PV40-out-control-D	Calcium	-158	8.41	1.68	None; sample concentration greater than 4x spike concentration
2019-0326-DGW-MW11-PV40-out-control-D	Magnesium	16.4	60.9	0.753	None; sample concentration greater than 4x spike concentration
2019-0326-DGW-MW11-PV40-out-control-D	Sodium	-160	-321	0.475	None; sample concentration greater than 4x spike concentration

Notes:
JL - Estimated data; data are qualified do to exceedance of one or more quality control criteria. Potential low bias.
LCS - Laboratory control sample
mg/L - milligrams per liter
NA - Not applicable
SD - Serial dilution
%R - percent recovery

TABLE 7 - DUPLICATE PRECISION CALCULATIONS

Duplicate and Parent Sample Field Identification	Analyte	Sample Result	Duplicate Result	RPD[a]	Accept or Reject	Qualifier Added
DGW-MW11-PV30out-30 / DGW-MW11-PV30out-30-DUP (March 2019)	Hardness (as CaCO3)	2050	1910	7.1	A	NA
	Calcium, dissolved	332	302	9.5	A	NA
	Calcium, total	328	313	4.7	A	NA
	Iron, dissolved	0.547 J	0.0600 U	160	A	J
	Iron, total	1.97	1.64	18.3	A	NA
	Magnesium, dissolved	299	284	5.1	A	NA
	Magnesium, total	298	273	8.8	A	NA
	Potassium, dissolved	19.5	17.9	8.6	A	NA
	Potassium, total	19.0	18.0	5.4	A	NA
	Sodium, dissolved	1770	1810	2.2	A	NA
	Sodium, total	1710	1750	2.3	A	NA
FD-PV30mid-35 / FD-PV30mid-35-DUP (February/March 2019)	Hardness (as CaCO3)	478	478	0.0	A	NA
	Calcium, total	190	190	0.0	A	NA
	Calcium, dissolved	194	197	1.5	A	NA
	Iron, total	1.01	0.666	41	A	J
	Iron, dissolved	0.125 J	0.249	66	A	NA (MQL)
	Magnesium, total	0.915	0.934	2.1	A	NA
	Magnesium, dissolved	0.934	0.943	1.0	A	NA
	Potassium, total	11.6	11.7	0.86	A	NA
	Potassium, dissolved	12.5	12.3	1.6	A	NA
	Sodium, total	260	256	1.6	A	NA
	Sodium, dissolved	261	261	0.0	A	NA
DGW-MW3-PV40inlet-30-35-40 / DGW-MW3-PV40inlet-30-35-40-Dup	Hardness (as CaCO3)	355	357	0.56	A	NA
	Antimony, dissolved	0.000402 J	0.000616 J	42	A	NA (MQL)
	Arsenic, total	0.00905	0.00923	2.0	A	NA
	Arsenic, dissolved	0.00556	0.00541	2.7	A	NA
	Calcium, total	110	109	0.91	A	NA
	Calcium, dissolved	120	123	2.5	A	NA
	Iron, total	0.475	0.461	3.0	A	NA
	Iron, dissolved	0.0305 J	0.0227 J	29	A	NA
	Magnesium, total	19.5	20.7	6.0	A	NA
	Magnesium, dissolved	21.5	21.2	1.4	A	NA
	Potassium, total	1.88	1.95	3.7	A	NA
	Potassium, dissolved	2.02	2.04	1.0	A	NA
	Selenium, total	0.00160 J	0.00116 J	32	A	NA (MQL)
	Selenium, dissolved	0.00138 J	0.00152 J	9.7	A	NA
	Sodium, total	182	192	5.3	A	NA
	Sodium, dissolved	186	179	3.8	A	NA

TABLE 7 - DUPLICATE PRECISION CALCULATIONS

Duplicate and Parent Sample Field Identification	Analyte	Sample Result	Duplicate Result	RPD[a]	Accept or Reject	Qualifier Added
FD-PV40inlet-control / FD-PV40inlet-control-DUP	Hardness (as CaCO3)	472	530	12	A	NA
	Antimony, total	0.0342	0.0352	2.9	A	NA
	Antimony, dissolved	0.0334	0.0335	0.30	A	NA
	Arsenic, total	0.00148 J	0.00123 J	18	A	NA
	Arsenic, dissolved	0.00136 J	0.00121 J	12	A	NA
	Calcium, total	187	210	12	A	NA
	Calcium, dissolved	195	192	1.6	A	NA
	Iron, total	0.0141 J	0.0136 J	3.6	A	NA
	Lead, total	0.000600 U	0.000823 J	31	A	NA (MQL)
	Magnesium, total	1.19	1.26	5.7	A	NA
	Magnesium, dissolved	1.26	1.33	5.4	A	NA
	Potassium, total	12.1	12.8	5.6	A	NA
	Potassium, dissolved	12.4	12.8	3.2	A	NA
	Selenium, total	0.00775	0.00824	6.1	A	NA
	Selenium, dissolved	0.00861	0.00868	0.81	A	NA
	Sodium, total	242	270	11	A	NA
	Sodium, dissolved	251	251	0.0	A	NA
DGW-MW11-PV40inlet-control / DGW-MW11-PV40inlet-control-DUP	Hardness (as CaCO3)	2340	2480	5.8	A	NA
	Cadmium, total	0.00646 J	0.00722 J	11	A	NA
	Cadmium, dissolved	0.00746 J	0.00683 J	8.8	A	NA
	Calcium, total	477	502	5.1	A	NA
	Calcium, dissolved	513	475	7.7	A	NA
	Iron, total	4.24	4.47	5.3	A	NA
	Iron, dissolved	1.68	1.58	6.1	A	NA
	Magnesium, total	280	298	6.2	A	NA
	Magnesium, dissolved	309	286	7.7	A	NA
	Potassium, total	18.2	19.0	4.3	A	NA
	Potassium, dissolved	19.5	18.0	8.0	A	NA
	Selenium, dissolved	0.00914 J	0.0106	14.8	A	NA
	Sodium, total	1670	1740	4.1	A	NA
	Sodium, dissolved	1700	1650	3.0	A	NA

Notes:

[a] Relative Percent Difference (RPD) = ((SR - DR)*200)/(SR + DR), where SR is the sample result and DR is the duplicate result.
The RPD test (<30%) applies if both results are greater than 5x MQL. Otherwise, the absolute difference test (< 2x MQL) applies.

A - Acceptable Data

J - Estimated

MQL - Method quanitation limit

NA - Not applicable

U - Not detected

DATA USABILITY SUMMARY

PROJECT NO: 130-2086-06 **CLIENT:** Exide Technologies

SAMPLE DATES: March 26, 2019 to May 9, 2019

LABORATORY: ALS Group (Houston, Texas)

WORK ORDERS: HS19031391, HS19040564, HS19041287, HS19041290, HS19041731, HS19041735, HS19050331, HS19050338, HS19050692, HS19050693

INTENDED USE: Column Study

SITE: Exide Recycling Center, 7471 5th Street, Frisco, TX

TESTS/METHODS

- SW-846 6020A - Inductively Coupled Plasma-Mass Spectrometry (ICP/MS)

SAMPLES

Table 1 lists the field and laboratory identification and analyses requested for 112 aqueous samples.

Golder completed a review of the analytical data for conformance with the requirements of the Texas Risk Reduction Program (TRRP) guidance document, Review and Reporting of COC Concentration Data (RGG-366/TRRP-13 Revised May 2010) and for adherence to project objectives. The results of the review are discussed in this data usability summary (DUS). Golder completed the review using the following submittals:

- Laboratory reportable data as defined in TRRP-13;
- Laboratory review checklists (LRC) with the associated exception reports; and
- Laboratory Electronic Data Deliverable (EDD).

The review of the reportable data included the quality control (QC) parameters listed below, as required per TRRP-13, using the applicable analytical method requirements:

- Data Completeness
- Chain-of-Custody Procedures
- Sample Condition - Holding Time, Preservation, and Containers
- Field Procedures
- Results Reporting Procedures – Total versus dissolved metals comparison and Detectability Check Sample (DCS)

- Field and Laboratory Blanks
- Laboratory Control Spike (LCS)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries
- Field Duplicate and Treatability Study Replicate Precision

Additionally, Golder used the LRC to evaluate the following QC parameters:

- Method Quantitation Limits (MQLs)
- Method Detection Limits (MDLs) and Sample Detection Limits (SDLs)
- Instrument Tuning, Calibration, and Performance
- Internal Standards

Criteria used for this data usability review are as follows:

- Precision: ±MQL difference or 30% relative percent difference (RPD) for laboratory duplicates or laboratory replicates; and ± 2x MQL difference (if either result is less than 5x MQL) for field duplicates as recommended in TRRP-13
- Accuracy: 70-130% spike recovery (and not less than 30% or data is rejected) as recommended in TRRP-13

If an item was found outside of the review criteria, the reviewer applied a data qualifier and bias code to the results for the affected samples in accordance with TRRP-13. Table 2 lists the qualified data, qualifiers, and reason for qualification.

LABORATORY CERTIFICATION

At the time the laboratory data were generated for this project, the laboratory was NELAC accredited under the Texas Laboratory Accreditation Program (TLAP Certification T104704231) for the matrices, methods and parameters of analysis requested on the chain-of-custody forms.

USABILITY SUMMARY

Data are usable for the intended purpose. A list of all qualified results and definitions of the qualifier and bias codes are given in Table 2.

Reviewer: Samantha DiCenso 5/15/2019

QUALITY CONTROL PARAMETERS AND OUTCOMES

Data Completeness

The laboratory data package contains necessary data (i.e., the laboratory reportable data per TRRP-13) and the EDD contains sample results in acceptable format.

Chain-of-Custody

Proper sample custody procedures were used, which confirms that the integrity of the samples was maintained. The information on the custody records is complete and agrees with that in the field notes and laboratory reports.

Sample Condition

Samples were collected in appropriate containers and properly preserved. Samples for metals analyses were received at temperatures greater than 6°C; temperature preservation is not required for metals analyses. Samples were prepared and analyzed within the holding times required by the analytical method.

Field Procedures

The samples were collected and placed immediately into laboratory supplied containers and then into a cooler for overnight delivery to the laboratory.

Results Reporting Procedures

Water results are reported in milligrams/liter (mg/L). Non-detects are reported using the SDL as specified per TRRP and detects between the SDL and MQL are reported with a laboratory J-flag. The concentration reported for detects between the SDL and MQL is below the calibration range and thus is considered estimated. Results for the DCS are included in the laboratory data packages.

The dissolved metals concentrations were slightly above the total metals concentrations in some samples as shown on Table 3. Data are qualified as listed in Tables 2 and 3.

Field and Laboratory Blanks

No field blanks were collected.

Analytes detected in laboratory method and continuing calibration blanks which were detected in the associated field samples at concentrations within five times the blank concentration are listed in Table 4. Data are qualified if the sample concentration is within five times the blank concentration. Data are qualified as listed in Tables 2 and 4.

Laboratory Control Sample

The LCS recoveries (%R) were within the TRRP-13 recommended criteria of 70 -130 %R.

Matrix Spike Recovery

Non-project MS/MSD data were not evaluated. MS/MSD recoveries outside the TRRP-13 recommended criteria of 70 – 130%R are listed in Table 5. Precision was within the TRRP-13 recommended criteria of 30 RPD. Post-digestate spike (PDS) recoveries outside the TRRP-13 recommended criteria of 70 – 130%R are listed in Table 5.

The serial dilution percent differences were within method criteria of 10% difference. Data are qualified as shown in Tables 2 and 5.

Field Duplicate and Treatability Study Replicate Precision

Field duplicates are those samples collected at the same sample location, date and time, split in the field, and submitted to the analytical laboratory as unique samples. Laboratory replicates are those samples collected from the treatability study using the same field sample, treatment conditions, and submitted to the analytical laboratory as unique samples. Laboratory duplicates are internal analytical laboratory samples split in the analytical laboratory for two separate analyses. No field duplicates were collected. Treatability study replicate precision is summarized in Table 6. Replicate precision was within the TRRP-13 recommended criteria of 30 RPD or ± the MQL.

Instrument Tuning and Performance

According to the LRC, instrument tuning and interference check sample results met method requirements.

Instrument Calibration

According to the LRC, some calibration data did not meet method requirements. Data are qualified as shown in Tables 2 and 4.

Internal Standards

According to the LRC, internal standard areas were acceptable for ICP/MS analyses.

TABLE 1
CROSS REFERENCE OF FIELD SAMPLE IDENTIFICATIONS AND LABORATORY IDENTIFICATIONS

Field Sample ID	Lab Sample ID	Sample Date	Total Metals	Dissolved Metals	Anions	Total Dissolved Solids	Alkalinity or Hardness	Comments
20190326-NSF-D	HS19031391-01	3/26/19		✓				Dissolved metals MS/MSD, PDS, and SD
20190326-NSF-T	HS19031391-02	3/26/19	✓					Total metals MS/MSD, PDS, and SD
20190408-NSF-T0-controlFD-D	HS19040564-01	4/8/19		✓				Dissolved metals MS/MSD, PDS, and SD
20190408-NSF-T0-controlFD-T	HS19040564-02	4/8/19	✓					
20190408-NSF-T0-30MW3-D	HS19040564-03	4/8/19		✓				
20190408-NSF-T0-30MW3-T	HS19040564-04	4/8/19	✓					
20190408-NSF-T0-30FD-D	HS19040564-05	4/8/19		✓				
20190408-NSF-T0-30FD-T	HS19040564-06	4/8/19	✓					
20190408-NSF-T0-30MW11-D	HS19040564-07	4/8/19		✓				
20190408-NSF-T0-30MW11-T	HS19040564-08	4/8/19	✓					
20190416-NSF-PV63inlet-30MW3-D	HS19041287-01	4/16/19		✓				
20190416-NSF-PV63inlet-30MW3-T	HS19041287-02	4/16/19	✓					
20190416-NSF-PV63mid-30MW3-D	HS19041287-03	4/16/19		✓				
20190416-NSF-PV63mid-30MW3-T	HS19041287-04	4/16/19	✓					
20190416-NSF-PV63out-30MW3-D	HS19041287-05	4/16/19		✓				
20190416-NSF-PV63out-30MW3-T	HS19041287-06	4/16/19	✓					
20190416-NSF-PV56inlet-30FD-D	HS19041287-07	4/16/19		✓				
20190416-NSF-PV56inlet-30FD-T	HS19041287-08	4/16/19	✓					
20190416-NSF-PV56mid-30FD-D	HS19041287-09	4/16/19		✓				
20190416-NSF-PV56mid-30FD-T	HS19041287-10	4/16/19	✓					
20190416-NSF-PV56out-30FD-D	HS19041287-11	4/16/19		✓				
20190416-NSF-PV56out-30FD-T	HS19041287-12	4/16/19	✓					
20190416-NSF-PV55inlet-30MW11-D	HS19041290-01	4/16/19		✓				
20190416-NSF-PV55inlet-30MW11-T	HS19041290-02	4/16/19	✓					
20190416-NSF-PV55mid-30MW11-D	HS19041290-03	4/16/19		✓				
20190416-NSF-PV55mid-30MW11-T	HS19041290-04	4/16/19	✓					
20190416-NSF-PV55out-30MW11-D	HS19041290-05	4/16/19		✓				
20190416-NSF-PV55out-30MW11-T	HS19041290-06	4/16/19	✓					
20190416-NSF-PV56inlet-controlFD-D	HS19041290-07	4/16/19		✓				
20190416-NSF-PV56inlet-controlFD-T	HS19041290-08	4/16/19	✓					
20190416-NSF-PV56mid-controlFD-D	HS19041290-09	4/16/19		✓				
20190416-NSF-PV56mid-controlFD-T	HS19041290-10	4/16/19	✓					
20190416-NSF-PV56out-controlFD-D	HS19041290-11	4/16/19		✓				
20190416-NSF-PV56out-controlFD-T	HS19041290-12	4/16/19	✓					
20190426-NSF-PV65inlet-30MW11-D	HS19041731-01	4/26/19		✓				Dissolved metals MS/MSD, PDS, and SD
20190426-NSF-PV65inlet-30MW11-T	HS19041731-02	4/26/19	✓					
20190426-NSF-PV65inlet-30MW11-D-DUP	HS19041731-03	4/26/19		✓				Duplicate of sample 20190426-NSF-PV65inlet-30MW11-D
20190426-NSF-PV65inlet-30MW11-T-DUP	HS19041731-04	4/26/19	✓					Duplicate of sample 20190426-NSF-PV65inlet-30MW11-T
20190426-NSF-PV65mid-30MW11-D	HS19041731-05	4/26/19		✓				
20190426-NSF-PV65mid-30MW11-T	HS19041731-06	4/26/19	✓					
20190426-NSF-PV65out-30MW11-D	HS19041731-07	4/26/19		✓				
20190426-NSF-PV65out-30MW-11-T	HS19041731-08	4/26/19	✓					
20190426-NSF-PV66inlet-controlFD-D	HS19041731-09	4/26/19		✓				
20190426-NSF-PV66inlet-controlFD-T	HS19041731-10	4/26/19	✓					
20190426-NSF-PV66mid-controlFD-D	HS19041731-11	4/26/19		✓				
20190426-NSF-PV66mid-controlFD-T	HS19041731-12	4/26/19	✓					
20190426-NSF-PV66out-controlFD-D	HS19041731-13	4/26/19		✓				
20190426-NSF-PV66out-controlFD-T	HS19041731-14	4/26/19	✓					

TABLE 1
CROSS REFERENCE OF FIELD SAMPLE IDENTIFICATIONS AND LABORATORY IDENTIFICATIONS

Field Sample ID	Lab Sample ID	Sample Date	Total Metals	Dissolved Metals	Anions	Total Dissolved Solids	Alkalinity or Hardness	Comments
20190426-NSF-PV73inlet-30MW3-D	HS19041735-01	4/26/19		✓				
20190426-NSF-PV73inlet-30MW3-T	HS19041735-02	4/26/19	✓					
20190426-NSF-PV73mid-30MW3-D	HS19041735-03	4/26/19		✓				
20190426-NSF-PV73mid-30MW3-T	HS19041735-04	4/26/19	✓					
20190426-NSF-PV73out-30MW3-D	HS19041735-05	4/26/19		✓				
20190426-NSF-PV73out-30MW3-T	HS19041735-06	4/26/19	✓					
20190426-NSF-PV66inlet-30FD-D	HS19041735-07	4/26/19		✓				
20190426-NSF-PV66inlet-30FD-T	HS19041735-08	4/26/19	✓					
20190426-NSF-PV66inlet-30FD-D-DUP	HS19041735-09	4/26/19		✓				Duplicate of sample 20190426-NSF-PV66inlet-30FD-D
20190426-NSF-PV66inlet-30FD-T-DUP	HS19041735-10	4/26/19	✓					Duplicate of sample 20190426-NSF-PV66inlet-30FD-T
20190426-NSF-PV66mid-30FD-D	HS19041735-11	4/26/19		✓				
20190426-NSF-PV66mid-30FD-T	HS19041735-12	4/26/19	✓					
20190426-NSF-PV66out-30DFD-D	HS19041735-13	4/26/19		✓				
20190426-NSF-PV66out-30FD-T	HS19041735-14	4/26/19	✓					
20190503-NSF-PV75inlet-30MW11-D	HS19050331-01	5/3/19		✓				Dissolved metals MS/MSD, PDS, and SD
20190503-NSF-PV75inlet-30MW11-T	HS19050331-02	5/3/19	✓					Total metals MS/MSD, PDS, and SD
20190503-NSF-PV75mid-30MW11-D	HS19050331-03	5/3/19		✓				
20190503-NSF-PV75mid-30MW11-T	HS19050331-04	5/3/19	✓					
20190503-NSF-PV75out-30MW11-D	HS19050331-05	5/3/19		✓				
20190503-NSF-PV75out-30MW11-T	HS19050331-06	5/3/19	✓					
20190503-NSF-PV76inlet-controlFD-D	HS19050331-07	5/3/19		✓				
20190503-NSF-PV76inlet-controlFD-T	HS19050331-08	5/3/19	✓					
20190503-NSF-PV76mid-controlFD-D	HS19050331-09	5/3/19		✓				
20190503-NSF-PV76mid-controlFD-T	HS19050331-10	5/3/19	✓					
20190503-NSF-PV76out-controlFD-D	HS19050331-11	5/3/19		✓				
20190503-NSF-PV76out-controlFD-T	HS19050331-12	5/3/19	✓					
20190503-NSF-PV83inlet-30MW3-D	HS19050338-01	5/3/19		✓				
20190503-NSF-PV83inlet-30MW3-T	HS19050338-02	5/3/19	✓					
20190503-NSF-PV83mid-30MW3-D	HS19050338-03	5/3/19		✓				
20190503-NSF-PV83mid-30MW3-T	HS19050338-04	5/3/19	✓					
20190503-NSF-PV83out-30MW3-D	HS19050338-05	5/3/19		✓				
20190503-NSF-PV83out-30MW3-T	HS19050338-06	5/3/19	✓					
20190503-NSF-PV76inlet-30FD-D	HS19050338-07	5/3/19		✓				
20190503-NSF-PV76inlet-30FD-T	HS19050338-08	5/3/19	✓					
20190503-NSF-PV76mid-30FD-D	HS19050338-09	5/3/19		✓				
20190503-NSF-PV76mid-30FD-T	HS19050338-10	5/3/19	✓					
20190503-NSF-PV76out-30FD-D	HS19050338-11	5/3/19		✓				
20190503-NSF-PV76out-30FD-T	HS19050338-12	5/3/19	✓					
20190509-NSF-PV91inlet-30MW3-D	HS19050692-01	5/9/19		✓				Dissolved metals MS/MSD, PDS, and SD
20190509-NSF-PV91inlet-30MW3-T	HS19050692-02	5/9/19	✓					Total metals MS/MSD, PDS, and SD
20190509-NSF-PV91mid-30MW3-D	HS19050692-03	5/9/19		✓				
20190509-NSF-PV91mid-30MW3-T	HS19050692-04	5/9/19	✓					
20190509-NSF-PV91out-30MW3-D	HS19050692-05	5/9/19		✓				
20190509-NSF-PV91out-30MW3-T	HS19050692-06	5/9/19	✓					
20190509-NSF-PV84inlet-30FD-D	HS19050692-07	5/9/19		✓				
20190509-NSF-PV84inlet-30FD-T	HS19050692-08	5/9/19	✓					
20190509-NSF-PV84mid-30FD-D	HS19050692-09	5/9/19		✓				

TABLE 1
CROSS REFERENCE OF FIELD SAMPLE IDENTIFICATIONS AND LABORATORY IDENTIFICATIONS

Field Sample ID	Lab Sample ID	Sample Date	Total Metals	Dissolved Metals	Anions	Total Dissolved Solids	Alkalinity or Hardness	Comments
20190509-NSF-PV84mid-30FD-T	HS19050692-10	5/9/19	✓					
20190509-NSF-PV84out-30FD-D	HS19050692-11	5/9/19		✓				
20190509-NSF-PV84out-30FD-T	HS19050692-12	5/9/19	✓					
20190509-NSF-PV83inlet-30MW11-D	HS19050693-01	5/9/19		✓				
20190509-NSF-PV83inlet-30MW11-T	HS19050693-02	5/9/19	✓					
20190509-NSF-PV83mid-30MW11-D	HS19050693-03	5/9/19		✓				
20190509-NSF-PV83mid-30MW-11-T	HS19050693-04	5/9/19	✓					
20190509-NSF-PV83out-30MW11-D	HS19050693-05	5/9/19		✓				
20190509-NSF-PV83out-30MW11-T	HS19050693-06	5/9/19	✓					
20190509-NSF-PV84inlet-controlFD-D	HS19050693-07	5/9/19		✓				
20190509-NSF-PV84inlet-controlFD-T	HS19050693-08	5/9/19	✓					
20190509-NSF-PV84mid-controlFD-D	HS19050693-09	5/9/19		✓				
20190509-NSF-PV84mid-controlFD-T	HS19050693-10	5/9/19	✓					
20190509-NSF-PV84out-controlFD-D	HS19050693-11	5/9/19		✓				
20190509-NSF-PV84out-controlFD-T	HS19050693-12	5/9/19	✓					
20190509-NSF-PV84inlet-controlFD-D-DUP	HS19050693-13	5/9/19		✓				Duplicate of sample 20190509-NSF-PV84inlet-controlFD-D
20190509-NSF-PV84inlet-controlFD-T-DUP	HS19050693-14	5/9/19	✓					Duplicate of sample 20190509-NSF-PV84inlet-controlFD-T

Notes:
Anions, Total dissolved solids, alkalinity or hardness were not analyzed for this event.
MS/MSD - Matrix spike/matrix spike duplicate
PDS - Post digestate spike
SD - Serial dilution

TABLE 2 - QUALIFIED DATA

Field Sample ID	Lab Sample ID	Analyte	Result	Units	Qualifier	Explanation
20190416-NSF-PV55out-30MW11-T	HS19041290-06	Selenium	0.00508	mg/L	U	Analyte detected in laboratory blank
20190426-NSF-PV65out-30MW-11-T	HS19041731-08	Selenium	0.00187	mg/L	UJ	Analyte detected in laboratory blank
20190503-NSF-PV75mid-30MW11-D	HS19050331-03	Selenium (dissolved)	0.00375	mg/L	U	Analyte detected in laboratory blank
20190503-NSF-PV75out-30MW11-D	HS19050331-05	Selenium (dissolved)	0.00160	mg/L	U	Analyte detected in laboratory blank; Total/Dissolved concentration differences greater than 30 RPD
20190503-NSF-PV75out-30MW11-T	HS19050331-06	Antimony	0.000567	mg/L	U	Analyte detected in laboratory blank
20190503-NSF-PV75out-30MW11-T	HS19050331-06	Selenium	0.00151	mg/L	J	Total/Dissolved concentration differences greater than 30 RPD
20190503-NSF-PV83mid-30MW3-T	HS19050338-04	Arsenic	0.000511	mg/L	U	Analyte detected in laboratory blank
20190503-NSF-PV76mid-30FD-T	HS19050338-10	Arsenic	0.000733	mg/L	U	Analyte detected in laboratory blank
20190503-NSF-PV76out-30FD-D	HS19050338-11	Selenium (dissolved)	0.00607	mg/L	U	Analyte detected in laboratory blank
20190503-NSF-PV76out-30FD-T	HS19050338-12	Arsenic	0.000633	mg/L	U	Analyte detected in laboratory blank
20190509-NSF-PV91inlet-30MW3-D	HS19050692-01	Antimony (dissolved)	0.0877	mg/L	JL	MS/MSD recovery outside quality control limits
20190509-NSF-PV83mid-30MW11-D	HS19050693-03	Selenium (dissolved)	0.00232	mg/L	J	Total/Dissolved concentration differences greater than 30 RPD
20190509-NSF-PV83mid-30MW-11-T	HS19050693-04	Selenium	0.00550	mg/L	UJ	Total/Dissolved concentration differences greater than 30 RPD
20190509-NSF-PV83out-30MW11-D	HS19050693-05	Selenium (dissolved)	0.00180	mg/L	J	Total/Dissolved concentration differences greater than 30 RPD
20190509-NSF-PV83out-30MW11-T	HS19050693-06	Selenium	0.00550	mg/L	UJ	Total/Dissolved concentration differences greater than 30 RPD
20190509-NSF-PV84out-controlFD-D	HS19050693-11	Lead (dissolved)	0.000744	mg/L	J	Total/Dissolved concentration differences greater than 30 RPD
20190509-NSF-PV84out-controlFD-T	HS19050693-12	Lead	0.00300	mg/L	UJ	Total/Dissolved concentration differences greater than 30 RPD

Notes:
J - Estimated
L - Biased low
mg/L - Milligram per liter
MS/MSD - Matrix spike/matrix spike duplicate
RPD - Relative percent dference
U - Not detected

TABLE 3 - TOTAL VERSUS DISSOLVED COMPARISON

Sample	Analyte	Total Concentration	Dissolved Concentration	Precision (RPD)	Qualification
20190326-NSF	Antimony	0.0143	0.0156	8.7	Acceptable
20190326-NSF	Selenium	0.00360	0.00527	37.7	Acceptable (MQL)
20190408-NSF-T0-controlFD	Antimony	< 0.214	0.198	7.8	Acceptable
20190408-NSF-T0-controlFD	Cadmium	0.0718	0.0769	6.9	Acceptable
20190408-NSF-T0-30MW3	Antimony	< 0.138	0.126	9.1	Acceptable
20190408-NSF-T0-30FD	Arsenic	0.275	0.297	7.7	Acceptable
20190408-NSF-T0-30MW11	Selenium	1.89	1.91	1.1	Acceptable
20190416-NSF-PV63mid-30MW3	Antimony	0.00284	0.00304	6.8	Acceptable
20190416-NSF-PV63mid-30MW3	Selenium	0.247	0.294	17.4	Acceptable
20190416-NSF-PV63out-30MW3	Selenium	0.0237	0.0256	7.7	Acceptable
20190416-NSF-PV56inlet-30FD	Antimony	0.114	0.124	8.4	Acceptable
20190416-NSF-PV56mid-30FD	Selenium	<0.0120	7.16	199.3	Acceptable
20190416-NSF-PV56out-30FD	Selenium	0.0237	0.0256	7.7	Acceptable
20190416-NSF-PV56mid-controlFD	Antimony	0.160	0.183	13.4	Acceptable
20190416-NSF-PV56out-controlFD	Antimony	0.153	0.180	16.2	Acceptable
20190426-NSF-PV65inlet-30MW11	Antimony	0.0480	0.0537	11.2	Acceptable
20190426-NSF-PV65inlet-30MW11	Selenium	2.08	2.28	9.2	Acceptable
20190426-NSF-PV65inlet-30MW11-DUP	Antimony	0.0476	0.0491	3.1	Acceptable
20190426-NSF-PV65inlet-30MW11-DUP	Arsenic	0.293	0.304	3.7	Acceptable
20190426-NSF-PV65inlet-30MW11-DUP	Selenium	2.04	2.07	1.5	Acceptable
20190426-NSF-PV66inlet-controlFD	Antimony	0.0448	0.0462	3.1	Acceptable
20190426-NSF-PV66mid-controlFD	Antimony	0.0450	0.0500	10.5	Acceptable
20190426-NSF-PV66mid-controlFD	Arsenic	0.186	0.209	11.6	Acceptable
20190426-NSF-PV66mid-controlFD	Cadmium	0.0476	0.0519	8.6	Acceptable
20190426-NSF-PV66out-controlFD	Antimony	0.0397	0.0477	18.3	Acceptable
20190426-NSF-PV66out-controlFD	Arsenic	0.188	0.224	17.5	Acceptable
20190426-NSF-PV66out-controlFD	Cadmium	0.0471	0.0519	9.7	Acceptable
20190426-NSF-PV66out-controlFD	Selenium	1.89	2.13	11.9	Acceptable
20190426-NSF-PV73inlet-30MW3	Antimony	0.0524	0.0575	9.3	Acceptable
20190426-NSF-PV73inlet-30MW3	Arsenic	0.285	0.316	10.3	Acceptable
20190426-NSF-PV73inlet-30MW3	Cadmium	0.0656	0.0693	5.5	Acceptable
20190426-NSF-PV73mid-30MW3	Antimony	0.00828	0.00836	1.0	Acceptable
20190426-NSF-PV73mid-30MW3	Selenium	0.686	0.781	13.0	Acceptable
20190426-NSF-PV66inlet-30FD	Antimony	0.0518	0.0548	5.6	Acceptable
20190426-NSF-PV66inlet-30FD	Arsenic	0.287	0.299	4.1	Acceptable
20190426-NSF-PV66inlet-30FD	Cadmium	0.0622	0.0661	6.1	Acceptable
20190426-NSF-PV66inlet-30FD-DUP	Cadmium	0.0640	0.0668	4.3	Acceptable
20190426-NSF-PV66mid-30FD	Selenium	0.521	0.561	7.4	Acceptable
20190426-NSF-PV66out-30DFD	Selenium	0.00477	0.00559	15.8	Acceptable
20190503-NSF-PV75mid-30MW11	Arsenic	< 0.000400	0.000889	75.9	Acceptable (MQL)
20190503-NSF-PV75mid-30MW11	Selenium	0.00371	0.00375	1.1	Acceptable
20190503-NSF-PV75out-30MW11	Arsenic	< 0.000400	0.000472 J	16.5	Acceptable
20190503-NSF-PV75out-30MW11	Selenium	0.00151 J	0.00160 J	101.2	J
20190503-NSF-PV76mid-controlFD	Antimony	0.0802	0.0845	5.2	Acceptable
20190503-NSF-PV76mid-controlFD	Selenium	2.10	2.25	6.9	Acceptable
20190503-NSF-PV76out-controlFD	Antimony	0.0808	0.0891	9.8	Acceptable
20190503-NSF-PV76out-controlFD	Arsenic	0.253	0.265	4.6	Acceptable
20190503-NSF-PV83inlet-30MW3	Selenium	2.18	2.20	0.9	Acceptable
20190503-NSF-PV83mid-30MW3	Arsenic	0.000511 J	0.000872 J	52.2	Acceptable (MQL)
20190503-NSF-PV83out-30MW3	Arsenic	< 0.000400	0.000682 J	52.1	Acceptable (MQL)
20190503-NSF-PV83out-30MW3	Selenium	0.127	0.134	5.4	Acceptable
20190503-NSF-PV76mid-30FD	Arsenic	0.000733 J	0.000878 J	18.0	Acceptable
20190503-NSF-PV76out-30FD	Selenium	0.00598	0.00607	1.5	Acceptable
20190503-NSF-PV83inlet-30MW3	Selenium	2.18	2.20	0.9	Acceptable
20190503-NSF-PV83mid-30MW3	Arsenic	0.000511	0.000872	52.2	Acceptable (MQL)
20190503-NSF-PV83out-30MW3	Arsenic	<0.000400	0.000682	52.2	Acceptable (MQL)
20190503-NSF-PV83out-30MW3	Selenium	0.127	0.134	5.4	Acceptable
20190509-NSF-PV91mid-30MW3	Antimony	0.0285	0.0291	2.1	Acceptable
20190509-NSF-PV91mid-30MW3	Selenium	1.02	1.17	13.7	Acceptable
20190509-NSF-PV91out-30MW3	Selenium	0.218	0.269	20.9	Acceptable
20190509-NSF-PV84mid-30FD	Antimony	<0.00200	0.00146 J	31.2	Acceptable (MQL)
20190509-NSF-PV84mid-30FD	Selenium	0.664	0.7530	12.6	Acceptable
20190509-NSF-PV84out-30FD	Selenium	<0.00550	0.00507	8.1	Acceptable

TABLE 3 - TOTAL VERSUS DISSOLVED COMPARISON

Sample	Analyte	Total Concentration	Dissolved Concentration	Precision (RPD)	Qualification
20190509-NSF-PV83inlet-30MW11	Antimony	0.0796	0.0876	9.6	Acceptable
20190509-NSF-PV83inlet-30MW11	Arsenic	0.286	0.298	4.1	Acceptable
20190509-NSF-PV83inlet-30MW11	Cadmium	0.0627	0.0635	1.3	Acceptable
20190509-NSF-PV83mid-30MW11	Arsenic	<0.00200	0.000481 J	126.4	Acceptable (MQL)
20190509-NSF-PV83mid-30MW11	Selenium	<0.00550	0.00232	81.3	J
20190509-NSF-PV83out-30MW11	Selenium	<0.00550	0.00180 J	101.4	J
20190509-NSF-PV84inlet-controlFD	Antimony	0.0860	0.0917	6.4	Acceptable
20190509-NSF-PV84inlet-controlFD	Arsenic	0.0776	0.0839	7.8	Acceptable
20190509-NSF-PV84mid-controlFD	Antimony	0.0722	0.0834	14.4	Acceptable
20190509-NSF-PV84mid-controlFD	Arsenic	0.0847	0.0932	9.6	Acceptable
20190509-NSF-PV84mid-controlFD	Cadmium	0.0566	0.0596	5.2	Acceptable
20190509-NSF-PV84out-controlFD	Antimony	0.0748	0.0754	0.8	Acceptable
20190509-NSF-PV84out-controlFD	Cadmium	0.0604	0.0606	0.3	Acceptable
20190509-NSF-PV84out-controlFD	Lead	<0.00300	0.000744 J	120.5	J
20190509-NSF-PV84inlet-controlFD-DUP	Cadmium	0.0671	0.0678	1.0	Acceptable

Notes:
mg/L - milligrams per liter
MQL - Method quantitation limit
RPD - relative percent difference
J - Estimated data; the analyte was detected and identified but one or more quality control criteria were not met.

TABLE 4 - BLANK DETECTIONS

Lab Sample ID	Analyte	Result	Qualified Concentration	Units	Explanation
MBLK-139202	Antimony (dissolved)	0.000415	0.0021	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS04_335460 CCB 10 3/28 1826	Antimony	0.0011	0.0055	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS04_336497 CCB 7 4/12 2252	Antimony	-0.0011	0.0055	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS04_337178 CCB 18 4/25 0000	Selenium	0.0013	0.0065	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS04_337345 CCB 17 4/27 0034	Selenium	0.0016	0.0079	mg/L	U: detection HS19041290-06
ICPMS04_337643 CCB 5 5/1 1711	Selenium	0.0013	0.0065	mg/L	U: detection HS19041731-08
ICPMS04_337643 CCB 6 5/1 1744	Selenium	0.0021	0.0106	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS05_338069 CCB 10 5/8 2320	Antimony	0.00070	0.0035	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS05_338069 CCB 11 5/8 2348	Antimony	0.00041	0.0021	mg/L	U: detection HS19050331-06
ICPMS06_338017 CCB 20 5/8 2331	Selenium (dissolved)	0.0013	0.0064	mg/L	U: detections HS19050331-03, -05
ICPMS05_338069 CCB 16 5/9 0207	Arsenic	0.00045	0.0023	mg/L	U: detections 19050338-04, -10, -12
ICPMS05_338069 CCB 16 5/9 0207	Iron	0.014	0.0687	mg/L	None; analyte concentrations greater than five times the blank concentration
ICPMS06_338017 CCB 21 5/8 2344	Selenium (dissolved)	0.0012	0.0061	mg/L	U: detection 19050338-11

Notes:
U - Not detected; the analyte was detected <5x the level in an associated blank and is not detected above the reported sample concentration.
mg/L - milligrams per liter

TABLE 5 - PRECISION AND ACCURACY

Sample	Analyte	Spike Recovery (%R)	Spike Duplicate Recovery (%R)	Precision	Qualification
20190408-NSF-T0-controlFD-D	Lead (dissolved)	135	163	1.41	None; sample concentration greater than 4x spike concentration
20190408-NSF-T0-controlFD-D	Selenium (dissolved)	185	241	1.25	None; sample concentration greater than 4x spike concentration
20190426-NSF-PV65inlet-30MW11-D	Arsenic (dissolved)	72.4	53.9	2.53	None; sample concentration greater than 4x spike concentration
20190426-NSF-PV65inlet-30MW11-D	Lead (dissolved)	-18.0	21.6	1.99	None; sample concentration greater than 4x spike concentration
20190426-NSF-PV65inlet-30MW11-D	Selenium (dissolved)	-293	-382	1.71	None; sample concentration greater than 4x spike concentration
20190503-NSF-PV75inlet-30MW11-T	Lead	121	133	0.984	None; sample concentration greater than 4x spike concentration
20190503-NSF-PV75inlet-30MW11-T	Selenium	190	105	1.79	None; sample concentration greater than 4x spike concentration
20190503-NSF-PV75inlet-30MW11-D	Arsenic	82.4	72.2	2.08	None; sample concentration greater than 4x spike concentration
20190503-NSF-PV75inlet-30MW11-D	Selenium	-155	-271	2.46	None; sample concentration greater than 4x spike concentration
20190509-NSF-PV91inlet-30MW3-D	Antimony	138	150	3.75	JL
20190509-NSF-PV91inlet-30MW3-D	Lead	150	11.3	12.9	None; sample concentration greater than 4x spike concentration
20190509-NSF-PV91inlet-30MW3-D	Selenium	150	232	1.51	None; sample concentration greater than 4x spike concentration
20190509-NSF-PV91inlet-30MW3-T	Arsenic	147	131	3.84	None; sample concentration greater than 4x spike concentration
20190509-NSF-PV91inlet-30MW3-T	Lead	340	562	6.7	None; sample concentration greater than 4x spike concentration
20190509-NSF-PV91inlet-30MW3-T	Selenium	192	150	0.575	None; sample concentration greater than 4x spike concentration
20190509-NSF-PV91inlet-30MW3-T	Lead	171	NA	NA	None; sample concentration greater than 4x spike concentration (PDS)

Notes:
JL - Estimated data; data are qualified do to exceedance of one or more quality control criteria. Potential low bias.
PDS - Post-digestate spike
NA - Not applicable
%R - percent recovery

TABLE 6 - DUPLICATE PRECISION CALCULATIONS

Duplicate and Parent Sample Field Identification	Analyte	Sample Result	Duplicate Result	RPD[a]	Accept or Reject	Qualifier Added
20190426-NSF-PV65inlet-30MW11 / 20190426-NSF-PV65inlet-30MW11-DUP	Antimony, dissolved	0.0537	0.0491	8.9	A	NA
	Antimony, total	0.0480	0.0476	0.8	A	NA
	Arsenic, dissolved	0.285	0.304	6.5	A	NA
	Arsenic, total	0.300	0.293	2.4	A	NA
	Cadmium, dissolved	0.0685	0.0653	4.8	A	NA
	Cadmium, total	0.0692	0.0682	1.5	A	NA
	Iron, total	0.141 J	0.159 J	12.0	A	NA
	Lead, dissolved	0.852	0.971	13.1	A	NA
	Lead, total	1.12	1.13	0.9	A	NA
	Selenium, dissolved	2.28	2.07	9.7	A	NA
	Selenium, total	2.08	2.04	1.9	A	NA
20190509-NSF-PV84inlet-controlFD / 20190509-NSF-PV84inlet-controlFD-DUP	Antimony, dissolved	0.0917	0.0857	6.8	A	NA
	Antimony, total	0.0860	0.0893	3.8	A	NA
	Arsenic, dissolved	0.0839	0.0776	7.8	A	NA
	Arsenic, total	0.0807	0.0870	7.5	A	NA
	Cadmium, dissolved	0.0650	0.0678	4.2	A	NA
	Cadmium, total	0.0669	0.0671	0.3	A	NA
	Iron, total	0.552 J	0.624 J	12.2	A	NA
	Lead, dissolved	0.863	0.896	3.8	A	NA
	Lead, total	1.30	1.35	3.8	A	NA
	Selenium, dissolved	2.11	1.95	7.9	A	NA
	Selenium, total	2.23	2.32	4.0	A	NA

Notes:

[a] Relative Percent Difference (RPD) = ((SR - DR)*200)/(SR + DR), where SR is the sample result and DR is the duplicate result.
The RPD test (<30%) applies if both results are greater than 5x MQL. Otherwise, the absolute difference test (< 2x MQL) applies.

A - Acceptable Data

J - Estimated

NA - Not applicable

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August 10, 2018

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS18080140**

Laboratory Results for: **Exide PDI Resample**

Dear Emily,

ALS Environmental received 11 sample(s) on Aug 02, 2018 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide PDI Resample	
WorkOrder:	**HS18080140**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide PDI Resample
WorkOrder:	**HS18080140**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data								
Laboratory Name: ALS Laboratory Group			LRC Date: 08/10/2018					
Project Name: Exide PDI Resample			Laboratory Job Number: HS18080140					
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 131197,131308					
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]	
R1	OI	**Chain-of-custody (C-O-C)**						
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X					
		Were all departures from standard conditions described in an exception report?	X					
R2	OI	**Sample and quality control (QC) identification**						
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X					
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X					
R3	OI	**Test reports**						
		Were all samples prepared and analyzed within holding times?	X					
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X					
		Were calculations checked by a peer or supervisor?	X					
		Were all analyte identifications checked by a peer or supervisor?	X					
		Were sample detection limits reported for all analytes not detected?	X					
		Were all results for soil and sediment samples reported on a dry weight basis?			X			
		Were % moisture (or solids) reported for all soil and sediment samples?			X			
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X			
		If required for the project, TICs reported?			X			
R4	O	**Surrogate recovery data**						
		Were surrogates added prior to extraction?			X			
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X			
R5	OI	**Test reports/summary forms for blank samples**						
		Were appropriate type(s) of blanks analyzed?	X					
		Were blanks analyzed at the appropriate frequency?	X					
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X					
		Were blank concentrations < MQL?	X					
R6	OI	**Laboratory control samples (LCS):**						
		Were all COCs included in the LCS?	X					
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X					
		Were LCSs analyzed at the required frequency?	X					
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X					
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X					
		Was the LCSD RPD within QC limits?	X					
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**						
		Were the project/method specified analytes included in the MS and MSD?	X					
		Were MS/MSD analyzed at the appropriate frequency?	X					
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	X					
		Were MS/MSD RPDs within laboratory QC limits?	X					
R8	OI	**Analytical duplicate data**						
		Were appropriate analytical duplicates analyzed for each matrix?			X			
		Were analytical duplicates analyzed at the appropriate frequency?			X			
		Were RPDs or relative standard deviations within the laboratory QC limits?			X			
R9	OI	**Method quantitation limits (MQLs):**						
		Are the MQLs for each method analyte included in the laboratory data package?	X					
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X					
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X					
R10	OI	**Other problems/anomalies**						
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X					
		Were all necessary corrective actions performed for the reported data?	X					
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X					
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X					

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 08/10/2018				
Project Name: Exide PDI Resample			Laboratory Job Number: HS18080140				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 131197,131308				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Data	
Laboratory Name: ALS Laboratory Group	LRC Date: 08/10/2018
Project Name: Exide PDI Resample	Laboratory Job Number: HS18080140
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 131197,131308

ER#[5]	Description
	No exceptions

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Client: Golder Associates
Project: Exide PDI Resample
Work Order: HS18080140

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18080140-01	DGW-MW-4	Groundwater		01-Aug-2018 10:23	02-Aug-2018 08:20	☐
HS18080140-02	DGW-MW-10S	Groundwater		01-Aug-2018 11:20	02-Aug-2018 08:20	☐
HS18080140-03	DGW-MW-11S	Groundwater		01-Aug-2018 12:05	02-Aug-2018 08:20	☐
HS18080140-04	DGW-MW-5	Groundwater		01-Aug-2018 15:00	02-Aug-2018 08:20	☐
HS18080140-05	DGW-MW-1	Groundwater		01-Aug-2018 15:50	02-Aug-2018 08:20	☐
HS18080140-06	DGW-MW-9	Groundwater		01-Aug-2018 15:55	02-Aug-2018 08:20	☐
HS18080140-07	DGW-MW-7	Groundwater		01-Aug-2018 16:45	02-Aug-2018 08:20	☐
HS18080140-08	DGW-MW-6	Groundwater		01-Aug-2018 16:55	02-Aug-2018 08:20	☐
HS18080140-09	DGW-MW-10	Groundwater		01-Aug-2018 17:57	02-Aug-2018 08:20	☐
HS18080140-10	MW-46	Groundwater		01-Aug-2018 18:40	02-Aug-2018 08:20	☐
HS18080140-11	DUP-03	Groundwater		01-Aug-2018 00:00	02-Aug-2018 08:20	☐

Client: Golder Associates
Project: Exide PDI Resample
Sample ID: DGW-MW-4
Collection Date: 01-Aug-2018 10:23

ANALYTICAL REPORT
WorkOrder:HS18080140
Lab ID:HS18080140-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 08-Aug-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	09-Aug-2018 18:38
Arsenic	**0.00616**		**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 18:38
Cadmium	U		0.000200	0.00200	mg/L	1	09-Aug-2018 18:38
Lead	U		0.000600	0.00200	mg/L	1	09-Aug-2018 18:38
Selenium	U		0.00110	0.00200	mg/L	1	09-Aug-2018 18:38
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 06-Aug-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	09-Aug-2018 01:13
Arsenic	**0.00632**		**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 01:13
Cadmium	U		0.000200	0.00200	mg/L	1	09-Aug-2018 01:13
Lead	**0.000943**	J	**0.000600**	**0.00200**	**mg/L**	1	09-Aug-2018 01:13
Selenium	U		0.00110	0.00200	mg/L	1	09-Aug-2018 01:13

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide PDI Resample
Sample ID: DGW-MW-10S
Collection Date: 01-Aug-2018 11:20

ANALYTICAL REPORT
WorkOrder:HS18080140
Lab ID:HS18080140-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 08-Aug-2018		Analyst: JDE
Antimony	**0.00136**	J	**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 18:48
Arsenic	**0.0412**		**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 18:48
Cadmium	**0.000293**	J	**0.000200**	**0.00200**	**mg/L**	1	09-Aug-2018 18:48
Lead	**0.00116**	J	**0.000600**	**0.00200**	**mg/L**	1	09-Aug-2018 18:48
Selenium	**0.00215**		**0.00110**	**0.00200**	**mg/L**	1	09-Aug-2018 18:48
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 06-Aug-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	09-Aug-2018 01:15
Arsenic	**0.0410**		**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 01:15
Cadmium	U		0.000200	0.00200	mg/L	1	09-Aug-2018 01:15
Lead	U		0.000600	0.00200	mg/L	1	09-Aug-2018 01:15
Selenium	**0.00224**		**0.00110**	**0.00200**	**mg/L**	1	09-Aug-2018 01:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide PDI Resample
Sample ID: DGW-MW-11S
Collection Date: 01-Aug-2018 12:05

ANALYTICAL REPORT
WorkOrder:HS18080140
Lab ID:HS18080140-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 08-Aug-2018		Analyst: JDE
Antimony	**0.00183**	J	**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 18:50
Arsenic	**0.0184**		**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 18:50
Cadmium	**0.00225**		**0.000200**	**0.00200**	**mg/L**	1	09-Aug-2018 18:50
Lead	**0.00299**		**0.000600**	**0.00200**	**mg/L**	1	09-Aug-2018 18:50
Selenium	**0.00250**		**0.00110**	**0.00200**	**mg/L**	1	09-Aug-2018 18:50
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 06-Aug-2018		Analyst: JDE
Antimony	**0.00121**	J	**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 01:17
Arsenic	**0.0183**		**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 01:17
Cadmium	**0.00191**	J	**0.000200**	**0.00200**	**mg/L**	1	09-Aug-2018 01:17
Lead	**0.00270**		**0.000600**	**0.00200**	**mg/L**	1	09-Aug-2018 01:17
Selenium	**0.00196**	J	**0.00110**	**0.00200**	**mg/L**	1	09-Aug-2018 01:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide PDI Resample
Sample ID: DGW-MW-5
Collection Date: 01-Aug-2018 15:00

ANALYTICAL REPORT
WorkOrder:HS18080140
Lab ID:HS18080140-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 08-Aug-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	09-Aug-2018 18:52
Arsenic	**0.00400**		**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 18:52
Cadmium	U		0.000200	0.00200	mg/L	1	09-Aug-2018 18:52
Lead	U		0.000600	0.00200	mg/L	1	09-Aug-2018 18:52
Selenium	U		0.00110	0.00200	mg/L	1	09-Aug-2018 18:52
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 06-Aug-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	09-Aug-2018 01:19
Arsenic	**0.00415**		**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 01:19
Cadmium	U		0.000200	0.00200	mg/L	1	09-Aug-2018 01:19
Lead	U		0.000600	0.00200	mg/L	1	09-Aug-2018 01:19
Selenium	U		0.00110	0.00200	mg/L	1	09-Aug-2018 01:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide PDI Resample
Sample ID: DGW-MW-1
Collection Date: 01-Aug-2018 15:50

ANALYTICAL REPORT
WorkOrder:HS18080140
Lab ID:HS18080140-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 08-Aug-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	09-Aug-2018 18:54
Arsenic	**0.00692**		**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 18:54
Cadmium	U		0.000200	0.00200	mg/L	1	09-Aug-2018 18:54
Lead	U		0.000600	0.00200	mg/L	1	09-Aug-2018 18:54
Selenium	U		0.00110	0.00200	mg/L	1	09-Aug-2018 18:54
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 06-Aug-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	09-Aug-2018 01:21
Arsenic	**0.00785**		**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 01:21
Cadmium	U		0.000200	0.00200	mg/L	1	09-Aug-2018 01:21
Lead	U		0.000600	0.00200	mg/L	1	09-Aug-2018 01:21
Selenium	U		0.00110	0.00200	mg/L	1	09-Aug-2018 01:21

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide PDI Resample
Sample ID: DGW-MW-9
Collection Date: 01-Aug-2018 15:55

ANALYTICAL REPORT
WorkOrder:HS18080140
Lab ID:HS18080140-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 08-Aug-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	09-Aug-2018 18:56
Arsenic	**0.00395**		**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 18:56
Cadmium	U		0.000200	0.00200	mg/L	1	09-Aug-2018 18:56
Lead	U		0.000600	0.00200	mg/L	1	09-Aug-2018 18:56
Selenium	U		0.00110	0.00200	mg/L	1	09-Aug-2018 18:56
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 06-Aug-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	09-Aug-2018 01:23
Arsenic	**0.00415**		**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 01:23
Cadmium	U		0.000200	0.00200	mg/L	1	09-Aug-2018 01:23
Lead	U		0.000600	0.00200	mg/L	1	09-Aug-2018 01:23
Selenium	U		0.00110	0.00200	mg/L	1	09-Aug-2018 01:23

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide PDI Resample
Sample ID: DGW-MW-7
Collection Date: 01-Aug-2018 16:45

ANALYTICAL REPORT
WorkOrder:HS18080140
Lab ID:HS18080140-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 08-Aug-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	09-Aug-2018 19:02
Arsenic	**0.0267**		**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 19:02
Cadmium	U		0.000200	0.00200	mg/L	1	09-Aug-2018 19:02
Lead	U		0.000600	0.00200	mg/L	1	09-Aug-2018 19:02
Selenium	U		0.00110	0.00200	mg/L	1	09-Aug-2018 19:02
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 06-Aug-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	09-Aug-2018 01:25
Arsenic	**0.0281**		**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 01:25
Cadmium	U		0.000200	0.00200	mg/L	1	09-Aug-2018 01:25
Lead	U		0.000600	0.00200	mg/L	1	09-Aug-2018 01:25
Selenium	**0.00130**	J	**0.00110**	**0.00200**	**mg/L**	1	09-Aug-2018 01:25

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide PDI Resample
Sample ID: DGW-MW-6
Collection Date: 01-Aug-2018 16:55

ANALYTICAL REPORT
WorkOrder:HS18080140
Lab ID:HS18080140-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 08-Aug-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	09-Aug-2018 19:04
Arsenic	**0.0108**		**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 19:04
Cadmium	U		0.000200	0.00200	mg/L	1	09-Aug-2018 19:04
Lead	**0.00153**	J	**0.000600**	**0.00200**	**mg/L**	1	09-Aug-2018 19:04
Selenium	U		0.00110	0.00200	mg/L	1	09-Aug-2018 19:04
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 06-Aug-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	09-Aug-2018 01:31
Arsenic	**0.00943**		**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 01:31
Cadmium	U		0.000200	0.00200	mg/L	1	09-Aug-2018 01:31
Lead	U		0.000600	0.00200	mg/L	1	09-Aug-2018 01:31
Selenium	U		0.00110	0.00200	mg/L	1	09-Aug-2018 01:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide PDI Resample
Sample ID: DGW-MW-10
Collection Date: 01-Aug-2018 17:57

ANALYTICAL REPORT
WorkOrder:HS18080140
Lab ID:HS18080140-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 08-Aug-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	09-Aug-2018 19:06
Arsenic	**0.0174**		**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 19:06
Cadmium	U		0.000200	0.00200	mg/L	1	09-Aug-2018 19:06
Lead	U		0.000600	0.00200	mg/L	1	09-Aug-2018 19:06
Selenium	**0.00150**	J	**0.00110**	**0.00200**	**mg/L**	1	09-Aug-2018 19:06
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 06-Aug-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	09-Aug-2018 01:33
Arsenic	**0.0186**		**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 01:33
Cadmium	U		0.000200	0.00200	mg/L	1	09-Aug-2018 01:33
Lead	U		0.000600	0.00200	mg/L	1	09-Aug-2018 01:33
Selenium	**0.00139**	J	**0.00110**	**0.00200**	**mg/L**	1	09-Aug-2018 01:33

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide PDI Resample
Sample ID: MW-46
Collection Date: 01-Aug-2018 18:40

ANALYTICAL REPORT
WorkOrder:HS18080140
Lab ID:HS18080140-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 08-Aug-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	09-Aug-2018 19:08
Arsenic	**0.00514**		**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 19:08
Cadmium	**0.000740**	J	**0.000200**	**0.00200**	**mg/L**	1	09-Aug-2018 19:08
Lead	**0.000876**	J	**0.000600**	**0.00200**	**mg/L**	1	09-Aug-2018 19:08
Selenium	**0.00134**	J	**0.00110**	**0.00200**	**mg/L**	1	09-Aug-2018 19:08
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 06-Aug-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	09-Aug-2018 01:35
Arsenic	**0.00481**		**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 01:35
Cadmium	**0.000776**	J	**0.000200**	**0.00200**	**mg/L**	1	09-Aug-2018 01:35
Lead	U		0.000600	0.00200	mg/L	1	09-Aug-2018 01:35
Selenium	**0.00163**	J	**0.00110**	**0.00200**	**mg/L**	1	09-Aug-2018 01:35

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide PDI Resample
Sample ID: DUP-03
Collection Date: 01-Aug-2018 00:00

ANALYTICAL REPORT
WorkOrder:HS18080140
Lab ID:HS18080140-11
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 08-Aug-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	09-Aug-2018 19:10
Arsenic	**0.00486**		**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 19:10
Cadmium	**0.000868**	J	**0.000200**	**0.00200**	**mg/L**	1	09-Aug-2018 19:10
Lead	**0.000912**	J	**0.000600**	**0.00200**	**mg/L**	1	09-Aug-2018 19:10
Selenium	**0.00136**	J	**0.00110**	**0.00200**	**mg/L**	1	09-Aug-2018 19:10
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 06-Aug-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	09-Aug-2018 01:37
Arsenic	**0.00478**		**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 01:37
Cadmium	**0.000741**	J	**0.000200**	**0.00200**	**mg/L**	1	09-Aug-2018 01:37
Lead	U		0.000600	0.00200	mg/L	1	09-Aug-2018 01:37
Selenium	**0.00158**	J	**0.00110**	**0.00200**	**mg/L**	1	09-Aug-2018 01:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide PDI Resample
WorkOrder: HS18080140

Batch ID: 131197 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18080140-01	1	10	10 (mL)	1
HS18080140-02	1	10	10 (mL)	1
HS18080140-03	1	10	10 (mL)	1
HS18080140-04	1	10	10 (mL)	1
HS18080140-05	1	10	10 (mL)	1
HS18080140-06	1	10	10 (mL)	1
HS18080140-07	1	10	10 (mL)	1
HS18080140-08	1	10	10 (mL)	1
HS18080140-09	1	10	10 (mL)	1
HS18080140-10	1	10	10 (mL)	1
HS18080140-11	1	10	10 (mL)	1

Batch ID: 131308 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18080140-01	1	10	10 (mL)	1
HS18080140-02	1	10	10 (mL)	1
HS18080140-03	1	10	10 (mL)	1
HS18080140-04	1	10	10 (mL)	1
HS18080140-05	1	10	10 (mL)	1
HS18080140-06	1	10	10 (mL)	1
HS18080140-07	1	10	10 (mL)	1
HS18080140-08	1	10	10 (mL)	1
HS18080140-09	1	10	10 (mL)	1
HS18080140-10	1	10	10 (mL)	1
HS18080140-11	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide PDI Resample
WorkOrder: HS18080140

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 131197	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS18080140-01	DGW-MW-4	01 Aug 2018 10:23		06 Aug 2018 09:52	09 Aug 2018 01:13	1
HS18080140-02	DGW-MW-10S	01 Aug 2018 11:20		06 Aug 2018 09:52	09 Aug 2018 01:15	1
HS18080140-03	DGW-MW-11S	01 Aug 2018 12:05		06 Aug 2018 09:52	09 Aug 2018 01:17	1
HS18080140-04	DGW-MW-5	01 Aug 2018 15:00		06 Aug 2018 09:52	09 Aug 2018 01:19	1
HS18080140-05	DGW-MW-1	01 Aug 2018 15:50		06 Aug 2018 09:52	09 Aug 2018 01:21	1
HS18080140-06	DGW-MW-9	01 Aug 2018 15:55		06 Aug 2018 09:52	09 Aug 2018 01:23	1
HS18080140-07	DGW-MW-7	01 Aug 2018 16:45		06 Aug 2018 09:52	09 Aug 2018 01:25	1
HS18080140-08	DGW-MW-6	01 Aug 2018 16:55		06 Aug 2018 09:52	09 Aug 2018 01:31	1
HS18080140-09	DGW-MW-10	01 Aug 2018 17:57		06 Aug 2018 09:52	09 Aug 2018 01:33	1
HS18080140-10	MW-46	01 Aug 2018 18:40		06 Aug 2018 09:52	09 Aug 2018 01:35	1
HS18080140-11	DUP-03	01 Aug 2018 00:00		06 Aug 2018 09:52	09 Aug 2018 01:37	1
Batch ID 131308	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS18080140-01	DGW-MW-4	01 Aug 2018 10:23		08 Aug 2018 13:00	09 Aug 2018 18:38	1
HS18080140-02	DGW-MW-10S	01 Aug 2018 11:20		08 Aug 2018 13:00	09 Aug 2018 18:48	1
HS18080140-03	DGW-MW-11S	01 Aug 2018 12:05		08 Aug 2018 13:00	09 Aug 2018 18:50	1
HS18080140-04	DGW-MW-5	01 Aug 2018 15:00		08 Aug 2018 13:00	09 Aug 2018 18:52	1
HS18080140-05	DGW-MW-1	01 Aug 2018 15:50		08 Aug 2018 13:00	09 Aug 2018 18:54	1
HS18080140-06	DGW-MW-9	01 Aug 2018 15:55		08 Aug 2018 13:00	09 Aug 2018 18:56	1
HS18080140-07	DGW-MW-7	01 Aug 2018 16:45		08 Aug 2018 13:00	09 Aug 2018 19:02	1
HS18080140-08	DGW-MW-6	01 Aug 2018 16:55		08 Aug 2018 13:00	09 Aug 2018 19:04	1
HS18080140-09	DGW-MW-10	01 Aug 2018 17:57		08 Aug 2018 13:00	09 Aug 2018 19:06	1
HS18080140-10	MW-46	01 Aug 2018 18:40		08 Aug 2018 13:00	09 Aug 2018 19:08	1
HS18080140-11	DUP-03	01 Aug 2018 00:00		08 Aug 2018 13:00	09 Aug 2018 19:10	1

WorkOrder: HS18080140
InstrumentID: ICPMS05
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.00100	0.00105	0.000400	0.00200
A	Arsenic	7440-38-2	0.00100	0.00103	0.000400	0.00200
A	Cadmium	7440-43-9	0.00100	0.000999	0.000200	0.00200
A	Lead	7439-92-1	0.00100	0.000964	0.000600	0.00200
A	Selenium	7782-49-2	0.00200	0.00203	0.00110	0.00200

WorkOrder: HS18080140
InstrumentID: ICPMS05
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.00100	0.00105	0.000400	0.00200
A	Arsenic	7440-38-2	0.00100	0.00103	0.000400	0.00200
A	Cadmium	7440-43-9	0.00100	0.000999	0.000200	0.00200
A	Lead	7439-92-1	0.00100	0.000964	0.000600	0.00200
A	Selenium	7782-49-2	0.00200	0.00203	0.00110	0.00200

Client: Golder Associates
Project: Exide PDI Resample
WorkOrder: HS18080140

QC BATCH REPORT

Batch ID: 131197 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLK-131197** Units: **mg/L** Analysis Date: **09-Aug-2018 01:09**
Client ID: Run ID: **ICPMS05_321327** SeqNo: **4685461** PrepDate: **06-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Lead	U	0.00200								
Selenium	U	0.00200								

LCS Sample ID: **LCS-131197** Units: **mg/L** Analysis Date: **09-Aug-2018 01:11**
Client ID: Run ID: **ICPMS05_321327** SeqNo: **4685462** PrepDate: **06-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04757	0.00200	0.05	0	95.1	80 - 120				
Arsenic	0.05169	0.00200	0.05	0	103	80 - 120				
Cadmium	0.04914	0.00200	0.05	0	98.3	80 - 120				
Lead	0.05004	0.00200	0.05	0	100	80 - 120				
Selenium	0.05565	0.00200	0.05	0	111	80 - 120				

MS Sample ID: **HS18080215-02MS** Units: **mg/L** Analysis Date: **09-Aug-2018 01:45**
Client ID: Run ID: **ICPMS05_321327** SeqNo: **4685479** PrepDate: **06-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04692	0.00200	0.05	0	93.8	75 - 125				
Arsenic	0.0563	0.00200	0.05	0.005732	101	75 - 125				
Cadmium	0.04714	0.00200	0.05	0	94.3	75 - 125				
Lead	0.04442	0.00200	0.05	0	88.8	75 - 125				
Selenium	0.05256	0.00200	0.05	0.001206	103	75 - 125				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide PDI Resample
WorkOrder: HS18080140

QC BATCH REPORT

Batch ID: 131197 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MSD Sample ID: **HS18080215-02MSD** Units: **mg/L** Analysis Date: **09-Aug-2018 01:47**
Client ID: Run ID: **ICPMS05_321327** SeqNo: **4685480** PrepDate: **06-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04503	0.00200	0.05	0	90.1	75 - 125	0.04692	4.12	20	
Arsenic	0.05458	0.00200	0.05	0.005732	97.7	75 - 125	0.0563	3.1	20	
Cadmium	0.04424	0.00200	0.05	0	88.5	75 - 125	0.04714	6.35	20	
Lead	0.04357	0.00200	0.05	0	87.1	75 - 125	0.04442	1.93	20	
Selenium	0.0507	0.00200	0.05	0.001206	99.0	75 - 125	0.05256	3.59	20	

PDS Sample ID: **HS18080215-02PDS** Units: **mg/L** Analysis Date: **09-Aug-2018 01:49**
Client ID: Run ID: **ICPMS05_321327** SeqNo: **4685481** PrepDate: **06-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09424	0.00200	0.1	0	94.2	75 - 125				
Arsenic	0.1083	0.00200	0.1	0.005732	103	75 - 125				
Cadmium	0.09296	0.00200	0.1	0	93.0	75 - 125				
Lead	0.09112	0.00200	0.1	0	91.1	75 - 125				
Selenium	0.1051	0.00200	0.1	0.001206	104	75 - 125				

SD Sample ID: **HS18080215-02SD** Units: **mg/L** Analysis Date: **09-Aug-2018 01:43**
Client ID: Run ID: **ICPMS05_321327** SeqNo: **4685478** PrepDate: **06-Aug-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0	0	10	
Arsenic	0.006322	0.0100					0.005732	0	10	J
Cadmium	U	0.0100					0	0	10	
Lead	U	0.0100					0	0	10	
Selenium	U	0.0100					0.001206	0	10	

The following samples were analyzed in this batch:

HS18080140-01	HS18080140-02	HS18080140-03	HS18080140-04
HS18080140-05	HS18080140-06	HS18080140-07	HS18080140-08
HS18080140-09	HS18080140-10	HS18080140-11	

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide PDI Resample
WorkOrder: HS18080140

QC BATCH REPORT

Batch ID: 131308 **Instrument: ICPMS05** **Method: SW6020**

MBLK Sample ID: **MBLK-131308** Units: **mg/L** Analysis Date: **09-Aug-2018 18:28**
Client ID: Run ID: **ICPMS05_321404** SeqNo: **4687228** PrepDate: **08-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Lead	U	0.00200								
Selenium	U	0.00200								

LCS Sample ID: **LCS-131308** Units: **mg/L** Analysis Date: **09-Aug-2018 18:30**
Client ID: Run ID: **ICPMS05_321404** SeqNo: **4687229** PrepDate: **08-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04937	0.00200	0.05	0	98.7	80 - 120				
Arsenic	0.04823	0.00200	0.05	0	96.5	80 - 120				
Cadmium	0.04831	0.00200	0.05	0	96.6	80 - 120				
Lead	0.04781	0.00200	0.05	0	95.6	80 - 120				
Selenium	0.04903	0.00200	0.05	0	98.1	80 - 120				

MS Sample ID: **HS18080140-01MS** Units: **mg/L** Analysis Date: **09-Aug-2018 18:42**
Client ID: **DGW-MW-4** Run ID: **ICPMS05_321404** SeqNo: **4687235** PrepDate: **08-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05386	0.00200	0.05	0	108	80 - 120				
Arsenic	0.05942	0.00200	0.05	0.006155	107	80 - 120				
Cadmium	0.04925	0.00200	0.05	0	98.5	80 - 120				
Lead	0.04323	0.00200	0.05	0	86.5	80 - 120				
Selenium	0.05372	0.00200	0.05	0	107	80 - 120				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide PDI Resample
WorkOrder: HS18080140

QC BATCH REPORT

Batch ID: 131308 **Instrument: ICPMS05** **Method: SW6020**

MSD Sample ID: **HS18080140-01MSD** Units: **mg/L** Analysis Date: **09-Aug-2018 18:44**
Client ID: **DGW-MW-4** Run ID: **ICPMS05_321404** SeqNo: **4687236** PrepDate: **08-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05129	0.00200	0.05	0	103	80 - 120	0.05386	4.89	20	
Arsenic	0.05659	0.00200	0.05	0.006155	101	80 - 120	0.05942	4.89	20	
Cadmium	0.05114	0.00200	0.05	0	102	80 - 120	0.04925	3.77	20	
Lead	0.04336	0.00200	0.05	0	86.7	80 - 120	0.04323	0.314	20	
Selenium	0.05199	0.00200	0.05	0	104	80 - 120	0.05372	3.27	20	

PDS Sample ID: **HS18080140-01PDS** Units: **mg/L** Analysis Date: **09-Aug-2018 18:46**
Client ID: **DGW-MW-4** Run ID: **ICPMS05_321404** SeqNo: **4687237** PrepDate: **08-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.08966	0.00200	0.1	0.000176	89.5	75 - 125				
Arsenic	0.09967	0.00200	0.1	0.006155	93.5	75 - 125				
Cadmium	0.09174	0.00200	0.1	0.000012	91.7	75 - 125				
Lead	0.08731	0.00200	0.1	0.000108	87.2	75 - 125				
Selenium	0.09634	0.00200	0.1	0.000461	95.9	75 - 125				

SD Sample ID: **HS18080140-01SD** Units: **mg/L** Analysis Date: **09-Aug-2018 18:40**
Client ID: **DGW-MW-4** Run ID: **ICPMS05_321404** SeqNo: **4687234** PrepDate: **08-Aug-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000176	0	10	
Arsenic	0.006307	0.0100					0.006155	0	10	J
Cadmium	U	0.0100					0.000012	0	10	
Lead	U	0.0100					0.000108	0	10	
Selenium	U	0.0100					0.000461	0	10	

The following samples were analyzed in this batch:

HS18080140-01	HS18080140-02	HS18080140-03	HS18080140-04
HS18080140-05	HS18080140-06	HS18080140-07	HS18080140-08
HS18080140-09	HS18080140-10	HS18080140-11	

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide PDI Resample
WorkOrder: **HS18080140**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Oklahoma	2017-088	31-Aug-2018
North Carolina	624-2018	31-Dec-2018
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	L2231 Rev 3-30-2018	22-Dec-2018
Kentucky	123043 - 2018	30-Apr-2019

Date: 10-Aug-18

Sample Receipt Checklist

Client Name:	Golder St Louis	Date/Time Received:	**02-Aug-2018 08:20**
Work Order:	HS18080140	Received by:	**JRM**

Checklist completed by: *Pablo Marinez* eSignature — 2-Aug-2018 Date

Reviewed by: *Dane J. Wacasey* eSignature — 2-Aug-2018 Date

Matrices: **WATER**

Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	2.3C/1.9C UC/C	IR # 11	
Cooler(s)/Kit(s):	43445		
Date/Time sample(s) sent to storage:	8/2/2018 16:15		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070

Chain of Custody Form

Page 1 of 2

COC ID: 186784

HS18080140

Golder Associates
Exide PDI Resample

ALS Project Manager:

Customer Information		Project Information	
Purchase Order	1302086-06	Project Name	Exide PDI Resample
Work Order		Project Number	1302086-06
Company Name	Golder Associates	Bill To Company	Golder Associates
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021
Phone	(314) 984-8800	Phone	(314) 984-8800
Fax		Fax	
e-Mail Address	ewhite@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com

A: ICP_TW (6020 Total Sb,As,Cd,Pb,Se)
B: ICP_DISS (6020 Diss Sb,As,Cd,Pb,Se (FdFltr))
C, D, E, F, G, H, I, J:

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	DGW-MW-4	8/01/18	1023	GW	2,8	2	X	X									
2	DGW-MW-10S		1120				X	X									
3	DGW-MW-11S		1205				X	X									
4	DGW-MW-5		1500				X	X									
5	DGW-MW-7		1550				X	X									
6	DGW-MW-9		1555				X	X									
7	DGW-MW-7		1645				X	X									
8	DGW-MW-6		1655				X	X									
9	DGW-MW-10		1757				X	X									
10	MW-46		1840				X	X									

Sampler(s) Please Print & Sign: Brian Works

Shipment Method: FedEX

Required Turnaround Time: (Check Box) ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other

Results Due Date:

Relinquished by: Date: 8/01/18 Time: 1930 Received by:

Relinquished by: Date: Time: Received by (Laboratory):

Logged by (Laboratory): Date: 8/2/18 Time: 08:20 Checked by (Laboratory): J. Mowery

Notes: Golder Exide DGW PDI

Cooler ID	Cooler Temp.
	UC
43445	2.3
	1.2.11
	CF-0.4

QC Package: (Check One Box Below)
☐ Level II Std QC
☐ Level III Std QC/Raw Data
☐ Level IV SW846/CLP
☐ Other
☒ TRRP Checklist
☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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Holland, MI +1 616 399 6070

Chain of Custody Form

Page 2 of 2

COC ID: 186783

HS18080140

WV

Golder Associates
Exide PDI Resample

ALS Project Manager:

Customer Information		Project Information	
Purchase Order	1302086-06	Project Name	Exide PDI Resample
Work Order		Project Number	1302086-06
Company Name	Golder Associates	Bill To Company	Golder Associates
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021
Phone	(314) 984-8800	Phone	(314) 984-8800
Fax		Fax	
e-Mail Address	ewhite@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com

A	ICP_TW (6020 Total Sb,As,Cd,Pb,Se)
B	ICP_DISS (6020 Diss Sb,As,Cd,Pb,Se (FdFltr))
C	
D	
E	
F	
G	
H	
I	
J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	Dup-03	8/01/18	—	GW	2.8	2	X	X									
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Bri Works

Shipment Method: FedEx

Required Turnaround Time: (Check Box) ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other

Results Due Date:

Relinquished by: Date: 8/6/18 Time: 1930 Received by:

Relinquished by: Date: Time: Received by (Laboratory):

Logged by (Laboratory): Date: 8/2/18 Time: 08:20 Checked by (Laboratory): J. Maguire

Notes: Golder Exide DGW PDI

Cooler ID	Cooler Temp.
43445	2.3 uc
	IR#1
	CF-0.4

QC Package: (Check One Box Below)

- ☐ Level II Std QC
- ☐ Level III Std QC/Raw Data
- ☐ Level IV SW846/CLP
- ☐ Other
- ☒ TRRP Checklist
- ☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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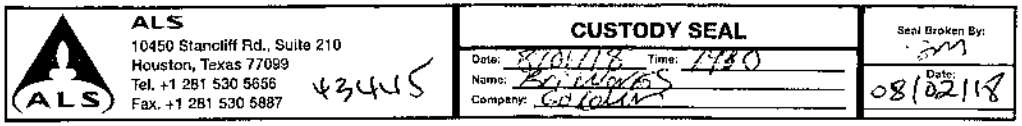

43445 AUG 0 2 2018

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656

43445

REF: EXIDE DGW PDI RESAMPLE - DW

RMA:

FedEx Express

TRK# 0221 4380 9531 1938

RETURNS MON-SAT
PRIORITY OVERNIGHT

FedEx
TRK# 0221 4380 9531 1938

THU - 02 AUG 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US IAH

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

August 10, 2018

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS18080215**

Laboratory Results for: **Exide PDI Resample 1302086-06**

Dear Emily,

ALS Environmental received 8 sample(s) on Aug 03, 2018 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide PDI Resample 1302086-06	
WorkOrder:	**HS18080215**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide PDI Resample 1302086-06
WorkOrder:	**HS18080215**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data								
Laboratory Name: ALS Laboratory Group			LRC Date: 08/10/2018					
Project Name: Exide PDI Resample 1302086-06			Laboratory Job Number: HS18080215					
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 131197,131308,131309					
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]	
R1	OI	**Chain-of-custody (C-O-C)**						
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X					
		Were all departures from standard conditions described in an exception report?	X					
R2	OI	**Sample and quality control (QC) identification**						
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X					
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X					
R3	OI	**Test reports**						
		Were all samples prepared and analyzed within holding times?	X					
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X					
		Were calculations checked by a peer or supervisor?	X					
		Were all analyte identifications checked by a peer or supervisor?	X					
		Were sample detection limits reported for all analytes not detected?	X					
		Were all results for soil and sediment samples reported on a dry weight basis?			X			
		Were % moisture (or solids) reported for all soil and sediment samples?			X			
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X			
		If required for the project, TICs reported?			X			
R4	O	**Surrogate recovery data**						
		Were surrogates added prior to extraction?			X			
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X			
R5	OI	**Test reports/summary forms for blank samples**						
		Were appropriate type(s) of blanks analyzed?	X					
		Were blanks analyzed at the appropriate frequency?	X					
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X					
		Were blank concentrations < MQL?	X					
R6	OI	**Laboratory control samples (LCS):**						
		Were all COCs included in the LCS?	X					
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X					
		Were LCSs analyzed at the required frequency?	X					
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X					
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X					
		Was the LCSD RPD within QC limits?	X					
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**						
		Were the project/method specified analytes included in the MS and MSD?	X					
		Were MS/MSD analyzed at the appropriate frequency?	X					
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1	
		Were MS/MSD RPDs within laboratory QC limits?	X					
R8	OI	**Analytical duplicate data**						
		Were appropriate analytical duplicates analyzed for each matrix?			X			
		Were analytical duplicates analyzed at the appropriate frequency?			X			
		Were RPDs or relative standard deviations within the laboratory QC limits?			X			
R9	OI	**Method quantitation limits (MQLs):**						
		Are the MQLs for each method analyte included in the laboratory data package?	X					
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X					
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X					
R10	OI	**Other problems/anomalies**						
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X					
		Were all necessary corrective actions performed for the reported data?	X					
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X					
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X					

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 08/10/2018				
Project Name: Exide PDI Resample 1302086-06			Laboratory Job Number: HS18080215				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 131197,131308,131309				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
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Laboratory Review Checklist: Exception Data		
Laboratory Name: ALS Laboratory Group		LRC Date: 08/10/2018
Project Name: Exide PDI Resample 1302086-06		Laboratory Job Number: HS18080215
Reviewer Name: Dane Wacasey		Prep Batch Number(s): 131197,131308,131309
ER#[5]	**Description**	
1	Batch 131309, Metals Method SW6020, sample DGW-MW-11, MS and MSD recovered outside the control limits for Lead due to suspect matrix effect.	

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Client: Golder Associates
Project: Exide PDI Resample 1302086-06
Work Order: HS18080215

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18080215-01	MW-27	Groundwater		02-Aug-2018 08:25	03-Aug-2018 08:28	☐
HS18080215-02	MW-31	Groundwater		02-Aug-2018 09:50	03-Aug-2018 08:28	☐
HS18080215-03	MW-30	Groundwater		02-Aug-2018 10:40	03-Aug-2018 08:28	☐
HS18080215-04	DGW-MW-3	Groundwater		02-Aug-2018 12:02	03-Aug-2018 08:28	☐
HS18080215-05	DGW-MW-8	Groundwater		02-Aug-2018 13:10	03-Aug-2018 08:28	☐
HS18080215-06	DGW-MW-2	Groundwater		02-Aug-2018 14:20	03-Aug-2018 08:28	☐
HS18080215-07	DGW-MW-11	Groundwater		02-Aug-2018 15:27	03-Aug-2018 08:28	☐
HS18080215-08	EB-1	Groundwater		02-Aug-2018 13:30	03-Aug-2018 08:28	☐

Client: Golder Associates
Project: Exide PDI Resample 1302086-06
Sample ID: MW-27
Collection Date: 02-Aug-2018 08:25

ANALYTICAL REPORT
WorkOrder:HS18080215
Lab ID:HS18080215-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 08-Aug-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	09-Aug-2018 19:12
Arsenic	**0.0121**		**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 19:12
Cadmium	U		0.000200	0.00200	mg/L	1	09-Aug-2018 19:12
Lead	U		0.000600	0.00200	mg/L	1	09-Aug-2018 19:12
Selenium	**0.00117**	J	**0.00110**	**0.00200**	**mg/L**	1	09-Aug-2018 19:12
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 06-Aug-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	09-Aug-2018 01:39
Arsenic	**0.0117**		**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 01:39
Cadmium	U		0.000200	0.00200	mg/L	1	09-Aug-2018 01:39
Lead	U		0.000600	0.00200	mg/L	1	09-Aug-2018 01:39
Selenium	U		0.00110	0.00200	mg/L	1	09-Aug-2018 01:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide PDI Resample 1302086-06
Sample ID: MW-31
Collection Date: 02-Aug-2018 09:50

ANALYTICAL REPORT
WorkOrder:HS18080215
Lab ID:HS18080215-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 08-Aug-2018		Analyst: JDE
Antimony	**0.000448**	J	**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 19:14
Arsenic	**0.00941**		**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 19:14
Cadmium	U		0.000200	0.00200	mg/L	1	09-Aug-2018 19:14
Lead	**0.00317**		**0.000600**	**0.00200**	**mg/L**	1	09-Aug-2018 19:14
Selenium	U		0.00110	0.00200	mg/L	1	09-Aug-2018 19:14
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 06-Aug-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	09-Aug-2018 01:41
Arsenic	**0.00573**		**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 01:41
Cadmium	U		0.000200	0.00200	mg/L	1	09-Aug-2018 01:41
Lead	U		0.000600	0.00200	mg/L	1	09-Aug-2018 01:41
Selenium	**0.00121**	J	**0.00110**	**0.00200**	**mg/L**	1	09-Aug-2018 01:41

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide PDI Resample 1302086-06
Sample ID: MW-30
Collection Date: 02-Aug-2018 10:40

ANALYTICAL REPORT
WorkOrder:HS18080215
Lab ID:HS18080215-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 08-Aug-2018		Analyst: JDE
Antimony	**0.00466**		**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 19:16
Arsenic	**0.111**		**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 19:16
Cadmium	U		0.000200	0.00200	mg/L	1	09-Aug-2018 19:16
Lead	**0.0110**		**0.000600**	**0.00200**	**mg/L**	1	09-Aug-2018 19:16
Selenium	U		0.00110	0.00200	mg/L	1	09-Aug-2018 19:16
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 06-Aug-2018		Analyst: JDE
Antimony	**0.000993**	J	**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 01:54
Arsenic	**0.104**		**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 01:54
Cadmium	U		0.000200	0.00200	mg/L	1	09-Aug-2018 01:54
Lead	U		0.000600	0.00200	mg/L	1	09-Aug-2018 01:54
Selenium	U		0.00110	0.00200	mg/L	1	09-Aug-2018 01:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide PDI Resample 1302086-06
Sample ID: DGW-MW-3
Collection Date: 02-Aug-2018 12:02

ANALYTICAL REPORT
WorkOrder:HS18080215
Lab ID:HS18080215-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 08-Aug-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	09-Aug-2018 19:18
Arsenic	**0.151**		**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 19:18
Cadmium	U		0.000200	0.00200	mg/L	1	09-Aug-2018 19:18
Lead	**0.00130**	J	**0.000600**	**0.00200**	**mg/L**	1	09-Aug-2018 19:18
Selenium	**0.00172**	J	**0.00110**	**0.00200**	**mg/L**	1	09-Aug-2018 19:18
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 06-Aug-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	09-Aug-2018 01:56
Arsenic	**0.149**		**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 01:56
Cadmium	U		0.000200	0.00200	mg/L	1	09-Aug-2018 01:56
Lead	U		0.000600	0.00200	mg/L	1	09-Aug-2018 01:56
Selenium	**0.00169**	J	**0.00110**	**0.00200**	**mg/L**	1	09-Aug-2018 01:56

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide PDI Resample 1302086-06
Sample ID: DGW-MW-8
Collection Date: 02-Aug-2018 13:10

ANALYTICAL REPORT
WorkOrder:HS18080215
Lab ID:HS18080215-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 08-Aug-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	09-Aug-2018 19:20
Arsenic	**0.00794**		**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 19:20
Cadmium	U		0.000200	0.00200	mg/L	1	09-Aug-2018 19:20
Lead	U		0.000600	0.00200	mg/L	1	09-Aug-2018 19:20
Selenium	U		0.00110	0.00200	mg/L	1	09-Aug-2018 19:20
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 06-Aug-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	09-Aug-2018 01:58
Arsenic	**0.00738**		**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 01:58
Cadmium	U		0.000200	0.00200	mg/L	1	09-Aug-2018 01:58
Lead	U		0.000600	0.00200	mg/L	1	09-Aug-2018 01:58
Selenium	U		0.00110	0.00200	mg/L	1	09-Aug-2018 01:58

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide PDI Resample 1302086-06
Sample ID: DGW-MW-2
Collection Date: 02-Aug-2018 14:20

ANALYTICAL REPORT
WorkOrder:HS18080215
Lab ID:HS18080215-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 08-Aug-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	09-Aug-2018 19:26
Arsenic	**0.0141**		**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 19:26
Cadmium	U		0.000200	0.00200	mg/L	1	09-Aug-2018 19:26
Lead	U		0.000600	0.00200	mg/L	1	09-Aug-2018 19:26
Selenium	U		0.00110	0.00200	mg/L	1	09-Aug-2018 19:26
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 06-Aug-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	09-Aug-2018 02:00
Arsenic	**0.0152**		**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 02:00
Cadmium	U		0.000200	0.00200	mg/L	1	09-Aug-2018 02:00
Lead	U		0.000600	0.00200	mg/L	1	09-Aug-2018 02:00
Selenium	U		0.00110	0.00200	mg/L	1	09-Aug-2018 02:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide PDI Resample 1302086-06
Sample ID: DGW-MW-11
Collection Date: 02-Aug-2018 15:27

ANALYTICAL REPORT
WorkOrder:HS18080215
Lab ID:HS18080215-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 08-Aug-2018		Analyst: JDE
Antimony	**0.000853**	J	**0.000400**	**0.00200**	**mg/L**	1	10-Aug-2018 00:24
Arsenic	**0.00196**	J	**0.000400**	**0.00200**	**mg/L**	1	10-Aug-2018 00:24
Cadmium	**0.00592**		**0.000200**	**0.00200**	**mg/L**	1	10-Aug-2018 00:24
Lead	**0.00760**		**0.000600**	**0.00200**	**mg/L**	1	10-Aug-2018 00:24
Selenium	U		0.00110	0.00200	mg/L	1	10-Aug-2018 00:24
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 06-Aug-2018		Analyst: JDE
Antimony	**0.000622**	J	**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 02:02
Arsenic	**0.00213**		**0.000400**	**0.00200**	**mg/L**	1	09-Aug-2018 02:02
Cadmium	**0.00607**		**0.000200**	**0.00200**	**mg/L**	1	09-Aug-2018 02:02
Lead	**0.00221**		**0.000600**	**0.00200**	**mg/L**	1	09-Aug-2018 02:02
Selenium	**0.00140**	J	**0.00110**	**0.00200**	**mg/L**	1	09-Aug-2018 02:02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide PDI Resample 1302086-06
Sample ID: EB-1
Collection Date: 02-Aug-2018 13:30

ANALYTICAL REPORT
WorkOrder:HS18080215
Lab ID:HS18080215-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 08-Aug-2018		Analyst: JDE
Antimony	**0.00122**	J	**0.000400**	**0.00200**	**mg/L**	1	10-Aug-2018 00:34
Arsenic	U		0.000400	0.00200	mg/L	1	10-Aug-2018 00:34
Cadmium	U		0.000200	0.00200	mg/L	1	10-Aug-2018 00:34
Lead	U		0.000600	0.00200	mg/L	1	10-Aug-2018 00:34
Selenium	U		0.00110	0.00200	mg/L	1	10-Aug-2018 00:34
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 06-Aug-2018		Analyst: JDE
Antimony	U		0.000400	0.00200	mg/L	1	09-Aug-2018 02:04
Arsenic	U		0.000400	0.00200	mg/L	1	09-Aug-2018 02:04
Cadmium	U		0.000200	0.00200	mg/L	1	09-Aug-2018 02:04
Lead	U		0.000600	0.00200	mg/L	1	09-Aug-2018 02:04
Selenium	U		0.00110	0.00200	mg/L	1	09-Aug-2018 02:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide PDI Resample 1302086-06
WorkOrder: HS18080215

Batch ID: 131197 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18080215-01	1	10	10 (mL)	1
HS18080215-02	1	10	10 (mL)	1
HS18080215-03	1	10	10 (mL)	1
HS18080215-04	1	10	10 (mL)	1
HS18080215-05	1	10	10 (mL)	1
HS18080215-06	1	10	10 (mL)	1
HS18080215-07	1	10	10 (mL)	1
HS18080215-08	1	10	10 (mL)	1

Batch ID: 131308 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18080215-01	1	10	10 (mL)	1
HS18080215-02	1	10	10 (mL)	1
HS18080215-03	1	10	10 (mL)	1
HS18080215-04	1	10	10 (mL)	1
HS18080215-05	1	10	10 (mL)	1
HS18080215-06	1	10	10 (mL)	1

Batch ID: 131309 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18080215-07	1	10	10 (mL)	1
HS18080215-08	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide PDI Resample 1302086-06
WorkOrder: HS18080215

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 131197	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS18080215-01	MW-27	02 Aug 2018 08:25		06 Aug 2018 09:52	09 Aug 2018 01:39	1
HS18080215-02	MW-31	02 Aug 2018 09:50		06 Aug 2018 09:52	09 Aug 2018 01:41	1
HS18080215-03	MW-30	02 Aug 2018 10:40		06 Aug 2018 09:52	09 Aug 2018 01:54	1
HS18080215-04	DGW-MW-3	02 Aug 2018 12:02		06 Aug 2018 09:52	09 Aug 2018 01:56	1
HS18080215-05	DGW-MW-8	02 Aug 2018 13:10		06 Aug 2018 09:52	09 Aug 2018 01:58	1
HS18080215-06	DGW-MW-2	02 Aug 2018 14:20		06 Aug 2018 09:52	09 Aug 2018 02:00	1
HS18080215-07	DGW-MW-11	02 Aug 2018 15:27		06 Aug 2018 09:52	09 Aug 2018 02:02	1
HS18080215-08	EB-1	02 Aug 2018 13:30		06 Aug 2018 09:52	09 Aug 2018 02:04	1
Batch ID 131308	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS18080215-01	MW-27	02 Aug 2018 08:25		08 Aug 2018 13:00	09 Aug 2018 19:12	1
HS18080215-02	MW-31	02 Aug 2018 09:50		08 Aug 2018 13:00	09 Aug 2018 19:14	1
HS18080215-03	MW-30	02 Aug 2018 10:40		08 Aug 2018 13:00	09 Aug 2018 19:16	1
HS18080215-04	DGW-MW-3	02 Aug 2018 12:02		08 Aug 2018 13:00	09 Aug 2018 19:18	1
HS18080215-05	DGW-MW-8	02 Aug 2018 13:10		08 Aug 2018 13:00	09 Aug 2018 19:20	1
HS18080215-06	DGW-MW-2	02 Aug 2018 14:20		08 Aug 2018 13:00	09 Aug 2018 19:26	1
Batch ID 131309	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS18080215-07	DGW-MW-11	02 Aug 2018 15:27		08 Aug 2018 13:30	10 Aug 2018 00:24	1
HS18080215-08	EB-1	02 Aug 2018 13:30		08 Aug 2018 13:30	10 Aug 2018 00:34	1

WorkOrder: HS18080215
InstrumentID: ICPMS05
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.00100	0.00105	0.000400	0.00200
A	Arsenic	7440-38-2	0.00100	0.00103	0.000400	0.00200
A	Cadmium	7440-43-9	0.00100	0.000999	0.000200	0.00200
A	Lead	7439-92-1	0.00100	0.000964	0.000600	0.00200
A	Selenium	7782-49-2	0.00200	0.00203	0.00110	0.00200

WorkOrder: HS18080215
InstrumentID: ICPMS05
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.00100	0.00105	0.000400	0.00200
A	Arsenic	7440-38-2	0.00100	0.00103	0.000400	0.00200
A	Cadmium	7440-43-9	0.00100	0.000999	0.000200	0.00200
A	Lead	7439-92-1	0.00100	0.000964	0.000600	0.00200
A	Selenium	7782-49-2	0.00200	0.00203	0.00110	0.00200

Client: Golder Associates
Project: Exide PDI Resample 1302086-06
WorkOrder: HS18080215

QC BATCH REPORT

Batch ID: 131197 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLK-131197** Units: **mg/L** Analysis Date: **09-Aug-2018 01:09**
Client ID: Run ID: **ICPMS05_321327** SeqNo: **4685461** PrepDate: **06-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Lead	U	0.00200								
Selenium	U	0.00200								

LCS Sample ID: **LCS-131197** Units: **mg/L** Analysis Date: **09-Aug-2018 01:11**
Client ID: Run ID: **ICPMS05_321327** SeqNo: **4685462** PrepDate: **06-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04757	0.00200	0.05	0	95.1	80 - 120				
Arsenic	0.05169	0.00200	0.05	0	103	80 - 120				
Cadmium	0.04914	0.00200	0.05	0	98.3	80 - 120				
Lead	0.05004	0.00200	0.05	0	100	80 - 120				
Selenium	0.05565	0.00200	0.05	0	111	80 - 120				

MS Sample ID: **HS18080215-02MS** Units: **mg/L** Analysis Date: **09-Aug-2018 01:45**
Client ID: **MW-31** Run ID: **ICPMS05_321327** SeqNo: **4685479** PrepDate: **06-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04692	0.00200	0.05	0	93.8	75 - 125				
Arsenic	0.0563	0.00200	0.05	0.005732	101	75 - 125				
Cadmium	0.04714	0.00200	0.05	0	94.3	75 - 125				
Lead	0.04442	0.00200	0.05	0	88.8	75 - 125				
Selenium	0.05256	0.00200	0.05	0.001206	103	75 - 125				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide PDI Resample 1302086-06
WorkOrder: HS18080215

QC BATCH REPORT

Batch ID: 131197 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MSD Sample ID: **HS18080215-02MSD** Units: **mg/L** Analysis Date: **09-Aug-2018 01:47**
Client ID: **MW-31** Run ID: **ICPMS05_321327** SeqNo: **4685480** PrepDate: **06-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04503	0.00200	0.05	0	90.1	75 - 125	0.04692	4.12	20	
Arsenic	0.05458	0.00200	0.05	0.005732	97.7	75 - 125	0.0563	3.1	20	
Cadmium	0.04424	0.00200	0.05	0	88.5	75 - 125	0.04714	6.35	20	
Lead	0.04357	0.00200	0.05	0	87.1	75 - 125	0.04442	1.93	20	
Selenium	0.0507	0.00200	0.05	0.001206	99.0	75 - 125	0.05256	3.59	20	

PDS Sample ID: **HS18080215-02PDS** Units: **mg/L** Analysis Date: **09-Aug-2018 01:49**
Client ID: **MW-31** Run ID: **ICPMS05_321327** SeqNo: **4685481** PrepDate: **06-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09424	0.00200	0.1	0	94.2	75 - 125				
Arsenic	0.1083	0.00200	0.1	0.005732	103	75 - 125				
Cadmium	0.09296	0.00200	0.1	0	93.0	75 - 125				
Lead	0.09112	0.00200	0.1	0	91.1	75 - 125				
Selenium	0.1051	0.00200	0.1	0.001206	104	75 - 125				

SD Sample ID: **HS18080215-02SD** Units: **mg/L** Analysis Date: **09-Aug-2018 01:43**
Client ID: **MW-31** Run ID: **ICPMS05_321327** SeqNo: **4685478** PrepDate: **06-Aug-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0	0	10	
Arsenic	0.006322	0.0100					0.005732	0	10	J
Cadmium	U	0.0100					0	0	10	
Lead	U	0.0100					0	0	10	
Selenium	U	0.0100					0.001206	0	10	

The following samples were analyzed in this batch:

HS18080215-01	HS18080215-02	HS18080215-03	HS18080215-04
HS18080215-05	HS18080215-06	HS18080215-07	HS18080215-08

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide PDI Resample 1302086-06
WorkOrder: HS18080215

QC BATCH REPORT

Batch ID: 131308 **Instrument: ICPMS05** **Method: SW6020**

MBLK Sample ID: **MBLK-131308** Units: **mg/L** Analysis Date: **09-Aug-2018 18:28**
Client ID: Run ID: **ICPMS05_321404** SeqNo: **4687228** PrepDate: **08-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Lead	U	0.00200								
Selenium	U	0.00200								

LCS Sample ID: **LCS-131308** Units: **mg/L** Analysis Date: **09-Aug-2018 18:30**
Client ID: Run ID: **ICPMS05_321404** SeqNo: **4687229** PrepDate: **08-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04937	0.00200	0.05	0	98.7	80 - 120				
Arsenic	0.04823	0.00200	0.05	0	96.5	80 - 120				
Cadmium	0.04831	0.00200	0.05	0	96.6	80 - 120				
Lead	0.04781	0.00200	0.05	0	95.6	80 - 120				
Selenium	0.04903	0.00200	0.05	0	98.1	80 - 120				

MS Sample ID: **HS18080140-01MS** Units: **mg/L** Analysis Date: **09-Aug-2018 18:42**
Client ID: Run ID: **ICPMS05_321404** SeqNo: **4687235** PrepDate: **08-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05386	0.00200	0.05	0	108	80 - 120				
Arsenic	0.05942	0.00200	0.05	0.006155	107	80 - 120				
Cadmium	0.04925	0.00200	0.05	0	98.5	80 - 120				
Lead	0.04323	0.00200	0.05	0	86.5	80 - 120				
Selenium	0.05372	0.00200	0.05	0	107	80 - 120				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide PDI Resample 1302086-06
WorkOrder: HS18080215

QC BATCH REPORT

Batch ID: 131308 **Instrument: ICPMS05** **Method: SW6020**

MSD Sample ID: **HS18080140-01MSD** Units: **mg/L** Analysis Date: **09-Aug-2018 18:44**
Client ID: Run ID: **ICPMS05_321404** SeqNo: **4687236** PrepDate: **08-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05129	0.00200	0.05	0	103	80 - 120	0.05386	4.89	20	
Arsenic	0.05659	0.00200	0.05	0.006155	101	80 - 120	0.05942	4.89	20	
Cadmium	0.05114	0.00200	0.05	0	102	80 - 120	0.04925	3.77	20	
Lead	0.04336	0.00200	0.05	0	86.7	80 - 120	0.04323	0.314	20	
Selenium	0.05199	0.00200	0.05	0	104	80 - 120	0.05372	3.27	20	

PDS Sample ID: **HS18080140-01PDS** Units: **mg/L** Analysis Date: **09-Aug-2018 18:46**
Client ID: Run ID: **ICPMS05_321404** SeqNo: **4687237** PrepDate: **08-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.08966	0.00200	0.1	0.000176	89.5	75 - 125				
Arsenic	0.09967	0.00200	0.1	0.006155	93.5	75 - 125				
Cadmium	0.09174	0.00200	0.1	0.000012	91.7	75 - 125				
Lead	0.08731	0.00200	0.1	0.000108	87.2	75 - 125				
Selenium	0.09634	0.00200	0.1	0.000461	95.9	75 - 125				

SD Sample ID: **HS18080140-01SD** Units: **mg/L** Analysis Date: **09-Aug-2018 18:40**
Client ID: Run ID: **ICPMS05_321404** SeqNo: **4687234** PrepDate: **08-Aug-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000176	0	10	
Arsenic	0.006307	0.0100					0.006155	0	10	J
Cadmium	U	0.0100					0.000012	0	10	
Lead	U	0.0100					0.000108	0	10	
Selenium	U	0.0100					0.000461	0	10	

The following samples were analyzed in this batch: HS18080215-01 HS18080215-02 HS18080215-03 HS18080215-04 HS18080215-05 HS18080215-06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide PDI Resample 1302086-06
WorkOrder: HS18080215

QC BATCH REPORT

Batch ID: 131309 **Instrument: ICPMS05** **Method: SW6020**

MBLK Sample ID: **MBLK-131309** Units: **mg/L** Analysis Date: **10-Aug-2018 00:10**
Client ID: Run ID: **ICPMS05_321404** SeqNo: **4687392** PrepDate: **08-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Lead	U	0.00200								
Selenium	U	0.00200								

LCS Sample ID: **LCS-131309** Units: **mg/L** Analysis Date: **10-Aug-2018 00:12**
Client ID: Run ID: **ICPMS05_321404** SeqNo: **4687393** PrepDate: **08-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04592	0.00200	0.05	0	91.8	80 - 120				
Arsenic	0.04573	0.00200	0.05	0	91.5	80 - 120				
Cadmium	0.04477	0.00200	0.05	0	89.5	80 - 120				
Lead	0.0477	0.00200	0.05	0	95.4	80 - 120				
Selenium	0.04636	0.00200	0.05	0	92.7	80 - 120				

MS Sample ID: **HS18080215-07MS** Units: **mg/L** Analysis Date: **10-Aug-2018 00:28**
Client ID: **DGW-MW-11** Run ID: **ICPMS05_321404** SeqNo: **4687401** PrepDate: **08-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04649	0.00200	0.05	0.000853	91.3	80 - 120				
Arsenic	0.05009	0.00200	0.05	0.001965	96.2	80 - 120				
Cadmium	0.05134	0.00200	0.05	0.005918	90.8	80 - 120				
Lead	0.04338	0.00200	0.05	0.007602	71.6	80 - 120				S
Selenium	0.05473	0.00200	0.05	0.000682	108	80 - 120				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide PDI Resample 1302086-06
WorkOrder: HS18080215

QC BATCH REPORT

Batch ID: 131309 **Instrument: ICPMS05** **Method: SW6020**

MSD Sample ID: **HS18080215-07MSD** Units: **mg/L** Analysis Date: **10-Aug-2018 00:30**
Client ID: **DGW-MW-11** Run ID: **ICPMS05_321404** SeqNo: **4687402** PrepDate: **08-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.048	0.00200	0.05	0.000853	94.3	80 - 120	0.04649	3.19	20	
Arsenic	0.05226	0.00200	0.05	0.001965	101	80 - 120	0.05009	4.24	20	
Cadmium	0.05204	0.00200	0.05	0.005918	92.2	80 - 120	0.05134	1.35	20	
Lead	0.04444	0.00200	0.05	0.007602	73.7	80 - 120	0.04338	2.41	20	S
Selenium	0.05716	0.00200	0.05	0.000682	113	80 - 120	0.05473	4.34	20	

PDS Sample ID: **HS18080215-07PDS** Units: **mg/L** Analysis Date: **10-Aug-2018 00:32**
Client ID: **DGW-MW-11** Run ID: **ICPMS05_321404** SeqNo: **4687403** PrepDate: **08-Aug-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09158	0.00200	0.1	0.000853	90.7	75 - 125				
Arsenic	0.1088	0.00200	0.1	0.001965	107	75 - 125				
Cadmium	0.1053	0.00200	0.1	0.005918	99.4	75 - 125				
Lead	0.09236	0.00200	0.1	0.007602	84.8	75 - 125				
Selenium	0.1162	0.00200	0.1	0.000682	116	75 - 125				

SD Sample ID: **HS18080215-07SD** Units: **mg/L** Analysis Date: **10-Aug-2018 00:26**
Client ID: **DGW-MW-11** Run ID: **ICPMS05_321404** SeqNo: **4687400** PrepDate: **08-Aug-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000853	0	10	
Arsenic	U	0.0100					0.001965	0	10	
Cadmium	0.005848	0.0100					0.005918	0	10	J
Lead	0.008186	0.0100					0.007602	0	10	J
Selenium	U	0.0100					0.000682	0	10	

The following samples were analyzed in this batch: HS18080215-07 HS18080215-08

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide PDI Resample 1302086-06
WorkOrder: **HS18080215**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Oklahoma	2017-088	31-Aug-2018
North Carolina	624-2018	31-Dec-2018
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	L2231 Rev 3-30-2018	22-Dec-2018
Kentucky	123043 - 2018	30-Apr-2019

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS18080215

Date/Time Received: **03-Aug-2018 08:28**
Received by: **JRM**

Checklist completed by: *Jared R. Makan* eSignature — 3-Aug-2018 Date

Reviewed by: *Dane J. Wacasey* eSignature — 8-Aug-2018 Date

Matrices: **Water**

Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	2.1c/1.7c UC/C	IR11	
Cooler(s)/Kit(s):	43930		
Date/Time sample(s) sent to storage:	08/03/2018 12:50		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page ___ of ___

COC ID: 186786

Orange, cooler (small) # 43930

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order	1302086-06	Project Name	Exide PDI Resample	A	ICP_TW (6020 Total Sb,As,Cd,Pb,Se)
Work Order		Project Number	1302086-06	B	ICP_DISS (6020 Diss Sb,As,Cd,Pb,Se (FdFltr))
Company Name	Golder Associates	Bill To Company	Golder Associates	C	
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P	D	
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit	E	
				F	
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021	G	
Phone	(314) 984-8800	Phone	(314) 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com	J	

ALS Project Manager: | ALS Work Order #:

HS18080215

Golder Associates

Exide PDI Resample

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-27	8/2/18	0825	GW	2.8	2	X	X									
2	MW-31		0950				X	X									
3	MW-30		1040				X	X									
4	DGW-MW-3		1202				X	X									
5	DGW-MW-8		1310				X	X									
6	DGW-MW-2		1420				X	X									
7	DGW-MW-11		1527				X	X									
8	EB-1		1330	WW			X	X									
9																	
10																	

Sampler(s) Please Print & Sign: Bri Works

Shipment Method: FedEx

Required Turnaround Time: (Check Box) ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other ___

Results Due Date:

Relinquished by: | Date: 8/2/18 Time: 1700 | Received by:

Relinquished by: | Date: 8/3/18 Time: 08:28 | Received by (Laboratory): J. Wagner

Logged by (Laboratory): | Date: Time: | Checked by (Laboratory):

Notes: Golder Exide DGW PDI

Cooler ID	Cooler Temp.
	UC
43930	2.1
	1411
	CF -0.4

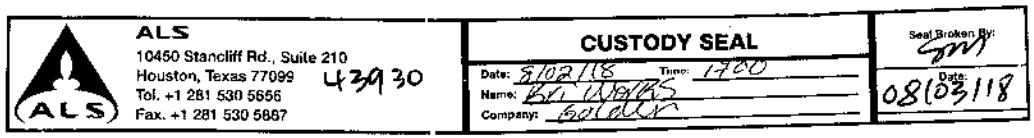
QC Package: (Check One Box Below)

- ☐ Level II Std QC
- ☐ Level III Std QC/Raw Data
- ☐ Level IV SW846/CLP
- ☐ Other
- ☒ TRRP Checklist
- ☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

Copyright 2011 by ALS Environmental.



43930 AUG 03 2018

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
43930
(281) 530 - 5656
REF: EXIDE DGW - DW

RMA:

FedEx Express

FedEx
TRK# 0221 4380 9530 5759

FRI - 03 AUG 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX - US IAH

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

November 13, 2018

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS18110259**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 2 sample(s) on Nov 06, 2018 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS18110259**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS18110259**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data								
Laboratory Name: ALS Laboratory Group			LRC Date: 11/13/2018					
Project Name: Exide Column Studies			Laboratory Job Number: HS18110259					
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 134294,134313,R326908,R326996,R327116,R32784					
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?	X				
		Were analytical duplicates analyzed at the appropriate frequency?	X				
		Were RPDs or relative standard deviations within the laboratory QC limits?		X			2
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				5
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 11/13/2018				
Project Name: Exide Column Studies			Laboratory Job Number: HS18110259				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 134294,134313,R326908,R326996,R327116,R32784				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			3
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		X			4
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Data	
Laboratory Name: ALS Laboratory Group	LRC Date: 11/13/2018
Project Name: Exide Column Studies	Laboratory Job Number: HS18110259
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 134294,134313,R326908,R326996,R327116,R32784

ER#[5]	Description
1	Batch 134294, Metals Method SW6020, sample HS18101676-02, MS and MSD were performed on unrelated sample. Batch 134313, Metals Method SW6020, sample HS18110034-01, MS and MSD were performed on unrelated sample.
2	Batch R327284, Total Dissolved Solids (Residue, Filterable) Method M2540C, sample DGW-MW-3, RPD between the sample and its duplicate was outside the control limit.
3	See Run Log and CCB Exceptions Report.
4	Batch 134294, Metals Method SW6020, sample HS18101676-02, PDS was performed on unrelated sample. Batch 134313, Metals Method SW6020, sample HS18110034-01, PDS was performed on unrelated sample.
5	This report was revised to remove the * qualifier from select analytes for sample HS18110259-01.

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18110259
Start Date: 06-Nov-2018 End Date: 07-Nov-2018

Run ID:ICS2100_326996
Instrument:ICS2100
Method:E300

Sample No.	D/F	Time	FileID	Analytes
CCV 1	1	06-Nov-2018 13:13		CL NO3N SO4
CCB 1	1	06-Nov-2018 13:28		CL NO3N SO4
WBLKW1-110618	1	06-Nov-2018 13:42		CL NO3N SO4
WLCSW1-110618	1	06-Nov-2018 13:57		CL NO3N SO4
WLCSDW1-110618	1	06-Nov-2018 14:11		CL NO3N SO4
DGW-MW-3	1	06-Nov-2018 15:59		CL NO3N
DGW-MW-3	10	06-Nov-2018 16:13		SO4
French Drain	1	06-Nov-2018 16:28		CL NO3N
French Drain	10	06-Nov-2018 16:42		SO4
CCB 2	1	06-Nov-2018 17:58		CL NO3N SO4
ZZZZZZMS	10	06-Nov-2018 19:47		CL NO3N SO4
ZZZZZZMSD	10	06-Nov-2018 20:02		CL NO3N SO4
CCV 2	1	06-Nov-2018 20:45		CL NO3N SO4
CCB 3	1	07-Nov-2018 09:54		CL NO3N SO4

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18110259

Run ID:ICS2100_326996
Instrument:ICS2100
Method:E300

CCB 1	Date: 06-Nov-2018 13:28	Seq: 4808565	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	202	200	500	
Sulfate	208	200	500	

CCB 3	Date: 07-Nov-2018 09:54	Seq: 4808587	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	213	200	500	
Sulfate	228	200	500	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18110259
Start Date: 07-Nov-2018 End Date: 07-Nov-2018

Run ID:ICPMS04_326956
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	07-Nov-2018 11:48	021_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	07-Nov-2018 11:50	022SMPL.d	AS CA CD FE K MG NA PB SB SE
LLICV5	1	07-Nov-2018 11:52	023LICV.d	AS CA CD FE K MG NA PB SB SE
ICB	1	07-Nov-2018 11:55	024_ICB.d	AS CA CD FE K MG NA PB SB SE
LLICV5	1	07-Nov-2018 11:59	026LICV.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	07-Nov-2018 12:05	027ICSA.d	AS CA CD FE K MG NA PB SB SE
ICSAB	1	07-Nov-2018 12:08	028ICSB.d	AS CA CD FE K MG NA PB SB SE
LCS-134313	1	07-Nov-2018 12:18	031SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZSD	5	07-Nov-2018 12:22	033SMPL.d	AS CD FE MG PB SB SE
ZZZZZZMS	1	07-Nov-2018 12:25	034SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZMSD	1	07-Nov-2018 12:27	035SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZPDS	1	07-Nov-2018 12:29	036SMPL.d	AS CD K MG PB SB SE
DGW-MW-3	1	07-Nov-2018 12:31	037SMPL.d	AS CA CD FE K MG PB SB SE
French Drain	1	07-Nov-2018 12:34	038SMPL.d	AS CD FE K MG NA PB SB SE
CCV 1	1	07-Nov-2018 12:38	040_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	07-Nov-2018 12:40	041_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-134294	1	07-Nov-2018 13:05	045SMPL.d	AS CA CD FE K MG NA PB SB SE
LCS-134294	1	07-Nov-2018 13:07	046SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZSD	5	07-Nov-2018 13:11	048SMPL.d	AS CA CD FE MG PB SB SE
ZZZZZZMS	1	07-Nov-2018 13:14	049SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZMSD	1	07-Nov-2018 13:16	050SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZPDS	1	07-Nov-2018 13:18	051SMPL.d	AS CA CD FE K MG PB SB SE
DGW-MW-3	1	07-Nov-2018 13:20	052SMPL.d	AS CA CD FE K MG PB SB SE
French Drain	1	07-Nov-2018 13:23	053SMPL.d	AS CD FE K MG NA PB SB SE
CCV 2	1	07-Nov-2018 13:27	055_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	07-Nov-2018 13:48	058_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-134313	1	07-Nov-2018 14:11	063SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZSD	100	07-Nov-2018 14:15	065SMPL.d	CA MG NA
ZZZZZZPDS	20	07-Nov-2018 14:18	066SMPL.d	CA MG NA
DGW-MW-3	10	07-Nov-2018 14:20	067SMPL.d	NA
French Drain	10	07-Nov-2018 14:22	068SMPL.d	CA
CCV 3	1	07-Nov-2018 14:24	069_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	07-Nov-2018 14:27	070_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-134294	1	07-Nov-2018 14:40	073SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZSD	50	07-Nov-2018 14:45	075SMPL.d	NA
ZZZZZZPDS	10	07-Nov-2018 14:47	076SMPL.d	NA
DGW-MW-3	10	07-Nov-2018 14:49	077SMPL.d	NA
French Drain	10	07-Nov-2018 14:51	078SMPL.d	CA
CCV 4	1	07-Nov-2018 14:56	080_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	07-Nov-2018 14:58	081_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	07-Nov-2018 16:12	098_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	07-Nov-2018 16:14	099_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	07-Nov-2018 16:44	107_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	07-Nov-2018 16:47	108_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	07-Nov-2018 17:38	119_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	07-Nov-2018 17:40	120_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 8	1	07-Nov-2018 18:23	136_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	07-Nov-2018 18:25	137SMPL.d	AS CA CD FE K MG NA PB SB SE
LLCCV5	1	07-Nov-2018 18:28	138LICV.d	AS CA CD FE K MG NA PB SB SE
ICCB 8	1	07-Nov-2018 18:30	139_ICB.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	07-Nov-2018 19:15	154_CCB.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18110259

Run ID:ICPMS04_326956
Instrument:ICPMS04
Method:SW6020

ICB	Date: 07-Nov-2018 11:55	Seq: 4807721	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Arsenic	1.488	0.4	2	

CCB 1	Date: 07-Nov-2018 12:40	Seq: 4807757	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Arsenic	-0.546	0.4	2	
Calcium	45.83	34	500	
Potassium	112.4	18	200	
Sodium	183.1	14	200	

CCB 2	Date: 07-Nov-2018 13:48	Seq: 4807978	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	22.4	12	200	
Potassium	52.62	18	200	
Selenium	-1.109	1.1	2	
Sodium	146.9	14	200	

CCB 3	Date: 07-Nov-2018 14:27	Seq: 4808056	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	93.4	18	200	
Sodium	86.29	14	200	

CCB 4	Date: 07-Nov-2018 14:58	Seq: 4808160	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Arsenic	-0.41	0.4	2	
Potassium	73.28	18	200	
Sodium	60.82	14	200	

CCB 5	Date: 07-Nov-2018 16:14	Seq: 4808516	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Arsenic	-0.637	0.4	2	
Potassium	51.47	18	200	
Sodium	96.88	14	200	

CCB 6	Date: 07-Nov-2018 16:47	Seq: 4808687	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	81.54	18	200	
Selenium	1.751	1.1	2	
Sodium	72.84	14	200	

CCB 7	Date: 07-Nov-2018 17:40	Seq: 4808893	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Arsenic	0.468	0.4	2	
Potassium	84.97	18	200	
Sodium	45.51	14	200	

ICCB 8	Date: 07-Nov-2018 18:30	Seq: 4808871	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Arsenic	0.542	0.4	2	
Selenium	-1.193	1.1	2	

CCB 9	Date: 07-Nov-2018 19:15	Seq: 4808972	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS18110259

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18110259-01	DGW-MW-3	Groundwater		05-Nov-2018 13:15	06-Nov-2018 09:30	☐
HS18110259-02	French Drain	Groundwater		05-Nov-2018 16:48	06-Nov-2018 09:30	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: DGW-MW-3
Collection Date: 05-Nov-2018 13:15

ANALYTICAL REPORT
WorkOrder:HS18110259
Lab ID:HS18110259-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**367**		**2.00**	**2.00**	**mg/L**	1	09-Nov-2018 09:59
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 06-Nov-2018		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	07-Nov-2018 13:20
Arsenic	**0.158**		**0.000400**	**0.00200**	**mg/L**	1	07-Nov-2018 13:20
Cadmium	**0.000216**	J	**0.000200**	**0.00200**	**mg/L**	1	07-Nov-2018 13:20
Calcium	**112**		**0.0340**	**0.500**	**mg/L**	1	07-Nov-2018 13:20
Iron	**17.9**		**0.0120**	**0.200**	**mg/L**	1	07-Nov-2018 13:20
Lead	**0.000912**	J	**0.000600**	**0.00200**	**mg/L**	1	07-Nov-2018 13:20
Magnesium	**21.2**		**0.0100**	**0.200**	**mg/L**	1	07-Nov-2018 13:20
Potassium	**2.29**		**0.0180**	**0.200**	**mg/L**	1	07-Nov-2018 13:20
Selenium	**0.00330**		**0.00110**	**0.00200**	**mg/L**	1	07-Nov-2018 13:20
Sodium	**184**		**0.140**	**2.00**	**mg/L**	10	07-Nov-2018 14:49
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**			Prep:SW3010A / 06-Nov-2018		Analyst: JCJ
Antimony	**0.00218**		**0.000400**	**0.00200**	**mg/L**	1	07-Nov-2018 12:31
Arsenic	**0.145**		**0.000400**	**0.00200**	**mg/L**	1	07-Nov-2018 12:31
Cadmium	U		0.000200	0.00200	mg/L	1	07-Nov-2018 12:31
Calcium	**114**		**0.0340**	**0.500**	**mg/L**	1	07-Nov-2018 12:31
Iron	**18.2**		**0.0120**	**0.200**	**mg/L**	1	07-Nov-2018 12:31
Lead	**0.000829**	J	**0.000600**	**0.00200**	**mg/L**	1	07-Nov-2018 12:31
Magnesium	**20.8**		**0.0100**	**0.200**	**mg/L**	1	07-Nov-2018 12:31
Potassium	**2.39**		**0.0180**	**0.200**	**mg/L**	1	07-Nov-2018 12:31
Selenium	**0.00123**	J	**0.00110**	**0.00200**	**mg/L**	1	07-Nov-2018 12:31
Sodium	**185**		**0.140**	**2.00**	**mg/L**	10	07-Nov-2018 14:20
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**47.1**		**0.200**	**0.500**	**mg/L**	1	06-Nov-2018 15:59
Nitrogen, Nitrate (As N)	U		0.0300	0.100	mg/L	1	06-Nov-2018 15:59
Sulfate	**251**		**2.00**	**5.00**	**mg/L**	10	06-Nov-2018 16:13
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	**938**		**5.00**	**10.0**	**mg/L**	1	09-Nov-2018 08:00
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**532**		**5.00**	**5.00**	**mg/L**	1	06-Nov-2018 14:16
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	06-Nov-2018 14:16
Alkalinity, Total (As CaCO3)	**532**		**5.00**	**5.00**	**mg/L**	1	06-Nov-2018 14:16

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: French Drain
Collection Date: 05-Nov-2018 16:48

ANALYTICAL REPORT
WorkOrder:HS18110259
Lab ID:HS18110259-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**491**		**2.00**	**2.00**	**mg/L**	1	09-Nov-2018 09:59
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 06-Nov-2018		Analyst: JCJ
Antimony	**0.0484**		**0.000400**	**0.00200**	**mg/L**	1	07-Nov-2018 13:23
Arsenic	**0.00215**		**0.000400**	**0.00200**	**mg/L**	1	07-Nov-2018 13:23
Cadmium	**0.00165**	J	**0.000200**	**0.00200**	**mg/L**	1	07-Nov-2018 13:23
Calcium	**194**		**0.340**	**5.00**	**mg/L**	10	07-Nov-2018 14:51
Iron	**0.147**	J	**0.0120**	**0.200**	**mg/L**	1	07-Nov-2018 13:23
Lead	**0.00630**		**0.000600**	**0.00200**	**mg/L**	1	07-Nov-2018 13:23
Magnesium	**1.66**		**0.0100**	**0.200**	**mg/L**	1	07-Nov-2018 13:23
Potassium	**12.5**		**0.0180**	**0.200**	**mg/L**	1	07-Nov-2018 13:23
Selenium	**0.00473**		**0.00110**	**0.00200**	**mg/L**	1	07-Nov-2018 13:23
Sodium	**127**		**0.0140**	**0.200**	**mg/L**	1	07-Nov-2018 13:23
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**			Prep:SW3010A / 06-Nov-2018		Analyst: JCJ
Antimony	**0.0484**		**0.000400**	**0.00200**	**mg/L**	1	07-Nov-2018 12:34
Arsenic	**0.00263**		**0.000400**	**0.00200**	**mg/L**	1	07-Nov-2018 12:34
Cadmium	**0.000766**	J	**0.000200**	**0.00200**	**mg/L**	1	07-Nov-2018 12:34
Calcium	**176**		**0.340**	**5.00**	**mg/L**	10	07-Nov-2018 14:22
Iron	**0.117**	J	**0.0120**	**0.200**	**mg/L**	1	07-Nov-2018 12:34
Lead	**0.00254**		**0.000600**	**0.00200**	**mg/L**	1	07-Nov-2018 12:34
Magnesium	**1.70**		**0.0100**	**0.200**	**mg/L**	1	07-Nov-2018 12:34
Potassium	**12.4**		**0.0180**	**0.200**	**mg/L**	1	07-Nov-2018 12:34
Selenium	**0.00760**		**0.00110**	**0.00200**	**mg/L**	1	07-Nov-2018 12:34
Sodium	**130**		**0.0140**	**0.200**	**mg/L**	1	07-Nov-2018 12:34
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**28.0**		**0.200**	**0.500**	**mg/L**	1	06-Nov-2018 16:28
Nitrogen, Nitrate (As N)	U		0.0300	0.100	mg/L	1	06-Nov-2018 16:28
Sulfate	**710**		**2.00**	**5.00**	**mg/L**	10	06-Nov-2018 16:42
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	**1,090**		**5.00**	**10.0**	**mg/L**	1	09-Nov-2018 08:00
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	U		5.00	5.00	mg/L	1	06-Nov-2018 14:25
Alkalinity, Carbonate (As CaCO3)	**34.3**		**5.00**	**5.00**	**mg/L**	1	06-Nov-2018 14:25
Alkalinity, Total (As CaCO3)	**37.7**		**5.00**	**5.00**	**mg/L**	1	06-Nov-2018 14:25

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18110259

Batch ID: 134294 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18110259-01	1	10	10 (mL)	1
HS18110259-02	1	10	10 (mL)	1

Batch ID: 134313 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18110259-01	1	10	10 (mL)	1
HS18110259-02	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18110259

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 134294	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS18110259-01	DGW-MW-3	05 Nov 2018 13:15		06 Nov 2018 13:00	07 Nov 2018 14:49	10
HS18110259-01	DGW-MW-3	05 Nov 2018 13:15		06 Nov 2018 13:00	07 Nov 2018 13:20	1
HS18110259-02	French Drain	05 Nov 2018 16:48		06 Nov 2018 13:00	07 Nov 2018 14:51	10
HS18110259-02	French Drain	05 Nov 2018 16:48		06 Nov 2018 13:00	07 Nov 2018 13:23	1
Batch ID 134313	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS18110259-01	DGW-MW-3	05 Nov 2018 13:15		06 Nov 2018 13:00	07 Nov 2018 14:20	10
HS18110259-01	DGW-MW-3	05 Nov 2018 13:15		06 Nov 2018 13:00	07 Nov 2018 12:31	1
HS18110259-02	French Drain	05 Nov 2018 16:48		06 Nov 2018 13:00	07 Nov 2018 14:22	10
HS18110259-02	French Drain	05 Nov 2018 16:48		06 Nov 2018 13:00	07 Nov 2018 12:34	1
Batch ID R326908	**Test Name :** ALKALINITY BY SM2320B			**Matrix:** Groundwater		
HS18110259-01	DGW-MW-3	05 Nov 2018 13:15			06 Nov 2018 14:16	1
HS18110259-02	French Drain	05 Nov 2018 16:48			06 Nov 2018 14:25	1
Batch ID R326996	**Test Name :** ANIONS BY E300.0			**Matrix:** Groundwater		
HS18110259-01	DGW-MW-3	05 Nov 2018 13:15			06 Nov 2018 16:13	10
HS18110259-01	DGW-MW-3	05 Nov 2018 13:15			06 Nov 2018 15:59	1
HS18110259-02	French Drain	05 Nov 2018 16:48			06 Nov 2018 16:42	10
HS18110259-02	French Drain	05 Nov 2018 16:48			06 Nov 2018 16:28	1
Batch ID R327116	**Test Name :** HARDNESS, TOTAL AS CACO3 BY SM2340B			**Matrix:** Groundwater		
HS18110259-01	DGW-MW-3	05 Nov 2018 13:15			09 Nov 2018 09:59	1
HS18110259-02	French Drain	05 Nov 2018 16:48			09 Nov 2018 09:59	1
Batch ID R327284	**Test Name :** TOTAL DISSOLVED SOLIDS BY SM2540C			**Matrix:** Groundwater		
HS18110259-01	DGW-MW-3	05 Nov 2018 13:15			09 Nov 2018 08:00	1
HS18110259-02	French Drain	05 Nov 2018 16:48			09 Nov 2018 08:00	1

WorkOrder: HS18110259
InstrumentID: MISC-Metals
Test Code: HARD
Test Number: M2340 B
Test Name: Hardness, Total as CaCO3 by

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Hardness (As CaCO3)	HARD	0	0	2.00	2.00

WorkOrder: HS18110259
InstrumentID: ICPMS04
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.00100	0.00135	0.000400	0.00200
A	Arsenic	7440-38-2	0.00100	0.000732	0.000400	0.00200
A	Cadmium	7440-43-9	0.00100	0.00101	0.000200	0.00200
A	Calcium	7440-70-2	0.100	0.0776	0.0340	0.500
A	Iron	7439-89-6	0.100	0.0850	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000864	0.000600	0.00200
A	Magnesium	7439-95-4	0.100	0.107	0.0100	0.200
A	Potassium	7440-09-7	0.100	0.0562	0.0180	0.200
A	Selenium	7782-49-2	0.00200	0.00213	0.00110	0.00200
A	Sodium	7440-23-5	0.100	0.102	0.0140	0.200

WorkOrder: HS18110259
InstrumentID: ICPMS04
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.00100	0.00135	0.000400	0.00200
A	Arsenic	7440-38-2	0.00100	0.000732	0.000400	0.00200
A	Cadmium	7440-43-9	0.00100	0.00101	0.000200	0.00200
A	Calcium	7440-70-2	0.100	0.0776	0.0340	0.500
A	Iron	7439-89-6	0.100	0.0850	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000864	0.000600	0.00200
A	Magnesium	7439-95-4	0.100	0.107	0.0100	0.200
A	Potassium	7440-09-7	0.100	0.0562	0.0180	0.200
A	Selenium	7782-49-2	0.00200	0.00213	0.00110	0.00200
A	Sodium	7440-23-5	0.100	0.102	0.0140	0.200

WorkOrder: HS18110259
InstrumentID: ICS2100
Test Code: 300_W
Test Number: E300
Test Name: Anions by E300.0

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Chloride	16887-00-6	0.500	0.576	0.200	0.500
A	Nitrogen, Nitrate (As N)	14797-55-8	0.100	0.129	0.0300	0.100
A	Sulfate	14808-79-8	0.500	0.616	0.200	0.500

WorkOrder: HS18110259
InstrumentID: ManTech01
Test Code: ALK_W 2320B
Test Number: SM2320B
Test Name: Alkalinity by SM2320B

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Alkalinity, Bicarbonate (As CaCO3)	ALK-Bicarb	5.00	3.49	5.00	5.00
A	Alkalinity, Carbonate (As CaCO3)	ALK-Carb	5.00	3.49	5.00	5.00
A	Alkalinity, Total (As CaCO3)	ALK	5.00	3.49	5.00	5.00

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18110259

QC BATCH REPORT

Batch ID: 134294 **Instrument: ICPMS04** **Method: SW6020**

MBLK Sample ID: **MBLK-134294** Units: **mg/L** Analysis Date: **07-Nov-2018 14:40**
Client ID: Run ID: **ICPMS04_326956** SeqNo: **4808084** PrepDate: **06-Nov-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	U	0.200								
Potassium	0.04673	0.200								J
Selenium	U	0.00200								
Sodium	0.06973	0.200								J

MBLK Sample ID: **MBLK-134294** Units: **mg/L** Analysis Date: **07-Nov-2018 13:05**
Client ID: Run ID: **ICPMS04_326956** SeqNo: **4807896** PrepDate: **06-Nov-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.02166	0.200								J
Potassium	0.03689	0.200								J
Selenium	U	0.00200								
Sodium	0.09789	0.200								J

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18110259

QC BATCH REPORT

Batch ID: 134294 **Instrument: ICPMS04** **Method: SW6020**

LCS Sample ID: **LCS-134294** Units: **mg/L** Analysis Date: **07-Nov-2018 13:07**
Client ID: Run ID: **ICPMS04_326956** SeqNo: **4807897** PrepDate: **06-Nov-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04771	0.00200	0.05	0	95.4	80 - 120				
Arsenic	0.04662	0.00200	0.05	0	93.2	80 - 120				
Cadmium	0.04712	0.00200	0.05	0	94.2	80 - 120				
Calcium	5.009	0.500	5	0	100	80 - 120				
Iron	4.966	0.200	5	0	99.3	80 - 120				
Lead	0.04557	0.00200	0.05	0	91.1	80 - 120				
Magnesium	4.717	0.200	5	0	94.3	80 - 120				
Potassium	5.121	0.200	5	0	102	80 - 120				
Selenium	0.04461	0.00200	0.05	0	89.2	80 - 120				
Sodium	5.03	0.200	5	0	101	80 - 120				

MS Sample ID: **HS18101676-02MS** Units: **mg/L** Analysis Date: **07-Nov-2018 13:14**
Client ID: Run ID: **ICPMS04_326956** SeqNo: **4807900** PrepDate: **06-Nov-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04835	0.00200	0.05	0.000181	96.3	80 - 120				
Arsenic	0.05067	0.00200	0.05	0.00196	97.4	80 - 120				
Cadmium	0.04654	0.00200	0.05	0.000084	92.9	80 - 120				
Calcium	70	0.500	5	68.14	37.2	80 - 120				SO
Iron	5.129	0.200	5	0.3359	95.9	80 - 120				
Lead	0.04596	0.00200	0.05	0.000104	91.7	80 - 120				
Magnesium	19.12	0.200	5	15.76	67.3	80 - 120				S
Potassium	5.912	0.200	5	1.06	97.0	80 - 120				
Selenium	0.05088	0.00200	0.05	0.000901	100.0	80 - 120				
Sodium	274.5	0.200	5	285.4	-218	80 - 120				SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18110259

QC BATCH REPORT

Batch ID: 134294 **Instrument: ICPMS04** **Method: SW6020**

MSD Sample ID: **HS18101676-02MSD** Units: **mg/L** Analysis Date: **07-Nov-2018 13:16**
Client ID: Run ID: **ICPMS04_326956** SeqNo: **4807901** PrepDate: **06-Nov-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04962	0.00200	0.05	0.000181	98.9	80 - 120	0.04835	2.59	20	
Arsenic	0.05227	0.00200	0.05	0.00196	101	80 - 120	0.05067	3.11	20	
Cadmium	0.04603	0.00200	0.05	0.000084	91.9	80 - 120	0.04654	1.1	20	
Calcium	73.2	0.500	5	68.14	101	80 - 120	70	4.46	20	O
Iron	5.244	0.200	5	0.3359	98.2	80 - 120	5.129	2.22	20	
Lead	0.04688	0.00200	0.05	0.000104	93.5	80 - 120	0.04596	1.98	20	
Magnesium	20.17	0.200	5	15.76	88.2	80 - 120	19.12	5.33	20	
Potassium	6.075	0.200	5	1.06	100	80 - 120	5.912	2.73	20	
Selenium	0.04575	0.00200	0.05	0.000901	89.7	80 - 120	0.05088	10.6	20	
Sodium	291.3	0.200	5	285.4	118	80 - 120	274.5	5.94	20	EO

PDS Sample ID: **HS18101676-02PDS** Units: **mg/L** Analysis Date: **07-Nov-2018 13:18**
Client ID: Run ID: **ICPMS04_326956** SeqNo: **4807902** PrepDate: **06-Nov-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09544	0.00200	0.1	0.000181	95.3	75 - 125				
Arsenic	0.09838	0.00200	0.1	0.00196	96.4	75 - 125				
Cadmium	0.0926	0.00200	0.1	0.000084	92.5	75 - 125				
Calcium	72.89	0.500	10	68.14	47.4	75 - 125				SO
Iron	9.589	0.200	10	0.3359	92.5	75 - 125				
Lead	0.09074	0.00200	0.1	0.000104	90.6	75 - 125				
Magnesium	23.42	0.200	10	15.76	76.6	75 - 125				
Potassium	10.7	0.200	10	1.06	96.4	75 - 125				
Selenium	0.1016	0.00200	0.1	0.000901	101	75 - 125				

PDS Sample ID: **HS18101676-02PDS** Units: **mg/L** Analysis Date: **07-Nov-2018 14:47**
Client ID: Run ID: **ICPMS04_326956** SeqNo: **4808087** PrepDate: **06-Nov-2018** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	374.4	2.00	100	288.6	85.8	75 - 125				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18110259

QC BATCH REPORT

Batch ID: 134294 **Instrument: ICPMS04** **Method: SW6020**

SD Sample ID: **HS18101676-02SD** Units: **mg/L** Analysis Date: **07-Nov-2018 13:11**
Client ID: Run ID: **ICPMS04_326956** SeqNo: **4807899** PrepDate: **06-Nov-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000181	0	10	
Arsenic	0.007374	0.0100					0.00196	0	10	J
Cadmium	U	0.0100					0.000084	0	10	
Calcium	65.86	2.50					68.14	3.35	10	
Iron	0.5164	1.00					0.3359	0	10	J
Lead	U	0.0100					0.000104	0	10	
Magnesium	15.47	1.00					15.76	1.8	10	
Selenium	U	0.0100					0.000901	0	10	

SD Sample ID: **HS18101676-02SD** Units: **mg/L** Analysis Date: **07-Nov-2018 14:45**
Client ID: Run ID: **ICPMS04_326956** SeqNo: **4808086** PrepDate: **06-Nov-2018** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Sodium	309.8	10.0					288.6	7.33	10	

The following samples were analyzed in this batch: HS18110259-01 HS18110259-02

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18110259

QC BATCH REPORT

Batch ID: 134313 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLK-134313** Units: **mg/L** Analysis Date: **07-Nov-2018 14:11**
Client ID: Run ID: **ICPMS04_326956** SeqNo: **4808049** PrepDate: **06-Nov-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	0.0008	0.00200								J
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	0.03383	0.200								J
Lead	U	0.00200								
Magnesium	U	0.200								
Potassium	0.04916	0.200								J
Selenium	U	0.00200								
Sodium	0.123	0.200								J

LCS Sample ID: **LCS-134313** Units: **mg/L** Analysis Date: **07-Nov-2018 12:18**
Client ID: Run ID: **ICPMS04_326956** SeqNo: **4807747** PrepDate: **06-Nov-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05084	0.00200	0.05	0	102	80 - 120				
Arsenic	0.0504	0.00200	0.05	0	101	80 - 120				
Cadmium	0.0513	0.00200	0.05	0	103	80 - 120				
Calcium	5.307	0.500	5	0	106	80 - 120				
Iron	5.264	0.200	5	0	105	80 - 120				
Lead	0.04855	0.00200	0.05	0	97.1	80 - 120				
Magnesium	5.085	0.200	5	0	102	80 - 120				
Potassium	5.377	0.200	5	0	108	80 - 120				
Selenium	0.05476	0.00200	0.05	0	110	80 - 120				
Sodium	5.237	0.200	5	0	105	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18110259

QC BATCH REPORT

Batch ID: 134313 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

MS Sample ID: **HS18110034-01MS** Units: **mg/L** Analysis Date: **07-Nov-2018 12:25**
Client ID: Run ID: **ICPMS04_326956** SeqNo: **4807750** PrepDate: **06-Nov-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05086	0.00200	0.05	0.000255	101	75 - 125				
Arsenic	0.06032	0.00200	0.05	0.009125	102	75 - 125				
Cadmium	0.04851	0.00200	0.05	0.000039	96.9	75 - 125				
Calcium	236.9	0.500	5	234.9	40.2	75 - 125				SEO
Iron	38.5	0.200	5	34.42	81.5	75 - 125				O
Lead	0.04832	0.00200	0.05	0.000594	95.4	75 - 125				
Magnesium	72.76	0.200	5	70.85	38.3	75 - 125				SO
Potassium	9.72	0.200	5	4.758	99.2	75 - 125				
Selenium	0.05927	0.00200	0.05	0.002692	113	75 - 125				
Sodium	281.4	0.200	5	286.5	-101	75 - 125				SEO

MSD Sample ID: **HS18110034-01MSD** Units: **mg/L** Analysis Date: **07-Nov-2018 12:27**
Client ID: Run ID: **ICPMS04_326956** SeqNo: **4807751** PrepDate: **06-Nov-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04896	0.00200	0.05	0.000255	97.4	75 - 125	0.05086	3.81	20	
Arsenic	0.05712	0.00200	0.05	0.009125	96.0	75 - 125	0.06032	5.44	20	
Cadmium	0.0492	0.00200	0.05	0.000039	98.3	75 - 125	0.04851	1.42	20	
Calcium	233.7	0.500	5	234.9	-24.3	75 - 125	236.9	1.37	20	SEO
Iron	38.27	0.200	5	34.42	77.0	75 - 125	38.5	0.592	20	O
Lead	0.0489	0.00200	0.05	0.000594	96.6	75 - 125	0.04832	1.2	20	
Magnesium	70.97	0.200	5	70.85	2.46	75 - 125	72.76	2.49	20	SO
Potassium	9.676	0.200	5	4.758	98.4	75 - 125	9.72	0.461	20	
Selenium	0.05139	0.00200	0.05	0.002692	97.4	75 - 125	0.05927	14.2	20	
Sodium	275.9	0.200	5	286.5	-212	75 - 125	281.4	2	20	SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18110259

QC BATCH REPORT

Batch ID: 134313 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

PDS Sample ID: **HS18110034-01PDS** Units: **mg/L** Analysis Date: **07-Nov-2018 12:29**
Client ID: Run ID: **ICPMS04_326956** SeqNo: **4807752** PrepDate: **06-Nov-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.08732	0.00200	0.1	0.000255	87.1	75 - 125				
Arsenic	0.1045	0.00200	0.1	0.009125	95.3	75 - 125				
Cadmium	0.08916	0.00200	0.1	0.000039	89.1	75 - 125				
Lead	0.09076	0.00200	0.1	0.000594	90.2	75 - 125				
Magnesium	71.08	0.200	10	70.85	2.38	75 - 125				SO
Potassium	14.01	0.200	10	4.758	92.6	75 - 125				
Selenium	0.09727	0.00200	0.1	0.002692	94.6	75 - 125				

PDS Sample ID: **HS18110034-01PDS** Units: **mg/L** Analysis Date: **07-Nov-2018 14:18**
Client ID: Run ID: **ICPMS04_326956** SeqNo: **4808052** PrepDate: **06-Nov-2018** DF: **20**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	422.3	10.0	200	213.8	104	75 - 125				
Magnesium	259.3	4.00	200	64.85	97.2	75 - 125				
Sodium	461.6	4.00	200	268.8	96.4	75 - 125				

SD Sample ID: **HS18110034-01SD** Units: **mg/L** Analysis Date: **07-Nov-2018 12:22**
Client ID: Run ID: **ICPMS04_326956** SeqNo: **4807749** PrepDate: **06-Nov-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000255	0	10	
Arsenic	0.007766	0.0100					0.009125	0	10	J
Cadmium	U	0.0100					0.000039	0	10	
Iron	33.23	1.00					34.42	3.45	10	
Lead	U	0.0100					0.000594	0	10	
Magnesium	64.25	1.00					70.85	9.31	10	
Selenium	U	0.0100					0.002692	0	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18110259

QC BATCH REPORT

Batch ID: 134313 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

SD Sample ID: **HS18110034-01SD** Units: **mg/L** Analysis Date: **07-Nov-2018 14:15**
Client ID: Run ID: **ICPMS04_326956** SeqNo: **4808051** PrepDate: **06-Nov-2018** DF: **100**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	217.3	50.0					213.8	1.64	10	
Magnesium	67.46	20.0					64.85	4.02	10	
Sodium	282.4	20.0					268.8	5.07	10	

The following samples were analyzed in this batch: HS18110259-01 HS18110259-02

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18110259

QC BATCH REPORT

Batch ID: R326908 **Instrument: ManTech01** **Method: SM2320B**

MBLK Sample ID: **WBLKW1-181105** Units: **mg/L** Analysis Date: **06-Nov-2018 12:39**
Client ID: Run ID: **ManTech01_326908** SeqNo: **4806490** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	U	5.00								
Alkalinity, Carbonate (As CaCO3)	U	5.00								
Alkalinity, Total (As CaCO3)	U	5.00								

LCS Sample ID: **WLCS1-181105** Units: **mg/L** Analysis Date: **06-Nov-2018 12:48**
Client ID: Run ID: **ManTech01_326908** SeqNo: **4806491** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	991.5	5.00	1000	0	99.2	85 - 115				
Alkalinity, Total (As CaCO3)	1025	5.00	1000	0	102	85 - 115				

LCSD Sample ID: **WLCSD1-181105** Units: **mg/L** Analysis Date: **06-Nov-2018 12:56**
Client ID: Run ID: **ManTech01_326908** SeqNo: **4806492** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	998.3	5.00	1000	0	99.8	85 - 115	991.5	0.684	20	
Alkalinity, Total (As CaCO3)	1032	5.00	1000	0	103	85 - 115	1025	0.648	20	

DUP Sample ID: **HS18110058-01DUP** Units: **mg/L** Analysis Date: **06-Nov-2018 13:39**
Client ID: Run ID: **ManTech01_326908** SeqNo: **4806498** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	304.5	5.00					304.5	0.00985	20	
Alkalinity, Carbonate (As CaCO3)	22.83	5.00					23.18	1.52	20	
Alkalinity, Total (As CaCO3)	327.3	5.00					327.7	0.113	20	

The following samples were analyzed in this batch: HS18110259-01 HS18110259-02

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18110259

QC BATCH REPORT

Batch ID: R326996 **Instrument: ICS2100** **Method: E300**

MBLK Sample ID: **WBLKW1-110618** Units: **mg/L** Analysis Date: **06-Nov-2018 13:42**
Client ID: Run ID: **ICS2100_326996** SeqNo: **4808566** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	0.500								
Nitrogen, Nitrate (As N)	U	0.100								
Sulfate	U	0.500								

LCS Sample ID: **WLCSW1-110618** Units: **mg/L** Analysis Date: **06-Nov-2018 13:57**
Client ID: Run ID: **ICS2100_326996** SeqNo: **4808567** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.2	0.500	20	0	101	90 - 110				
Nitrogen, Nitrate (As N)	3.904	0.100	4	0	97.6	90 - 110				
Sulfate	20.37	0.500	20	0	102	90 - 110				

LCSD Sample ID: **WLCSDW1-110618** Units: **mg/L** Analysis Date: **06-Nov-2018 14:11**
Client ID: Run ID: **ICS2100_326996** SeqNo: **4808568** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.06	0.500	20	0	100	90 - 110	20.2	0.691	20	
Nitrogen, Nitrate (As N)	3.872	0.100	4	0	96.8	90 - 110	3.904	0.823	20	
Sulfate	20.15	0.500	20	0	101	90 - 110	20.37	1.08	20	

MS Sample ID: **HS18110081-20MS** Units: **mg/L** Analysis Date: **06-Nov-2018 19:47**
Client ID: Run ID: **ICS2100_326996** SeqNo: **4808582** PrepDate: DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	555.2	5.00	100	457	98.2	80 - 120				O
Nitrogen, Nitrate (As N)	19.62	1.00	20	0	98.1	80 - 120				
Sulfate	1441	5.00	100	1350	91.5	80 - 120				EO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18110259

QC BATCH REPORT

Batch ID: R326996 **Instrument: ICS2100** **Method: E300**

MSD Sample ID: **HS18110081-20MSD** Units: **mg/L** Analysis Date: **06-Nov-2018 20:02**
Client ID: Run ID: **ICS2100_326996** SeqNo: **4808583** PrepDate: DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	552.5	5.00	100	457	95.5	80 - 120	555.2	0.501	20	O
Nitrogen, Nitrate (As N)	19.58	1.00	20	0	97.9	80 - 120	19.62	0.225	20	
Sulfate	1433	5.00	100	1350	83.5	80 - 120	1441	0.556	20	EO

The following samples were analyzed in this batch: HS18110259-01 HS18110259-02

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18110259

QC BATCH REPORT

Batch ID: R327284 **Instrument: Balance1** **Method: M2540C**

MBLK Sample ID: **WBLK-110918** Units: **mg/L** Analysis Date: **09-Nov-2018 08:00**
Client ID: Run ID: **Balance1_327284** SeqNo: **4814717** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	U	10.0								

LCS Sample ID: **WLCS-110918** Units: **mg/L** Analysis Date: **09-Nov-2018 08:00**
Client ID: Run ID: **Balance1_327284** SeqNo: **4814718** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	1022	10.0	1000	0	102	85 - 115				

DUP Sample ID: **HS18110489-09DUP** Units: **mg/L** Analysis Date: **09-Nov-2018 08:00**
Client ID: Run ID: **Balance1_327284** SeqNo: **4814716** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	198	10.0					188	5.18	5	R

DUP Sample ID: **HS18110259-01DUP** Units: **mg/L** Analysis Date: **09-Nov-2018 08:00**
Client ID: **DGW-MW-3** Run ID: **Balance1_327284** SeqNo: **4814709** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	952	10.0					938	1.48	5	

The following samples were analyzed in this batch: HS18110259-01 HS18110259-02

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS18110259**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
North Carolina	624-2018	31-Dec-2018
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	22-Dec-2018
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS18110259
Date/Time Received: **06-Nov-2018 09:30**
Received by: **NDR**

Checklist completed by: *Nilesh D. Ranchod* eSignature — 6-Nov-2018 Date
Reviewed by: *Dane J. Wacasey* eSignature — 6-Nov-2018 Date

Matrices: **Water**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	2.2C / 1.9C UC/C	IR # 25	
Cooler(s)/Kit(s):	44208		
Date/Time sample(s) sent to storage:	11/06/2018 10:30am		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070

Chain of Custody Form

Page 1 of 1

COC ID: 189515

HS18110259

Golder Associates
Exide Column Studies

TRK# 4380 9533 1024

Customer Information		Project Information	
Purchase Order	130-2086-01	Project Name	Exide Column Studies
Work Order		Project Number	130-2086
Company Name	Golder Associates	Bill To Company	Golder Associates
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021
Phone	(314) 984-8600	Phone	(314) 984-8800
Fax		Fax	
e-Mail Address	ewhite@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com

ALS Project Manager:

A	300_W (300 Cl, SO4, [*NO3* *48hr HT*])
B	TDS_W 2540C (2540C TDS)
C	ALK_W 2320B (2320B Alkalinity)
D	HARD (2340B Hardness (calc))
E	ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
F	ICP_TW (6020A Total Metals (6)+Cations)
G	
H	
I	
J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	DGN-MW-3	11/5/18	1315	Groundwa	2,8	3	X	X	X	X	X	X					
2	French Drain	"	1648	"	"	"	X	X	X	X	X	X					
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Bri Marks

Shipment Method: FedEx

Required Turnaround Time: (Check Box) ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☒ 24 Hour ☐ Other

Results Due Date:

Relinquished by: — Date: 11/5/18 Time: 1800 — Received by:

Relinquished by: — Date: — Time: — Received by (Laboratory):

Logged by (Laboratory): — Date: 11/6/18 Time: 10:00 — Checked by (Laboratory): J. Magerum

Notes: Exide Column Studies

Cooler ID	Cooler Temp.
	uc
44208	2.2
	1429
	CF-0.3

QC Package: (Check One Box Below)

- ☐ Level II Std QC
- ☐ Level III Std QC/Raw Data
- ☐ Level IV SW846/CLP
- ☐ Other
- ☒ TRRP Checklist
- ☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

44208

CUSTODY SEAL

Date: 11/5/18 Time: 1800
Name: Bay Works
Company: Golder

Seal Broken By: BM
Date: 11/06/18

44208 NOV 0 6 2018

Must Deliver Next Business Day
Time and Tempature Sensitive!

44208

ORIGIN ID:SGRA (310) 304-1326
EMILY WHITE
EXIDE TECHNOLOGIES
7471 S. 5TH STREET

FRISCO, TX 75034
UNITED STATES US

SHIP DATE: 02OCT18
ACTWGT: 1.00 LB MAN
CAD: 3001330/CAFE3211
DIMS: 19x16x13 IN

TO **CLIENT SERVICES**
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: EXIDE COLUMN STUDIES – DW

RMA:

FedEx Express

FedEx
TRK# (0221) 4380 9533 1024

TUE – 06 NOV 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX – US IAH

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

November 14, 2018

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS18110338**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 1 sample(s) on Nov 07, 2018 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS18110338**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS18110338**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data								
Laboratory Name: ALS Laboratory Group			LRC Date: 11/14/2018					
Project Name: Exide Column Studies			Laboratory Job Number: HS18110338					
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 134340,134341,R327064,R327116,R327240,R327476					
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?	X				
		Were surrogate percent recoveries in all samples within the laboratory QC limits?	X				
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?	X				
		Were analytical duplicates analyzed at the appropriate frequency?	X				
		Were RPDs or relative standard deviations within the laboratory QC limits?	X				
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 11/14/2018				
Project Name: Exide Column Studies			Laboratory Job Number: HS18110338				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 134340,134341,R327064,R327116,R327240,R327476				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			2
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		X			3
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Data	
Laboratory Name: ALS Laboratory Group	LRC Date: 11/14/2018
Project Name: Exide Column Studies	Laboratory Job Number: HS18110338
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 134340,134341,R327064,R327116,R327240,R327476

ER#[5]	Description
1	Batch 134340, Dissolved Metals Method SW6020, sample MW-46, MS and or MSD recovered outside the control limits for Calcium, Iron, Magnesium and Sodium, however, the result in the parent sample is greater than 4x the spike amount Batch 134341, Metals Method SW6020, sample MW-46, the MS and or MSD recovered outside the control limits for Calcium, Iron, Magnesium and Sodium, however, the result in the parent sample is greater than 4x the spike amount Batch R327064, Anions Method E300, sample HS18110381-02, MS and MSD were performed on unrelated sample.
2	See Run Log and CCB Exceptions Report.
3	Batch 134340, Dissolved Metals Method SW6020, sample MW-46, PDS recovered outside the control limits for Iron, Magnesium and Sodium, however, the result in the parent sample is greater than4x the spike amount. Batch 134341, Metals Method SW6020, sample MW-46, PDS recovered outside the control limit for Calcium, however, the result in the parent sample is greater than 4x the spike amount.

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18110338
Start Date: 07-Nov-2018 End Date: 08-Nov-2018

Run ID:ICPMS05_326964
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	07-Nov-2018 13:13	018_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	07-Nov-2018 13:15	019SMPL.d	AS CD FE K MG PB SB SE
LLICV5	1	07-Nov-2018 13:17	020LICV.d	AS CD FE K MG PB SB SE
ICB	1	07-Nov-2018 13:19	021_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	07-Nov-2018 13:32	022ICSA.d	AS CD FE K MG PB SB SE
ICSAB	1	07-Nov-2018 13:34	023ICSB.d	AS CD FE K MG PB SB SE
CCV 1	1	07-Nov-2018 14:07	030_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	07-Nov-2018 14:09	031_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	07-Nov-2018 14:42	042_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	07-Nov-2018 14:44	043_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	07-Nov-2018 15:08	053_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	07-Nov-2018 15:10	054_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	07-Nov-2018 16:37	061_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	07-Nov-2018 16:39	062_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	07-Nov-2018 18:30	065_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	07-Nov-2018 18:32	066_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	07-Nov-2018 18:48	074_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	07-Nov-2018 18:50	075_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	07-Nov-2018 19:10	085_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	07-Nov-2018 19:12	086_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 8	1	07-Nov-2018 19:30	095_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	07-Nov-2018 19:32	096_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	07-Nov-2018 19:40	100_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	07-Nov-2018 19:42	101_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 10	1	07-Nov-2018 19:58	109_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	07-Nov-2018 20:00	110_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 11	1	07-Nov-2018 21:48	141_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	07-Nov-2018 21:50	142SMPL.d	AS CD FE K MG PB SB SE
LLCCV5	1	07-Nov-2018 21:52	143LICV.d	AS CD FE K MG PB SB SE
ICCB 11	1	07-Nov-2018 21:54	144_ICB.d	AS CA CD FE K MG NA PB SB SE
MBLK-134340	1	07-Nov-2018 21:56	145SMPL.d	AS CA CD FE K MG NA PB SB SE
LCS-134340	1	07-Nov-2018 21:58	146SMPL.d	AS CA CD FE K MG NA PB SB SE
MW-46	2	07-Nov-2018 22:00	147SMPL.d	AS CD FE K MG PB SB SE
MW-46SD	10	07-Nov-2018 22:02	148SMPL.d	AS CD FE K MG PB SB SE
MW-46MS	2	07-Nov-2018 22:04	149SMPL.d	AS CA CD FE K MG NA PB SB SE
MW-46MSD	2	07-Nov-2018 22:06	150SMPL.d	AS CA CD FE K MG NA PB SB SE
MW-46PDS	2	07-Nov-2018 22:08	151SMPL.d	AS CD FE K MG PB SB SE
CCV 12	1	07-Nov-2018 22:10	152_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 12	1	07-Nov-2018 22:12	153_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-134341	1	07-Nov-2018 22:14	154SMPL.d	AS CA CD FE K MG NA PB SB SE
LCS-134341	1	07-Nov-2018 22:16	155SMPL.d	AS CA CD FE K MG NA PB SB SE
MW-46	2	07-Nov-2018 22:18	156SMPL.d	AS CD FE K MG PB SB SE
MW-46SD	10	07-Nov-2018 22:20	157SMPL.d	AS CD K PB SB SE
MW-46MS	2	07-Nov-2018 22:22	158SMPL.d	AS CA CD FE K MG NA PB SB SE
MW-46MSD	2	07-Nov-2018 22:26	160SMPL.d	AS CA CD FE K MG NA PB SB SE
MW-46PDS	2	07-Nov-2018 22:28	161SMPL.d	AS CD FE K MG PB SB SE
CCV 13	1	07-Nov-2018 22:33	163_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 13	1	07-Nov-2018 22:34	164_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 14	1	07-Nov-2018 22:51	172_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 14	1	07-Nov-2018 22:53	173_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 15	1	07-Nov-2018 23:15	184_CCV.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18110338

Run ID:ICPMS05_326964
Instrument:ICPMS05
Method:SW6020

	Sodium	24.93	14	200	
ICCB 11	Date: 07-Nov-2018 21:54	Seq: 4809017	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Potassium	22.78	18	200	
CCB 12	Date: 07-Nov-2018 22:12	Seq: 4809111	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.442	0.4	2	
	Magnesium	12.69	10	200	
	Potassium	-19.5	18	200	
	Sodium	88.09	14	200	
CCB 13	Date: 07-Nov-2018 22:34	Seq: 4809122	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.468	0.4	2	
	Sodium	71.61	14	200	
CCB 14	Date: 07-Nov-2018 22:53	Seq: 4809131	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.597	0.4	2	
	Sodium	27.32	14	200	
CCB 15	Date: 07-Nov-2018 23:17	Seq: 4809143	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.434	0.4	2	
	Sodium	28.66	14	200	
CCB 16	Date: 07-Nov-2018 23:41	Seq: 4809155	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.452	0.4	2	
	Sodium	20.01	14	200	
CCB 17	Date: 07-Nov-2018 23:59	Seq: 4809343	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.473	0.4	2	
CCB 19	Date: 08-Nov-2018 00:49	Seq: 4809395	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.414	0.4	2	
	Magnesium	12.99	10	200	
	Potassium	24.89	18	200	
	Sodium	302.5	14	200	
CCB 20	Date: 08-Nov-2018 01:03	Seq: 4809402	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Arsenic	0.46	0.4	2	
	Calcium	65.37	34	500	
	Magnesium	70.6	10	200	
	Potassium	51.79	18	200	
	Sodium	969.9	14	200	
CCB 21	Date: 08-Nov-2018 01:07	Seq: 4809404	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.721	0.4	2	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18110338
Start Date: 08-Nov-2018 End Date: 08-Nov-2018

Run ID:ICPMS05_327048
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	08-Nov-2018 12:09	018_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	08-Nov-2018 12:11	019SMPL.d	CA NA
LLICV5	1	08-Nov-2018 12:13	020LICV.d	CA NA
ICB	1	08-Nov-2018 12:15	021_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	08-Nov-2018 12:22	023ICSA.d	CA NA
ICSAB	1	08-Nov-2018 12:24	024ICSB.d	CA NA
ICSAB	1	08-Nov-2018 12:32	026ICSB.d	CA NA
MW-46	10	08-Nov-2018 12:39	028SMPL.d	CA NA
MW-46SD	50	08-Nov-2018 12:41	029SMPL.d	CA NA
MW-46PDS	10	08-Nov-2018 12:43	030SMPL.d	CA NA
MBLK-134341	1	08-Nov-2018 12:47	032SMPL.d	
LCS-134341	1	08-Nov-2018 12:49	033SMPL.d	
MW-46	10	08-Nov-2018 12:51	034SMPL.d	CA NA
MW-46SD	50	08-Nov-2018 12:53	035SMPL.d	CA NA
MW-46PDS	10	08-Nov-2018 12:55	036SMPL.d	CA NA
CCV 1	1	08-Nov-2018 12:59	038_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	08-Nov-2018 13:01	039_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	08-Nov-2018 14:54	041_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	08-Nov-2018 14:56	042_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	08-Nov-2018 15:18	052_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	08-Nov-2018 15:20	053_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	08-Nov-2018 15:52	062_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	08-Nov-2018 15:54	063_CCB.d	AS CA CD FE K MG NA PB SB SE
MW-46SD	10	08-Nov-2018 16:03	065SMPL.d	FE
MW-46SD	25	08-Nov-2018 16:09	068SMPL.d	MG
MW-46MS	5	08-Nov-2018 16:11	069SMPL.d	
MW-46MSD	5	08-Nov-2018 16:13	070SMPL.d	
MW-46PDS	5	08-Nov-2018 16:15	071SMPL.d	
CCB 5	1	08-Nov-2018 16:21	074_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	08-Nov-2018 16:31	076_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	08-Nov-2018 18:05	080_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	08-Nov-2018 18:07	081_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	08-Nov-2018 18:21	088_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	08-Nov-2018 18:23	089_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 8	1	08-Nov-2018 18:35	095_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	08-Nov-2018 18:37	096_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 9	1	08-Nov-2018 19:19	111_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	08-Nov-2018 19:21	112SMPL.d	CA NA
LLCCV5	1	08-Nov-2018 19:23	113LICV.d	CA NA
ICCB 9	1	08-Nov-2018 19:25	114_ICB.d	AS CA CD FE K MG NA PB SB SE
CCV 10	1	08-Nov-2018 19:45	124_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	08-Nov-2018 19:47	125_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 11	1	08-Nov-2018 20:09	136_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	08-Nov-2018 20:11	137_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 12	1	08-Nov-2018 20:27	145_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 12	1	08-Nov-2018 20:29	146_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 13	1	08-Nov-2018 20:45	154_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 13	1	08-Nov-2018 20:47	155_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 14	1	08-Nov-2018 21:09	166_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 14	1	08-Nov-2018 21:11	167_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 15	1	08-Nov-2018 21:42	178_CCV.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18110338

Run ID:ICPMS05_327048
Instrument:ICPMS05
Method:SW6020

ICB	Date: 08-Nov-2018 12:15	Seq: 4809713		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		-16.56	14	200	
CCB 3	Date: 08-Nov-2018 15:20	Seq: 4810427		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		-16.29	14	200	
CCB 4	Date: 08-Nov-2018 15:54	Seq: 4810562		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		144.2	14	200	
CCB 5	Date: 08-Nov-2018 16:21	Seq: 4810603		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		-50.2	14	200	
CCB 7	Date: 08-Nov-2018 18:23	Seq: 4810865		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		18.26	14	200	
CCB 8	Date: 08-Nov-2018 18:37	Seq: 4810872		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		40.38	14	200	
CCB 10	Date: 08-Nov-2018 19:47	Seq: 4810901		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		46.7	14	200	
CCB 11	Date: 08-Nov-2018 20:11	Seq: 4810928		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		52.28	14	200	
CCB 12	Date: 08-Nov-2018 20:29	Seq: 4810953		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		50.34	14	200	
CCB 13	Date: 08-Nov-2018 20:47	Seq: 4810962		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		18.96	14	200	
CCB 14	Date: 08-Nov-2018 21:11	Seq: 4810974		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		24.58	14	200	
CCB 15	Date: 08-Nov-2018 21:44	Seq: 4811102		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Calcium		35.53	34	500	
Sodium		50.35	14	200	
CCB 16	Date: 08-Nov-2018 22:02	Seq: 4811111		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		56.18	14	200	
ICCB 17	Date: 08-Nov-2018 22:28	Seq: 4811124		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS18110338

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18110338-01	MW-46	Groundwater		06-Nov-2018 15:00	07-Nov-2018 08:50	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: MW-46
Collection Date: 06-Nov-2018 15:00

ANALYTICAL REPORT
WorkOrder:HS18110338
Lab ID:HS18110338-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**2,440**		**2.00**	**2.00**	**mg/L**	1	09-Nov-2018 09:59
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 07-Nov-2018		Analyst: ALR
Antimony	U		0.000800	0.00400	mg/L	2	07-Nov-2018 22:18
Arsenic	**0.00317**	J	**0.000800**	**0.00400**	**mg/L**	2	07-Nov-2018 22:18
Cadmium	**0.000791**	J	**0.000400**	**0.00400**	**mg/L**	2	07-Nov-2018 22:18
Calcium	**597**		**0.340**	**5.00**	**mg/L**	10	08-Nov-2018 12:51
Iron	**66.6**		**0.0240**	**0.400**	**mg/L**	2	07-Nov-2018 22:18
Lead	U		0.00120	0.00400	mg/L	2	07-Nov-2018 22:18
Magnesium	**231**		**0.0200**	**0.400**	**mg/L**	2	07-Nov-2018 22:18
Potassium	**4.62**		**0.0360**	**0.400**	**mg/L**	2	07-Nov-2018 22:18
Selenium	U		0.00220	0.00400	mg/L	2	07-Nov-2018 22:18
Sodium	**695**		**0.140**	**2.00**	**mg/L**	10	08-Nov-2018 12:51
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**			Prep:SW3010A / 07-Nov-2018		Analyst: ALR
Antimony	U		0.000800	0.00400	mg/L	2	07-Nov-2018 22:00
Arsenic	**0.00309**	J	**0.000800**	**0.00400**	**mg/L**	2	07-Nov-2018 22:00
Cadmium	**0.000969**	J	**0.000400**	**0.00400**	**mg/L**	2	07-Nov-2018 22:00
Calcium	**565**		**0.340**	**5.00**	**mg/L**	10	08-Nov-2018 12:39
Iron	**76.1**		**0.0240**	**0.400**	**mg/L**	2	07-Nov-2018 22:00
Lead	U		0.00120	0.00400	mg/L	2	07-Nov-2018 22:00
Magnesium	**241**		**0.0200**	**0.400**	**mg/L**	2	07-Nov-2018 22:00
Potassium	**5.01**		**0.0360**	**0.400**	**mg/L**	2	07-Nov-2018 22:00
Selenium	U		0.00220	0.00400	mg/L	2	07-Nov-2018 22:00
Sodium	**664**		**0.140**	**2.00**	**mg/L**	10	08-Nov-2018 12:39
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**485**		**1.00**	**2.50**	**mg/L**	5	07-Nov-2018 16:58
Nitrogen, Nitrate (As N)	U		0.150	0.500	mg/L	5	07-Nov-2018 16:58
Sulfate	**2,760**		**20.0**	**50.0**	**mg/L**	100	07-Nov-2018 17:42
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	**5,240**		**5.00**	**10.0**	**mg/L**	1	13-Nov-2018 17:30
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**358**		**5.00**	**5.00**	**mg/L**	1	10-Nov-2018 19:52
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	10-Nov-2018 19:52
Alkalinity, Total (As CaCO3)	**358**		**5.00**	**5.00**	**mg/L**	1	10-Nov-2018 19:52

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18110338

Batch ID: 134340 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18110338-01	1	10	10 (mL)	1

Batch ID: 134341 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18110338-01	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18110338

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 134340	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS18110338-01	MW-46	06 Nov 2018 15:00		07 Nov 2018 10:30	08 Nov 2018 12:39	10
HS18110338-01	MW-46	06 Nov 2018 15:00		07 Nov 2018 10:30	07 Nov 2018 22:00	2
Batch ID 134341	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS18110338-01	MW-46	06 Nov 2018 15:00		07 Nov 2018 10:30	08 Nov 2018 12:51	10
HS18110338-01	MW-46	06 Nov 2018 15:00		07 Nov 2018 10:30	07 Nov 2018 22:18	2
Batch ID R327064	**Test Name :** ANIONS BY E300.0			**Matrix:** Groundwater		
HS18110338-01	MW-46	06 Nov 2018 15:00			07 Nov 2018 17:42	100
HS18110338-01	MW-46	06 Nov 2018 15:00			07 Nov 2018 16:58	5
Batch ID R327116	**Test Name :** HARDNESS, TOTAL AS CACO3 BY SM2340B			**Matrix:** Groundwater		
HS18110338-01	MW-46	06 Nov 2018 15:00			09 Nov 2018 09:59	1
Batch ID R327240	**Test Name :** ALKALINITY BY SM2320B			**Matrix:** Groundwater		
HS18110338-01	MW-46	06 Nov 2018 15:00			10 Nov 2018 19:52	1
Batch ID R327476	**Test Name :** TOTAL DISSOLVED SOLIDS BY SM2540C			**Matrix:** Groundwater		
HS18110338-01	MW-46	06 Nov 2018 15:00			13 Nov 2018 17:30	1

WorkOrder: HS18110338
InstrumentID: ICPMS05
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.00100	0.00105	0.000400	0.00200
A	Arsenic	7440-38-2	0.00100	0.00103	0.000400	0.00200
A	Cadmium	7440-43-9	0.00100	0.000999	0.000200	0.00200
A	Calcium	7440-70-2	0.100	0.105	0.0340	0.500
A	Iron	7439-89-6	0.100	0.105	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000964	0.000600	0.00200
A	Magnesium	7439-95-4	0.100	0.108	0.0100	0.200
A	Potassium	7440-09-7	0.100	0.0788	0.0180	0.200
A	Selenium	7782-49-2	0.00200	0.00203	0.00110	0.00200
A	Sodium	7440-23-5	0.100	0.127	0.0140	0.200

WorkOrder: HS18110338
InstrumentID: ICPMS05
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.00100	0.00105	0.000400	0.00200
A	Arsenic	7440-38-2	0.00100	0.00103	0.000400	0.00200
A	Cadmium	7440-43-9	0.00100	0.000999	0.000200	0.00200
A	Calcium	7440-70-2	0.100	0.105	0.0340	0.500
A	Iron	7439-89-6	0.100	0.105	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000964	0.000600	0.00200
A	Magnesium	7439-95-4	0.100	0.108	0.0100	0.200
A	Potassium	7440-09-7	0.100	0.0788	0.0180	0.200
A	Selenium	7782-49-2	0.00200	0.00203	0.00110	0.00200
A	Sodium	7440-23-5	0.100	0.127	0.0140	0.200

WorkOrder: HS18110338
InstrumentID: ICS3K2
Test Code: 300_W
Test Number: E300
Test Name: Anions by E300.0

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Chloride	16887-00-6	0.500	0.580	0.200	0.500
A	Nitrogen, Nitrate (As N)	14797-55-8	0.100	0.126	0.0300	0.100
A	Sulfate	14808-79-8	0.500	0.644	0.200	0.500

WorkOrder: HS18110338
InstrumentID: ManTech01
Test Code: ALK_W 2320B
Test Number: SM2320B
Test Name: Alkalinity by SM2320B

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Alkalinity, Bicarbonate (As CaCO3)	ALK-Bicarb	5.00	3.49	5.00	5.00
A	Alkalinity, Carbonate (As CaCO3)	ALK-Carb	5.00	3.49	5.00	5.00
A	Alkalinity, Total (As CaCO3)	ALK	5.00	3.49	5.00	5.00

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18110338

QC BATCH REPORT

Batch ID: 134340 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLK-134340** Units: **mg/L** Analysis Date: **07-Nov-2018 21:56**
Client ID: Run ID: **ICPMS05_326964** SeqNo: **4809018** PrepDate: **07-Nov-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01989	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	U	0.200								

LCS Sample ID: **LCS-134340** Units: **mg/L** Analysis Date: **07-Nov-2018 21:58**
Client ID: Run ID: **ICPMS05_326964** SeqNo: **4809019** PrepDate: **07-Nov-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04798	0.00200	0.05	0	96.0	80 - 120				
Arsenic	0.04917	0.00200	0.05	0	98.3	80 - 120				
Cadmium	0.05021	0.00200	0.05	0	100	80 - 120				
Calcium	5.065	0.500	5	0	101	80 - 120				
Iron	5.009	0.200	5	0	100	80 - 120				
Lead	0.0507	0.00200	0.05	0	101	80 - 120				
Magnesium	4.982	0.200	5	0	99.6	80 - 120				
Potassium	4.987	0.200	5	0	99.7	80 - 120				
Selenium	0.05013	0.00200	0.05	0	100	80 - 120				
Sodium	5.11	0.200	5	0	102	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18110338

QC BATCH REPORT

Batch ID: 134340 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MS Sample ID: **HS18110338-01MS** Units: **mg/L** Analysis Date: **07-Nov-2018 22:04**
Client ID: **MW-46** Run ID: **ICPMS05_326964** SeqNo: **4809022** PrepDate: **07-Nov-2018** DF: **2**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04328	0.00400	0.05	0.000214	86.1	75 - 125				
Arsenic	0.04743	0.00400	0.05	0.003094	88.7	75 - 125				
Cadmium	0.04634	0.00400	0.05	0.000969	90.7	75 - 125				
Calcium	501.6	1.00	5	519.2	-351	75 - 125				SEO
Iron	75.98	0.400	5	76.13	-2.94	75 - 125				SO
Lead	0.04192	0.00400	0.05	0.000288	83.3	75 - 125				
Magnesium	232.1	0.400	5	240.6	-170	75 - 125				SO
Potassium	9.226	0.400	5	5.006	84.4	75 - 125				
Selenium	0.04319	0.00400	0.05	0.001471	83.4	75 - 125				
Sodium	585.6	0.400	5	606.2	-410	75 - 125				SEO

MSD Sample ID: **HS18110338-01MSD** Units: **mg/L** Analysis Date: **07-Nov-2018 22:06**
Client ID: **MW-46** Run ID: **ICPMS05_326964** SeqNo: **4809023** PrepDate: **07-Nov-2018** DF: **2**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04625	0.00400	0.05	0.000214	92.1	75 - 125	0.04328	6.63	20	
Arsenic	0.04998	0.00400	0.05	0.003094	93.8	75 - 125	0.04743	5.22	20	
Cadmium	0.04944	0.00400	0.05	0.000969	97.0	75 - 125	0.04634	6.49	20	
Calcium	520.2	1.00	5	519.2	21.3	75 - 125	501.6	3.65	20	SEO
Iron	83.37	0.400	5	76.13	145	75 - 125	75.98	9.28	20	SO
Lead	0.04496	0.00400	0.05	0.000288	89.3	75 - 125	0.04192	6.99	20	
Magnesium	246.9	0.400	5	240.6	126	75 - 125	232.1	6.18	20	SO
Potassium	9.31	0.400	5	5.006	86.1	75 - 125	9.226	0.9	20	
Selenium	0.04835	0.00400	0.05	0.001471	93.8	75 - 125	0.04319	11.3	20	
Sodium	616.9	0.400	5	606.2	215	75 - 125	585.6	5.2	20	SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18110338

QC BATCH REPORT

Batch ID: 134340 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

PDS Sample ID: **HS18110338-01PDS** Units: **mg/L** Analysis Date: **07-Nov-2018 22:08**
Client ID: **MW-46** Run ID: **ICPMS05_326964** SeqNo: **4809024** PrepDate: **07-Nov-2018** DF: **2**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09231	0.00400	0.1	0	92.3	75 - 125				
Arsenic	0.09525	0.00400	0.1	0.003094	92.2	75 - 125				
Cadmium	0.09498	0.00400	0.1	0.000969	94.0	75 - 125				
Iron	81.85	0.400	10	76.13	57.3	75 - 125				SO
Lead	0.08792	0.00400	0.1	0	87.9	75 - 125				
Magnesium	237.4	0.400	10	240.6	-31.5	75 - 125				SO
Potassium	13.61	0.400	10	5.006	86.1	75 - 125				
Selenium	0.09335	0.00400	0.1	0	93.3	75 - 125				

PDS Sample ID: **HS18110338-01PDS** Units: **mg/L** Analysis Date: **08-Nov-2018 12:43**
Client ID: **MW-46** Run ID: **ICPMS05_327048** SeqNo: **4809791** PrepDate: **07-Nov-2018** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	660.4	5.00	100	564.8	95.7	75 - 125				O
Sodium	732.6	2.00	100	664.1	68.5	75 - 125				SO

SD Sample ID: **HS18110338-01SD** Units: **mg/L** Analysis Date: **07-Nov-2018 22:02**
Client ID: **MW-46** Run ID: **ICPMS05_326964** SeqNo: **4809021** PrepDate: **07-Nov-2018** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0200					0.000214	0	10	
Arsenic	U	0.0200					0.003094	0	10	
Cadmium	U	0.0200					0.000969	0	10	
Iron	81.02	2.00					76.13	6.42	10	
Lead	U	0.0200					0.000288	0	10	
Magnesium	260.9	2.00					240.6	8.46	10	
Potassium	5.077	2.00					5.006	1.43	10	
Selenium	U	0.0200					0.001471	0	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18110338

QC BATCH REPORT

Batch ID: 134340 **Instrument:** ICPMS05 **Method:** SW6020 (dissolved) (DISSOLVED)

SD Sample ID: **HS18110338-01SD** Units: **mg/L** Analysis Date: **08-Nov-2018 12:41**
Client ID: **MW-46** Run ID: **ICPMS05_327048** SeqNo: **4809790** PrepDate: **07-Nov-2018** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	590.9	25.0					564.8	4.63	10	
Sodium	696.5	10.0					664.1	4.88	10	

The following samples were analyzed in this batch: HS18110338-01

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18110338

QC BATCH REPORT

Batch ID: 134341 **Instrument: ICPMS05** **Method: SW6020**

MBLK Sample ID: **MBLK-134341** Units: **mg/L** Analysis Date: **07-Nov-2018 22:14**
Client ID: Run ID: **ICPMS05_326964** SeqNo: **4809112** PrepDate: **07-Nov-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.0271	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	0.05991	0.200								J

LCS Sample ID: **LCS-134341** Units: **mg/L** Analysis Date: **07-Nov-2018 22:16**
Client ID: Run ID: **ICPMS05_326964** SeqNo: **4809113** PrepDate: **07-Nov-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04704	0.00200	0.05	0	94.1	80 - 120				
Arsenic	0.04733	0.00200	0.05	0	94.7	80 - 120				
Cadmium	0.04803	0.00200	0.05	0	96.1	80 - 120				
Calcium	4.868	0.500	5	0	97.4	80 - 120				
Iron	5.056	0.200	5	0	101	80 - 120				
Lead	0.04963	0.00200	0.05	0	99.3	80 - 120				
Magnesium	4.975	0.200	5	0	99.5	80 - 120				
Potassium	4.904	0.200	5	0	98.1	80 - 120				
Selenium	0.04814	0.00200	0.05	0	96.3	80 - 120				
Sodium	4.994	0.200	5	0	99.9	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18110338

QC BATCH REPORT

Batch ID: 134341 **Instrument: ICPMS05** **Method: SW6020**

MS Sample ID: **HS18110338-01MS** Units: **mg/L** Analysis Date: **07-Nov-2018 22:22**
Client ID: **MW-46** Run ID: **ICPMS05_326964** SeqNo: **4809116** PrepDate: **07-Nov-2018** DF: **2**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04859	0.00400	0.05	0.000182	96.8	80 - 120				
Arsenic	0.05238	0.00400	0.05	0.003167	98.4	80 - 120				
Cadmium	0.04987	0.00400	0.05	0.000791	98.2	80 - 120				
Calcium	561.9	1.00	5	525.7	723	80 - 120				SEO
Iron	73.2	0.400	5	66.56	133	80 - 120				SO
Lead	0.04697	0.00400	0.05	0.000932	92.1	80 - 120				
Magnesium	239.3	0.400	5	230.5	176	80 - 120				SO
Potassium	9.769	0.400	5	4.62	103	80 - 120				
Selenium	0.04728	0.00400	0.05	0.001478	91.6	80 - 120				
Sodium	649.7	0.400	5	630.2	390	80 - 120				SEO

MSD Sample ID: **HS18110338-01MSD** Units: **mg/L** Analysis Date: **07-Nov-2018 22:26**
Client ID: **MW-46** Run ID: **ICPMS05_326964** SeqNo: **4809118** PrepDate: **07-Nov-2018** DF: **2**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.0489	0.00400	0.05	0.000182	97.4	80 - 120	0.04859	0.636	20	
Arsenic	0.05145	0.00400	0.05	0.003167	96.6	80 - 120	0.05238	1.79	20	
Cadmium	0.04804	0.00400	0.05	0.000791	94.5	80 - 120	0.04987	3.72	20	
Calcium	548.6	1.00	5	525.7	457	80 - 120	561.9	2.4	20	SEO
Iron	73	0.400	5	66.56	129	80 - 120	73.2	0.263	20	SO
Lead	0.04657	0.00400	0.05	0.000932	91.3	80 - 120	0.04697	0.857	20	
Magnesium	238.6	0.400	5	230.5	162	80 - 120	239.3	0.293	20	SO
Potassium	9.268	0.400	5	4.62	93.0	80 - 120	9.769	5.27	20	
Selenium	0.04762	0.00400	0.05	0.001478	92.3	80 - 120	0.04728	0.714	20	
Sodium	646.4	0.400	5	630.2	325	80 - 120	649.7	0.505	20	SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18110338

QC BATCH REPORT

Batch ID: 134341 **Instrument: ICPMS05** **Method: SW6020**

PDS Sample ID: **HS18110338-01PDS** Units: **mg/L** Analysis Date: **07-Nov-2018 22:28**
Client ID: **MW-46** Run ID: **ICPMS05_326964** SeqNo: **4809119** PrepDate: **07-Nov-2018** DF: **2**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.2957	0.00400	0.25	0	118	75 - 125				
Arsenic	0.2968	0.00400	0.25	0.003167	117	75 - 125				
Cadmium	0.3001	0.00400	0.25	0.000791	120	75 - 125				
Iron	97.27	0.400	25	66.56	123	75 - 125				
Lead	0.2819	0.00400	0.25	0	113	75 - 125				
Magnesium	258.7	0.400	25	230.5	113	75 - 125				O
Potassium	33.4	0.400	25	4.62	115	75 - 125				
Selenium	0.2943	0.00400	0.25	0	118	75 - 125				

PDS Sample ID: **HS18110338-01PDS** Units: **mg/L** Analysis Date: **08-Nov-2018 12:55**
Client ID: **MW-46** Run ID: **ICPMS05_327048** SeqNo: **4809813** PrepDate: **07-Nov-2018** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	647.3	5.00	100	597.5	49.9	75 - 125				SO
Sodium	786.6	2.00	100	694.5	92.1	75 - 125				O

SD Sample ID: **HS18110338-01SD** Units: **mg/L** Analysis Date: **07-Nov-2018 22:20**
Client ID: **MW-46** Run ID: **ICPMS05_326964** SeqNo: **4809115** PrepDate: **07-Nov-2018** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0200					0.000182	0	10	
Arsenic	U	0.0200					0.003167	0	10	
Cadmium	U	0.0200					0.000791	0	10	
Lead	U	0.0200					0.000932	0	10	
Potassium	4.919	2.00					4.62	6.47	10	
Selenium	U	0.0200					0.001478	0	10	

SD Sample ID: **HS18110338-01SD** Units: **mg/L** Analysis Date: **08-Nov-2018 12:53**
Client ID: **MW-46** Run ID: **ICPMS05_327048** SeqNo: **4809811** PrepDate: **07-Nov-2018** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	623	25.0					597.5	4.28	10	
Sodium	722.1	10.0					694.5	3.96	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18110338

QC BATCH REPORT

Batch ID: 134341 **Instrument: ICPMS05** **Method: SW6020**

SD Sample ID: **HS18110338-01SD** Units: **mg/L** Analysis Date: **08-Nov-2018 16:03**
Client ID: **MW-46** Run ID: **ICPMS05_327048** SeqNo: **4810594** PrepDate: **07-Nov-2018** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Iron	71.24	2.00					66.56	7.03	10	

SD Sample ID: **HS18110338-01SD** Units: **mg/L** Analysis Date: **08-Nov-2018 16:09**
Client ID: **MW-46** Run ID: **ICPMS05_327048** SeqNo: **4810597** PrepDate: **07-Nov-2018** DF: **25**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Magnesium	268.9	5.00					260.7	3.15	10	

The following samples were analyzed in this batch: HS18110338-01

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18110338

QC BATCH REPORT

Batch ID: R327064 **Instrument: ICS3K2** **Method: E300**

MBLK Sample ID: **WBLKW1-110718** Units: **mg/L** Analysis Date: **07-Nov-2018 13:35**
Client ID: Run ID: **ICS3K2_327064** SeqNo: **4810030** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	0.500								
Nitrogen, Nitrate (As N)	U	0.100								
Sulfate	U	0.500								

LCS Sample ID: **WLCSW1-110718** Units: **mg/L** Analysis Date: **07-Nov-2018 13:56**
Client ID: Run ID: **ICS3K2_327064** SeqNo: **4810031** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	18.98	0.500	20	0	94.9	90 - 110				
Nitrogen, Nitrate (As N)	3.775	0.100	4	0	94.4	90 - 110				
Sulfate	18.46	0.500	20	0	92.3	90 - 110				

LCSD Sample ID: **WLCSDW1-110718** Units: **mg/L** Analysis Date: **07-Nov-2018 14:18**
Client ID: Run ID: **ICS3K2_327064** SeqNo: **4810032** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.07	0.500	20	0	95.4	90 - 110	18.98	0.505	20	
Nitrogen, Nitrate (As N)	3.794	0.100	4	0	94.8	90 - 110	3.775	0.502	20	
Sulfate	18.54	0.500	20	0	92.7	90 - 110	18.46	0.438	20	

MS Sample ID: **HS18110381-02MS** Units: **mg/L** Analysis Date: **07-Nov-2018 21:18**
Client ID: Run ID: **ICS3K2_327064** SeqNo: **4810046** PrepDate: DF: **20**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	2654	10.0	200	2511	71.4	80 - 120				SEO
Nitrogen, Nitrate (As N)	127.8	2.00	40	90.37	93.5	80 - 120				
Sulfate	192.7	10.0	200	22.27	85.2	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18110338

QC BATCH REPORT

Batch ID: R327064 **Instrument: ICS3K2** **Method: E300**

MSD Sample ID: **HS18110381-02MSD** Units: **mg/L** Analysis Date: **07-Nov-2018 21:40**
Client ID: Run ID: **ICS3K2_327064** SeqNo: **4810047** PrepDate: DF: **20**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	2666	10.0	200	2511	77.4	80 - 120	2654	0.457	20	SEO
Nitrogen, Nitrate (As N)	127.8	2.00	40	90.37	93.6	80 - 120	127.8	0.025	20	
Sulfate	194.2	10.0	200	22.27	85.9	80 - 120	192.7	0.761	20	

The following samples were analyzed in this batch: HS18110338-01

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18110338

QC BATCH REPORT

Batch ID: R327240 **Instrument: ManTech01** **Method: SM2320B**

MBLK Sample ID: **WBLKW1-181110** Units: **mg/L** Analysis Date: **10-Nov-2018 16:39**
Client ID: Run ID: **ManTech01_327240** SeqNo: **4813898** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	U	5.00								
Alkalinity, Carbonate (As CaCO3)	U	5.00								
Alkalinity, Total (As CaCO3)	U	5.00								

LCS Sample ID: **WLCS1-181110** Units: **mg/L** Analysis Date: **10-Nov-2018 16:47**
Client ID: Run ID: **ManTech01_327240** SeqNo: **4813899** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1013	5.00	1000	0	101	85 - 115				
Alkalinity, Total (As CaCO3)	1060	5.00	1000	0	106	85 - 115				

LCSD Sample ID: **WLCSD1-181110** Units: **mg/L** Analysis Date: **10-Nov-2018 16:56**
Client ID: Run ID: **ManTech01_327240** SeqNo: **4813900** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1016	5.00	1000	0	102	85 - 115	1013	0.273	20	
Alkalinity, Total (As CaCO3)	1062	5.00	1000	0	106	85 - 115	1060	0.233	20	

DUP Sample ID: **HS18101676-02DUP** Units: **mg/L** Analysis Date: **10-Nov-2018 17:18**
Client ID: Run ID: **ManTech01_327240** SeqNo: **4813903** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	713.3	5.00					712.8	0.0799	20	
Alkalinity, Carbonate (As CaCO3)	U	5.00					0	0	20	
Alkalinity, Total (As CaCO3)	713.3	5.00					712.8	0.0799	20	

The following samples were analyzed in this batch: HS18110338-01

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18110338

QC BATCH REPORT

Batch ID: R327476 **Instrument: Balance1** **Method: M2540C**

MBLK Sample ID: **WBLK-111318** Units: **mg/L** Analysis Date: **13-Nov-2018 17:30**
Client ID: Run ID: **Balance1_327476** SeqNo: **4822637** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	U	10.0								

LCS Sample ID: **WLCS-111318** Units: **mg/L** Analysis Date: **13-Nov-2018 17:30**
Client ID: Run ID: **Balance1_327476** SeqNo: **4822638** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	994	10.0	1000	0	99.4	85 - 115				

DUP Sample ID: **HS18110378-04DUP** Units: **mg/L** Analysis Date: **13-Nov-2018 17:30**
Client ID: Run ID: **Balance1_327476** SeqNo: **4822634** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	658	10.0					636	3.4	5	

DUP Sample ID: **HS18110338-01DUP** Units: **mg/L** Analysis Date: **13-Nov-2018 17:30**
Client ID: **MW-46** Run ID: **Balance1_327476** SeqNo: **4822616** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	5204	10.0					5244	0.766	5	

The following samples were analyzed in this batch: HS18110338-01

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS18110338**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
North Carolina	624-2018	31-Dec-2018
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	22-Dec-2018
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS18110338
Date/Time Received: **07-Nov-2018 08:50**
Received by: **PMG**

Checklist completed by: *Paresh M. Giga* eSignature 7-Nov-2018 Date
Reviewed by: *Dane J. Wacasey* eSignature 7-Nov-2018 Date

Matrices: **Groundwater**
Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	0.7c/0.3c U/C	IR11	
Cooler(s)/Kit(s):	43992		
Date/Time sample(s) sent to storage:	11/7/18 09:50		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Middletown, PA +1 717 944 5541
Spring City, PA +1 610 948 4903
Salt Lake City, UT +1 801 266 7700

Chain of Custody Form

Page 1 of 1

COC ID: 189514

SHORT HOLDING TIME

TRK# 4580 9531 1927

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order	130-2086-01	Project Name	Exide Column Studies	A	300_W (300 Cl, SO4, [*NO3* *48hr HT*])
Work Order		Project Number	130-2086	B	TDS_W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK_W 2320B (2320B Alkalinity)
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P	D	HARD (2340B Hardness (calc))
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit	E	ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021	F	ICP_TW (6020A Total Metals (6)+Cations)
Phone	(314) 984-8800	Phone	(314) 984-8800	G	
Fax		Fax		H	
e-Mail Address	ewhite@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com	I	
				J	

ALS Project Manager:

ALS Work Order #:

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-46	11/6/18	1500	Groundwa	2,8	3	X	X	X	X	X	X					
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

HS18110338
Golder Associates
Exide Column Studies

Sampler(s) Please Print & Sign: Bo Works

Shipment Method: FedEx

Required Turnaround Time: (Check Box) ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☒ 24 Hour ☐ Other

Results Due Date:

Notes: Exide Column Studies

	Date:	Time:	
Relinquished by:	11/6/18	1830	Received by:
Relinquished by:	11/7/18	0850	Received by (Laboratory):
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory): PS

Cooler ID	Cooler Temp.	QC Package: (Check One Box Below)
45992	0.7	☐ Level II Std QC ☐ Level III Std QC/Raw Data ☐ Level IV SW846/CLP ☐ Other ☒ TRRP Checklist ☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

IR # 11

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ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

CUSTODY SEAL

Date: 11/6/18 Time: 1830
Name: Bri Works
Company: Golder

Seal Broken By:
Date:

ORIGIN ID:SGRA (314) 304-1326
EMILY WHITE/ BRI WORKS
GOLDER ASSOCIATES
7471 5TH STREET

FRISCO, TX 75034
UNITED STATES US

SHIP DATE: 26JUL18
ACTWGT: 1.00 LB MAN
CAD: 3001307CAFE311
DIMS: 19x16x13 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656

Exide column studies

REF: ~~EXIDE DGW PBI RESAMPLE DW~~

RMA:

FedEx Express

TRK# 0221 4380 9531 1927

RETURNS MON-SAT
PRIORITY OVERNIGHT

J3992

FedEx
TRK# 0221 4380 9531 1927

WED - 07 NOV 10:30A
PRIORITY OVERNGHT

AB SGRA

77099
TX-US IAH

10450 Stancliff Rd. Suite 210
Houston, TX 77099
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December 19, 2018

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS18111408**

Laboratory Results for: **Exide Column Studies 112718**

Dear Emily,

ALS Environmental received 2 sample(s) on Nov 30, 2018 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies 112718	
WorkOrder:	**HS18111408**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies 112718
WorkOrder:	**HS18111408**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data								
Laboratory Name: ALS Laboratory Group			LRC Date: 12/19/2018					
Project Name: Exide Column Studies 112718			Laboratory Job Number: HS18111408					
Reviewer Name: Corey Grandits			Prep Batch Number(s): 135253,R320424,R328588,R328636,R328855					
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?		X			1
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?	X				
		Were % moisture (or solids) reported for all soil and sediment samples?	X				
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?	X				
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			2
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?	X				
		Were analytical duplicates analyzed at the appropriate frequency?	X				
		Were RPDs or relative standard deviations within the laboratory QC limits?	X				
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;

R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 12/19/2018				
Project Name: Exide Column Studies 112718			Laboratory Job Number: HS18111408				
Reviewer Name: Corey Grandits			Prep Batch Number(s): 135253,R320424,R328588,R328636,R328855				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			3
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		X			4
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Data		
Laboratory Name: ALS Laboratory Group		LRC Date: 12/19/2018
Project Name: Exide Column Studies 112718		Laboratory Job Number: HS18111408
Reviewer Name: Corey Grandits		Prep Batch Number(s): 135253,R320424,R328588,R328636,R328855
ER#[5]	**Description**	
1	Anions Method E300, samples 2018-11-27-GW-MW3-T0-CONTROL, 2018-11-27-GW-MW3-T0-30-35-40, holding time expired prior to sample receipt. Samples analyzed at the request of the client. Results should be considered estimated.	
2	Batch 135253, Metals Method SW6020, sample HS18111487-48, MS and MSD were performed on unrelated sample.	
3	See Run Log and CCB Exceptions Report.	
4	Batch 135253, Metals Method SW6020, sample HS18111487-48, PDS was performed on unrelated sample.	

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies 112718
WorkOrder: HS18111408
Start Date: 30-Nov-2018 End Date: 01-Dec-2018

Run ID:ICS3K2_328424
Instrument:ICS3K2
Method:E300

Sample No.	D/F	Time	FileID	Analytes
CCV 1	1	30-Nov-2018 04:26		CL NO3N SO4
CCB 1	1	30-Nov-2018 04:48		CL NO3N SO4
CCB 2	1	30-Nov-2018 09:08		CL NO3N SO4
WBLKW1-113018	1	30-Nov-2018 09:30		CL NO3N SO4
WLCSW1-113018	1	30-Nov-2018 09:51		CL NO3N SO4
WLCSDW1-113018	1	30-Nov-2018 10:13		CL NO3N SO4
ZZZZZZMS	20	30-Nov-2018 10:56		CL NO3N SO4
ZZZZZZMSD	20	30-Nov-2018 11:18		CL NO3N SO4
CCV 2	1	30-Nov-2018 13:07		CL NO3N SO4
CCB 3	1	30-Nov-2018 13:28		CL NO3N SO4
2018-11-27-GW-MW3-T0-CONTROL	1	30-Nov-2018 16:26		CL NO3N
2018-11-27-GW-MW3-T0-CONTROL	10	30-Nov-2018 16:48		SO4
2018-11-27-GW-MW3-T0-30-35-40	1	30-Nov-2018 17:10		CL NO3N
2018-11-27-GW-MW3-T0-30-35-40	10	30-Nov-2018 17:31		SO4
CCB 4	1	30-Nov-2018 18:15		CL NO3N SO4
ZZZZZZMS	1	30-Nov-2018 19:29		CL NO3N SO4
ZZZZZZMSD	1	30-Nov-2018 19:51		CL NO3N
CCV 3	1	30-Nov-2018 22:44		CL NO3N SO4
CCB 5	1	30-Nov-2018 23:06		CL NO3N SO4
CCB 6	1	01-Dec-2018 03:26		CL NO3N SO4

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies 112718
WorkOrder: HS18111408

Run ID:ICS3K2_328424
Instrument:ICS3K2
Method:E300

CCB 1	Date: 30-Nov-2018 04:48	Seq: 4843985	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	299	200	500	
Sulfate	487	200	500	

CCB 3	Date: 30-Nov-2018 13:28	Seq: 4844001	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	293	200	500	
Sulfate	476	200	500	

CCB 4	Date: 30-Nov-2018 18:15	Seq: 4844627	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	268	200	500	
Nitrogen, Nitrate (As N)	72	30	100	
Sulfate	448	200	500	

CCB 6	Date: 01-Dec-2018 03:26	Seq: 4844641	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sulfate	442	200	500	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies 112718
WorkOrder: HS18111408
Start Date: 08-Dec-2018 End Date: 08-Dec-2018

Run ID:ICPMS05_328833
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
LLICV2	1	08-Dec-2018 11:55	013SMPL.d	AS CA CD FE K MG NA PB SB SE
LLICV5	1	08-Dec-2018 11:57	014LICV.d	AS CA CD FE K MG NA PB SB SE
ICB	1	08-Dec-2018 11:59	015_ICB.d	AS CA CD FE K MG NA PB SB SE
ICV	1	08-Dec-2018 12:01	016_ICV.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	08-Dec-2018 12:03	017ICSA.d	AS CA CD FE K MG NA PB SB SE
ICSAB	1	08-Dec-2018 12:05	018ICSB.d	AS CA CD FE K MG NA PB SB SE
MBLK-135253	1	08-Dec-2018 12:22	026SMPL.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	08-Dec-2018 12:28	029_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 1	1	08-Dec-2018 12:30	030_CCV.d	AS CA CD FE K MG NA PB SB SE
LCS-135253	1	08-Dec-2018 12:33	031SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZSD	5	08-Dec-2018 12:39	034SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZMS	1	08-Dec-2018 12:41	035SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZPDS	1	08-Dec-2018 12:45	037SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZMSD	1	08-Dec-2018 12:47	038SMPL.d	AS CA CD FE K MG NA PB SB SE
2018-11-27-GW-MW3-T0-CONTROL	1	08-Dec-2018 12:49	039SMPL.d	AS CA CD FE K MG PB SB SE
2018-11-27-GW-MW3-T0-30-35-40	1	08-Dec-2018 12:51	040SMPL.d	AS CA CD FE K MG PB SB SE
CCV 2	1	08-Dec-2018 12:53	041_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	08-Dec-2018 12:55	042_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	08-Dec-2018 13:18	053_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	08-Dec-2018 13:20	054_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	08-Dec-2018 13:43	065_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	08-Dec-2018 13:45	066_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	08-Dec-2018 14:08	077_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	08-Dec-2018 14:10	078_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	08-Dec-2018 14:35	090_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	08-Dec-2018 14:40	092_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	08-Dec-2018 15:01	102_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	08-Dec-2018 15:03	103_CCV.d	AS CA CD FE K MG NA PB SB SE
2018-11-27-GW-MW3-T0-CONTROL	10	08-Dec-2018 15:11	107SMPL.d	NA
2018-11-27-GW-MW3-T0-30-35-40	10	08-Dec-2018 15:20	111SMPL.d	NA
CCV 8	1	08-Dec-2018 15:26	114_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	08-Dec-2018 15:28	115_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	08-Dec-2018 15:51	126_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	08-Dec-2018 15:53	127_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 10	1	08-Dec-2018 16:15	138_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	08-Dec-2018 16:17	139_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 11	1	08-Dec-2018 16:40	150_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	08-Dec-2018 16:42	151_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 12	1	08-Dec-2018 17:05	162_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 12	1	08-Dec-2018 17:07	163_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 13	1	08-Dec-2018 17:30	174_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 13	1	08-Dec-2018 17:32	175_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 14	1	08-Dec-2018 17:55	186_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 14	1	08-Dec-2018 17:57	187_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 15	1	08-Dec-2018 18:20	198_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 15	1	08-Dec-2018 18:22	199_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 16	1	08-Dec-2018 18:47	211_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 16	1	08-Dec-2018 18:49	212_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 17	1	08-Dec-2018 19:04	219_CCV.d	AS CA CD FE K MG NA PB SB SE

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies 112718
WorkOrder: HS18111408
Start Date: 08-Dec-2018 End Date: 08-Dec-2018

Run ID:ICPMS05_328833
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
CCB 17	1	08-Dec-2018 19:06	220_CCB.d	AS CA CD FE K MG NA PB SB SE
LLCCV5	1	08-Dec-2018 19:08	221LICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	08-Dec-2018 19:10	222SMPL.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	08-Dec-2018 19:12	223ICSA.d	AS CA CD FE K MG NA PB SB SE
ICSAB	1	08-Dec-2018 19:14	224ICSB.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies 112718
WorkOrder: HS18111408

Run ID:ICPMS05_328833
Instrument:ICPMS05
Method:SW6020

CCB 1	Date: 08-Dec-2018 12:28	Seq: 4854744	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	-21.97	18	200	
Sodium	33.61	14	200	

CCB 2	Date: 08-Dec-2018 12:55	Seq: 4854785	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	80.71	14	200	

CCB 3	Date: 08-Dec-2018 13:20	Seq: 4854797	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Lead	-0.609	0.6	2	
Sodium	57.46	14	200	

CCB 4	Date: 08-Dec-2018 13:45	Seq: 4854847	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Lead	-0.66	0.6	2	
Potassium	-24.69	18	200	
Sodium	45.35	14	200	

CCB 5	Date: 08-Dec-2018 14:10	Seq: 4854859	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Lead	-0.699	0.6	2	
Sodium	37.52	14	200	

CCB 6	Date: 08-Dec-2018 14:35	Seq: 4854871	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Lead	1.437	0.6	2	
Potassium	-34.24	18	200	
Sodium	42.9	14	200	

CCB 7	Date: 08-Dec-2018 15:01	Seq: 4854883	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	-39.17	18	200	
Sodium	36.23	14	200	

CCB 8	Date: 08-Dec-2018 15:28	Seq: 4854905	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Lead	-0.626	0.6	2	
Potassium	-34.16	18	200	
Sodium	19.87	14	200	

CCB 9	Date: 08-Dec-2018 15:53	Seq: 4854917	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Lead	-0.68	0.6	2	
Potassium	-40.43	18	200	
Sodium	84.93	14	200	

CCB 10	Date: 08-Dec-2018 16:17	Seq: 4855318	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Lead	-0.717	0.6	2	
Potassium	-39.07	18	200	
Sodium	27.13	14	200	

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies 112718
WorkOrder: HS18111408

Run ID:ICPMS05_328833
Instrument:ICPMS05
Method:SW6020

CCB 11	Date: 08-Dec-2018 16:42	Seq: 4855330	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	115.8	34	500	
Lead	-0.732	0.6	2	
Potassium	-38.17	18	200	
Sodium	23.09	14	200	

CCB 12	Date: 08-Dec-2018 17:07	Seq: 4855342	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	35.27	34	500	
Lead	-0.708	0.6	2	
Sodium	18.67	14	200	

CCB 13	Date: 08-Dec-2018 17:32	Seq: 4855136	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	15.9	12	200	
Lead	1.557	0.6	2	
Potassium	-67.55	18	200	

CCB 14	Date: 08-Dec-2018 17:57	Seq: 4855148	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	14.64	12	200	
Potassium	-76.99	18	200	

CCB 15	Date: 08-Dec-2018 18:22	Seq: 4855160	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	13.22	12	200	
Lead	-0.621	0.6	2	
Potassium	-76.4	18	200	

CCB 16	Date: 08-Dec-2018 18:49	Seq: 4855173	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	47.05	34	500	
Lead	-0.666	0.6	2	
Potassium	-41.54	18	200	
Sodium	71.15	14	200	

CCB 17	Date: 08-Dec-2018 19:06	Seq: 4855181	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Lead	-0.661	0.6	2	
Potassium	-39.06	18	200	
Sodium	72.54	14	200	

Client: Golder Associates
Project: Exide Column Studies 112718
Work Order: HS18111408

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18111408-01	2018-11-27-GW-MW3-T0-CONTROL	Groundwater		27-Nov-2018 14:30	30-Nov-2018 09:40	☐
HS18111408-02	2018-11-27-GW-MW3-T0-30-35-40	Groundwater		27-Nov-2018 14:30	30-Nov-2018 09:40	☐

Client: Golder Associates
Project: Exide Column Studies 112718
Sample ID: 2018-11-27-GW-MW3-T0-CONTROL
Collection Date: 27-Nov-2018 14:30

ANALYTICAL REPORT
WorkOrder:HS18111408
Lab ID:HS18111408-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**362**		**2.00**	**2.00**	**mg/L**	1	10-Dec-2018 09:07
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 05-Dec-2018		Analyst: RPM
Antimony	**0.000525**	J	**0.000400**	**0.00200**	**mg/L**	1	08-Dec-2018 12:49
Arsenic	**0.0471**		**0.000400**	**0.00200**	**mg/L**	1	08-Dec-2018 12:49
Cadmium	U		0.000200	0.00200	mg/L	1	08-Dec-2018 12:49
Calcium	**111**		**0.0340**	**0.500**	**mg/L**	1	08-Dec-2018 12:49
Iron	**6.19**		**0.0120**	**0.200**	**mg/L**	1	08-Dec-2018 12:49
Lead	U		0.000600	0.00200	mg/L	1	08-Dec-2018 12:49
Magnesium	**20.5**		**0.0100**	**0.200**	**mg/L**	1	08-Dec-2018 12:49
Potassium	**1.98**		**0.0180**	**0.200**	**mg/L**	1	08-Dec-2018 12:49
Selenium	U		0.00110	0.00200	mg/L	1	08-Dec-2018 12:49
Sodium	**188**		**0.140**	**2.00**	**mg/L**	10	08-Dec-2018 15:11
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**46.3**		**0.200**	**0.500**	**mg/L**	1	30-Nov-2018 16:26
Nitrogen, Nitrate (As N)	**0.0770**	JH	**0.0300**	**0.100**	**mg/L**	1	30-Nov-2018 16:26
Sulfate	**202**		**2.00**	**5.00**	**mg/L**	10	30-Nov-2018 16:48
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	**884**		**5.00**	**10.0**	**mg/L**	1	04-Dec-2018 08:00
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**524**		**5.00**	**5.00**	**mg/L**	1	04-Dec-2018 22:16
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	04-Dec-2018 22:16
Alkalinity, Total (As CaCO3)	**524**		**5.00**	**5.00**	**mg/L**	1	04-Dec-2018 22:16

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies 112718
Sample ID: 2018-11-27-GW-MW3-T0-30-35-40
Collection Date: 27-Nov-2018 14:30

ANALYTICAL REPORT
WorkOrder:HS18111408
Lab ID:HS18111408-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**376**		**2.00**	**2.00**	**mg/L**	1	10-Dec-2018 09:07
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 05-Dec-2018		Analyst: RPM
Antimony	U		0.000400	0.00200	mg/L	1	08-Dec-2018 12:51
Arsenic	**0.0474**		**0.000400**	**0.00200**	**mg/L**	1	08-Dec-2018 12:51
Cadmium	U		0.000200	0.00200	mg/L	1	08-Dec-2018 12:51
Calcium	**115**		**0.0340**	**0.500**	**mg/L**	1	08-Dec-2018 12:51
Iron	**6.24**		**0.0120**	**0.200**	**mg/L**	1	08-Dec-2018 12:51
Lead	U		0.000600	0.00200	mg/L	1	08-Dec-2018 12:51
Magnesium	**21.6**		**0.0100**	**0.200**	**mg/L**	1	08-Dec-2018 12:51
Potassium	**2.10**		**0.0180**	**0.200**	**mg/L**	1	08-Dec-2018 12:51
Selenium	U		0.00110	0.00200	mg/L	1	08-Dec-2018 12:51
Sodium	**194**		**0.140**	**2.00**	**mg/L**	10	08-Dec-2018 15:20
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**46.4**		**0.200**	**0.500**	**mg/L**	1	30-Nov-2018 17:10
Nitrogen, Nitrate (As N)	**0.0770**	JH	**0.0300**	**0.100**	**mg/L**	1	30-Nov-2018 17:10
Sulfate	**204**		**2.00**	**5.00**	**mg/L**	10	30-Nov-2018 17:31
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	**904**		**5.00**	**10.0**	**mg/L**	1	04-Dec-2018 08:00
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**527**		**5.00**	**5.00**	**mg/L**	1	04-Dec-2018 22:24
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	04-Dec-2018 22:24
Alkalinity, Total (As CaCO3)	**527**		**5.00**	**5.00**	**mg/L**	1	04-Dec-2018 22:24

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies 112718
WorkOrder: HS18111408

Batch ID: 135253 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18111408-01	1	10	10 (mL)	1
HS18111408-02	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies 112718
WorkOrder: HS18111408

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 135253	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS18111408-01	2018-11-27-GW-MW3-T0-CONTROL	27 Nov 2018 14:30		05 Dec 2018 11:00	08 Dec 2018 15:11	10
HS18111408-01	2018-11-27-GW-MW3-T0-CONTROL	27 Nov 2018 14:30		05 Dec 2018 11:00	08 Dec 2018 12:49	1
HS18111408-02	2018-11-27-GW-MW3-T0-30-35-40	27 Nov 2018 14:30		05 Dec 2018 11:00	08 Dec 2018 15:20	10
HS18111408-02	2018-11-27-GW-MW3-T0-30-35-40	27 Nov 2018 14:30		05 Dec 2018 11:00	08 Dec 2018 12:51	1
Batch ID R328424	**Test Name :** ANIONS BY E300.0			**Matrix:** Groundwater		
HS18111408-01	2018-11-27-GW-MW3-T0-CONTROL	27 Nov 2018 14:30			30 Nov 2018 16:48	10
HS18111408-01	2018-11-27-GW-MW3-T0-CONTROL	27 Nov 2018 14:30			30 Nov 2018 16:26	1
HS18111408-02	2018-11-27-GW-MW3-T0-30-35-40	27 Nov 2018 14:30			30 Nov 2018 17:31	10
HS18111408-02	2018-11-27-GW-MW3-T0-30-35-40	27 Nov 2018 14:30			30 Nov 2018 17:10	1
Batch ID R328588	**Test Name :** TOTAL DISSOLVED SOLIDS BY SM2540C			**Matrix:** Groundwater		
HS18111408-01	2018-11-27-GW-MW3-T0-CONTROL	27 Nov 2018 14:30			04 Dec 2018 08:00	1
HS18111408-02	2018-11-27-GW-MW3-T0-30-35-40	27 Nov 2018 14:30			04 Dec 2018 08:00	1
Batch ID R328636	**Test Name :** ALKALINITY BY SM2320B			**Matrix:** Groundwater		
HS18111408-01	2018-11-27-GW-MW3-T0-CONTROL	27 Nov 2018 14:30			04 Dec 2018 22:16	1
HS18111408-02	2018-11-27-GW-MW3-T0-30-35-40	27 Nov 2018 14:30			04 Dec 2018 22:24	1
Batch ID R328855	**Test Name :** HARDNESS, TOTAL AS CACO3 BY SM2340B			**Matrix:** Groundwater		
HS18111408-01	2018-11-27-GW-MW3-T0-CONTROL	27 Nov 2018 14:30			10 Dec 2018 09:07	1
HS18111408-02	2018-11-27-GW-MW3-T0-30-35-40	27 Nov 2018 14:30			10 Dec 2018 09:07	1

WorkOrder: HS18111408
InstrumentID: ICPMS05
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.00100	0.000983	0.000400	0.00200
A	Arsenic	7440-38-2	0.00100	0.000927	0.000400	0.00200
A	Cadmium	7440-43-9	0.00100	0.00101	0.000200	0.00200
A	Calcium	7440-70-2	0.100	0.125	0.0340	0.500
A	Iron	7439-89-6	0.100	0.122	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.00100	0.000600	0.00200
A	Magnesium	7439-95-4	0.100	0.116	0.0100	0.200
A	Potassium	7440-09-7	0.100	0.0991	0.0180	0.200
A	Selenium	7782-49-2	0.00100	0.000902	0.00110	0.00200
A	Sodium	7440-23-5	0.100	0.0985	0.0140	0.200

WorkOrder: HS18111408
InstrumentID: ICS3K2
Test Code: 300_W
Test Number: E300
Test Name: Anions by E300.0

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Chloride	16887-00-6	0.500	0.580	0.200	0.500
A	Nitrogen, Nitrate (As N)	14797-55-8	0.100	0.126	0.0300	0.100
A	Sulfate	14808-79-8	0.500	0.644	0.200	0.500

WorkOrder: HS18111408
InstrumentID: ManTech01
Test Code: ALK_W 2320B
Test Number: SM2320B
Test Name: Alkalinity by SM2320B

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Alkalinity, Bicarbonate (As CaCO3)	ALK-Bicarb	5.00	3.49	5.00	5.00
A	Alkalinity, Carbonate (As CaCO3)	ALK-Carb	5.00	3.49	5.00	5.00
A	Alkalinity, Total (As CaCO3)	ALK	5.00	3.49	5.00	5.00

WorkOrder: HS18111408
InstrumentID: Balance1
Test Code: TDS_W 2540C
Test Number: M2540C
Test Name: Total Dissolved Solids by

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Total Dissolved Solids (Residue, Filterable)	TDS	5.00	6.00	5.00	10.0

Client: Golder Associates
Project: Exide Column Studies 112718
WorkOrder: HS18111408

QC BATCH REPORT

Batch ID: 135253 **Instrument: ICPMS05** **Method: SW6020**

MBLK Sample ID: **MBLK-135253** Units: **mg/L** Analysis Date: **08-Dec-2018 12:22**
Client ID: Run ID: **ICPMS05_328833** SeqNo: **4854741** PrepDate: **05-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01813	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	0.06109	0.200								J

LCS Sample ID: **LCS-135253** Units: **mg/L** Analysis Date: **08-Dec-2018 12:33**
Client ID: Run ID: **ICPMS05_328833** SeqNo: **4854774** PrepDate: **05-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04514	0.00200	0.05	0	90.3	80 - 120				
Arsenic	0.0458	0.00200	0.05	0	91.6	80 - 120				
Cadmium	0.04547	0.00200	0.05	0	90.9	80 - 120				
Calcium	4.961	0.500	5	0	99.2	80 - 120				
Iron	4.812	0.200	5	0	96.2	80 - 120				
Lead	0.0443	0.00200	0.05	0	88.6	80 - 120				
Magnesium	4.946	0.200	5	0	98.9	80 - 120				
Potassium	4.982	0.200	5	0	99.6	80 - 120				
Selenium	0.04368	0.00200	0.05	0	87.4	80 - 120				
Sodium	5.029	0.200	5	0	101	80 - 120				

Client: Golder Associates
Project: Exide Column Studies 112718
WorkOrder: HS18111408

QC BATCH REPORT

Batch ID: 135253 **Instrument: ICPMS05** **Method: SW6020**

MS Sample ID: **HS18111487-48MS** Units: **mg/L** Analysis Date: **08-Dec-2018 12:41**
Client ID: Run ID: **ICPMS05_328833** SeqNo: **4854778** PrepDate: **05-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04851	0.00200	0.05	0	97.0	80 - 120				
Arsenic	0.05371	0.00200	0.05	0.003842	99.7	80 - 120				
Cadmium	0.0508	0.00200	0.05	0	102	80 - 120				
Calcium	164.6	0.500	5	155.7	177	80 - 120				SO
Iron	6.352	0.200	5	1.246	102	80 - 120				
Lead	0.04389	0.00200	0.05	0	87.8	80 - 120				
Magnesium	31.23	0.200	5	25.58	113	80 - 120				O
Potassium	5.141	0.200	5	0.3893	95.0	80 - 120				
Selenium	0.04773	0.00200	0.05	0	95.5	80 - 120				
Sodium	392.8	0.200	5	374	376	80 - 120				SEO

MSD Sample ID: **HS18111487-48MSD** Units: **mg/L** Analysis Date: **08-Dec-2018 12:47**
Client ID: Run ID: **ICPMS05_328833** SeqNo: **4854781** PrepDate: **05-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04871	0.00200	0.05	0	97.4	80 - 120	0.04851	0.416	20	
Arsenic	0.0536	0.00200	0.05	0.003842	99.5	80 - 120	0.05371	0.203	20	
Cadmium	0.04944	0.00200	0.05	0	98.9	80 - 120	0.0508	2.71	20	
Calcium	163.8	0.500	5	155.7	162	80 - 120	164.6	0.469	20	SO
Iron	6.229	0.200	5	1.246	99.7	80 - 120	6.352	1.96	20	
Lead	0.04386	0.00200	0.05	0	87.7	80 - 120	0.04389	0.0593	20	
Magnesium	30.94	0.200	5	25.58	107	80 - 120	31.23	0.938	20	O
Potassium	5.285	0.200	5	0.3893	97.9	80 - 120	5.141	2.76	20	
Selenium	0.04816	0.00200	0.05	0	96.3	80 - 120	0.04773	0.897	20	
Sodium	386.4	0.200	5	374	249	80 - 120	392.8	1.63	20	SEO

Client: Golder Associates
Project: Exide Column Studies 112718
WorkOrder: HS18111408

QC BATCH REPORT

Batch ID: 135253 **Instrument: ICPMS05** **Method: SW6020**

PDS Sample ID: **HS18111487-48PDS** Units: **mg/L** Analysis Date: **08-Dec-2018 12:45**
Client ID: Run ID: **ICPMS05_328833** SeqNo: **4854780** PrepDate: **05-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1013	0.00200	0.1	0.000091	101	75 - 125				
Arsenic	0.1193	0.00200	0.1	0.003842	115	75 - 125				
Cadmium	0.1167	0.00200	0.1	0.000152	117	75 - 125				
Calcium	154.9	0.500	10	155.7	-8.10	75 - 125				SO
Iron	12.72	0.200	10	1.246	115	75 - 125				
Lead	0.1022	0.00200	0.1	-0.000617	103	75 - 125				
Magnesium	35.25	0.200	10	25.58	96.7	75 - 125				
Potassium	11.58	0.200	10	0.3893	112	75 - 125				
Selenium	0.1103	0.00200	0.1	0.000835	109	75 - 125				
Sodium	365.6	0.200	10	374	-84.0	75 - 125				SEO

SD Sample ID: **HS18111487-48SD** Units: **mg/L** Analysis Date: **08-Dec-2018 12:39**
Client ID: Run ID: **ICPMS05_328833** SeqNo: **4854777** PrepDate: **05-Dec-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000091	0	10	
Arsenic	0.003426	0.0100					0.003842	0	10	J
Cadmium	U	0.0100					0.000152	0	10	
Calcium	151.2	2.50					155.7	2.87	10	
Iron	1.232	1.00					1.246	1.16	10	
Lead	U	0.0100					-0.000617	0	10	
Magnesium	25.32	1.00					25.58	1.01	10	
Potassium	0.3102	1.00					0.3893	0	10	J
Selenium	U	0.0100					0.000835	0	10	
Sodium	368.7	1.00					374	1.4	10	

The following samples were analyzed in this batch: HS18111408-01 HS18111408-02

Client: Golder Associates
Project: Exide Column Studies 112718
WorkOrder: HS18111408

QC BATCH REPORT

Batch ID: R328424 **Instrument: ICS3K2** **Method: E300**

MBLK Sample ID: **WBLKW1-113018** Units: **mg/L** Analysis Date: **30-Nov-2018 09:30**
Client ID: Run ID: **ICS3K2_328424** SeqNo: **4843990** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	0.500								
Nitrogen, Nitrate (As N)	U	0.100								
Sulfate	U	0.500								

LCS Sample ID: **WLCSW1-113018** Units: **mg/L** Analysis Date: **30-Nov-2018 09:51**
Client ID: Run ID: **ICS3K2_328424** SeqNo: **4843991** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.47	0.500	20	0	97.3	90 - 110				
Nitrogen, Nitrate (As N)	3.835	0.100	4	0	95.9	90 - 110				
Sulfate	18.66	0.500	20	0	93.3	90 - 110				

LCSD Sample ID: **WLCSDW1-113018** Units: **mg/L** Analysis Date: **30-Nov-2018 10:13**
Client ID: Run ID: **ICS3K2_328424** SeqNo: **4843992** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.33	0.500	20	0	96.7	90 - 110	19.47	0.706	20	
Nitrogen, Nitrate (As N)	3.813	0.100	4	0	95.3	90 - 110	3.835	0.575	20	
Sulfate	18.58	0.500	20	0	92.9	90 - 110	18.66	0.424	20	

MS Sample ID: **HS18111497-01MS** Units: **mg/L** Analysis Date: **30-Nov-2018 19:29**
Client ID: Run ID: **ICS3K2_328424** SeqNo: **4844629** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	14.04	0.500	10	4.637	94.0	80 - 120				
Nitrogen, Nitrate (As N)	1.89	0.100	2	0.127	88.2	80 - 120				
Sulfate	20.01	0.500	10	9.649	104	80 - 120				

Client: Golder Associates
Project: Exide Column Studies 112718
WorkOrder: HS18111408

QC BATCH REPORT

Batch ID: R328424 **Instrument: ICS3K2** **Method: E300**

MS Sample ID: **HS18110696-02MS** Units: **mg/L** Analysis Date: **30-Nov-2018 10:56**
Client ID: Run ID: **ICS3K2_328424** SeqNo: **4843994** PrepDate: DF: **20**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	718.4	10.0	200	532.4	93.0	80 - 120				
Nitrogen, Nitrate (As N)	42.11	2.00	40	5.016	92.7	80 - 120				
Sulfate	524.6	10.0	200	329.7	97.5	80 - 120				

MSD Sample ID: **HS18111497-01MSD** Units: **mg/L** Analysis Date: **30-Nov-2018 19:51**
Client ID: Run ID: **ICS3K2_328424** SeqNo: **4844630** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	14.12	0.500	10	4.637	94.8	80 - 120	14.04	0.611	20	
Nitrogen, Nitrate (As N)	1.913	0.100	2	0.127	89.3	80 - 120	1.89	1.21	20	
Sulfate	U	0.500	10	9.649	0	80 - 120	20.01	0	20	

MSD Sample ID: **HS18110696-02MSD** Units: **mg/L** Analysis Date: **30-Nov-2018 11:18**
Client ID: Run ID: **ICS3K2_328424** SeqNo: **4843995** PrepDate: DF: **20**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	724	10.0	200	532.4	95.8	80 - 120	718.4	0.778	20	
Nitrogen, Nitrate (As N)	42.33	2.00	40	5.016	93.3	80 - 120	42.11	0.512	20	
Sulfate	528.1	10.0	200	329.7	99.2	80 - 120	524.6	0.67	20	

The following samples were analyzed in this batch: HS18111408-01 HS18111408-02

Client: Golder Associates
Project: Exide Column Studies 112718
WorkOrder: HS18111408

QC BATCH REPORT

Batch ID: R328588 **Instrument: Balance1** **Method: M2540C**

MBLK Sample ID: **WBLK-120318** Units: **mg/L** Analysis Date: **04-Dec-2018 08:00**
Client ID: Run ID: **Balance1_328588** SeqNo: **4848148** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	U	10.0								

LCS Sample ID: **WLCS-120318** Units: **mg/L** Analysis Date: **04-Dec-2018 08:00**
Client ID: Run ID: **Balance1_328588** SeqNo: **4848149** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	1092	10.0	1000	0	109	85 - 115				

DUP Sample ID: **HS18120006-01DUP** Units: **mg/L** Analysis Date: **04-Dec-2018 08:00**
Client ID: Run ID: **Balance1_328588** SeqNo: **4848147** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	38020	10.0					37620	1.06	5	

DUP Sample ID: **HS18111462-01DUP** Units: **mg/L** Analysis Date: **04-Dec-2018 08:00**
Client ID: Run ID: **Balance1_328588** SeqNo: **4848817** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	1140	10.0					1154	1.22	5	

The following samples were analyzed in this batch: HS18111408-01 HS18111408-02

Client: Golder Associates
Project: Exide Column Studies 112718
WorkOrder: HS18111408

QC BATCH REPORT

Batch ID: R328636 **Instrument: ManTech01** **Method: SM2320B**

MBLK Sample ID: **WBLKW1-181204** Units: **mg/L** Analysis Date: **04-Dec-2018 20:29**
Client ID: Run ID: **ManTech01_328636** SeqNo: **4849590** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	U	5.00								
Alkalinity, Carbonate (As CaCO3)	U	5.00								
Alkalinity, Total (As CaCO3)	U	5.00								

LCS Sample ID: **WLCS1-181204** Units: **mg/L** Analysis Date: **04-Dec-2018 20:38**
Client ID: Run ID: **ManTech01_328636** SeqNo: **4849591** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1023	5.00	1000	0	102	85 - 115				
Alkalinity, Total (As CaCO3)	1056	5.00	1000	0	106	85 - 115				

LCSD Sample ID: **WLCSD1-181204** Units: **mg/L** Analysis Date: **04-Dec-2018 20:46**
Client ID: Run ID: **ManTech01_328636** SeqNo: **4849592** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1032	5.00	1000	0	103	85 - 115	1023	0.872	20	
Alkalinity, Total (As CaCO3)	1065	5.00	1000	0	106	85 - 115	1056	0.812	20	

DUP Sample ID: **HS18120067-01DUP** Units: **mg/L** Analysis Date: **04-Dec-2018 21:04**
Client ID: Run ID: **ManTech01_328636** SeqNo: **4849594** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	5.83	5.00					6.36	8.7	20	
Alkalinity, Carbonate (As CaCO3)	32.77	5.00					33.06	0.881	20	
Alkalinity, Total (As CaCO3)	38.6	5.00					39.42	2.1	20	

The following samples were analyzed in this batch: HS18111408-01 HS18111408-02

Client: Golder Associates
Project: Exide Column Studies 112718
WorkOrder: **HS18111408**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
North Carolina	624-2018	31-Dec-2018
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	22-Dec-2018
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS18111408
Date/Time Received: **30-Nov-2018 09:40**
Received by: **PJM**

Checklist completed by: *Paresh M. Giga* eSignature 30-Nov-2018 Date
Reviewed by: *Dane J. Wacasey* eSignature 6-Dec-2018 Date

Matrices: **Groundwater**
Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	0.5c/0.8c U/c	IR25	
Cooler(s)/Kit(s):	Blue		
Date/Time sample(s) sent to storage:	11/30/18 10:25		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number: 17 -

Page 1 of 1

Report To	Contact and company name below will appear on the final report
Company:	Golder
Contact:	Emily White
Phone:	(314)-304-1326
	Company address below will appear on the final report
Street:	13515 Barrell Parkway Drive, Ste
City/Province:	Ballwin, Missouri
Postal Code:	63021
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☑ YES ☐ NO
Company:	Golder
Contact:	Emily White

Report Format / Distribution	
Select Report Format:	☐ PDF ☐ EXCEL ☐ EDD (DIGITAL)
Quality Control (QC) Report with Report	☐ YES ☐ NO
☐ Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	☐ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	Emily_White@golder.com
Email 2	
Email 3	

Invoice Distribution	
Select Invoice Distribution:	☐ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	
Email 2	

Project Information	
ALS Account # / Quote #:	
Job #:	1302036006-0012-02
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)	
AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (lab use only):

ALS Contact: Dane Wawrsey

Sampler: Giovanna Lamastra

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4-20%] ☐ | 3 day [P3-25%] ☐ | 2 day [P2-50%] ☐

EMERGENCY: 1 Business day [E - 100%] ☐ | Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] ☐

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Geochem Analysis	Total Metals (P)	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
	2018-11-27-GW-MW3-TD-CONTROL	27-11-18	2:30 PM	GW	2	X	X		
	2018-11-27-GW-MW3-TD-30-35-40	27-11-18	2:30 PM	GW	2	X	X		

HS18111408

Golder Associates

Exide Column Studies 112718

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)
Are samples taken from a Regulated DW System? ☐ YES ☑ NO	See with project Manager Dane Wawrsey and Emily White from Golder for Project specifications
Are samples for human consumption/ use? ☐ YES ☑ NO	

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ | SIF Observations Yes ☐ No ☐

Ice Packs ☐ Ice Cubes ☐ | Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			

SHIPMENT RELEASE (client use)		
Released by:	Date:	Time:
Katrina Emile	2018-11-27	3:24 PM

INITIAL SHIPMENT RECEPTION (lab use only)		
Received by:	Date:	Time:
	11/27/18	09:40

FINAL SHIPMENT RECEPTION (lab use only)		
Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

Blue 0.5 425 <LF 0.3

ORIGIN ID:YUXA (514) 383-0990
AUDREY ETHEVES
GOLDER ASSOCIATES LTD
7250 RUE DU MILE END
3E ETAGE
MONTREAL, PQ H2R3A4
CANADA CA

SHIP DATE: 27NOV18
ACTWGT: 33.00 KG
CAD: 108680724/INET4042
DIMS: 33x60x45 CM

BILL SENDER

TO **DANE WACASEY**
ALS HOUSTON LABORATORY
10450 STANCLIFF RD
STE 210
HOUSTON TX 77099 **(US)**
(281) 530-5656 REF.
INV:
PO: DEPT

FedEx Express

E

TRK# 0430 **7738 1738 1530**

10:30A
INTL PRIORITY
ASR
77099

NH SGRA

TX-US IAH

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Golder Associates Ltd
7250 rue du Mile End
3e etage
MONTREAL, PQ H2R3A4
CANADA, CA

Ship Date: 27NOV18
ActWgt: 33.00 KG
CAD: 108680724/INET4042

Dims: 33x60x45 CM
BILL SENDER
EIN/VAT:

TO Dane Wacasey
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

(281) 530-5656

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(US)

J18211808152dw

AWB

TRK# 7738 1738 1530

Form 0430

NH SGRA

ASR
PKG:YOUR PKG

10:30A
INTL PRIORITY

REF:
DESC1:Water Sample for analysis
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: Audrey ETHEVES
T/C: S 167982832
D/T: S 167982832

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Audrey ETHEVES
Golder Associates Ltd
7250 rue du Mile End
3e etage
MONTREAL, PQ H2R3A4
CANADA, CA

Ship Date: 27NOV18
ActWgt: 33.00 KG
CAD: 108680724/INET4042

Dims: 33x60x45 CM
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TO Dane Wacasey
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

(281) 530-5656

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J18211605152Qur

AWB

NH SGRA

ASR
PKG:YOUR PKG

TRK# 7738 1738 1530

Form
0430

10:30A
INTL PRIORITY

REF:
DESC1:Water Sample for analysis
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: Audrey ETHEVES
T/C: S 167982832
D/T: S 167982832

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10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

December 19, 2018

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS18120067**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 6 sample(s) on Dec 04, 2018 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DAYNA.FISHER
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS18120067**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS18120067**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data								
Laboratory Name: ALS Laboratory Group			LRC Date: 12/19/2018					
Project Name: Exide Column Studies			Laboratory Job Number: HS18120067					
Reviewer Name: Corey Grandits			Prep Batch Number(s): 135209, 135210, R328992, R329205					
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]	
R1	OI	**Chain-of-custody (C-O-C)**						
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X					
		Were all departures from standard conditions described in an exception report?	X					
R2	OI	**Sample and quality control (QC) identification**						
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X					
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X					
R3	OI	**Test reports**						
		Were all samples prepared and analyzed within holding times?	X					
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X					
		Were calculations checked by a peer or supervisor?	X					
		Were all analyte identifications checked by a peer or supervisor?	X					
		Were sample detection limits reported for all analytes not detected?	X					
		Were all results for soil and sediment samples reported on a dry weight basis?			X			
		Were % moisture (or solids) reported for all soil and sediment samples?			X			
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X			
		If required for the project, TICs reported?			X			
R4	O	**Surrogate recovery data**						
		Were surrogates added prior to extraction?	X					
		Were surrogate percent recoveries in all samples within the laboratory QC limits?	X					
R5	OI	**Test reports/summary forms for blank samples**						
		Were appropriate type(s) of blanks analyzed?	X					
		Were blanks analyzed at the appropriate frequency?	X					
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X					
		Were blank concentrations < MQL?	X					
R6	OI	**Laboratory control samples (LCS):**						
		Were all COCs included in the LCS?	X					
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X					
		Were LCSs analyzed at the required frequency?	X					
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X					
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X					
		Was the LCSD RPD within QC limits?	X					
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**						
		Were the project/method specified analytes included in the MS and MSD?	X					
		Were MS/MSD analyzed at the appropriate frequency?	X					
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1	
		Were MS/MSD RPDs within laboratory QC limits?	X					
R8	OI	**Analytical duplicate data**						
		Were appropriate analytical duplicates analyzed for each matrix?			X			
		Were analytical duplicates analyzed at the appropriate frequency?			X			
		Were RPDs or relative standard deviations within the laboratory QC limits?			X			
R9	OI	**Method quantitation limits (MQLs):**						
		Are the MQLs for each method analyte included in the laboratory data package?	X					
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X					
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X					
R10	OI	**Other problems/anomalies**						
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X					
		Were all necessary corrective actions performed for the reported data?	X					
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				2	
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X					

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 12/19/2018				
Project Name: Exide Column Studies			Laboratory Job Number: HS18120067				
Reviewer Name: Corey Grandits			Prep Batch Number(s): 135209, 135210, R328992, R329205				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			3
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		X			4
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports	
Laboratory Name: ALS Laboratory Group	LRC Date: 12/19/2018
Project Name: Exide Column Studies	Laboratory Job Number: HS18120067
Reviewer Name: Corey Grandits	Prep Batch Number(s): 135209, 135210, R328992, R329205

ER#[5]	Description
1	Batch 135209, Metals by Method SW6020, Sample HS18111501-09, MS and MSD were performed on an unrelated sample. Batch 135210, Dissolved Metals by Method SW6020, Sample French Drain, MS/MSD recovered outside control limits for Calcium and Sodium; however, the results in the parent sample is greater than 4x the spike amount Batch R329205, Anions by Method E300, Samples HS18120459-01, HS18120173-06, MS and MSD were performed on an unrelated sample.
2	Batch R328992, Nitrogen, Nitrate (As N) by Method E300, Samples DUP-01, MW-46, MW-30, DGW-MW-11, DGW-MW-11S: The reporting limit is elevated due to dilution for high concentrations of non-target analytes.
3	See Run Log and CCB Exception Reports
4	Batch 135209, Metals by Method SW6020, Sample HS18111501-09, PDS was performed on an unrelated sample.

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120067
Start Date: 12-Dec-2018 End Date: 13-Dec-2018

Run ID:ICS2100_329205
Instrument:ICS2100
Method:E300

Sample No.	D/F	Time	FileID	Analytes
CCV 1	1	12-Dec-2018 21:36		CL NO3N SO4
CCB 1	1	12-Dec-2018 21:50		CL NO3N SO4
WBLKW1-121218	1	12-Dec-2018 22:05		CL NO3N SO4
WLCSW1-121218	1	12-Dec-2018 22:19		CL NO3N SO4
WLCSDW1-121218	1	12-Dec-2018 22:34		CL NO3N SO4
CCB 2	1	13-Dec-2018 00:45		CL NO3N SO4
ZZZZZZMS	1	13-Dec-2018 01:14		CL NO3N SO4
ZZZZZZMSD	1	13-Dec-2018 01:29		CL NO3N SO4
CCV 2	1	13-Dec-2018 03:25		CL NO3N SO4
CCB 3	1	13-Dec-2018 03:40		CL NO3N SO4
French Drain	20	13-Dec-2018 03:54		SO4
MW-46	100	13-Dec-2018 04:09		SO4
DGW-MW-11	100	13-Dec-2018 04:23		CL SO4
DGW-MW-11S	100	13-Dec-2018 04:38		CL SO4
MW-30	20	13-Dec-2018 04:52		SO4
DUP-01	100	13-Dec-2018 05:07		SO4
ZZZZZZMS	1	13-Dec-2018 05:36		CL NO3N SO4
ZZZZZZMSD	1	13-Dec-2018 05:50		CL NO3N SO4
CCB 4	1	13-Dec-2018 06:20		CL NO3N SO4
CCV 3	1	13-Dec-2018 08:01		CL NO3N SO4
CCB 5	1	13-Dec-2018 08:16		CL NO3N SO4

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120067
Start Date: 04-Dec-2018 End Date: 11-Dec-2018

Run ID:ICS3K2_328992
Instrument:ICS3K2
Method:E300

Sample No.	D/F	Time	FileID	Analytes
CCV 1	1	04-Dec-2018 21:02		CL NO3N
CCB 1	1	04-Dec-2018 21:23		CL NO3N
CCB 2	1	05-Dec-2018 10:55		CL NO3N
WBLKW1-120418	1	05-Dec-2018 11:17		CL NO3N
French Drain	1	05-Dec-2018 11:39		CL NO3N
French DrainMS	1	05-Dec-2018 12:00		CL NO3N
French DrainMSD	1	05-Dec-2018 12:22		CL NO3N
DUP-01	2	05-Dec-2018 12:44		NO3N
MW-46	2	05-Dec-2018 13:05		NO3N
DUP-01	20	05-Dec-2018 13:27		CL
MW-46	20	05-Dec-2018 13:49		CL
CCV 2	1	05-Dec-2018 15:58		CL NO3N
CCB 3	1	05-Dec-2018 16:20		CL NO3N
MW-30	2	05-Dec-2018 16:41		CL NO3N
DGW-MW-11	2	05-Dec-2018 17:03		NO3N
DGW-MW-11S	2	05-Dec-2018 17:25		NO3N
CCB 4	1	05-Dec-2018 18:08		CL NO3N
CCV 3	1	05-Dec-2018 18:46		CL NO3N
ICV	1	11-Dec-2018 12:50		CL NO3N
ICB	1	11-Dec-2018 13:12		CL NO3N
WLCSW1-120418	1	11-Dec-2018 13:41		CL NO3N
WLCSDW1-120418	1	11-Dec-2018 14:03		CL NO3N
CCB 5	1	11-Dec-2018 14:51		CL NO3N

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120067

Run ID:ICS2100_329205
Instrument:ICS2100
Method:E300

CCB 1	Date: 12-Dec-2018 21:50	Seq: 4863770	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	230	200	500	
Nitrogen, Nitrate (As N)	76	30	100	
Sulfate	311	200	500	

CCB 2	Date: 13-Dec-2018 00:45	Seq: 4863775	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	430	200	500	
Nitrogen, Nitrate (As N)	71	30	100	
Sulfate	399	200	500	

CCB 3	Date: 13-Dec-2018 03:40	Seq: 4863787	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	231	200	500	
Sulfate	312	200	500	

CCB 4	Date: 13-Dec-2018 06:20	Seq: 4863798	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	249	200	500	
Sulfate	331	200	500	

CCB 5	Date: 13-Dec-2018 08:16	Seq: 4863804	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	257	200	500	
Sulfate	312	200	500	

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120067

Run ID:ICS3K2_328992
Instrument:ICS3K2
Method:E300

CCB 2	Date: 05-Dec-2018 10:55	Seq: 4858800	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	282	200	500	
Nitrogen, Nitrate (As N)	75	30	100	

CCB 3	Date: 05-Dec-2018 16:20	Seq: 4858812	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	277	200	500	
Nitrogen, Nitrate (As N)	73	30	100	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120067
Start Date: 04-Dec-2018 End Date: 05-Dec-2018

Run ID:ICPMS05_328542
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
LLICV2	1	04-Dec-2018 12:00	019SMPL.d	AS CD FE MG SB SE
LLICV5	1	04-Dec-2018 12:02	020LICV.d	AS CD FE MG SB SE
ICB	1	04-Dec-2018 12:04	021_ICB.d	AS CA CD FE K MG NA PB SB SE
ICV	1	04-Dec-2018 12:12	023_ICV.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	04-Dec-2018 12:16	024ICSA.d	AS CD FE MG SB SE
ICSAB	1	04-Dec-2018 12:18	025ICSB.d	AS CD FE MG SB SE
CCV 1	1	04-Dec-2018 12:38	033_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	04-Dec-2018 12:49	036_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	04-Dec-2018 13:12	046_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	04-Dec-2018 13:14	047_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	04-Dec-2018 13:39	058_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	04-Dec-2018 13:41	059_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	04-Dec-2018 14:03	070_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	04-Dec-2018 14:05	071_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	04-Dec-2018 14:55	082_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	04-Dec-2018 14:57	083_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	04-Dec-2018 15:22	095_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	04-Dec-2018 15:27	097_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	04-Dec-2018 15:47	107_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	04-Dec-2018 15:49	108_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 8	1	04-Dec-2018 15:55	111_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	04-Dec-2018 15:58	112_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 9	1	04-Dec-2018 16:40	127_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	04-Dec-2018 16:41	128SMPL.d	AS CD FE MG SB SE
LLCCV5	1	04-Dec-2018 16:43	129LICV.d	AS CD FE MG SB SE
ICCB 9	1	04-Dec-2018 16:45	130_ICB.d	AS CA CD FE K MG NA PB SB SE
CCV 10	1	04-Dec-2018 17:03	139_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	04-Dec-2018 17:05	140_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 11	1	04-Dec-2018 17:17	146_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	04-Dec-2018 17:19	147_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 12	1	04-Dec-2018 17:41	158_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 12	1	04-Dec-2018 17:43	159_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 13	1	04-Dec-2018 18:55	175_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	04-Dec-2018 18:57	176SMPL.d	AS CD FE MG SB SE
LLCCV5	1	04-Dec-2018 18:59	177LICV.d	AS CD FE MG SB SE
ICCB 13	1	04-Dec-2018 19:01	178_ICB.d	AS CA CD FE K MG NA PB SB SE
CCV 14	1	04-Dec-2018 19:13	184_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 14	1	04-Dec-2018 19:15	185_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 15	1	04-Dec-2018 19:31	193_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 15	1	04-Dec-2018 19:33	194_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 16	1	04-Dec-2018 19:45	200_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 16	1	04-Dec-2018 19:47	201_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 17	1	04-Dec-2018 20:09	212_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 17	1	04-Dec-2018 20:11	213_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 18	1	04-Dec-2018 20:34	224_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 18	1	04-Dec-2018 20:36	225_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 19	1	04-Dec-2018 20:58	236_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 19	1	04-Dec-2018 21:00	237_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 20	1	04-Dec-2018 21:22	248_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 20	1	04-Dec-2018 21:24	249_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 21	1	04-Dec-2018 21:46	260_CCV.d	AS CA CD FE K MG NA PB SB SE

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120067
Start Date: 04-Dec-2018 End Date: 05-Dec-2018

Run ID:ICPMS05_328542
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
CCB 21	1	04-Dec-2018 21:48	261_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 22	1	04-Dec-2018 22:06	270_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 22	1	04-Dec-2018 22:08	271_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 23	1	04-Dec-2018 22:40	285_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	04-Dec-2018 22:42	286SMPL.d	AS CD FE MG SB SE
LLCCV5	1	04-Dec-2018 22:44	287LICV.d	AS CD FE MG SB SE
ICCB 23	1	04-Dec-2018 22:46	288_ICB.d	AS CA CD FE K MG NA PB SB SE
MBLK-135209	1	04-Dec-2018 22:48	289SMPL.d	AS CA CD FE MG NA SB SE
LCS-135209	1	04-Dec-2018 22:50	290SMPL.d	AS CA CD FE MG NA SB SE
French Drain	1	04-Dec-2018 22:51	291SMPL.d	AS CD FE MG SB SE
MW-46	1	04-Dec-2018 22:53	292SMPL.d	AS CD FE SB SE
DGW-MW-11	1	04-Dec-2018 22:55	293SMPL.d	AS CD FE SB SE
DGW-MW-11S	1	04-Dec-2018 22:57	294SMPL.d	AS CD FE MG SB SE
MW-30	1	04-Dec-2018 22:59	295SMPL.d	AS CD FE MG SB SE
DUP-01	1	04-Dec-2018 23:01	296SMPL.d	AS CD FE SB SE
CCV 24	1	04-Dec-2018 23:05	298_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 24	1	04-Dec-2018 23:07	299_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 25	1	04-Dec-2018 23:09	300_CCV.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZSD	5	04-Dec-2018 23:13	302SMPL.d	AS CA CD FE MG NA SB SE
ZZZZZZMS	1	04-Dec-2018 23:15	303SMPL.d	AS CA CD FE MG NA SB SE
ZZZZZZMSD	1	04-Dec-2018 23:17	304SMPL.d	AS CA CD FE MG NA SB SE
ZZZZZZPDS	1	04-Dec-2018 23:19	305SMPL.d	AS CA CD FE MG NA SB SE
CCV 26	1	04-Dec-2018 23:23	307_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 25	1	04-Dec-2018 23:25	308_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-135210	1	04-Dec-2018 23:27	309SMPL.d	AS CA CD FE MG NA SB SE
LCS-135210	1	04-Dec-2018 23:29	310SMPL.d	AS CA CD FE MG NA SB SE
French Drain	1	04-Dec-2018 23:31	311SMPL.d	AS CD FE MG SB SE
French DrainSD	5	04-Dec-2018 23:33	312SMPL.d	AS CD FE MG SE
French DrainMS	1	04-Dec-2018 23:35	313SMPL.d	AS CA CD FE MG NA SB SE
French DrainMSD	1	04-Dec-2018 23:37	314SMPL.d	AS CA CD FE MG NA SB SE
French DrainPDS	1	04-Dec-2018 23:39	315SMPL.d	AS CD FE MG SB SE
CCV 27	1	04-Dec-2018 23:41	316_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 26	1	04-Dec-2018 23:43	317_CCB.d	AS CA CD FE K MG NA PB SB SE
MW-46	1	04-Dec-2018 23:45	318SMPL.d	AS CD FE SB SE
DGW-MW-11	1	04-Dec-2018 23:47	319SMPL.d	AS CD FE SB SE
DGW-MW-11S	1	04-Dec-2018 23:49	320SMPL.d	AS CD FE MG SB SE
MW-30	1	04-Dec-2018 23:51	321SMPL.d	AS CD FE MG SB SE
DUP-01	1	04-Dec-2018 23:53	322SMPL.d	AS CD FE SB SE
CCV 28	1	04-Dec-2018 23:57	324_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 27	1	04-Dec-2018 23:59	325_CCB.d	AS CA CD FE K MG NA PB SB SE
LLCCV5	1	05-Dec-2018 00:01	326LICV.d	AS CD FE MG SB SE
LLCCV2	1	05-Dec-2018 00:03	327SMPL.d	AS CD FE MG SB SE
ICSA	1	05-Dec-2018 00:05	328ICSA.d	AS CD FE MG SB SE
ICSAB	1	05-Dec-2018 00:07	329ICSB.d	AS CD FE MG SB SE

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120067
Start Date: 05-Dec-2018 End Date: 06-Dec-2018

Run ID:ICPMS05_328643
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
LLICV2	1	05-Dec-2018 12:54	020SMPL.d	CA K MG NA PB
LLICV5	1	05-Dec-2018 12:56	021LICV.d	CA K MG NA PB
ICB	1	05-Dec-2018 12:58	022_ICB.d	AS CA CD FE K MG NA PB SB SE
ICV	1	05-Dec-2018 13:04	024_ICV.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	05-Dec-2018 13:58	026ICSA.d	CA K MG NA PB
ICSAB	1	05-Dec-2018 14:00	027ICSB.d	CA K MG NA PB
CCV 1	1	05-Dec-2018 14:26	039_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	05-Dec-2018 14:28	040_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	05-Dec-2018 14:58	051_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	05-Dec-2018 15:00	052_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	05-Dec-2018 15:22	063_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	05-Dec-2018 15:24	064_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	05-Dec-2018 15:47	075_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	05-Dec-2018 15:49	076_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	05-Dec-2018 16:14	087_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	05-Dec-2018 16:16	088_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-135209	1	05-Dec-2018 16:18	089SMPL.d	K PB
LCS-135209	1	05-Dec-2018 16:20	090SMPL.d	K PB
ZZZZZZSD	5	05-Dec-2018 16:24	092SMPL.d	PB
ZZZZZZMS	1	05-Dec-2018 16:26	093SMPL.d	K PB
ZZZZZZMSD	1	05-Dec-2018 16:28	094SMPL.d	K PB
ZZZZZZPDS	1	05-Dec-2018 16:30	095SMPL.d	K PB
French Drain	10	05-Dec-2018 16:32	096SMPL.d	CA NA
MW-46	10	05-Dec-2018 16:34	097SMPL.d	CA MG NA
DGW-MW-11	50	05-Dec-2018 16:36	098SMPL.d	CA MG NA
CCV 6	1	05-Dec-2018 16:38	099_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	05-Dec-2018 16:40	100_CCB.d	AS CA CD FE K MG NA PB SB SE
DGW-MW-11S	50	05-Dec-2018 16:42	101SMPL.d	CA NA
MW-30	10	05-Dec-2018 16:44	102SMPL.d	CA NA
DUP-01	10	05-Dec-2018 16:46	103SMPL.d	CA MG NA
MBLK-135210	1	05-Dec-2018 16:49	105SMPL.d	K PB
LCS-135210	1	05-Dec-2018 16:51	106SMPL.d	K PB
French Drain	10	05-Dec-2018 16:53	107SMPL.d	CA NA
French DrainSD	50	05-Dec-2018 16:55	108SMPL.d	CA NA
French DrainPDS	10	05-Dec-2018 16:57	109SMPL.d	CA NA
MW-46	10	05-Dec-2018 16:59	110SMPL.d	CA MG NA
CCV 7	1	05-Dec-2018 17:01	111_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	05-Dec-2018 17:03	112_CCB.d	AS CA CD FE K MG NA PB SB SE
DGW-MW-11	50	05-Dec-2018 17:05	113SMPL.d	CA MG NA
DGW-MW-11S	50	05-Dec-2018 17:07	114SMPL.d	CA NA
MW-30	10	05-Dec-2018 17:09	115SMPL.d	CA NA
DUP-01	10	05-Dec-2018 17:11	116SMPL.d	CA MG NA
CCV 8	1	05-Dec-2018 17:13	117_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	05-Dec-2018 17:15	118_CCB.d	AS CA CD FE K MG NA PB SB SE
French Drain	1	05-Dec-2018 17:17	119SMPL.d	K PB
French DrainSD	5	05-Dec-2018 17:19	120SMPL.d	K PB
French DrainMS	1	05-Dec-2018 17:21	121SMPL.d	K PB
French DrainMSD	1	05-Dec-2018 17:23	122SMPL.d	K PB
French DrainPDS	1	05-Dec-2018 17:25	123SMPL.d	K PB
CCV 9	1	05-Dec-2018 17:27	124_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	05-Dec-2018 17:29	125_CCB.d	AS CA CD FE K MG NA PB SB SE

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120067
Start Date: 05-Dec-2018 End Date: 06-Dec-2018

Run ID:ICPMS05_328643
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
MW-46	2	05-Dec-2018 17:31	126SMPL.d	K PB
DGW-MW-11	5	05-Dec-2018 17:33	127SMPL.d	K PB
DGW-MW-11S	5	05-Dec-2018 17:35	128SMPL.d	K PB
MW-30	2	05-Dec-2018 17:37	129SMPL.d	K PB
DUP-01	2	05-Dec-2018 17:39	130SMPL.d	K PB
CCB 10	1	05-Dec-2018 17:43	132_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 10	1	05-Dec-2018 18:01	134_CCV.d	AS CA CD FE K MG NA PB SB SE
French Drain	1	05-Dec-2018 18:03	135SMPL.d	K PB
MW-46	2	05-Dec-2018 18:05	136SMPL.d	K PB
DGW-MW-11	5	05-Dec-2018 18:07	137SMPL.d	K PB
DGW-MW-11S	5	05-Dec-2018 18:09	138SMPL.d	K PB
MW-30	2	05-Dec-2018 18:11	139SMPL.d	K PB
DUP-01	2	05-Dec-2018 18:13	140SMPL.d	K PB
CCV 11	1	05-Dec-2018 18:15	141_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	05-Dec-2018 18:17	142_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 12	1	05-Dec-2018 18:52	152_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 12	1	05-Dec-2018 18:54	153_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 13	1	05-Dec-2018 19:14	163_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 13	1	05-Dec-2018 19:16	164_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 14	1	05-Dec-2018 19:38	175_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 14	1	05-Dec-2018 19:40	176_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 15	1	05-Dec-2018 20:00	186_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 15	1	05-Dec-2018 20:02	187_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 16	1	05-Dec-2018 20:20	196_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 16	1	05-Dec-2018 20:22	197_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 17	1	05-Dec-2018 20:33	201_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 17	1	05-Dec-2018 20:35	202_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 18	1	05-Dec-2018 20:53	211_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 18	1	05-Dec-2018 20:55	212_CCV.d	AS CA CD FE K MG NA PB SB SE
ICCV 19	1	05-Dec-2018 21:38	226_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	05-Dec-2018 21:40	227SMPL.d	CA K MG NA PB
LLCCV5	1	05-Dec-2018 21:42	228LICV.d	CA K MG NA PB
ICCB 19	1	05-Dec-2018 21:44	229_ICB.d	AS CA CD FE K MG NA PB SB SE
CCV 20	1	05-Dec-2018 22:04	239_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 20	1	05-Dec-2018 22:06	240_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 21	1	05-Dec-2018 22:20	247_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 21	1	05-Dec-2018 22:22	248_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-135209	1	05-Dec-2018 22:24	249SMPL.d	K PB
CCV 22	1	05-Dec-2018 22:44	259_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 22	1	05-Dec-2018 22:46	260_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 23	1	05-Dec-2018 23:08	271_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 23	1	05-Dec-2018 23:10	272_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 24	1	05-Dec-2018 23:32	283_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 24	1	05-Dec-2018 23:34	284_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 25	1	05-Dec-2018 23:55	295_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 25	1	05-Dec-2018 23:57	296_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 26	1	06-Dec-2018 00:13	304_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 26	1	06-Dec-2018 00:15	305_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 27	1	06-Dec-2018 00:37	316_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 27	1	06-Dec-2018 00:39	317_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 28	1	06-Dec-2018 00:51	323_CCV.d	AS CA CD FE K MG NA PB SB SE

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120067
Start Date: 05-Dec-2018 End Date: 06-Dec-2018

Run ID:ICPMS05_328643
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
CCB 28	1	06-Dec-2018 00:53	324_CCB.d	AS CA CD FE K MG NA PB SB SE
LLCCV5	1	06-Dec-2018 00:55	325LICV.d	CA K MG NA PB
LLCCV2	1	06-Dec-2018 00:57	326SMPL.d	CA K MG NA PB
ICSA	1	06-Dec-2018 00:59	327ICSA.d	CA K MG NA PB
ICSAB	1	06-Dec-2018 01:01	328ICSB.d	CA K MG NA PB

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120067

Run ID:ICPMS05_328542
Instrument:ICPMS05
Method:SW6020

CCB 1	Date: 04-Dec-2018 12:49	Seq: 4847465	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	12.35	12	200	
Sodium	16.14	14	200	

CCB 2	Date: 04-Dec-2018 13:14	Seq: 4847593	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.8	0.4	2	
Iron	13.99	12	200	
Sodium	21.12	14	200	

CCB 3	Date: 04-Dec-2018 13:41	Seq: 4847702	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.925	0.4	2	
Iron	14.9	12	200	
Sodium	14.87	14	200	

CCB 4	Date: 04-Dec-2018 14:05	Seq: 4847714	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.579	0.4	2	
Iron	14.46	12	200	
Sodium	17.1	14	200	

CCB 5	Date: 04-Dec-2018 14:57	Seq: 4847938	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.004	0.4	2	
Iron	15.84	12	200	
Sodium	35.61	14	200	

CCB 6	Date: 04-Dec-2018 15:22	Seq: 4847950	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.495	0.4	2	
Iron	15.54	12	200	
Sodium	32.28	14	200	

CCB 7	Date: 04-Dec-2018 15:49	Seq: 4848141	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.477	0.4	2	
Iron	16.26	12	200	
Sodium	48.22	14	200	

CCB 8	Date: 04-Dec-2018 15:58	Seq: 4848145	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.514	0.4	2	
Iron	16.21	12	200	
Sodium	33.36	14	200	

CCB 10	Date: 04-Dec-2018 17:05	Seq: 4848424	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	16.73	12	200	
Sodium	21.2	14	200	

CCB 11	Date: 04-Dec-2018 17:19	Seq: 4848431	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120067

Run ID:ICPMS05_328542
Instrument:ICPMS05
Method:SW6020

Antimony	0.791	0.4	2	
Iron	17.96	12	200	
Magnesium	10.33	10	200	
Sodium	39.11	14	200	

CCB 12 Date: 04-Dec-2018 17:43 Seq: 4848443 D/F: 1 Units: ug/L

Analyte	Result	MDL	Report Limit
Antimony	0.623	0.4	2
Iron	19.45	12	200
Sodium	51.66	14	200

CCB 14 Date: 04-Dec-2018 19:15 Seq: 4848462 D/F: 1 Units: ug/L

Analyte	Result	MDL	Report Limit
Iron	22.52	12	200
Sodium	91.72	14	200

CCB 15 Date: 04-Dec-2018 19:33 Seq: 4848477 D/F: 1 Units: ug/L

Analyte	Result	MDL	Report Limit
Antimony	0.425	0.4	2
Iron	19.26	12	200
Sodium	35.81	14	200

CCB 16 Date: 04-Dec-2018 19:47 Seq: 4848498 D/F: 1 Units: ug/L

Analyte	Result	MDL	Report Limit
Iron	22.56	12	200
Sodium	46.07	14	200

CCB 17 Date: 04-Dec-2018 20:11 Seq: 4848510 D/F: 1 Units: ug/L

Analyte	Result	MDL	Report Limit
Iron	20.84	12	200
Magnesium	10.17	10	200
Sodium	46.92	14	200

CCB 18 Date: 04-Dec-2018 20:36 Seq: 4848522 D/F: 1 Units: ug/L

Analyte	Result	MDL	Report Limit
Iron	21.24	12	200
Magnesium	12.95	10	200
Sodium	31.77	14	200

CCB 19 Date: 04-Dec-2018 21:00 Seq: 4848534 D/F: 1 Units: ug/L

Analyte	Result	MDL	Report Limit
Calcium	58.38	34	500
Sodium	238.9	14	200

CCB 20 Date: 04-Dec-2018 21:24 Seq: 4848546 D/F: 1 Units: ug/L

Analyte	Result	MDL	Report Limit
Calcium	41.98	34	500
Magnesium	17.04	10	200
Sodium	151.3	14	200

CCB 21 Date: 04-Dec-2018 21:48 Seq: 4848558 D/F: 1 Units: ug/L

Analyte	Result	MDL	Report Limit
Calcium	142	34	500
Magnesium	19.82	10	200
Sodium	328.5	14	200

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120067

Run ID:ICPMS05_328542
Instrument:ICPMS05
Method:SW6020

CCB 22	Date: 04-Dec-2018 22:08	Seq: 4848568	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Magnesium	13.82	10	200	
Selenium	1.232	1.1	2	
Sodium	121.3	14	200	

ICCB 23	Date: 04-Dec-2018 22:46	Seq: 4848858	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	32.63	14	200	

CCB 24	Date: 04-Dec-2018 23:07	Seq: 4848869	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	42.28	34	500	
Magnesium	12.52	10	200	
Sodium	322.7	14	200	

CCB 25	Date: 04-Dec-2018 23:25	Seq: 4848878	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	49.69	14	200	

CCB 26	Date: 04-Dec-2018 23:43	Seq: 4849013	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.535	0.4	2	
Sodium	69.22	14	200	

CCB 27	Date: 04-Dec-2018 23:59	Seq: 4849035	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Magnesium	18.15	10	200	
Sodium	337.2	14	200	

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120067

Run ID:ICPMS05_328643
Instrument:ICPMS05
Method:SW6020

CCB 1	Date: 05-Dec-2018 14:28	Seq: 4850127	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	19.68	14	200	

CCB 2	Date: 05-Dec-2018 15:00	Seq: 4850139	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	46.73	34	500	
Magnesium	22.95	10	200	
Sodium	114.3	14	200	

CCB 3	Date: 05-Dec-2018 15:24	Seq: 4850151	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	54.94	34	500	
Magnesium	16.55	10	200	
Sodium	173.8	14	200	

CCB 4	Date: 05-Dec-2018 15:49	Seq: 4850305	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	53.25	34	500	
Magnesium	14.66	10	200	
Sodium	157.4	14	200	

CCB 5	Date: 05-Dec-2018 16:16	Seq: 4850480	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Magnesium	10.58	10	200	
Sodium	41.58	14	200	

CCB 6	Date: 05-Dec-2018 16:40	Seq: 4850492	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	31.58	18	200	
Sodium	47.59	14	200	

CCB 7	Date: 05-Dec-2018 17:03	Seq: 4850563	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	39.91	14	200	

CCB 8	Date: 05-Dec-2018 17:15	Seq: 4850569	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	40.12	14	200	

CCB 9	Date: 05-Dec-2018 17:29	Seq: 4850576	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	45.62	34	500	
Potassium	42.81	18	200	
Sodium	123.1	14	200	

CCB 10	Date: 05-Dec-2018 17:43	Seq: 4850698	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Magnesium	15.11	10	200	
Potassium	36.47	18	200	
Sodium	181.1	14	200	

CCB 11	Date: 05-Dec-2018 18:17	Seq: 4850708	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120067

Run ID:ICPMS05_328643
Instrument:ICPMS05
Method:SW6020

Calcium	86.47	34	500	
Magnesium	10.82	10	200	
Sodium	153.8	14	200	

CCB 12 Date: 05-Dec-2018 18:54 Seq: 4850909 D/F: 1 Units: ug/L

Analyte	Result	MDL	Report Limit
Calcium	60.67	34	500
Sodium	45.7	14	200

CCB 13 Date: 05-Dec-2018 19:16 Seq: 4850920 D/F: 1 Units: ug/L

Analyte	Result	MDL	Report Limit
Calcium	59.4	34	500
Potassium	21.36	18	200
Sodium	46.92	14	200

CCB 14 Date: 05-Dec-2018 19:40 Seq: 4850932 D/F: 1 Units: ug/L

Analyte	Result	MDL	Report Limit
Calcium	56.38	34	500
Potassium	19.07	18	200
Sodium	75.36	14	200

CCB 15 Date: 05-Dec-2018 20:02 Seq: 4850943 D/F: 1 Units: ug/L

Analyte	Result	MDL	Report Limit
Calcium	38.27	34	500
Sodium	42.48	14	200

CCB 16 Date: 05-Dec-2018 20:22 Seq: 4850953 D/F: 1 Units: ug/L

Analyte	Result	MDL	Report Limit
Magnesium	15.76	10	200
Potassium	69.24	18	200
Sodium	139.4	14	200

CCB 17 Date: 05-Dec-2018 20:33 Seq: 4850957 D/F: 1 Units: ug/L

Analyte	Result	MDL	Report Limit
Potassium	69.22	18	200
Sodium	72.56	14	200

CCB 18 Date: 05-Dec-2018 20:53 Seq: 4850964 D/F: 1 Units: ug/L

Analyte	Result	MDL	Report Limit
Calcium	44.99	34	500
Potassium	74.83	18	200
Sodium	62.19	14	200

ICCB 19 Date: 05-Dec-2018 21:44 Seq: 4850982 D/F: 1 Units: ug/L

Analyte	Result	MDL	Report Limit
Sodium	-18.16	14	200

CCB 20 Date: 05-Dec-2018 22:06 Seq: 4850993 D/F: 1 Units: ug/L

Analyte	Result	MDL	Report Limit
Potassium	45.83	18	200
Sodium	68.03	14	200

CCB 21 Date: 05-Dec-2018 22:22 Seq: 4851001 D/F: 1 Units: ug/L

Analyte	Result	MDL	Report Limit
Calcium	57.27	34	500

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120067

Run ID:ICPMS05_328643
Instrument:ICPMS05
Method:SW6020

	Potassium	25.75	18	200	
	Sodium	53.84	14	200	
CCB 22	Date: 05-Dec-2018 22:46	Seq: 4851312	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	25.8	14	200	
CCB 23	Date: 05-Dec-2018 23:10	Seq: 4851324	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Calcium	53.48	34	500	
	Sodium	31	14	200	
CCB 24	Date: 05-Dec-2018 23:34	Seq: 4851336	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	44.09	14	200	
CCB 25	Date: 05-Dec-2018 23:57	Seq: 4851355	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Potassium	-39.15	18	200	
	Sodium	30.5	14	200	
CCB 26	Date: 06-Dec-2018 00:15	Seq: 4851364	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Potassium	-18.82	18	200	
CCB 27	Date: 06-Dec-2018 00:39	Seq: 4851376	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Lead	1.097	0.6	2	
	Potassium	-33.3	18	200	
	Sodium	-19	14	200	
CCB 28	Date: 06-Dec-2018 00:53	Seq: 4851383	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Potassium	-40.51	18	200	
	Sodium	-27.92	14	200	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS18120067

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18120067-01	French Drain	Groundwater		03-Dec-2018 13:55	04-Dec-2018 09:30	☐
HS18120067-02	MW-46	Groundwater		03-Dec-2018 15:20	04-Dec-2018 09:30	☐
HS18120067-03	DGW-MW-11	Groundwater		03-Dec-2018 17:50	04-Dec-2018 09:30	☐
HS18120067-04	DGW-MW-11S	Groundwater		03-Dec-2018 17:50	04-Dec-2018 09:30	☐
HS18120067-05	MW-30	Groundwater		03-Dec-2018 16:50	04-Dec-2018 09:30	☐
HS18120067-06	DUP-01	Groundwater		03-Dec-2018 00:00	04-Dec-2018 09:30	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: French Drain
Collection Date: 03-Dec-2018 13:55

ANALYTICAL REPORT
WorkOrder:HS18120067
Lab ID:HS18120067-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 04-Dec-2018		Analyst: JCJ
Antimony	**0.0374**		**0.000400**	**0.00200**	**mg/L**	1	04-Dec-2018 22:51
Arsenic	**0.00219**		**0.000400**	**0.00200**	**mg/L**	1	04-Dec-2018 22:51
Cadmium	**0.000273**	J	**0.000200**	**0.00200**	**mg/L**	1	04-Dec-2018 22:51
Calcium	**186**		**0.340**	**5.00**	**mg/L**	10	05-Dec-2018 16:32
Iron	**0.0569**	J	**0.0120**	**0.200**	**mg/L**	1	04-Dec-2018 22:51
Lead	**0.00362**		**0.000600**	**0.00200**	**mg/L**	1	05-Dec-2018 18:03
Magnesium	**1.33**		**0.0100**	**0.200**	**mg/L**	1	04-Dec-2018 22:51
Potassium	**13.2**		**0.0180**	**0.200**	**mg/L**	1	05-Dec-2018 18:03
Selenium	**0.00774**		**0.00110**	**0.00200**	**mg/L**	1	04-Dec-2018 22:51
Sodium	**231**		**0.140**	**2.00**	**mg/L**	10	05-Dec-2018 16:32
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 04-Dec-2018		Analyst: JCJ
Antimony	**0.0346**		**0.000400**	**0.00200**	**mg/L**	1	04-Dec-2018 23:31
Arsenic	**0.00209**		**0.000400**	**0.00200**	**mg/L**	1	04-Dec-2018 23:31
Cadmium	U		0.000200	0.00200	mg/L	1	04-Dec-2018 23:31
Calcium	**178**		**0.340**	**5.00**	**mg/L**	10	05-Dec-2018 16:53
Iron	**0.0175**	J	**0.0120**	**0.200**	**mg/L**	1	04-Dec-2018 23:31
Lead	**0.000614**	J	**0.000600**	**0.00200**	**mg/L**	1	05-Dec-2018 17:17
Magnesium	**1.25**		**0.0100**	**0.200**	**mg/L**	1	04-Dec-2018 23:31
Potassium	**13.8**		**0.0180**	**0.200**	**mg/L**	1	05-Dec-2018 17:17
Selenium	**0.00685**		**0.00110**	**0.00200**	**mg/L**	1	04-Dec-2018 23:31
Sodium	**228**		**0.140**	**2.00**	**mg/L**	10	05-Dec-2018 16:53
ANIONS BY E300.0	**Method:E300**						Analyst: KMU
Chloride	**28.2**		**0.200**	**0.500**	**mg/L**	1	05-Dec-2018 11:39
Nitrogen, Nitrate (As N)	**1.47**		**0.0300**	**0.100**	**mg/L**	1	05-Dec-2018 11:39
Sulfate	**964**		**4.00**	**10.0**	**mg/L**	20	13-Dec-2018 03:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: MW-46
Collection Date: 03-Dec-2018 15:20

ANALYTICAL REPORT
WorkOrder:HS18120067
Lab ID:HS18120067-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 04-Dec-2018		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	04-Dec-2018 22:53
Arsenic	**0.00228**		**0.000400**	**0.00200**	**mg/L**	1	04-Dec-2018 22:53
Cadmium	**0.000959**	J	**0.000200**	**0.00200**	**mg/L**	1	04-Dec-2018 22:53
Calcium	**499**		**0.340**	**5.00**	**mg/L**	10	05-Dec-2018 16:34
Iron	**67.5**		**0.0120**	**0.200**	**mg/L**	1	04-Dec-2018 22:53
Lead	U		0.00120	0.00400	mg/L	2	05-Dec-2018 18:05
Magnesium	**216**		**0.100**	**2.00**	**mg/L**	10	05-Dec-2018 16:34
Potassium	**4.93**		**0.0360**	**0.400**	**mg/L**	2	05-Dec-2018 18:05
Selenium	U		0.00110	0.00200	mg/L	1	04-Dec-2018 22:53
Sodium	**625**		**0.140**	**2.00**	**mg/L**	10	05-Dec-2018 16:34
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 04-Dec-2018		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	04-Dec-2018 23:45
Arsenic	**0.00176**	J	**0.000400**	**0.00200**	**mg/L**	1	04-Dec-2018 23:45
Cadmium	**0.000900**	J	**0.000200**	**0.00200**	**mg/L**	1	04-Dec-2018 23:45
Calcium	**556**		**0.340**	**5.00**	**mg/L**	10	05-Dec-2018 16:59
Iron	**65.3**		**0.0120**	**0.200**	**mg/L**	1	04-Dec-2018 23:45
Lead	U		0.00120	0.00400	mg/L	2	05-Dec-2018 17:31
Magnesium	**240**		**0.100**	**2.00**	**mg/L**	10	05-Dec-2018 16:59
Potassium	**5.75**		**0.0360**	**0.400**	**mg/L**	2	05-Dec-2018 17:31
Selenium	U		0.00110	0.00200	mg/L	1	04-Dec-2018 23:45
Sodium	**687**		**0.140**	**2.00**	**mg/L**	10	05-Dec-2018 16:59
ANIONS BY E300.0	**Method:E300**						Analyst: KMU
Chloride	**506**		**4.00**	**10.0**	**mg/L**	20	05-Dec-2018 13:49
Nitrogen, Nitrate (As N)	U		0.0600	0.200	mg/L	2	05-Dec-2018 13:05
Sulfate	**2,920**		**20.0**	**50.0**	**mg/L**	100	13-Dec-2018 04:09

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: DGW-MW-11
Collection Date: 03-Dec-2018 17:50

ANALYTICAL REPORT
WorkOrder:HS18120067
Lab ID:HS18120067-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 04-Dec-2018		Analyst: JCJ
Antimony	**0.000708**	J	**0.000400**	**0.00200**	**mg/L**	1	04-Dec-2018 22:55
Arsenic	**0.00478**		**0.000400**	**0.00200**	**mg/L**	1	04-Dec-2018 22:55
Cadmium	**0.00289**		**0.000200**	**0.00200**	**mg/L**	1	04-Dec-2018 22:55
Calcium	**459**		**1.70**	**25.0**	**mg/L**	50	05-Dec-2018 16:36
Iron	**3.45**		**0.0120**	**0.200**	**mg/L**	1	04-Dec-2018 22:55
Lead	**0.0383**		**0.00300**	**0.0100**	**mg/L**	5	05-Dec-2018 18:07
Magnesium	**246**		**0.500**	**10.0**	**mg/L**	50	05-Dec-2018 16:36
Potassium	**17.7**		**0.0900**	**1.00**	**mg/L**	5	05-Dec-2018 18:07
Selenium	U		0.00110	0.00200	mg/L	1	04-Dec-2018 22:55
Sodium	**1,710**		**0.700**	**10.0**	**mg/L**	50	05-Dec-2018 16:36
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 04-Dec-2018		Analyst: JCJ
Antimony	**0.000686**	J	**0.000400**	**0.00200**	**mg/L**	1	04-Dec-2018 23:47
Arsenic	**0.00145**	J	**0.000400**	**0.00200**	**mg/L**	1	04-Dec-2018 23:47
Cadmium	**0.00249**		**0.000200**	**0.00200**	**mg/L**	1	04-Dec-2018 23:47
Calcium	**474**		**1.70**	**25.0**	**mg/L**	50	05-Dec-2018 17:05
Iron	**0.324**		**0.0120**	**0.200**	**mg/L**	1	04-Dec-2018 23:47
Lead	U		0.00300	0.0100	mg/L	5	05-Dec-2018 17:33
Magnesium	**267**		**0.500**	**10.0**	**mg/L**	50	05-Dec-2018 17:05
Potassium	**17.5**		**0.0900**	**1.00**	**mg/L**	5	05-Dec-2018 17:33
Selenium	U		0.00110	0.00200	mg/L	1	04-Dec-2018 23:47
Sodium	**1,860**		**0.700**	**10.0**	**mg/L**	50	05-Dec-2018 17:05
ANIONS BY E300.0	**Method:E300**						Analyst: KMU
Chloride	**221**		**20.0**	**50.0**	**mg/L**	100	13-Dec-2018 04:23
Nitrogen, Nitrate (As N)	U		0.0600	0.200	mg/L	2	05-Dec-2018 17:03
Sulfate	**4,950**		**20.0**	**50.0**	**mg/L**	100	13-Dec-2018 04:23

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: DGW-MW-11S
Collection Date: 03-Dec-2018 17:50

ANALYTICAL REPORT
WorkOrder:HS18120067
Lab ID:HS18120067-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 04-Dec-2018		Analyst: JCJ
Antimony	**0.000632**	J	**0.000400**	**0.00200**	**mg/L**	1	04-Dec-2018 22:57
Arsenic	**0.00707**		**0.000400**	**0.00200**	**mg/L**	1	04-Dec-2018 22:57
Cadmium	**0.000964**	J	**0.000200**	**0.00200**	**mg/L**	1	04-Dec-2018 22:57
Calcium	**415**		**1.70**	**25.0**	**mg/L**	50	05-Dec-2018 16:42
Iron	**2.48**		**0.0120**	**0.200**	**mg/L**	1	04-Dec-2018 22:57
Lead	U		0.00300	0.0100	mg/L	5	05-Dec-2018 18:09
Magnesium	**172**		**0.0100**	**0.200**	**mg/L**	1	04-Dec-2018 22:57
Potassium	**2.41**		**0.0900**	**1.00**	**mg/L**	5	05-Dec-2018 18:09
Selenium	U		0.00110	0.00200	mg/L	1	04-Dec-2018 22:57
Sodium	**2,100**		**0.700**	**10.0**	**mg/L**	50	05-Dec-2018 16:42
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 04-Dec-2018		Analyst: JCJ
Antimony	**0.00101**	J	**0.000400**	**0.00200**	**mg/L**	1	04-Dec-2018 23:49
Arsenic	**0.00642**		**0.000400**	**0.00200**	**mg/L**	1	04-Dec-2018 23:49
Cadmium	**0.00101**	J	**0.000200**	**0.00200**	**mg/L**	1	04-Dec-2018 23:49
Calcium	**493**		**1.70**	**25.0**	**mg/L**	50	05-Dec-2018 17:07
Iron	**1.99**		**0.0120**	**0.200**	**mg/L**	1	04-Dec-2018 23:49
Lead	**0.00439**	J	**0.00300**	**0.0100**	**mg/L**	5	05-Dec-2018 17:35
Magnesium	**151**		**0.0100**	**0.200**	**mg/L**	1	04-Dec-2018 23:49
Potassium	**2.49**		**0.0900**	**1.00**	**mg/L**	5	05-Dec-2018 17:35
Selenium	U		0.00110	0.00200	mg/L	1	04-Dec-2018 23:49
Sodium	**2,390**		**0.700**	**10.0**	**mg/L**	50	05-Dec-2018 17:07
ANIONS BY E300.0	**Method:E300**						Analyst: KMU
Chloride	**234**		**20.0**	**50.0**	**mg/L**	100	13-Dec-2018 04:38
Nitrogen, Nitrate (As N)	U		0.0600	0.200	mg/L	2	05-Dec-2018 17:25
Sulfate	**5,610**		**20.0**	**50.0**	**mg/L**	100	13-Dec-2018 04:38

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: MW-30
Collection Date: 03-Dec-2018 16:50

ANALYTICAL REPORT
WorkOrder:HS18120067
Lab ID:HS18120067-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 04-Dec-2018		Analyst: JCJ
Antimony	**0.00886**		**0.000400**	**0.00200**	**mg/L**	1	04-Dec-2018 22:59
Arsenic	**0.109**		**0.000400**	**0.00200**	**mg/L**	1	04-Dec-2018 22:59
Cadmium	U		0.000200	0.00200	mg/L	1	04-Dec-2018 22:59
Calcium	**329**		**0.340**	**5.00**	**mg/L**	10	05-Dec-2018 16:44
Iron	**31.9**		**0.0120**	**0.200**	**mg/L**	1	04-Dec-2018 22:59
Lead	**0.0230**		**0.00120**	**0.00400**	**mg/L**	2	05-Dec-2018 18:11
Magnesium	**33.6**		**0.0100**	**0.200**	**mg/L**	1	04-Dec-2018 22:59
Potassium	**2.41**		**0.0360**	**0.400**	**mg/L**	2	05-Dec-2018 18:11
Selenium	U		0.00110	0.00200	mg/L	1	04-Dec-2018 22:59
Sodium	**159**		**0.140**	**2.00**	**mg/L**	10	05-Dec-2018 16:44
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 04-Dec-2018		Analyst: JCJ
Antimony	**0.00423**		**0.000400**	**0.00200**	**mg/L**	1	04-Dec-2018 23:51
Arsenic	**0.0961**		**0.000400**	**0.00200**	**mg/L**	1	04-Dec-2018 23:51
Cadmium	U		0.000200	0.00200	mg/L	1	04-Dec-2018 23:51
Calcium	**335**		**0.340**	**5.00**	**mg/L**	10	05-Dec-2018 17:09
Iron	**27.6**		**0.0120**	**0.200**	**mg/L**	1	04-Dec-2018 23:51
Lead	U		0.00120	0.00400	mg/L	2	05-Dec-2018 17:37
Magnesium	**30.2**		**0.0100**	**0.200**	**mg/L**	1	04-Dec-2018 23:51
Potassium	**2.37**		**0.0360**	**0.400**	**mg/L**	2	05-Dec-2018 17:37
Selenium	U		0.00110	0.00200	mg/L	1	04-Dec-2018 23:51
Sodium	**163**		**0.140**	**2.00**	**mg/L**	10	05-Dec-2018 17:09
ANIONS BY E300.0	**Method:E300**						Analyst: KMU
Chloride	**109**		**0.400**	**1.00**	**mg/L**	2	05-Dec-2018 16:41
Nitrogen, Nitrate (As N)	U		0.0600	0.200	mg/L	2	05-Dec-2018 16:41
Sulfate	**715**		**4.00**	**10.0**	**mg/L**	20	13-Dec-2018 04:52

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: DUP-01
Collection Date: 03-Dec-2018 00:00

ANALYTICAL REPORT
WorkOrder:HS18120067
Lab ID:HS18120067-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 04-Dec-2018		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	04-Dec-2018 23:01
Arsenic	**0.00188**	J	**0.000400**	**0.00200**	**mg/L**	1	04-Dec-2018 23:01
Cadmium	**0.000759**	J	**0.000200**	**0.00200**	**mg/L**	1	04-Dec-2018 23:01
Calcium	**532**		**0.340**	**5.00**	**mg/L**	10	05-Dec-2018 16:46
Iron	**61.0**		**0.0120**	**0.200**	**mg/L**	1	04-Dec-2018 23:01
Lead	U		0.00120	0.00400	mg/L	2	05-Dec-2018 18:13
Magnesium	**227**		**0.100**	**2.00**	**mg/L**	10	05-Dec-2018 16:46
Potassium	**4.75**		**0.0360**	**0.400**	**mg/L**	2	05-Dec-2018 18:13
Selenium	U		0.00110	0.00200	mg/L	1	04-Dec-2018 23:01
Sodium	**663**		**0.140**	**2.00**	**mg/L**	10	05-Dec-2018 16:46
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 04-Dec-2018		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	04-Dec-2018 23:53
Arsenic	**0.00193**	J	**0.000400**	**0.00200**	**mg/L**	1	04-Dec-2018 23:53
Cadmium	**0.000894**	J	**0.000200**	**0.00200**	**mg/L**	1	04-Dec-2018 23:53
Calcium	**568**		**0.340**	**5.00**	**mg/L**	10	05-Dec-2018 17:11
Iron	**66.0**		**0.0120**	**0.200**	**mg/L**	1	04-Dec-2018 23:53
Lead	U		0.00120	0.00400	mg/L	2	05-Dec-2018 17:39
Magnesium	**249**		**0.100**	**2.00**	**mg/L**	10	05-Dec-2018 17:11
Potassium	**4.77**		**0.0360**	**0.400**	**mg/L**	2	05-Dec-2018 17:39
Selenium	U		0.00110	0.00200	mg/L	1	04-Dec-2018 23:53
Sodium	**690**		**0.140**	**2.00**	**mg/L**	10	05-Dec-2018 17:11
ANIONS BY E300.0	**Method:E300**						Analyst: KMU
Chloride	**498**		**4.00**	**10.0**	**mg/L**	20	05-Dec-2018 13:27
Nitrogen, Nitrate (As N)	**0.149**	J	**0.0600**	**0.200**	**mg/L**	2	05-Dec-2018 12:44
Sulfate	**2,850**		**20.0**	**50.0**	**mg/L**	100	13-Dec-2018 05:07

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120067

Batch ID: 135209 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18120067-01	1	10	10 (mL)	1
HS18120067-02	1	10	10 (mL)	1
HS18120067-03	1	10	10 (mL)	1
HS18120067-04	1	10	10 (mL)	1
HS18120067-05	1	10	10 (mL)	1
HS18120067-06	1	10	10 (mL)	1

Batch ID: 135210 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18120067-01	1	10	10 (mL)	1
HS18120067-02	1	10	10 (mL)	1
HS18120067-03	1	10	10 (mL)	1
HS18120067-04	1	10	10 (mL)	1
HS18120067-05	1	10	10 (mL)	1
HS18120067-06	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120067

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 135209	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS18120067-01	French Drain	03 Dec 2018 13:55		04 Dec 2018 10:00	05 Dec 2018 18:03	1
HS18120067-01	French Drain	03 Dec 2018 13:55		04 Dec 2018 10:00	05 Dec 2018 16:32	10
HS18120067-01	French Drain	03 Dec 2018 13:55		04 Dec 2018 10:00	04 Dec 2018 22:51	1
HS18120067-02	MW-46	03 Dec 2018 15:20		04 Dec 2018 10:00	05 Dec 2018 18:05	2
HS18120067-02	MW-46	03 Dec 2018 15:20		04 Dec 2018 10:00	05 Dec 2018 16:34	10
HS18120067-02	MW-46	03 Dec 2018 15:20		04 Dec 2018 10:00	04 Dec 2018 22:53	1
HS18120067-03	DGW-MW-11	03 Dec 2018 17:50		04 Dec 2018 10:00	05 Dec 2018 18:07	5
HS18120067-03	DGW-MW-11	03 Dec 2018 17:50		04 Dec 2018 10:00	05 Dec 2018 16:36	50
HS18120067-03	DGW-MW-11	03 Dec 2018 17:50		04 Dec 2018 10:00	04 Dec 2018 22:55	1
HS18120067-04	DGW-MW-11S	03 Dec 2018 17:50		04 Dec 2018 10:00	05 Dec 2018 18:09	5
HS18120067-04	DGW-MW-11S	03 Dec 2018 17:50		04 Dec 2018 10:00	05 Dec 2018 16:42	50
HS18120067-04	DGW-MW-11S	03 Dec 2018 17:50		04 Dec 2018 10:00	04 Dec 2018 22:57	1
HS18120067-05	MW-30	03 Dec 2018 16:50		04 Dec 2018 10:00	05 Dec 2018 18:11	2
HS18120067-05	MW-30	03 Dec 2018 16:50		04 Dec 2018 10:00	05 Dec 2018 16:44	10
HS18120067-05	MW-30	03 Dec 2018 16:50		04 Dec 2018 10:00	04 Dec 2018 22:59	1
HS18120067-06	DUP-01	03 Dec 2018 00:00		04 Dec 2018 10:00	05 Dec 2018 18:13	2
HS18120067-06	DUP-01	03 Dec 2018 00:00		04 Dec 2018 10:00	05 Dec 2018 16:46	10
HS18120067-06	DUP-01	03 Dec 2018 00:00		04 Dec 2018 10:00	04 Dec 2018 23:01	1
Batch ID 135210	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS18120067-01	French Drain	03 Dec 2018 13:55		04 Dec 2018 11:00	05 Dec 2018 17:17	1
HS18120067-01	French Drain	03 Dec 2018 13:55		04 Dec 2018 11:00	05 Dec 2018 16:53	10
HS18120067-01	French Drain	03 Dec 2018 13:55		04 Dec 2018 11:00	04 Dec 2018 23:31	1
HS18120067-02	MW-46	03 Dec 2018 15:20		04 Dec 2018 11:00	05 Dec 2018 17:31	2
HS18120067-02	MW-46	03 Dec 2018 15:20		04 Dec 2018 11:00	05 Dec 2018 16:59	10
HS18120067-02	MW-46	03 Dec 2018 15:20		04 Dec 2018 11:00	04 Dec 2018 23:45	1
HS18120067-03	DGW-MW-11	03 Dec 2018 17:50		04 Dec 2018 11:00	05 Dec 2018 17:33	5
HS18120067-03	DGW-MW-11	03 Dec 2018 17:50		04 Dec 2018 11:00	05 Dec 2018 17:05	50
HS18120067-03	DGW-MW-11	03 Dec 2018 17:50		04 Dec 2018 11:00	04 Dec 2018 23:47	1
HS18120067-04	DGW-MW-11S	03 Dec 2018 17:50		04 Dec 2018 11:00	05 Dec 2018 17:35	5
HS18120067-04	DGW-MW-11S	03 Dec 2018 17:50		04 Dec 2018 11:00	05 Dec 2018 17:07	50
HS18120067-04	DGW-MW-11S	03 Dec 2018 17:50		04 Dec 2018 11:00	04 Dec 2018 23:49	1
HS18120067-05	MW-30	03 Dec 2018 16:50		04 Dec 2018 11:00	05 Dec 2018 17:37	2
HS18120067-05	MW-30	03 Dec 2018 16:50		04 Dec 2018 11:00	05 Dec 2018 17:09	10
HS18120067-05	MW-30	03 Dec 2018 16:50		04 Dec 2018 11:00	04 Dec 2018 23:51	1
HS18120067-06	DUP-01	03 Dec 2018 00:00		04 Dec 2018 11:00	05 Dec 2018 17:39	2
HS18120067-06	DUP-01	03 Dec 2018 00:00		04 Dec 2018 11:00	05 Dec 2018 17:11	10
HS18120067-06	DUP-01	03 Dec 2018 00:00		04 Dec 2018 11:00	04 Dec 2018 23:53	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120067

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R328992	**Test Name :** ANIONS BY E300.0			**Matrix:** Groundwater		
HS18120067-01	French Drain	03 Dec 2018 13:55			05 Dec 2018 11:39	1
HS18120067-02	MW-46	03 Dec 2018 15:20			05 Dec 2018 13:49	20
HS18120067-02	MW-46	03 Dec 2018 15:20			05 Dec 2018 13:05	2
HS18120067-03	DGW-MW-11	03 Dec 2018 17:50			05 Dec 2018 17:03	2
HS18120067-04	DGW-MW-11S	03 Dec 2018 17:50			05 Dec 2018 17:25	2
HS18120067-05	MW-30	03 Dec 2018 16:50			05 Dec 2018 16:41	2
HS18120067-06	DUP-01	03 Dec 2018 00:00			05 Dec 2018 13:27	20
HS18120067-06	DUP-01	03 Dec 2018 00:00			05 Dec 2018 12:44	2
Batch ID R329205	**Test Name :** ANIONS BY E300.0			**Matrix:** Groundwater		
HS18120067-01	French Drain	03 Dec 2018 13:55			13 Dec 2018 03:54	20
HS18120067-02	MW-46	03 Dec 2018 15:20			13 Dec 2018 04:09	100
HS18120067-03	DGW-MW-11	03 Dec 2018 17:50			13 Dec 2018 04:23	100
HS18120067-04	DGW-MW-11S	03 Dec 2018 17:50			13 Dec 2018 04:38	100
HS18120067-05	MW-30	03 Dec 2018 16:50			13 Dec 2018 04:52	20
HS18120067-06	DUP-01	03 Dec 2018 00:00			13 Dec 2018 05:07	100

WorkOrder: HS18120067
InstrumentID: ICPMS05
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.00100	0.000983	0.000400	0.00200
A	Arsenic	7440-38-2	0.00100	0.000927	0.000400	0.00200
A	Cadmium	7440-43-9	0.00100	0.00101	0.000200	0.00200
A	Calcium	7440-70-2	0.100	0.125	0.0340	0.500
A	Iron	7439-89-6	0.100	0.122	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.00100	0.000600	0.00200
A	Magnesium	7439-95-4	0.100	0.116	0.0100	0.200
A	Potassium	7440-09-7	0.100	0.0991	0.0180	0.200
A	Selenium	7782-49-2	0.00100	0.000902	0.00110	0.00200
A	Sodium	7440-23-5	0.100	0.0985	0.0140	0.200

WorkOrder: HS18120067
InstrumentID: ICPMS05
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.00100	0.000983	0.000400	0.00200
A	Arsenic	7440-38-2	0.00100	0.000927	0.000400	0.00200
A	Cadmium	7440-43-9	0.00100	0.00101	0.000200	0.00200
A	Calcium	7440-70-2	0.100	0.125	0.0340	0.500
A	Iron	7439-89-6	0.100	0.122	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.00100	0.000600	0.00200
A	Magnesium	7439-95-4	0.100	0.116	0.0100	0.200
A	Potassium	7440-09-7	0.100	0.0991	0.0180	0.200
A	Selenium	7782-49-2	0.00100	0.000902	0.00110	0.00200
A	Sodium	7440-23-5	0.100	0.0985	0.0140	0.200

WorkOrder: HS18120067
InstrumentID: ICS3K2
Test Code: 300_W
Test Number: E300
Test Name: Anions by E300.0

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Chloride	16887-00-6	0.500	0.580	0.200	0.500
A	Nitrogen, Nitrate (As N)	14797-55-8	0.100	0.126	0.0300	0.100

WorkOrder: HS18120067
InstrumentID: ICS2100
Test Code: 300_W
Test Number: E300
Test Name: Anions by E300.0

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Chloride	16887-00-6	0.500	0.576	0.200	0.500
A	Sulfate	14808-79-8	0.500	0.616	0.200	0.500

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120067

QC BATCH REPORT

Batch ID: 135209 **Instrument: ICPMS05** **Method: SW6020**

MBLK Sample ID: **MBLK-135209** Units: **mg/L** Analysis Date: **04-Dec-2018 22:48**
Client ID: Run ID: **ICPMS05_328542** SeqNo: **4848859** PrepDate: **04-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Magnesium	0.01852	0.200								J
Selenium	U	0.00200								
Sodium	U	0.200								

MBLK Sample ID: **MBLK-135209** Units: **mg/L** Analysis Date: **05-Dec-2018 16:18**
Client ID: Run ID: **ICPMS05_328643** SeqNo: **4850481** PrepDate: **04-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	U	0.00200								
Potassium	U	0.200								

MBLK Sample ID: **MBLK-135209** Units: **mg/L** Analysis Date: **05-Dec-2018 22:24**
Client ID: Run ID: **ICPMS05_328643** SeqNo: **4851002** PrepDate: **04-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	U	0.00200								
Potassium	0.02443	0.200								J

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120067

QC BATCH REPORT

Batch ID: 135209 **Instrument: ICPMS05** **Method: SW6020**

LCS Sample ID: **LCS-135209** Units: **mg/L** Analysis Date: **04-Dec-2018 22:50**
Client ID: Run ID: **ICPMS05_328542** SeqNo: **4848860** PrepDate: **04-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05113	0.00200	0.05	0	102	80 - 120				
Arsenic	0.05027	0.00200	0.05	0	101	80 - 120				
Cadmium	0.04954	0.00200	0.05	0	99.1	80 - 120				
Calcium	5.339	0.500	5	0	107	80 - 120				
Iron	5.386	0.200	5	0	108	80 - 120				
Magnesium	5.381	0.200	5	0	108	80 - 120				
Selenium	0.05008	0.00200	0.05	0	100	80 - 120				
Sodium	5.317	0.200	5	0	106	80 - 120				

LCS Sample ID: **LCS-135209** Units: **mg/L** Analysis Date: **05-Dec-2018 16:20**
Client ID: Run ID: **ICPMS05_328643** SeqNo: **4850482** PrepDate: **04-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.05362	0.00200	0.05	0	107	80 - 120				
Potassium	5.332	0.200	5	0	107	80 - 120				

MS Sample ID: **HS18111501-09MS** Units: **mg/L** Analysis Date: **04-Dec-2018 23:15**
Client ID: Run ID: **ICPMS05_328542** SeqNo: **4848873** PrepDate: **04-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05151	0.00200	0.05	0.00043	102	80 - 120				
Arsenic	0.06018	0.00200	0.05	0.005582	109	80 - 120				
Cadmium	0.05293	0.00200	0.05	0	106	80 - 120				
Calcium	64.89	0.500	5	53.3	232	80 - 120				SO
Iron	7.217	0.200	5	1.555	113	80 - 120				
Magnesium	11.91	0.200	5	6.14	115	80 - 120				
Selenium	0.05362	0.00200	0.05	0	107	80 - 120				
Sodium	146.3	0.200	5	130.7	312	80 - 120				SO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120067

QC BATCH REPORT

Batch ID: 135209 **Instrument: ICPMS05** **Method: SW6020**

MS Sample ID: **HS18111501-09MS** Units: **mg/L** Analysis Date: **05-Dec-2018 16:26**
Client ID: Run ID: **ICPMS05_328643** SeqNo: **4850485** PrepDate: **04-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.05192	0.00200	0.05	0	104	80 - 120				
Potassium	6.581	0.200	5	1.202	108	80 - 120				

MSD Sample ID: **HS18111501-09MSD** Units: **mg/L** Analysis Date: **04-Dec-2018 23:17**
Client ID: Run ID: **ICPMS05_328542** SeqNo: **4848874** PrepDate: **04-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05192	0.00200	0.05	0.00043	103	80 - 120	0.05151	0.804	20	
Arsenic	0.05995	0.00200	0.05	0.005582	109	80 - 120	0.06018	0.385	20	
Cadmium	0.05371	0.00200	0.05	0	107	80 - 120	0.05293	1.47	20	
Calcium	62.98	0.500	5	53.3	194	80 - 120	64.89	2.99	20	SO
Iron	7.221	0.200	5	1.555	113	80 - 120	7.217	0.063	20	
Magnesium	11.95	0.200	5	6.14	116	80 - 120	11.91	0.338	20	
Selenium	0.0544	0.00200	0.05	0	109	80 - 120	0.05362	1.45	20	
Sodium	146.3	0.200	5	130.7	312	80 - 120	146.3	0.0185	20	SO

MSD Sample ID: **HS18111501-09MSD** Units: **mg/L** Analysis Date: **05-Dec-2018 16:28**
Client ID: Run ID: **ICPMS05_328643** SeqNo: **4850486** PrepDate: **04-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.05198	0.00200	0.05	0	104	80 - 120	0.05192	0.121	20	
Potassium	6.262	0.200	5	1.202	101	80 - 120	6.581	4.96	20	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120067

QC BATCH REPORT

Batch ID: 135209 **Instrument: ICPMS05** **Method: SW6020**

PDS Sample ID: **HS18111501-09PDS** Units: **mg/L** Analysis Date: **04-Dec-2018 23:19**
Client ID: Run ID: **ICPMS05_328542** SeqNo: **4848875** PrepDate: **04-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.08802	0.00200	0.1	0.00043	87.6	75 - 125				
Arsenic	0.1045	0.00200	0.1	0.005582	99.0	75 - 125				
Cadmium	0.09666	0.00200	0.1	0.000075	96.6	75 - 125				
Calcium	59.74	0.500	10	53.3	64.4	75 - 125				SO
Iron	11.31	0.200	10	1.555	97.6	75 - 125				
Magnesium	15.26	0.200	10	6.14	91.2	75 - 125				
Selenium	0.09892	0.00200	0.1	0.000033	98.9	75 - 125				
Sodium	133.2	0.200	10	130.7	25.4	75 - 125				SO

PDS Sample ID: **HS18111501-09PDS** Units: **mg/L** Analysis Date: **05-Dec-2018 16:30**
Client ID: Run ID: **ICPMS05_328643** SeqNo: **4850487** PrepDate: **04-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.103	0.00200	0.1	0.000382	103	75 - 125				
Potassium	11.22	0.200	10	1.202	100	75 - 125				

SD Sample ID: **HS18111501-09SD** Units: **mg/L** Analysis Date: **04-Dec-2018 23:13**
Client ID: Run ID: **ICPMS05_328542** SeqNo: **4848872** PrepDate: **04-Dec-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.00043	0	10	
Arsenic	0.005227	0.0100					0.005582	0	10	J
Cadmium	U	0.0100					0.000075	0	10	
Calcium	49.28	2.50					53.3	7.56	10	
Iron	1.487	1.00					1.555	4.35	10	
Magnesium	5.914	1.00					6.14	3.69	10	
Selenium	U	0.0100					0.000033	0	10	
Sodium	128	1.00					130.7	2.05	10	

SD Sample ID: **HS18111501-09SD** Units: **mg/L** Analysis Date: **05-Dec-2018 16:24**
Client ID: Run ID: **ICPMS05_328643** SeqNo: **4850484** PrepDate: **04-Dec-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Lead	U	0.0100					0.000382	0	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120067

QC BATCH REPORT

Batch ID: 135209 **Instrument: ICPMS05** **Method: SW6020**

The following samples were analyzed in this batch:				
	HS18120067-01	HS18120067-02	HS18120067-03	HS18120067-04
	HS18120067-05	HS18120067-06		

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120067

QC BATCH REPORT

Batch ID: 135210 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLK-135210** Units: **mg/L** Analysis Date: **04-Dec-2018 23:27**
Client ID: Run ID: **ICPMS05_328542** SeqNo: **4849005** PrepDate: **04-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Magnesium	0.02149	0.200								J
Selenium	U	0.00200								
Sodium	0.02209	0.200								J

MBLK Sample ID: **MBLK-135210** Units: **mg/L** Analysis Date: **05-Dec-2018 16:49**
Client ID: Run ID: **ICPMS05_328643** SeqNo: **4850556** PrepDate: **04-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	U	0.00200								
Potassium	0.03373	0.200								J

LCS Sample ID: **LCS-135210** Units: **mg/L** Analysis Date: **04-Dec-2018 23:29**
Client ID: Run ID: **ICPMS05_328542** SeqNo: **4849006** PrepDate: **04-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05247	0.00200	0.05	0	105	80 - 120				
Arsenic	0.05331	0.00200	0.05	0	107	80 - 120				
Cadmium	0.05171	0.00200	0.05	0	103	80 - 120				
Calcium	5.831	0.500	5	0	117	80 - 120				
Iron	5.589	0.200	5	0	112	80 - 120				
Magnesium	5.496	0.200	5	0	110	80 - 120				
Selenium	0.05361	0.00200	0.05	0	107	80 - 120				
Sodium	5.505	0.200	5	0	110	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120067

QC BATCH REPORT

Batch ID: 135210 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

LCS Sample ID: **LCS-135210** Units: **mg/L** Analysis Date: **05-Dec-2018 16:51**
Client ID: Run ID: **ICPMS05_328643** SeqNo: **4850557** PrepDate: **04-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.05548	0.00200	0.05	0	111	80 - 120				
Potassium	5.487	0.200	5	0	110	80 - 120				

MS Sample ID: **HS18120067-01MS** Units: **mg/L** Analysis Date: **04-Dec-2018 23:35**
Client ID: **French Drain** Run ID: **ICPMS05_328542** SeqNo: **4849009** PrepDate: **04-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.08485	0.00200	0.05	0.03462	100	75 - 125				
Arsenic	0.05409	0.00200	0.05	0.002088	104	75 - 125				
Cadmium	0.05221	0.00200	0.05	0.000159	104	75 - 125				
Calcium	216.9	0.500	5	220.9	-80.2	75 - 125				SEO
Iron	5.203	0.200	5	0.01746	104	75 - 125				
Magnesium	6.443	0.200	5	1.252	104	75 - 125				
Selenium	0.05871	0.00200	0.05	0.006847	104	75 - 125				
Sodium	274.4	0.200	5	263.4	220	75 - 125				SEO

MS Sample ID: **HS18120067-01MS** Units: **mg/L** Analysis Date: **05-Dec-2018 17:21**
Client ID: **French Drain** Run ID: **ICPMS05_328643** SeqNo: **4850572** PrepDate: **04-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.05382	0.00200	0.05	0.000614	106	75 - 125				
Potassium	18.67	0.200	5	13.78	97.7	75 - 125				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120067

QC BATCH REPORT

Batch ID: 135210 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MSD Sample ID: **HS18120067-01MSD** Units: **mg/L** Analysis Date: **04-Dec-2018 23:37**
Client ID: **French Drain** Run ID: **ICPMS05_328542** SeqNo: **4849010** PrepDate: **04-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.0823	0.00200	0.05	0.03462	95.4	75 - 125	0.08485	3.05	20	
Arsenic	0.05241	0.00200	0.05	0.002088	101	75 - 125	0.05409	3.17	20	
Cadmium	0.05088	0.00200	0.05	0.000159	101	75 - 125	0.05221	2.58	20	
Calcium	210.4	0.500	5	220.9	-209	75 - 125	216.9	3.01	20	SEO
Iron	5.076	0.200	5	0.01746	101	75 - 125	5.203	2.46	20	
Magnesium	6.112	0.200	5	1.252	97.2	75 - 125	6.443	5.27	20	
Selenium	0.05675	0.00200	0.05	0.006847	99.8	75 - 125	0.05871	3.39	20	
Sodium	256.3	0.200	5	263.4	-142	75 - 125	274.4	6.81	20	SEO

MSD Sample ID: **HS18120067-01MSD** Units: **mg/L** Analysis Date: **05-Dec-2018 17:23**
Client ID: **French Drain** Run ID: **ICPMS05_328643** SeqNo: **4850573** PrepDate: **04-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.05283	0.00200	0.05	0.000614	104	75 - 125	0.05382	1.85	20	
Potassium	18.04	0.200	5	13.78	85.0	75 - 125	18.67	3.46	20	

PDS Sample ID: **HS18120067-01PDS** Units: **mg/L** Analysis Date: **04-Dec-2018 23:39**
Client ID: **French Drain** Run ID: **ICPMS05_328542** SeqNo: **4849011** PrepDate: **04-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1239	0.00200	0.1	0.03462	89.3	75 - 125				
Arsenic	0.1048	0.00200	0.1	0.002088	103	75 - 125				
Cadmium	0.1049	0.00200	0.1	0.000159	105	75 - 125				
Iron	10.14	0.200	10	0.01746	101	75 - 125				
Magnesium	11.06	0.200	10	1.252	98.1	75 - 125				
Selenium	0.1089	0.00200	0.1	0.006847	102	75 - 125				

PDS Sample ID: **HS18120067-01PDS** Units: **mg/L** Analysis Date: **05-Dec-2018 16:57**
Client ID: **French Drain** Run ID: **ICPMS05_328643** SeqNo: **4850560** PrepDate: **04-Dec-2018** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	267.2	5.00	100	177.6	89.6	75 - 125				
Sodium	323.4	2.00	100	228.3	95.1	75 - 125				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120067

QC BATCH REPORT

Batch ID: 135210 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

PDS Sample ID: **HS18120067-01PDS** Units: **mg/L** Analysis Date: **05-Dec-2018 17:25**
Client ID: **French Drain** Run ID: **ICPMS05_328643** SeqNo: **4850574** PrepDate: **04-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.11	0.00200	0.1	0.000614	109	75 - 125				
Potassium	23.67	0.200	10	13.78	98.8	75 - 125				

SD Sample ID: **HS18120067-01SD** Units: **mg/L** Analysis Date: **04-Dec-2018 23:33**
Client ID: **French Drain** Run ID: **ICPMS05_328542** SeqNo: **4849008** PrepDate: **04-Dec-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Arsenic	U	0.0100					0.002088	0	10	
Cadmium	U	0.0100					0.000159	0	10	
Iron	U	1.00					0.01746	0	10	
Magnesium	1.144	1.00					1.252	8.66	10	
Selenium	U	0.0100					0.006847	0	10	

SD Sample ID: **HS18120067-01SD** Units: **mg/L** Analysis Date: **05-Dec-2018 16:55**
Client ID: **French Drain** Run ID: **ICPMS05_328643** SeqNo: **4850559** PrepDate: **04-Dec-2018** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	174.3	25.0					177.6	1.82	10	
Sodium	229.1	10.0					228.3	0.352	10	

SD Sample ID: **HS18120067-01SD** Units: **mg/L** Analysis Date: **05-Dec-2018 17:19**
Client ID: **French Drain** Run ID: **ICPMS05_328643** SeqNo: **4850571** PrepDate: **04-Dec-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Lead	U	0.0100					0.000614	0	10	
Potassium	14.25	1.00					13.78	3.37	10	

The following samples were analyzed in this batch: HS18120067-01 HS18120067-02 HS18120067-03 HS18120067-04 HS18120067-05 HS18120067-06

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120067

QC BATCH REPORT

Batch ID: R328992 **Instrument: ICS3K2** **Method: E300**

MBLK Sample ID: **WBLKW1-120418** Units: **mg/L** Analysis Date: **05-Dec-2018 11:17**
Client ID: Run ID: **ICS3K2_328992** SeqNo: **4858801** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	0.500								
Nitrogen, Nitrate (As N)	U	0.100								

LCS Sample ID: **WLCSW1-120418** Units: **mg/L** Analysis Date: **11-Dec-2018 13:41**
Client ID: Run ID: **ICS3K2_328992** SeqNo: **4858820** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.64	0.500	20	0	98.2	90 - 110				
Nitrogen, Nitrate (As N)	3.831	0.100	4	0	95.8	90 - 110				

LCSD Sample ID: **WLCSDW1-120418** Units: **mg/L** Analysis Date: **11-Dec-2018 14:03**
Client ID: Run ID: **ICS3K2_328992** SeqNo: **4858821** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.54	0.500	20	0	97.7	90 - 110	19.64	0.47	20	
Nitrogen, Nitrate (As N)	3.818	0.100	4	0	95.4	90 - 110	3.831	0.34	20	

MS Sample ID: **HS18120067-01MS** Units: **mg/L** Analysis Date: **05-Dec-2018 12:00**
Client ID: **French Drain** Run ID: **ICS3K2_328992** SeqNo: **4858803** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	37.45	0.500	10	28.22	92.3	80 - 120				
Nitrogen, Nitrate (As N)	3.401	0.100	2	1.472	96.4	80 - 120				

MSD Sample ID: **HS18120067-01MSD** Units: **mg/L** Analysis Date: **05-Dec-2018 12:22**
Client ID: **French Drain** Run ID: **ICS3K2_328992** SeqNo: **4858804** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	37.72	0.500	10	28.22	95.0	80 - 120	37.45	0.718	20	
Nitrogen, Nitrate (As N)	3.416	0.100	2	1.472	97.2	80 - 120	3.401	0.44	20	

The following samples were analyzed in this batch: HS18120067-01 HS18120067-02 HS18120067-03 HS18120067-04 HS18120067-05 HS18120067-06

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120067

QC BATCH REPORT

Batch ID: R329205 **Instrument: ICS2100** **Method: E300**

MBLK Sample ID: **WBLKW1-121218** Units: **mg/L** Analysis Date: **12-Dec-2018 22:05**
Client ID: Run ID: **ICS2100_329205** SeqNo: **4863771** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	0.500								
Sulfate	U	0.500								

LCS Sample ID: **WLCSW1-121218** Units: **mg/L** Analysis Date: **12-Dec-2018 22:19**
Client ID: Run ID: **ICS2100_329205** SeqNo: **4863772** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.92	0.500	20	0	99.6	90 - 110				
Sulfate	19.97	0.500	20	0	99.8	90 - 110				

LCSD Sample ID: **WLCSDW1-121218** Units: **mg/L** Analysis Date: **12-Dec-2018 22:34**
Client ID: Run ID: **ICS2100_329205** SeqNo: **4863773** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.51	0.500	20	0	97.6	90 - 110	19.92	2.07	20	
Sulfate	19.54	0.500	20	0	97.7	90 - 110	19.97	2.13	20	

MS Sample ID: **HS18120459-01MS** Units: **mg/L** Analysis Date: **13-Dec-2018 01:14**
Client ID: Run ID: **ICS2100_329205** SeqNo: **4863777** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	42.73	0.500	10	34.82	79.2	80 - 120				S
Sulfate	75.7	0.500	10	69.69	60.0	80 - 120				SO

MS Sample ID: **HS18120173-06MS** Units: **mg/L** Analysis Date: **13-Dec-2018 05:36**
Client ID: Run ID: **ICS2100_329205** SeqNo: **4863795** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	106.5	0.500	10	102.4	41.4	80 - 120				SEO
Sulfate	74.89	0.500	10	69.44	54.5	80 - 120				SO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120067

QC BATCH REPORT

Batch ID: R329205 **Instrument: ICS2100** **Method: E300**

MSD Sample ID: **HS18120459-01MSD** Units: **mg/L** Analysis Date: **13-Dec-2018 01:29**
Client ID: Run ID: **ICS2100_329205** SeqNo: **4863778** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	43.3	0.500	10	34.82	84.8	80 - 120	42.73	1.32	20	
Sulfate	76.33	0.500	10	69.69	66.4	80 - 120	75.7	0.83	20	SO

MSD Sample ID: **HS18120173-06MSD** Units: **mg/L** Analysis Date: **13-Dec-2018 05:50**
Client ID: Run ID: **ICS2100_329205** SeqNo: **4863796** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	108.1	0.500	10	102.4	57.1	80 - 120	106.5	1.46	20	SEO
Sulfate	76.11	0.500	10	69.44	66.7	80 - 120	74.89	1.62	20	SO

The following samples were analyzed in this batch: HS18120067-01 HS18120067-02 HS18120067-03 HS18120067-04 HS18120067-05 HS18120067-06

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS18120067**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
North Carolina	624-2018	31-Dec-2018
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	22-Dec-2018
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS18120067
Date/Time Received: **04-Dec-2018 09:30**
Received by: **NDD**

Checklist completed by: *Nilesh D. Ranchod* eSignature — 4-Dec-2018 Date
Reviewed by: *Dane J. Wacasey* eSignature — 4-Dec-2018 Date

Matrices: **water**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	0.6C / 1.0C UC/C	IR # 11	
Cooler(s)/Kit(s):	23746		
Date/Time sample(s) sent to storage:	12/04/2018 10:30am		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070

Chain of Custody For

COC ID: 191821

HS18120067

Golder Associates
Exide Column Studies

Customer Information		Project Information		ALS Project Manager:
Purchase Order	130-2086-01	Project Name	Exide Column Studies	
Work Order		Project Number	130-2086	
Company Name	Golder Associates	Bill To Company	Golder Associates	
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P	
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit	
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021	
Phone	(314) 984-8800	Phone	(314) 984-8800	
Fax		Fax		
e-Mail Address	ewhite@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com	

A	300_W (300 Cl, SO4, [*NO3* *48hr HT*])
B	TDS_W 2540C (2540C TDS)
C	ALK_W 2320B (2320B Alkalinity)
D	HARD (2340B Hardness (calc))
E	ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
F	ICP_TW (6020A Total Metals (6)+Cations)
G	
H	
I	
J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	French Drain	12/03/18	1355	Groundwa	2,8	3	X	X	X	X	X	X					
2	MW-46		1520				X	X	X	X	X	X					
3	DGW-MW-11		1750				X	X	X	X	X	X					
4	DGW-MW-11S		1750				X	X	X	X	X	X					
5	MW-30		1650				X	X	X	X	X	X					
6	DUP-01		—				X	X	X	X	X	X					
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Emily White Emily White

Shipment Method: FedEX

Required Turnaround Time: (Check Box) ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other

Results Due Date:

Relinquished by: Emily White Date: 12/03/18 Time: 1830

Relinquished by: Date: 12/4/18 Time: 0930

Received by:

Received by (Laboratory):

Logged by (Laboratory): Date: Time:

Checked by (Laboratory): NO

Notes: Exide Column Studies

Cooler ID	Cooler Temp.
23746	0.6

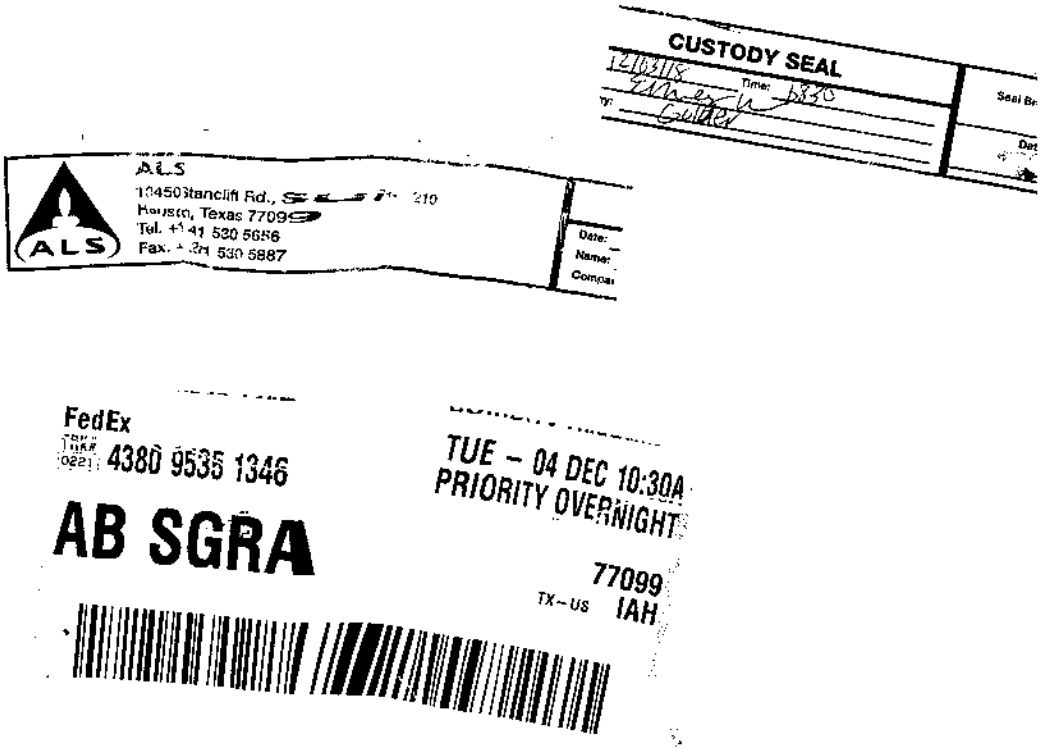
QC Package: (Check One Box Below)

- ☐ Level II Std QC
- ☐ Level III Std QC/Raw Data
- ☐ Level IV SWB46/CLP
- ☐ Other
- ☒ TRRP Checklist
- ☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

Copyright 2011 by ALS Environmental.


CUSTODY SEAL
Time:
ALS
10450 Stancliff Rd., Ste 210
Houston, Texas 77099
Tel. +1 41 530 5656
Fax. +1 281 530 5887
Date:
Name:
FedEx
4380 9535 1346
AB SGRA
TUE – 04 DEC 10:30A
PRIORITY OVERNIGHT
77099
TX–US IAH

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

December 19, 2018

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS18120545**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 4 sample(s) on Dec 11, 2018 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS18120545**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS18120545**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data								
Laboratory Name: ALS Laboratory Group			LRC Date: 12/19/2018					
Project Name: Exide Column Studies			Laboratory Job Number: HS18120545					
Reviewer Name: Corey Grandits			Prep Batch Number(s): R329000,R329027,R329200,R329490					
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]	
R1	OI	**Chain-of-custody (C-O-C)**						
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X					
		Were all departures from standard conditions described in an exception report?	X					
R2	OI	**Sample and quality control (QC) identification**						
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X					
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X					
R3	OI	**Test reports**						
		Were all samples prepared and analyzed within holding times?	X					
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X					
		Were calculations checked by a peer or supervisor?	X					
		Were all analyte identifications checked by a peer or supervisor?	X					
		Were sample detection limits reported for all analytes not detected?	X					
		Were all results for soil and sediment samples reported on a dry weight basis?			X			
		Were % moisture (or solids) reported for all soil and sediment samples?			X			
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X			
		If required for the project, TICs reported?			X			
R4	O	**Surrogate recovery data**						
		Were surrogates added prior to extraction?			X			
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X			
R5	OI	**Test reports/summary forms for blank samples**						
		Were appropriate type(s) of blanks analyzed?	X					
		Were blanks analyzed at the appropriate frequency?	X					
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X					
		Were blank concentrations < MQL?	X					
R6	OI	**Laboratory control samples (LCS):**						
		Were all COCs included in the LCS?	X					
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X					
		Were LCSs analyzed at the required frequency?	X					
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X					
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X					
		Was the LCSD RPD within QC limits?	X					
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**						
		Were the project/method specified analytes included in the MS and MSD?	X					
		Were MS/MSD analyzed at the appropriate frequency?	X					
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1	
		Were MS/MSD RPDs within laboratory QC limits?	X					
R8	OI	**Analytical duplicate data**						
		Were appropriate analytical duplicates analyzed for each matrix?	X					
		Were analytical duplicates analyzed at the appropriate frequency?	X					
		Were RPDs or relative standard deviations within the laboratory QC limits?	X					
R9	OI	**Method quantitation limits (MQLs):**						
		Are the MQLs for each method analyte included in the laboratory data package?	X					
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X					
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X					
R10	OI	**Other problems/anomalies**						
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X					
		Were all necessary corrective actions performed for the reported data?	X					
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X					
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X					

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 12/19/2018				
Project Name: Exide Column Studies			Laboratory Job Number: HS18120545				
Reviewer Name: Corey Grandits			Prep Batch Number(s): R329000,R329027,R329200,R329490				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			2
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?			X		
		Were ion abundance data within the method-required QC limits?			X		
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?			X		
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?			X		
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Data		
Laboratory Name: ALS Laboratory Group		LRC Date: 12/19/2018
Project Name: Exide Column Studies		Laboratory Job Number: HS18120545
Reviewer Name: Corey Grandits		Prep Batch Number(s): R329000,R329027,R329200,R329490
ER#[5]	**Description**	
1	Batch R329000, Anions Method E300, sample 2018-12-10-DGW-MW3-PV5out-40, MS and MSD recovered outside the control limit for Sulfate, however, the result in the parent sample is greater than 4x the spike amount.	
2	See Run Log and CCB Exceptions Report.	

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120545
Start Date: 11-Dec-2018 End Date: 12-Dec-2018

Run ID:ICS2100_329000
Instrument:ICS2100
Method:E300

Sample No.	D/F	Time	FileID	Analytes
CCB 1	1	11-Dec-2018 09:18		CL NO3N SO4
2018-12-10-DGW-MW3-PV5out-30	1	11-Dec-2018 10:45		CL NO3N
2018-12-10-DGW-MW3-PV5out-35	1	11-Dec-2018 11:00		CL NO3N
2018-12-10-DGW-MW3-PV5out-40	1	11-Dec-2018 11:14		CL NO3N
2018-12-10-DGW-MW3-PV5out-Control	1	11-Dec-2018 11:29		CL NO3N
2018-12-10-DGW-MW3-PV5out-Control	5	11-Dec-2018 11:44		SO4
CCV 1	1	11-Dec-2018 11:58		CL NO3N SO4
CCB 2	1	11-Dec-2018 12:13		CL NO3N SO4
WBLKW1-121118	1	11-Dec-2018 12:27		CL NO3N SO4
WLCSW1-121118	1	11-Dec-2018 12:42		CL NO3N SO4
WLCSDW1-121118	1	11-Dec-2018 12:56		CL NO3N SO4
2018-12-10-DGW-MW3-PV5out-40MS	1	11-Dec-2018 13:37		CL NO3N SO4
2018-12-10-DGW-MW3-PV5out-40MSD	1	11-Dec-2018 13:52		CL NO3N SO4
2018-12-10-DGW-MW3-PV5out-40	5	11-Dec-2018 14:07		SO4
CCB 3	1	11-Dec-2018 15:34		CL NO3N SO4
2018-12-10-DGW-MW3-PV5out-30	5	11-Dec-2018 16:47		SO4
ZZZZZZMS	1	11-Dec-2018 17:16		CL NO3N SO4
ZZZZZZMSD	1	11-Dec-2018 17:30		CL NO3N SO4
CCV 2	1	11-Dec-2018 18:14		CL NO3N SO4
CCB 4	1	11-Dec-2018 18:28		CL NO3N SO4
CCB 5	1	11-Dec-2018 21:23		CL NO3N SO4
2018-12-10-DGW-MW3-PV5out-35	5	11-Dec-2018 21:37		SO4
CCV 3	1	12-Dec-2018 00:03		CL NO3N SO4
CCB 6	1	12-Dec-2018 00:17		CL NO3N SO4
CCV 4	1	12-Dec-2018 04:39		CL NO3N SO4
CCB 7	1	12-Dec-2018 04:54		CL NO3N SO4
CCB 8	1	12-Dec-2018 07:19		CL NO3N SO4

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120545

Run ID:ICS2100_329000
Instrument:ICS2100
Method:E300

CCB 1	Date: 11-Dec-2018 09:18	Seq: 4858990	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Nitrogen, Nitrate (As N)	65	30	100	

CCB 8	Date: 12-Dec-2018 07:19	Seq: 4862870	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	227	200	500	
Nitrogen, Nitrate (As N)	66	30	100	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS18120545

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18120545-01	2018-12-10-DGW-MW3-PV5out-Control	Groundwater		10-Dec-2018 13:00	11-Dec-2018 09:00	☐
HS18120545-02	2018-12-10-DGW-MW3-PV5out-30	Groundwater		10-Dec-2018 13:00	11-Dec-2018 09:00	☐
HS18120545-03	2018-12-10-DGW-MW3-PV5out-35	Groundwater		10-Dec-2018 13:00	11-Dec-2018 09:00	☐
HS18120545-04	2018-12-10-DGW-MW3-PV5out-40	Groundwater		10-Dec-2018 13:00	11-Dec-2018 09:00	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 2018-12-10-DGW-MW3-PV5out-Control
Collection Date: 10-Dec-2018 13:00

ANALYTICAL REPORT
WorkOrder:HS18120545
Lab ID:HS18120545-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**46.9**		**0.200**	**0.500**	**mg/L**	1	11-Dec-2018 11:29
Nitrogen, Nitrate (As N)	U		0.0300	0.100	mg/L	1	11-Dec-2018 11:29
Sulfate	**217**		**1.00**	**2.50**	**mg/L**	5	11-Dec-2018 11:44
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	**898**		**5.00**	**10.0**	**mg/L**	1	17-Dec-2018 17:20
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**488**		**5.00**	**5.00**	**mg/L**	1	11-Dec-2018 23:01
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	11-Dec-2018 23:01
Alkalinity, Total (As CaCO3)	**488**		**5.00**	**5.00**	**mg/L**	1	11-Dec-2018 23:01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 2018-12-10-DGW-MW3-PV5out-30
Collection Date: 10-Dec-2018 13:00

ANALYTICAL REPORT
WorkOrder:HS18120545
Lab ID:HS18120545-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**46.7**		**0.200**	**0.500**	**mg/L**	1	11-Dec-2018 10:45
Nitrogen, Nitrate (As N)	U		0.0300	0.100	mg/L	1	11-Dec-2018 10:45
Sulfate	**224**		**1.00**	**2.50**	**mg/L**	5	11-Dec-2018 16:47
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	**630**		**5.00**	**10.0**	**mg/L**	1	17-Dec-2018 17:20
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**192**		**5.00**	**5.00**	**mg/L**	1	11-Dec-2018 23:07
Alkalinity, Carbonate (As CaCO3)	**24.8**		**5.00**	**5.00**	**mg/L**	1	11-Dec-2018 23:07
Alkalinity, Total (As CaCO3)	**216**		**5.00**	**5.00**	**mg/L**	1	11-Dec-2018 23:07

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 2018-12-10-DGW-MW3-PV5out-35
Collection Date: 10-Dec-2018 13:00

ANALYTICAL REPORT
WorkOrder:HS18120545
Lab ID:HS18120545-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**46.0**		**0.200**	**0.500**	**mg/L**	1	11-Dec-2018 11:00
Nitrogen, Nitrate (As N)	U		0.0300	0.100	mg/L	1	11-Dec-2018 11:00
Sulfate	**230**		**1.00**	**2.50**	**mg/L**	5	11-Dec-2018 21:37
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	**600**		**5.00**	**10.0**	**mg/L**	1	17-Dec-2018 17:20
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**174**		**5.00**	**5.00**	**mg/L**	1	13-Dec-2018 14:18
Alkalinity, Carbonate (As CaCO3)	**27.6**		**5.00**	**5.00**	**mg/L**	1	13-Dec-2018 14:18
Alkalinity, Total (As CaCO3)	**201**		**5.00**	**5.00**	**mg/L**	1	13-Dec-2018 14:18

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 2018-12-10-DGW-MW3-PV5out-40
Collection Date: 10-Dec-2018 13:00

ANALYTICAL REPORT
WorkOrder:HS18120545
Lab ID:HS18120545-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**48.1**		**0.200**	**0.500**	**mg/L**	1	11-Dec-2018 11:14
Nitrogen, Nitrate (As N)	U		0.0300	0.100	mg/L	1	11-Dec-2018 11:14
Sulfate	**223**		**1.00**	**2.50**	**mg/L**	5	11-Dec-2018 14:07
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	**586**		**5.00**	**10.0**	**mg/L**	1	17-Dec-2018 17:20
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**160**		**5.00**	**5.00**	**mg/L**	1	13-Dec-2018 14:24
Alkalinity, Carbonate (As CaCO3)	**21.6**		**5.00**	**5.00**	**mg/L**	1	13-Dec-2018 14:24
Alkalinity, Total (As CaCO3)	**181**		**5.00**	**5.00**	**mg/L**	1	13-Dec-2018 14:24

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120545

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R329000	**Test Name :** ANIONS BY E300.0			**Matrix:** Groundwater		
HS18120545-01	2018-12-10-DGW-MW3-PV5out-Control	10 Dec 2018 13:00			11 Dec 2018 11:44	5
HS18120545-01	2018-12-10-DGW-MW3-PV5out-Control	10 Dec 2018 13:00			11 Dec 2018 11:29	1
HS18120545-02	2018-12-10-DGW-MW3-PV5out-30	10 Dec 2018 13:00			11 Dec 2018 16:47	5
HS18120545-02	2018-12-10-DGW-MW3-PV5out-30	10 Dec 2018 13:00			11 Dec 2018 10:45	1
HS18120545-03	2018-12-10-DGW-MW3-PV5out-35	10 Dec 2018 13:00			11 Dec 2018 21:37	5
HS18120545-03	2018-12-10-DGW-MW3-PV5out-35	10 Dec 2018 13:00			11 Dec 2018 11:00	1
HS18120545-04	2018-12-10-DGW-MW3-PV5out-40	10 Dec 2018 13:00			11 Dec 2018 14:07	5
HS18120545-04	2018-12-10-DGW-MW3-PV5out-40	10 Dec 2018 13:00			11 Dec 2018 11:14	1
Batch ID R329027	**Test Name :** ALKALINITY BY SM2320B			**Matrix:** Groundwater		
HS18120545-01	2018-12-10-DGW-MW3-PV5out-Control	10 Dec 2018 13:00			11 Dec 2018 23:01	1
HS18120545-02	2018-12-10-DGW-MW3-PV5out-30	10 Dec 2018 13:00			11 Dec 2018 23:07	1
Batch ID R329200	**Test Name :** ALKALINITY BY SM2320B			**Matrix:** Groundwater		
HS18120545-03	2018-12-10-DGW-MW3-PV5out-35	10 Dec 2018 13:00			13 Dec 2018 14:18	1
HS18120545-04	2018-12-10-DGW-MW3-PV5out-40	10 Dec 2018 13:00			13 Dec 2018 14:24	1
Batch ID R329490	**Test Name :** TOTAL DISSOLVED SOLIDS BY SM2540C			**Matrix:** Groundwater		
HS18120545-01	2018-12-10-DGW-MW3-PV5out-Control	10 Dec 2018 13:00			17 Dec 2018 17:20	1
HS18120545-02	2018-12-10-DGW-MW3-PV5out-30	10 Dec 2018 13:00			17 Dec 2018 17:20	1
HS18120545-03	2018-12-10-DGW-MW3-PV5out-35	10 Dec 2018 13:00			17 Dec 2018 17:20	1
HS18120545-04	2018-12-10-DGW-MW3-PV5out-40	10 Dec 2018 13:00			17 Dec 2018 17:20	1

WorkOrder: HS18120545
InstrumentID: ICS2100
Test Code: 300_W
Test Number: E300
Test Name: Anions by E300.0

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Chloride	16887-00-6	0.500	0.576	0.200	0.500
A	Nitrogen, Nitrate (As N)	14797-55-8	0.100	0.129	0.0300	0.100
A	Sulfate	14808-79-8	0.500	0.616	0.200	0.500

WorkOrder: HS18120545
InstrumentID: ManTech01
Test Code: ALK_W 2320B
Test Number: SM2320B
Test Name: Alkalinity by SM2320B

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Alkalinity, Bicarbonate (As CaCO3)	ALK-Bicarb	5.00	3.49	5.00	5.00
A	Alkalinity, Carbonate (As CaCO3)	ALK-Carb	5.00	3.49	5.00	5.00
A	Alkalinity, Total (As CaCO3)	ALK	5.00	3.49	5.00	5.00

WorkOrder: HS18120545
InstrumentID: Balance1
Test Code: TDS_W 2540C
Test Number: M2540C
Test Name: Total Dissolved Solids by

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Total Dissolved Solids (Residue, Filterable)	TDS	5.00	6.00	5.00	10.0

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120545

QC BATCH REPORT

Batch ID: R329000 **Instrument: ICS2100** **Method: E300**

MBLK Sample ID: **WBLKW1-121118** Units: **mg/L** Analysis Date: **11-Dec-2018 12:27**
Client ID: Run ID: **ICS2100_329000** SeqNo: **4858998** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	0.500								
Nitrogen, Nitrate (As N)	U	0.100								
Sulfate	U	0.500								

LCS Sample ID: **WLCSW1-121118** Units: **mg/L** Analysis Date: **11-Dec-2018 12:42**
Client ID: Run ID: **ICS2100_329000** SeqNo: **4858999** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.46	0.500	20	0	102	90 - 110				
Nitrogen, Nitrate (As N)	3.958	0.100	4	0	99.0	90 - 110				
Sulfate	20.21	0.500	20	0	101	90 - 110				

LCSD Sample ID: **WLCSDW1-121118** Units: **mg/L** Analysis Date: **11-Dec-2018 12:56**
Client ID: Run ID: **ICS2100_329000** SeqNo: **4859000** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.86	0.500	20	0	99.3	90 - 110	20.46	3	20	
Nitrogen, Nitrate (As N)	3.852	0.100	4	0	96.3	90 - 110	3.958	2.71	20	
Sulfate	19.6	0.500	20	0	98.0	90 - 110	20.21	3.05	20	

MS Sample ID: **HS18120545-04MS** Units: **mg/L** Analysis Date: **11-Dec-2018 13:37**
Client ID: **2018-12-10-DGW-MW3-PV5out-40** Run ID: **ICS2100_329000** SeqNo: **4859001** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	57.89	0.500	10	48.13	97.7	80 - 120				O
Nitrogen, Nitrate (As N)	2.143	0.100	2	0	107	80 - 120				
Sulfate	233.4	0.500	10	228	54.5	80 - 120				SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120545

QC BATCH REPORT

Batch ID: R329000 **Instrument: ICS2100** **Method: E300**

MS Sample ID: **HS18120487-01MS** Units: **mg/L** Analysis Date: **11-Dec-2018 17:16**
Client ID: Run ID: **ICS2100_329000** SeqNo: **4862843** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	30.95	0.500	10	21.76	91.9	80 - 120				
Nitrogen, Nitrate (As N)	1.967	0.100	2	0.15	90.8	80 - 120				
Sulfate	51.45	0.500	10	43.21	82.4	80 - 120				O

MSD Sample ID: **HS18120545-04MSD** Units: **mg/L** Analysis Date: **11-Dec-2018 13:52**
Client ID: **2018-12-10-DGW-MW3-PV5out-40** Run ID: **ICS2100_329000** SeqNo: **4859002** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	56.2	0.500	10	48.13	80.7	80 - 120	57.89	2.98	20	O
Nitrogen, Nitrate (As N)	2.065	0.100	2	0	103	80 - 120	2.143	3.71	20	
Sulfate	227.1	0.500	10	228	-8.64	80 - 120	233.4	2.74	20	SEO

MSD Sample ID: **HS18120487-01MSD** Units: **mg/L** Analysis Date: **11-Dec-2018 17:30**
Client ID: Run ID: **ICS2100_329000** SeqNo: **4862844** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	31.01	0.500	10	21.76	92.6	80 - 120	30.95	0.207	20	
Nitrogen, Nitrate (As N)	1.975	0.100	2	0.15	91.2	80 - 120	1.967	0.406	20	
Sulfate	51.31	0.500	10	43.21	81.0	80 - 120	51.45	0.282	20	O

The following samples were analyzed in this batch: HS18120545-01 HS18120545-02 HS18120545-03 HS18120545-04

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120545

QC BATCH REPORT

Batch ID: R329027 **Instrument: ManTech01** **Method: SM2320B**

MBLK Sample ID: **WBLKW1-181211** Units: **mg/L** Analysis Date: **11-Dec-2018 19:56**
Client ID: Run ID: **ManTech01_329027** SeqNo: **4859850** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	U	5.00								
Alkalinity, Carbonate (As CaCO3)	U	5.00								
Alkalinity, Total (As CaCO3)	U	5.00								

LCS Sample ID: **LCS1-181211** Units: **mg/L** Analysis Date: **11-Dec-2018 20:04**
Client ID: Run ID: **ManTech01_329027** SeqNo: **4859851** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1035	5.00	1000	0	103	85 - 115				
Alkalinity, Total (As CaCO3)	1070	5.00	1000	0	107	85 - 115				

LCSD Sample ID: **LCSD1-181211** Units: **mg/L** Analysis Date: **11-Dec-2018 20:13**
Client ID: Run ID: **ManTech01_329027** SeqNo: **4859852** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1039	5.00	1000	0	104	85 - 115	1035	0.421	20	
Alkalinity, Total (As CaCO3)	1072	5.00	1000	0	107	85 - 115	1070	0.156	20	

DUP Sample ID: **HS18111440-01DUP** Units: **mg/L** Analysis Date: **11-Dec-2018 20:25**
Client ID: Run ID: **ManTech01_329027** SeqNo: **4859854** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	114.7	5.00					118.2	3.01	20	
Alkalinity, Carbonate (As CaCO3)	U	5.00					0	0	20	
Alkalinity, Total (As CaCO3)	114.7	5.00					118.2	3.01	20	

The following samples were analyzed in this batch: HS18120545-01 HS18120545-02

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120545

QC BATCH REPORT

Batch ID: R329200 **Instrument: ManTech01** **Method: SM2320B**

MBLK Sample ID: **WBLKW1-181213** Units: **mg/L** Analysis Date: **13-Dec-2018 13:33**
Client ID: Run ID: **ManTech01_329200** SeqNo: **4863544** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	U	5.00								
Alkalinity, Carbonate (As CaCO3)	U	5.00								
Alkalinity, Total (As CaCO3)	U	5.00								

LCS Sample ID: **WLCS1-181213** Units: **mg/L** Analysis Date: **13-Dec-2018 13:42**
Client ID: Run ID: **ManTech01_329200** SeqNo: **4863545** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1029	5.00	1000	0	103	85 - 115				
Alkalinity, Total (As CaCO3)	1059	5.00	1000	0	106	85 - 115				

LCSD Sample ID: **WLCSD1-181213** Units: **mg/L** Analysis Date: **13-Dec-2018 13:51**
Client ID: Run ID: **ManTech01_329200** SeqNo: **4863546** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1029	5.00	1000	0	103	85 - 115	1029	0.00292	20	
Alkalinity, Total (As CaCO3)	1054	5.00	1000	0	105	85 - 115	1059	0.489	20	

DUP Sample ID: **HS18120696-04DUP** Units: **mg/L** Analysis Date: **13-Dec-2018 14:04**
Client ID: Run ID: **ManTech01_329200** SeqNo: **4863548** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	113.9	5.00					112.7	1.07	20	
Alkalinity, Carbonate (As CaCO3)	U	5.00					0	0	20	
Alkalinity, Total (As CaCO3)	113.9	5.00					112.7	1.07	20	

The following samples were analyzed in this batch: HS18120545-03 HS18120545-04

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120545

QC BATCH REPORT

Batch ID: R329490 **Instrument: Balance1** **Method: M2540C**

MBLK Sample ID: **WBLK-121718** Units: **mg/L** Analysis Date: **17-Dec-2018 17:20**
Client ID: Run ID: **Balance1_329490** SeqNo: **4871165** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	U	10.0								

LCS Sample ID: **WLCS-121718** Units: **mg/L** Analysis Date: **17-Dec-2018 17:20**
Client ID: Run ID: **Balance1_329490** SeqNo: **4871166** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	1048	10.0	1000	0	105	85 - 115				

DUP Sample ID: **HS18120612-02DUP** Units: **mg/L** Analysis Date: **17-Dec-2018 17:20**
Client ID: Run ID: **Balance1_329490** SeqNo: **4871160** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	2072	10.0					2100	1.34	5	

DUP Sample ID: **HS18120545-01DUP** Units: **mg/L** Analysis Date: **17-Dec-2018 17:20**
Client ID: **2018-12-10-DGW-MW3-PV5out-Control** Run ID: **Balance1_329490** SeqNo: **4871153** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	896	10.0					898	0.223	5	

The following samples were analyzed in this batch: HS18120545-01 HS18120545-02 HS18120545-03 HS18120545-04

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS18120545**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
North Carolina	624-2018	31-Dec-2018
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	22-Dec-2018
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS18120545
Date/Time Received: **11-Dec-2018 09:00**
Received by: **JRM**

Checklist completed by: *Paresh M. Giga* eSignature 11-Dec-2018 Date
Reviewed by: *Dane J. Wacasey* eSignature 11-Dec-2018 Date

Matrices: **Groundwater**
Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	1.6c/1.9c U/c	IR25	
Cooler(s)/Kit(s):	43335		
Date/Time sample(s) sent to storage:	12/11/18 10:10		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070

Chain of Custody For

Page ____ of ____

COC ID: 192208

HS18120545

Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information	
Purchase Order	130-2086-01	Project Name	Exide Column Studies
Work Order		Project Number	130-2086
Company Name	Golder Associates	Bill To Company	Golder Associates
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021
Phone	(314) 984-8800	Phone	(314) 984-8800
Fax		Fax	
e-Mail Address	ewhite@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com

A 300_W (300 Cl, SO4, [NO3 + NO2]-N, TKN)
B TDS_W 2540C (2540C TDS)
C ALK_W 2320B (2320B Alkalinity)
D HARD (2340B Hardness (calc))
E ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
F ICP_TW (6020A Total Metals (6)+Cations)
G
H
I
J

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1		2018/12/10		Groundwa	2,8	3	X	X	X	X	X	X					
2	2018-12-10-D6W-MW3-PVSout-Control		13h00	GW		1	X	X	X	X							
3	2018-12-10-D6W-MW3-PVSout-30	2018/12/10	13h00	GW		1	X	X	X	X							
4	2018-12-10-D6W-MW3-PVSout-35	2018/12/10	13h00	GW		1	X	X	X	X							
5	2018-12-10-D6W-MW3-PVSout-40	2018/12/10	13h00	GW		1	X	X	X	X							
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Jovanne Chavarria

Shipment Method:

Required Turnaround Time: (Check Box) ☐ Other ____ ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour

Results Due Date:

Relinquished by: Bethia Exide / Jovanne Chavarria — Date: 12-18-12-10 — Time: 3:00pm

Relinquished by: — Date: 12/11/18 — Time: 09:20

Received by:

Received by (Laboratory): J. Mawm

Checked by (Laboratory):

Logged by (Laboratory): — Date: 12/11/18 — Time:

Notes: Exide Column Studies

Cooler ID	Cooler Temp.
	cc
43335	1-6
	1N25
	1N0.3

QC Package: (Check One Box Below)
☐ Level II Std QC
☐ Level III Std QC/Raw Data
☐ Level IV SW846/CLP
☒ [illegible]
☐ [illegible]

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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AUDREY ETHEVES
GOLDER ASSOCIATES LTD
7250 RUE DU MILE END
3E ETAGE
MONTREAL, PQ H2R3A4
CANADA CA

SHIP DATE: 10DEC18
ACTWGT: 40.00 LB
CAD: 108680724/INET4042

BILL SENDER

TO **DANE WACASEY**
ALS HOUSTON LABORATORY
10450 STANCLIFF RD
STE 210
HOUSTON TX 77099 **(US)**
(281) 530-5656 REF:
INV:
PO: DEPT:

552J2/E4AF/DCA5

FedEx Express

E

J113118031502uv

TRK# 0430 **7739 2735 0568** 10:30A INTL PRIORITY

NH SGRA 77099 TX-US IAH

FedEx
TRK# 0430 7739 2735 0568 0A INTL PRIORITY CLR

NH SGRA CLR 77099 TX-US IAH

5208580 IND 12/11 547G1/F1FE/53C3

DEC 11 2018

43335

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ORIGIN ID:YUXA (514) 383-0990
Audrey Elheves
Golder Associates Ltd
7250 rue du Mile End
3e etage
MONTREAL, PQ H2R3A4
CANADA, CA

Ship Date: 10DEC18
ActWgt: 40.00 LB
CAD: 108660724/INET4042

BILL SENDER
EIN/VAT:

TO Danie Wacasey (281) 530-5656
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

FedEx Express

(US)

AWB

J1521168815200x

NH SGRA

PKG:YOUR PKG

TRK# 7739 2735 0568

Form
0430

10:30A
INTL PRIORITY

REF:
DESC1:...chantillons d'eau
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: Audrey Elheves
T/C: S 167982832
D/T: R

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10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

December 24, 2018

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS18120828**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 2 sample(s) on Dec 14, 2018 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DAYNA.FISHER
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS18120828**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS18120828**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 12/24/2018				
Project Name: Exide Column Studies			Laboratory Job Number: HS18120828				
Reviewer Name: Corey Grandits			Prep Batch Number(s): R329363, R329581, R329664, R329753				
#[1]	A[2]	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	X				
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?	X				
		Were analytical duplicates analyzed at the appropriate frequency?	X				
		Were RPDs or relative standard deviations within the laboratory QC limits?	X				
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 12/24/2018				
Project Name: Exide Column Studies			Laboratory Job Number: HS18120828				
Reviewer Name: Corey Grandits			Prep Batch Number(s): R329363, R329581, R329664, R329753				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			1
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?			X		
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports	
Laboratory Name: ALS Laboratory Group	LRC Date: 12/24/2018
Project Name: Exide Column Studies	Laboratory Job Number: HS18120828
Reviewer Name: Corey Grandits	Prep Batch Number(s): R329363, R329581, R329664, R329753

ER#[5]	Description
1	See Run Log and CCB Exceptions Report.

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120828
Start Date: 14-Dec-2018 End Date: 17-Dec-2018

Run ID:ICS2100_329363
Instrument:ICS2100
Method:E300

Sample No.	D/F	Time	FileID	Analytes
CCV 1	1	14-Dec-2018 06:59		CL NO3N SO4
CCB 1	1	14-Dec-2018 07:13		CL NO3N SO4
WBLKW1-121418	1	14-Dec-2018 07:28		CL NO3N SO4
WLCSW1-121418	1	14-Dec-2018 07:42		CL NO3N SO4
WLCSDW1-121418	1	14-Dec-2018 07:57		CL NO3N SO4
ZZZZZZMS	10	14-Dec-2018 08:40		CL NO3N SO4
ZZZZZZMSD	10	14-Dec-2018 08:55		CL NO3N SO4
CCB 2	1	14-Dec-2018 10:08		CL NO3N SO4
CCV 2	1	14-Dec-2018 14:32		CL NO3N SO4
CCB 3	1	14-Dec-2018 14:46		CL NO3N SO4
20181213-FD-T0-Control	1	14-Dec-2018 15:01		CL NO3N
20181213-FD-T0-Control	20	14-Dec-2018 15:15		SO4
20181213-FD-T0-30-35-40	1	14-Dec-2018 15:30		CL NO3N
20181213-FD-T0-30-35-40	20	14-Dec-2018 15:45		SO4
CCB 4	1	14-Dec-2018 16:43		CL NO3N SO4
CCV 3	1	14-Dec-2018 19:32		CL NO3N SO4
CCB 5	1	14-Dec-2018 19:47		CL NO3N SO4
CCV 4	1	17-Dec-2018 12:38		CL NO3N SO4
CCB 6	1	17-Dec-2018 12:52		CL NO3N SO4
ZZZZZZMS	1	17-Dec-2018 13:59		CL NO3N SO4
ZZZZZZMSD	1	17-Dec-2018 14:13		CL NO3N SO4

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120828

Run ID:ICS2100_329363
Instrument:ICS2100
Method:E300

CCB 1	Date: 14-Dec-2018 07:13	Seq: 4867909	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	250	200	500	
Sulfate	305	200	500	

CCB 2	Date: 14-Dec-2018 10:08	Seq: 4867921	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	267	200	500	
Nitrogen, Nitrate (As N)	66	30	100	
Sulfate	328	200	500	

CCB 3	Date: 14-Dec-2018 14:46	Seq: 4867933	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	254	200	500	
Sulfate	320	200	500	

CCB 4	Date: 14-Dec-2018 16:43	Seq: 4867941	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	307	200	500	
Nitrogen, Nitrate (As N)	70	30	100	
Sulfate	392	200	500	

CCB 5	Date: 14-Dec-2018 19:47	Seq: 4867944	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	289	200	500	
Sulfate	389	200	500	

CCB 6	Date: 17-Dec-2018 12:52	Seq: 4868337	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	280	200	500	
Sulfate	330	200	500	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS18120828

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18120828-01	20181213-FD-T0-Control	Groundwater		13-Dec-2018 13:00	14-Dec-2018 10:00	☐
HS18120828-02	20181213-FD-T0-30-35-40	Groundwater		13-Dec-2018 13:30	14-Dec-2018 10:00	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181213-FD-T0-Control
Collection Date: 13-Dec-2018 13:00

ANALYTICAL REPORT
WorkOrder:HS18120828
Lab ID:HS18120828-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**26.8**		**0.200**	**0.500**	**mg/L**	1	14-Dec-2018 15:01
Nitrogen, Nitrate (As N)	**2.00**		**0.0300**	**0.100**	**mg/L**	1	14-Dec-2018 15:01
Sulfate	**991**		**4.00**	**10.0**	**mg/L**	20	14-Dec-2018 15:15
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	**1,460**		**5.00**	**10.0**	**mg/L**	1	20-Dec-2018 17:20
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	U		5.00	5.00	mg/L	1	19-Dec-2018 03:15
Alkalinity, Carbonate (As CaCO3)	**22.2**		**5.00**	**5.00**	**mg/L**	1	19-Dec-2018 03:15
Alkalinity, Total (As CaCO3)	**26.9**		**5.00**	**5.00**	**mg/L**	1	19-Dec-2018 03:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181213-FD-T0-30-35-40
Collection Date: 13-Dec-2018 13:30

ANALYTICAL REPORT
WorkOrder:HS18120828
Lab ID:HS18120828-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**27.2**		**0.200**	**0.500**	**mg/L**	1	14-Dec-2018 15:30
Nitrogen, Nitrate (As N)	**2.08**		**0.0300**	**0.100**	**mg/L**	1	14-Dec-2018 15:30
Sulfate	**929**		**4.00**	**10.0**	**mg/L**	20	14-Dec-2018 15:45
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	**1,470**		**5.00**	**10.0**	**mg/L**	1	20-Dec-2018 17:20
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	U		5.00	5.00	mg/L	1	20-Dec-2018 16:01
Alkalinity, Carbonate (As CaCO3)	**22.6**		**5.00**	**5.00**	**mg/L**	1	20-Dec-2018 16:01
Alkalinity, Total (As CaCO3)	**27.5**		**5.00**	**5.00**	**mg/L**	1	20-Dec-2018 16:01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120828

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R329363	**Test Name :** ANIONS BY E300.0				**Matrix:** Groundwater	
HS18120828-01	20181213-FD-T0-Control	13 Dec 2018 13:00			14 Dec 2018 15:15	20
HS18120828-01	20181213-FD-T0-Control	13 Dec 2018 13:00			14 Dec 2018 15:01	1
HS18120828-02	20181213-FD-T0-30-35-40	13 Dec 2018 13:30			14 Dec 2018 15:45	20
HS18120828-02	20181213-FD-T0-30-35-40	13 Dec 2018 13:30			14 Dec 2018 15:30	1
Batch ID R329581	**Test Name :** ALKALINITY BY SM2320B				**Matrix:** Groundwater	
HS18120828-01	20181213-FD-T0-Control	13 Dec 2018 13:00			19 Dec 2018 03:15	1
Batch ID R329664	**Test Name :** ALKALINITY BY SM2320B				**Matrix:** Groundwater	
HS18120828-02	20181213-FD-T0-30-35-40	13 Dec 2018 13:30			20 Dec 2018 16:01	1
Batch ID R329753	**Test Name :** TOTAL DISSOLVED SOLIDS BY SM2540C				**Matrix:** Groundwater	
HS18120828-01	20181213-FD-T0-Control	13 Dec 2018 13:00			20 Dec 2018 17:20	1
HS18120828-02	20181213-FD-T0-30-35-40	13 Dec 2018 13:30			20 Dec 2018 17:20	1

WorkOrder: HS18120828
InstrumentID: ICS2100
Test Code: 300_W
Test Number: E300
Test Name: Anions by E300.0

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Chloride	16887-00-6	0.500	0.576	0.200	0.500
A	Nitrogen, Nitrate (As N)	14797-55-8	0.100	0.129	0.0300	0.100
A	Sulfate	14808-79-8	0.500	0.616	0.200	0.500

WorkOrder: HS18120828
InstrumentID: ManTech01
Test Code: ALK_W 2320B
Test Number: SM2320B
Test Name: Alkalinity by SM2320B

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Alkalinity, Bicarbonate (As CaCO3)	ALK-Bicarb	5.00	3.49	5.00	5.00
A	Alkalinity, Carbonate (As CaCO3)	ALK-Carb	5.00	3.49	5.00	5.00
A	Alkalinity, Total (As CaCO3)	ALK	5.00	3.49	5.00	5.00

WorkOrder: HS18120828
InstrumentID: Balance1
Test Code: TDS_W 2540C
Test Number: M2540C
Test Name: Total Dissolved Solids by

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Total Dissolved Solids (Residue, Filterable)	TDS	5.00	6.00	5.00	10.0

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120828

QC BATCH REPORT

Batch ID: R329363 **Instrument: ICS2100** **Method: E300**

MBLK Sample ID: **WBLKW1-121418** Units: **mg/L** Analysis Date: **14-Dec-2018 07:28**
Client ID: Run ID: **ICS2100_329363** SeqNo: **4867910** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	0.500								
Nitrogen, Nitrate (As N)	U	0.100								
Sulfate	U	0.500								

LCS Sample ID: **WLCSW1-121418** Units: **mg/L** Analysis Date: **14-Dec-2018 07:42**
Client ID: Run ID: **ICS2100_329363** SeqNo: **4867911** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.86	0.500	20	0	99.3	90 - 110				
Nitrogen, Nitrate (As N)	3.831	0.100	4	0	95.8	90 - 110				
Sulfate	19.86	0.500	20	0	99.3	90 - 110				

LCSD Sample ID: **WLCSDW1-121418** Units: **mg/L** Analysis Date: **14-Dec-2018 07:57**
Client ID: Run ID: **ICS2100_329363** SeqNo: **4867912** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.73	0.500	20	0	98.7	90 - 110	19.86	0.652	20	
Nitrogen, Nitrate (As N)	3.787	0.100	4	0	94.7	90 - 110	3.831	1.16	20	
Sulfate	19.56	0.500	20	0	97.8	90 - 110	19.86	1.52	20	

MS Sample ID: **HS18120653-01MS** Units: **mg/L** Analysis Date: **17-Dec-2018 13:59**
Client ID: Run ID: **ICS2100_329363** SeqNo: **4868339** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.05	0.500	10	8.757	103	80 - 120				
Nitrogen, Nitrate (As N)	2.425	0.100	2	0.439	99.3	80 - 120				
Sulfate	34.98	0.500	10	24.57	104	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120828

QC BATCH REPORT

Batch ID: R329363 **Instrument: ICS2100** **Method: E300**

MS Sample ID: **HS18111377-02MS** Units: **mg/L** Analysis Date: **14-Dec-2018 08:40**
Client ID: Run ID: **ICS2100_329363** SeqNo: **4867915** PrepDate: DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	242.2	5.00	100	149	93.3	80 - 120				
Nitrogen, Nitrate (As N)	17.57	1.00	20	0	87.8	80 - 120				
Sulfate	108.6	5.00	100	15.41	93.2	80 - 120				

MSD Sample ID: **HS18120653-01MSD** Units: **mg/L** Analysis Date: **17-Dec-2018 14:13**
Client ID: Run ID: **ICS2100_329363** SeqNo: **4868341** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	18.38	0.500	10	8.757	96.3	80 - 120	19.05	3.56	20	
Nitrogen, Nitrate (As N)	2.344	0.100	2	0.439	95.2	80 - 120	2.425	3.4	20	
Sulfate	33.75	0.500	10	24.57	91.8	80 - 120	34.98	3.56	20	

MSD Sample ID: **HS18111377-02MSD** Units: **mg/L** Analysis Date: **14-Dec-2018 08:55**
Client ID: Run ID: **ICS2100_329363** SeqNo: **4867916** PrepDate: DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	248.3	5.00	100	149	99.3	80 - 120	242.2	2.48	20	
Nitrogen, Nitrate (As N)	17.59	1.00	20	0	88.0	80 - 120	17.57	0.137	20	
Sulfate	110.5	5.00	100	15.41	95.1	80 - 120	108.6	1.68	20	

The following samples were analyzed in this batch: HS18120828-01 HS18120828-02

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120828

QC BATCH REPORT

Batch ID: R329581 **Instrument: ManTech01** **Method: SM2320B**

MBLK Sample ID: **WBLKW2-181218** Units: **mg/L** Analysis Date: **18-Dec-2018 23:33**
Client ID: Run ID: **ManTech01_329581** SeqNo: **4873117** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	U	5.00								
Alkalinity, Carbonate (As CaCO3)	U	5.00								
Alkalinity, Total (As CaCO3)	U	5.00								

LCS Sample ID: **WLCS2-181218** Units: **mg/L** Analysis Date: **18-Dec-2018 23:42**
Client ID: Run ID: **ManTech01_329581** SeqNo: **4873118** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1028	5.00	1000	0	103	85 - 115				
Alkalinity, Total (As CaCO3)	1058	5.00	1000	0	106	85 - 115				

LCSD Sample ID: **WLCSD2-181218** Units: **mg/L** Analysis Date: **18-Dec-2018 23:51**
Client ID: Run ID: **ManTech01_329581** SeqNo: **4873119** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1056	5.00	1000	0	106	85 - 115	1028	2.75	20	
Alkalinity, Total (As CaCO3)	1056	5.00	1000	0	106	85 - 115	1058	0.176	20	

DUP Sample ID: **HS18120347-01DUP** Units: **mg/L** Analysis Date: **19-Dec-2018 01:19**
Client ID: Run ID: **ManTech01_329581** SeqNo: **4873130** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	354.2	5.00					354.1	0.0254	20	
Alkalinity, Carbonate (As CaCO3)	114.8	5.00					118.7	3.29	20	
Alkalinity, Total (As CaCO3)	469	5.00					472.8	0.796	20	

The following samples were analyzed in this batch: HS18120828-01

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120828

QC BATCH REPORT

Batch ID: R329664 **Instrument: ManTech01** **Method: SM2320B**

MBLK Sample ID: **WBLKW1-181220** Units: **mg/L** Analysis Date: **20-Dec-2018 14:27**
Client ID: Run ID: **ManTech01_329664** SeqNo: **4875397** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	U	5.00								
Alkalinity, Carbonate (As CaCO3)	U	5.00								
Alkalinity, Total (As CaCO3)	U	5.00								

LCS Sample ID: **WLCS1-181220** Units: **mg/L** Analysis Date: **20-Dec-2018 14:36**
Client ID: Run ID: **ManTech01_329664** SeqNo: **4875398** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1031	5.00	1000	0	103	85 - 115				
Alkalinity, Total (As CaCO3)	1067	5.00	1000	0	107	85 - 115				

LCSD Sample ID: **WLCSD1-181220** Units: **mg/L** Analysis Date: **20-Dec-2018 14:45**
Client ID: Run ID: **ManTech01_329664** SeqNo: **4875399** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1033	5.00	1000	0	103	85 - 115	1031	0.208	20	
Alkalinity, Total (As CaCO3)	1066	5.00	1000	0	107	85 - 115	1067	0.0647	20	

DUP Sample ID: **HS18121083-02DUP** Units: **mg/L** Analysis Date: **20-Dec-2018 15:45**
Client ID: Run ID: **ManTech01_329664** SeqNo: **4875410** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	141	5.00					139.2	1.31	20	
Alkalinity, Carbonate (As CaCO3)	U	5.00					0	0	20	
Alkalinity, Total (As CaCO3)	141	5.00					139.2	1.31	20	

The following samples were analyzed in this batch: HS18120828-02

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18120828

QC BATCH REPORT

Batch ID: R329753 **Instrument: Balance1** **Method: M2540C**

MBLK Sample ID: **WBLK-122018** Units: **mg/L** Analysis Date: **20-Dec-2018 17:20**
Client ID: Run ID: **Balance1_329753** SeqNo: **4877884** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	U	10.0								

LCS Sample ID: **WLCS-122018** Units: **mg/L** Analysis Date: **20-Dec-2018 17:20**
Client ID: Run ID: **Balance1_329753** SeqNo: **4877885** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	1026	10.0	1000	0	103	85 - 115				

DUP Sample ID: **HS18120988-01DUP** Units: **mg/L** Analysis Date: **20-Dec-2018 17:20**
Client ID: Run ID: **Balance1_329753** SeqNo: **4877883** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	U	10.0					2	0	5	

DUP Sample ID: **HS18120768-01DUP** Units: **mg/L** Analysis Date: **20-Dec-2018 17:20**
Client ID: Run ID: **Balance1_329753** SeqNo: **4877863** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	1132	10.0					1174	3.64	5	

The following samples were analyzed in this batch: HS18120828-01 HS18120828-02

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS18120828**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
North Carolina	624-2018	31-Dec-2018
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	22-Dec-2018
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS18120828
Date/Time Received: **14-Dec-2018 10:00**
Received by: **JRM**

Checklist completed by: *Jared R. Makan* eSignature 14-Dec-2018 Date
Reviewed by: *Dane J. Wacasey* eSignature 15-Dec-2018 Date

Matrices: **Water**
Carrier name: **FedEx International Priority**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	1.3c/1.7c UC/C	IR11	
Cooler(s)/Kit(s):	43594		
Date/Time sample(s) sent to storage:	12/14/2018 11:20		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070

Chain of Custody Form

Page ____ of ____

COC ID: 192210

HS18120828

Golder Associates
Exide Column Studies

Customer Information		Project Information		ALS Project Manager:
Purchase Order	130-2086-01	Project Name	Exide Column Studies	
Work Order		Project Number	130-2086	
Company Name	Golder Associates	Bill To Company	Golder Associates	
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P	
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit	
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021	
Phone	(314) 984-8800	Phone	(314) 984-8800	
Fax		Fax		
e-Mail Address	ewhite@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com	

A	300_W (300 Cl, SO4, [NO3 - 48hr HT*])
B	TDS_W 2540C (2540C TDS)
C	ALK_W 2320B (2320B Alkalinity)
D	HARD (2340B Hardness (calc))
E	ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
F	ICP_TW (6020A Total Metals (6)+Cations)
G	
H	
I	
J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1				Groundwa	2,8	3	X	X	X	X	X	X					
2	2018 1213 - FD - TC - control	2018/12/13	13:00	GW		1	X	X	X								
3	2018 1213 - FD - TC - 30 - 3540	2018/12/13	13:30	GW		1	X	X	X								
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Emily White

Shipment Method:

Required Turnaround Time: (Check Box) ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other ____

Results Due Date:

Relinquished by: Emily White

Date: 2018/12/13 Time: 15:00

Received by:

Relinquished by:

Date: 12/14/18 Time: 10:00

Received by (Laboratory):

Logged by (Laboratory):

Date: Time:

Checked by (Laboratory):

Notes: Exide Column Studies

Cooler ID	Cooler Temp.
43594	1.3
	1.1
	0.4

QC Package: (Check One Box Below)

☐ Level II Std QC
☐ Level III Std QC/Data
☐ Level IV SW846 QC/
☐ Other
☒ TRRP Checklist
☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

ote:
1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

Copyright 2011 by ALS Environmental.

ORIGIN ID:YUXA (514) 383-0990
AUDREY ETHEVES
GOLDER ASSOCIATES LTD
7250 RUE DU MILE END
3E ETAGE
MONTREAL, PQ H2R3A4
CANADA CA

SHIP DATE: 13DEC18
ACTWGT: 25.55 LB
CAD: 108680724/NET4042

BILL SENDER

TO **DANE WACASEY**
ALS HOUSTON LABORATORY
10450 STANCLIFF RD
STE 210
HOUSTON TX 77099 (US)
(281) 530-5656 REF:
INV:
PO: DEPT:

552J2E44AF/DCA5

FedEx Express

J182118031602uv

TRK# 0430 **7739 6688 2060**

10:30A
INTL PRIORITY

NH SGRA

77099
TX-US **IAH**

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DÉFINITIONS. Dans la présente lettre de transport aérien, « nous », « notre » et « FedEx » se rapportent à Federal Express Corporation, ses filiales, concessionnaires et leurs employés; mandataires et prestataires indemnes. « Vous » et « votre » se rapportent à l'expéditeur, ses employés, donneurs d'ordres et mandataires. Si vous ne payez pas des Débours, votre contrat d'expédition est conclu avec la filiale, la succursale ou l'un prestataire externe de FedEx ayant à l'origine accepté de procéder à l'expédition. « Colis » désigne tout contenant ou tout autre article accepté par nous aux fins de transport et/ou de livraison. « Débours » désigne les droits de douane, taxes, impôts et autres frais que nous payons pour votre compte. « Convention de Varsovie » désigne la Convention de Varsovie amendée telle que modifiée par le Protocole de La Haye, le Protocole de Guatemala City, la Convention de Montréal ou toute autre convention ou loi applicable régissant la responsabilité en cas de perte, retard ou dommage affectant votre envoi. La Convention de Varsovie amendée limite la responsabilité de FedEx. Par exemple, aux États-Unis, la Convention de Varsovie amendée limite la responsabilité de FedEx, en cas de perte, retard ou dommage affectant votre envoi. LA Convention de Varsovie amendée limite la responsabilité de FedEx. Par exemple, aux États-Unis, la responsabilité est limitée à 9,07 $ par livre (20 $ par kilogramme), à moins qu'une valeur d'expédition supérieure ne soit déclarée comme décrit ci-dessous, sous frais supplémentaire. Dans alors à votre charge. L'interprétation et la mise en application des dispositions de la Convention de Varsovie peuvent varier d'un pays à l'autre. FedEx se réserve le droit d'organiser l'itinéraire emprunté et les escales à sa convenance. REMARQUE RELATIVE AU TRANSPORT ROUTIER. Les envois transportés uniquement par voie terrestre vers ou depuis un pays ayant ratifié la Convention de Varsovie ou la Convention relative au contrat de transport international de marchandises par route (« CMR ») sont soumis aux termes et conditions de la CMR, sans limitation de toute autre disposition contenue dans la présente lettre de transport aérien. Conformément à la convention applicable, FedEx est responsable de la CMR prévoient un cas de conflit entre les dispositions de la CMR et celles de la présente lettre de transport aérien, LIMITATION DE RESPONSABILITÉ. La responsabilité maximale de FedEx en cas de dommage, perte, retard, manque, erreur de livraison, défaut de livraison, informations incorrectes ou défaut d'informations relatives à l'envoi est limitée par le présent Contrat et conforme aux termes et conditions du contrat d'expédition, à moins responsabilité n'est pas régie par la Convention de Varsovie, (b) CMR ou autres traités internationaux. Des dispositions réglementaires, donnés ou clauses. Veuillez vous référer au contrat d'expédition énoncé dans le Guide des Services FedEx en vigueur ou document équivalent afin de déterminer les limites correspondantes. FedEx ne propose pas de responsabilité maximale de 100 $ US pour tout type de matériel transporté par FedEx ayant à l'origine accepté de procéder à l'expédition. « Débours réglementaires » désigne les droits de douane, taxes, impôts et autres frais que nous payons pour votre compte. « Envoi » désigne tout contenant ou tout autre article accepté par nous aux fins de transport et/ou de livraison. « Nous », « notre » et « FedEx » se rapportent à Federal Express Corporation, ses filiales, concessionnaires et leurs employés; mandataires et prestataires indemnes. « Vous » et « votre » se rapportent à l'expéditeur, ses employés, donneurs d'ordres et mandataires. Si vous ne payez pas des Débours, votre contrat d'expédition est conclu avec la filiale, la succursale ou l'un prestataire externe de FedEx ayant à l'origine accepté de procéder à l'expédition. « Colis » désigne tout contenant ou tout autre article accepté par nous aux fins de transport et/ou de livraison. « Débours » désigne les droits de douane, taxes, impôts et autres frais que nous payons pour votre compte. « Convention de Varsovie » désigne la Convention de Varsovie amendée telle que modifiée par le Protocole de La Haye, le Protocole de Guatemala City, la Convention de Montréal ou toute autre convention ou loi applicable régissant la responsabilité en cas de perte, retard ou dommage affectant votre envoi. La Convention de Varsovie amendée limite la responsabilité de FedEx. 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Conformément à la convention applicable, FedEx est responsable de la CMR prévoient un cas de conflit entre les dispositions de la CMR et celles de la présente lettre de transport aérien, LIMITATION DE RESPONSABILITÉ. La responsabilité maximale de FedEx en cas de dommage, perte, retard, manque, erreur de livraison, défaut de livraison, informations incorrectes ou défaut d'informations relatives à l'envoi est limitée par le présent Contrat et conforme aux termes et conditions du contrat d'expédition, à moins responsabilité n'est pas régie par la Convention de Varsovie, (b) CMR ou autres traités internationaux. Des dispositions réglementaires, données ou clauses. Veuillez vous référer au contrat d'expédition énoncé dans le Guide des Services FedEx en vigueur ou document équivalent afin de déterminer les limites correspondantes. FedEx ne propose pas de responsabilité maximale de 100 $ US pour tout type de matériel transporté par FedEx ayant à l'origine accepté de procéder à l'expédition. EXCLUSION DE RESPONSABILITÉ. FEDEX NE SAURAIT ÊTRE TENU POUR RESPONSABLE DE TOUT DOMMAGE DIRECT, INDIRECT, ACCESSOIRE, SPÉCIAL OU CONSÉCUTIF SUPÉRIEUR À LA VALEUR D'EXPÉDITION DÉCLARÉE (Y COMPRIS, SANS QUE CELA SOIT LIMITATIF, DE PERTES DE REVENUS OU BÉNÉFICES) OU À LA VALEUR RÉELLE DE L'ENVOI, SI CELLE-CI EST INFÉRIEURE, SAUF PEDEX AIT PU OU NON SAVOIR QUE DE TELS DOMMAGES POURRAIENT SURVENIR. FedEx ne saurait en aucun cas être tenu pour responsable de tout dommage indirect, spécial ou consécutif (y compris, sans que cela soit limitatif, de déclarations incorrectes de marchandises, d'intelligence, de valeur réelle ou autres marchandises interdites) n'étant pas limité par la présente clause, même si FedEx a été informé de la possibilité de tels dommages. Certains États ou pays n'autorisent pas l'exclusion ou la limitation de responsabilité pour dommages indirects ou consécutifs, auquel cas la présente limitation ne s'applique pas à votre envoi. Le droit à dommages-intérêts réels, tant à un recours en terre dans un délai de deux ans, comme indiqué sur le bulletin de livraison. FedEx considérera alors que la marchandise a été livrée dans les conditions. Afin que nous puissions répondre aux demandes de dommages, nous vous demandons de mettre à notre disposition, à toutes vos dépens, toutes les factures originales, lettres d'expédition, emballages d'origine, à des fins d'inspection. DROIT PRÉPÉRATIF. Dès lors que les dispositions contenues dans la présente lettre de transport aérien ou à l'encontre des intérêts, tous dépositaires ou détenteurs légitimes. Toutes dispositions mettant en vigueur dans le cadre du présent contrat dans la mesure où cela n'est pas interdit par la législation applicable. Le fait que l'une des dispositions ci-présente n'interdit pas les autres prises de la présente lettre de transport aérien. Sauf indication contraire, FEDERAL EXPRESS CORPORATION, 2005 Corporate Avenue, Memphis, TN 38132, USA, est le premier transporteur du présent envoi.

ORIGIN ID:YUXA (514) 383-0990
Audrey Etheves
Golder Associates Ltd
7250 rue du Mile End
3e etage
MONTREAL, PQ H2R3A4
CANADA, CA

Ship Date: 13DEC18
ActWgt: 25.55 LB
CAD: 108680724/INET4042

BILL SENDER
EINVAT:

TO Dane Wacasey (281) 530-5656
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

FedEx Express

(US)

J16211803f520sv

AWB

NH SGRA

PKG:YOUR PKG

TRK# 7739 6688 2060

Form 0430

10:30A
INTL PRIORITY

REF:
DESC1:GlaciEre avec 2 bouteilles d'eau de 250 ml
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: Audrey Etheves
T/C: S 167982832
D/T: R 967554812

Des marchandises, cette technologie ou ce logiciel ont été exportés du Canada conformement a la reglementation sur l'administration des exportations. Toute modification contraire a la loi canadienne est interdite. La Convention de Varsovie peut s'appliquer et elle regit, et dans la grande majorite des cas, elle limite la responsabilite de Federal Express pour toute perte, retard ou dommage cause a votre envoi. Sous reserve des conditions et modalites du contrat.

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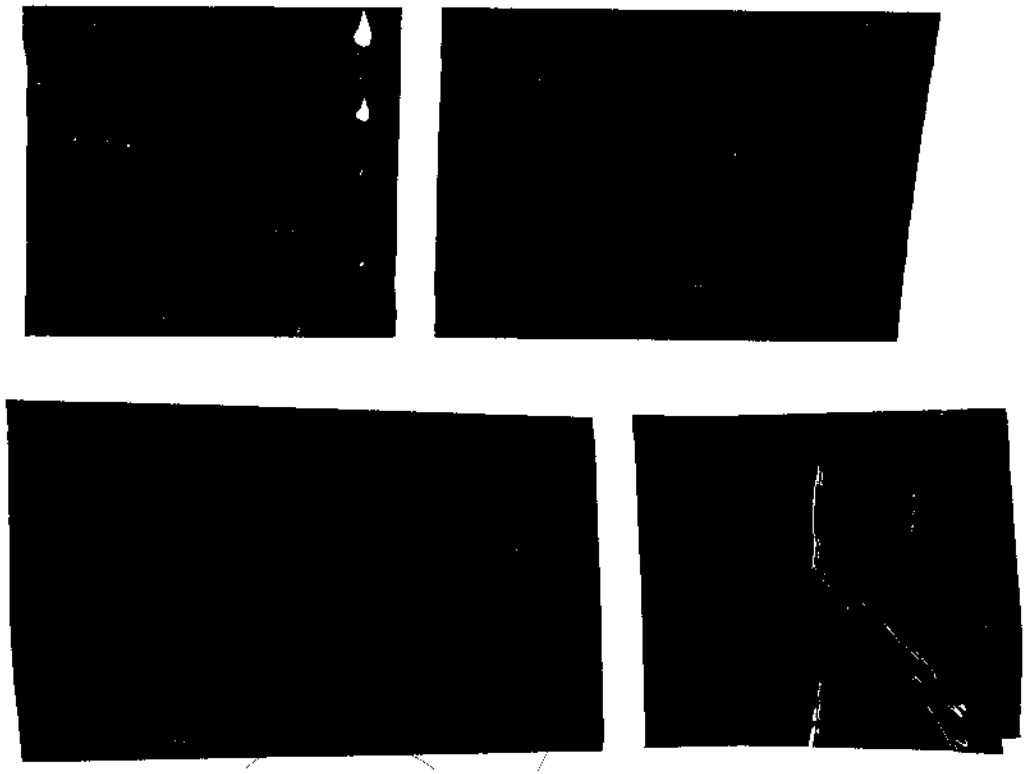
FedEx
TRK#
0430 7739 6688 2060
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209416 IND 12/14 547G1/FIFE/53C1

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

December 27, 2018

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS18121010**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 2 sample(s) on Dec 18, 2018 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DAYNA.FISHER
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS18121010**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS18121010**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data								
Laboratory Name: ALS Laboratory Group			LRC Date: 12/27/2018					
Project Name: Exide Column Studies			Laboratory Job Number: HS18121010					
Reviewer Name: Dane Wacasey			Prep Batch Number(s): R329614, R329853, R330003					
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]	
R1	OI	**Chain-of-custody (C-O-C)**						
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X					
		Were all departures from standard conditions described in an exception report?	X					
R2	OI	**Sample and quality control (QC) identification**						
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X					
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X					
R3	OI	**Test reports**						
		Were all samples prepared and analyzed within holding times?	X					
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X					
		Were calculations checked by a peer or supervisor?	X					
		Were all analyte identifications checked by a peer or supervisor?	X					
		Were sample detection limits reported for all analytes not detected?	X					
		Were all results for soil and sediment samples reported on a dry weight basis?			X			
		Were % moisture (or solids) reported for all soil and sediment samples?			X			
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X			
		If required for the project, TICs reported?			X			
R4	O	**Surrogate recovery data**						
		Were surrogates added prior to extraction?			X			
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X			
R5	OI	**Test reports/summary forms for blank samples**						
		Were appropriate type(s) of blanks analyzed?	X					
		Were blanks analyzed at the appropriate frequency?	X					
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X					
		Were blank concentrations < MQL?	X					
R6	OI	**Laboratory control samples (LCS):**						
		Were all COCs included in the LCS?	X					
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X					
		Were LCSs analyzed at the required frequency?	X					
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X					
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X					
		Was the LCSD RPD within QC limits?	X					
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**						
		Were the project/method specified analytes included in the MS and MSD?	X					
		Were MS/MSD analyzed at the appropriate frequency?	X					
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1	
		Were MS/MSD RPDs within laboratory QC limits?	X					
R8	OI	**Analytical duplicate data**						
		Were appropriate analytical duplicates analyzed for each matrix?	X					
		Were analytical duplicates analyzed at the appropriate frequency?	X					
		Were RPDs or relative standard deviations within the laboratory QC limits?	X					
R9	OI	**Method quantitation limits (MQLs):**						
		Are the MQLs for each method analyte included in the laboratory data package?	X					
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X					
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X					
R10	OI	**Other problems/anomalies**						
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X					
		Were all necessary corrective actions performed for the reported data?	X					
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				2	
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X					

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 12/27/2018				
Project Name: Exide Column Studies			Laboratory Job Number: HS18121010				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): R329614, R329853, R330003				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			3
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports		
Laboratory Name: ALS Laboratory Group		LRC Date: 12/27/2018
Project Name: Exide Column Studies		Laboratory Job Number: HS18121010
Reviewer Name: Dane Wacasey		Prep Batch Number(s): R329614, R329853, R330003
ER#[5]	**Description**	
1	Batch R329614, Anions by Method E300, Sample HS18120973-03, MSD is for an unrelated sample.	
2	Batch R329614, Nitrogen, Nitrate (As N), Samples 2018-12-17-DGW-MW11-T0-Control and 2018-12-17-DGW-NW11-T0-30-35-40: The reporting limit is elevated due to dilution for high concentrations of non-target analytes.	
3	See Run Log and CCB Exception Reports	

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121010
Start Date: 18-Dec-2018 End Date: 19-Dec-2018

Run ID:ICS2100_329614
Instrument:ICS2100
Method:E300

Sample No.	D/F	Time	FileID	Analytes
CCB 1	1	18-Dec-2018 17:21		CL NO3N SO4
WBLKW1-121818	1	18-Dec-2018 17:50		CL NO3N SO4
WLCSW1-121818	1	18-Dec-2018 18:04		CL NO3N SO4
WLCSDW1-121818	1	18-Dec-2018 18:19		CL NO3N SO4
ZZZZZZMS	1	18-Dec-2018 19:46		CL NO3N SO4
ZZZZZZMSD	1	18-Dec-2018 20:01		CL NO3N SO4
CCV 1	1	18-Dec-2018 20:15		CL NO3N SO4
CCB 2	1	18-Dec-2018 20:30		CL NO3N SO4
2018-12-17-DGW-MW11-T0-Control	10	18-Dec-2018 21:13		CL NO3N
2018-12-17-DGW-NW11-T0-30-35-40	10	18-Dec-2018 21:28		CL NO3N
CCB 3	1	18-Dec-2018 23:24		CL NO3N SO4
ZZZZZZMS	20	19-Dec-2018 00:23		CL NO3N SO4
ZZZZZZMSD	20	19-Dec-2018 00:37		CL NO3N SO4
CCV 2	1	19-Dec-2018 01:50		CL NO3N SO4
CCB 4	1	19-Dec-2018 02:04		CL NO3N SO4
CCV 3	1	19-Dec-2018 07:39		CL NO3N SO4
CCB 5	1	19-Dec-2018 07:53		CL NO3N SO4
2018-12-17-DGW-MW11-T0-Control	100	19-Dec-2018 13:57		SO4
2018-12-17-DGW-NW11-T0-30-35-40	100	19-Dec-2018 14:11		SO4
CCB 6	1	19-Dec-2018 15:09		CL NO3N SO4

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121010

Run ID:ICS2100_329614
Instrument:ICS2100
Method:E300

CCB 1	Date: 18-Dec-2018 17:21	Seq: 4873784	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	360	200	500	
Nitrogen, Nitrate (As N)	72	30	100	
Sulfate	359	200	500	

CCB 2	Date: 18-Dec-2018 20:30	Seq: 4873796	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	262	200	500	
Sulfate	478	200	500	

CCB 3	Date: 18-Dec-2018 23:24	Seq: 4873808	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	252	200	500	
Sulfate	295	200	500	

CCB 4	Date: 19-Dec-2018 02:04	Seq: 4873819	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	219	200	500	
Sulfate	285	200	500	

CCB 5	Date: 19-Dec-2018 07:53	Seq: 4873821	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	219	200	500	
Sulfate	283	200	500	

CCB 6	Date: 19-Dec-2018 15:09	Seq: 4873830	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	239	200	500	
Sulfate	297	200	500	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS18121010

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18121010-01	2018-12-17-DGW-MW11-T0-Control	Groundwater		17-Dec-2018 12:45	18-Dec-2018 11:00	☐
HS18121010-02	2018-12-17-DGW-NW11-T0-30-35-40	Groundwater		17-Dec-2018 12:45	18-Dec-2018 11:00	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 2018-12-17-DGW-MW11-T0-Control
Collection Date: 17-Dec-2018 12:45

ANALYTICAL REPORT
WorkOrder:HS18121010
Lab ID:HS18121010-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**206**		**2.00**	**5.00**	**mg/L**	10	18-Dec-2018 21:13
Nitrogen, Nitrate (As N)	U		0.300	1.00	mg/L	10	18-Dec-2018 21:13
Sulfate	**5,020**		**20.0**	**50.0**	**mg/L**	100	19-Dec-2018 13:57
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	**7,650**		**5.00**	**10.0**	**mg/L**	1	21-Dec-2018 17:20
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**264**		**5.00**	**5.00**	**mg/L**	1	26-Dec-2018 20:28
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	26-Dec-2018 20:28
Alkalinity, Total (As CaCO3)	**264**		**5.00**	**5.00**	**mg/L**	1	26-Dec-2018 20:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 2018-12-17-DGW-NW11-T0-30-35-40
Collection Date: 17-Dec-2018 12:45

ANALYTICAL REPORT
WorkOrder:HS18121010
Lab ID:HS18121010-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**214**		**2.00**	**5.00**	**mg/L**	10	18-Dec-2018 21:28
Nitrogen, Nitrate (As N)	U		0.300	1.00	mg/L	10	18-Dec-2018 21:28
Sulfate	**5,140**		**20.0**	**50.0**	**mg/L**	100	19-Dec-2018 14:11
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	**7,700**		**5.00**	**10.0**	**mg/L**	1	21-Dec-2018 17:20
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**212**		**5.00**	**5.00**	**mg/L**	1	26-Dec-2018 20:34
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	26-Dec-2018 20:34
Alkalinity, Total (As CaCO3)	**212**		**5.00**	**5.00**	**mg/L**	1	26-Dec-2018 20:34

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121010

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R329614	**Test Name :** ANIONS BY E300.0				**Matrix:** Groundwater	
HS18121010-01	2018-12-17-DGW-MW11-T0-Control	17 Dec 2018 12:45			19 Dec 2018 13:57	100
HS18121010-01	2018-12-17-DGW-MW11-T0-Control	17 Dec 2018 12:45			18 Dec 2018 21:13	10
HS18121010-02	2018-12-17-DGW-NW11-T0-30-35-40	17 Dec 2018 12:45			19 Dec 2018 14:11	100
HS18121010-02	2018-12-17-DGW-NW11-T0-30-35-40	17 Dec 2018 12:45			18 Dec 2018 21:28	10
Batch ID R329853	**Test Name :** TOTAL DISSOLVED SOLIDS BY SM2540C				**Matrix:** Groundwater	
HS18121010-01	2018-12-17-DGW-MW11-T0-Control	17 Dec 2018 12:45			21 Dec 2018 17:20	1
HS18121010-02	2018-12-17-DGW-NW11-T0-30-35-40	17 Dec 2018 12:45			21 Dec 2018 17:20	1
Batch ID R330003	**Test Name :** ALKALINITY BY SM2320B				**Matrix:** Groundwater	
HS18121010-01	2018-12-17-DGW-MW11-T0-Control	17 Dec 2018 12:45			26 Dec 2018 20:28	1
HS18121010-02	2018-12-17-DGW-NW11-T0-30-35-40	17 Dec 2018 12:45			26 Dec 2018 20:34	1

WorkOrder: HS18121010
InstrumentID: ICS2100
Test Code: 300_W
Test Number: E300
Test Name: Anions by E300.0

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Chloride	16887-00-6	0.500	0.576	0.200	0.500
A	Nitrogen, Nitrate (As N)	14797-55-8	0.100	0.129	0.0300	0.100
A	Sulfate	14808-79-8	0.500	0.616	0.200	0.500

WorkOrder: HS18121010
InstrumentID: ManTech01
Test Code: ALK_W 2320B
Test Number: SM2320B
Test Name: Alkalinity by SM2320B

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Alkalinity, Bicarbonate (As CaCO3)	ALK-Bicarb	5.00	3.49	5.00	5.00
A	Alkalinity, Carbonate (As CaCO3)	ALK-Carb	5.00	3.49	5.00	5.00
A	Alkalinity, Total (As CaCO3)	ALK	5.00	3.49	5.00	5.00

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121010

QC BATCH REPORT

Batch ID: R329614 **Instrument: ICS2100** **Method: E300**

MBLK Sample ID: **WBLKW1-121818** Units: **mg/L** Analysis Date: **18-Dec-2018 17:50**
Client ID: Run ID: **ICS2100_329614** SeqNo: **4873785** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	0.500								
Nitrogen, Nitrate (As N)	U	0.100								
Sulfate	U	0.500								

LCS Sample ID: **WLCSW1-121818** Units: **mg/L** Analysis Date: **18-Dec-2018 18:04**
Client ID: Run ID: **ICS2100_329614** SeqNo: **4873786** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.3	0.500	20	0	96.5	90 - 110				
Nitrogen, Nitrate (As N)	3.742	0.100	4	0	93.6	90 - 110				
Sulfate	19.13	0.500	20	0	95.7	90 - 110				

LCSD Sample ID: **WLCSDW1-121818** Units: **mg/L** Analysis Date: **18-Dec-2018 18:19**
Client ID: Run ID: **ICS2100_329614** SeqNo: **4873787** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.32	0.500	20	0	102	90 - 110	19.3	5.13	20	
Nitrogen, Nitrate (As N)	3.909	0.100	4	0	97.7	90 - 110	3.742	4.37	20	
Sulfate	20.07	0.500	20	0	100	90 - 110	19.13	4.8	20	

MS Sample ID: **HS18120973-03MS** Units: **mg/L** Analysis Date: **18-Dec-2018 19:46**
Client ID: Run ID: **ICS2100_329614** SeqNo: **4873793** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	32.77	0.500	10	22.77	100.0	80 - 120				
Nitrogen, Nitrate (As N)	2.362	0.100	2	0.41	97.6	80 - 120				
Sulfate	379.6	0.500	10	369.8	97.2	80 - 120				EO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121010

QC BATCH REPORT

Batch ID: R329614 **Instrument: ICS2100** **Method: E300**

MS Sample ID: **HS18120880-08MS** Units: **mg/L** Analysis Date: **19-Dec-2018 00:23**
Client ID: Run ID: **ICS2100_329614** SeqNo: **4873812** PrepDate: DF: **20**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	590.8	10.0	200	369.1	111	80 - 120				
Nitrogen, Nitrate (As N)	38.56	2.00	40	0	96.4	80 - 120				
Sulfate	267.1	10.0	200	59.47	104	80 - 120				

MSD Sample ID: **HS18120973-03MSD** Units: **mg/L** Analysis Date: **18-Dec-2018 20:01**
Client ID: Run ID: **ICS2100_329614** SeqNo: **4873794** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	34.06	0.500	10	22.77	113	80 - 120	32.77	3.85	20	
Nitrogen, Nitrate (As N)	2.462	0.100	2	0.41	103	80 - 120	2.362	4.15	20	
Sulfate	394.1	0.500	10	369.8	242	80 - 120	379.6	3.75	20	SEO

MSD Sample ID: **HS18120880-08MSD** Units: **mg/L** Analysis Date: **19-Dec-2018 00:37**
Client ID: Run ID: **ICS2100_329614** SeqNo: **4873813** PrepDate: DF: **20**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	562.8	10.0	200	369.1	96.9	80 - 120	590.8	4.85	20	
Nitrogen, Nitrate (As N)	37.01	2.00	40	0	92.5	80 - 120	38.56	4.08	20	
Sulfate	256.1	10.0	200	59.47	98.3	80 - 120	267.1	4.21	20	

The following samples were analyzed in this batch: HS18121010-01 HS18121010-02

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121010

QC BATCH REPORT

Batch ID: R329853 **Instrument: Balance1** **Method: M2540C**

MBLK Sample ID: **WBLK-122118** Units: **mg/L** Analysis Date: **21-Dec-2018 17:20**
Client ID: Run ID: **Balance1_329853** SeqNo: **4880327** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	U	10.0								

LCS Sample ID: **WLCS-122118** Units: **mg/L** Analysis Date: **21-Dec-2018 17:20**
Client ID: Run ID: **Balance1_329853** SeqNo: **4880328** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	984	10.0	1000	0	98.4	85 - 115				

DUP Sample ID: **HS18121029-01DUP** Units: **mg/L** Analysis Date: **21-Dec-2018 17:20**
Client ID: Run ID: **Balance1_329853** SeqNo: **4880319** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	1604	10.0					1620	0.993	5	

The following samples were analyzed in this batch: HS18121010-01 HS18121010-02

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121010

QC BATCH REPORT

Batch ID: R330003 **Instrument: ManTech01** **Method: SM2320B**

MBLK Sample ID: **WBLKW1-181224** Units: **mg/L** Analysis Date: **26-Dec-2018 20:03**
Client ID: Run ID: **ManTech01_330003** SeqNo: **4883405** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	U	5.00								
Alkalinity, Carbonate (As CaCO3)	U	5.00								
Alkalinity, Total (As CaCO3)	U	5.00								

LCS Sample ID: **WLCS1-181224** Units: **mg/L** Analysis Date: **26-Dec-2018 20:12**
Client ID: Run ID: **ManTech01_330003** SeqNo: **4883406** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1016	5.00	1000	0	102	85 - 115				
Alkalinity, Total (As CaCO3)	1048	5.00	1000	0	105	85 - 115				

LCSD Sample ID: **WLCSD1-181224** Units: **mg/L** Analysis Date: **26-Dec-2018 20:20**
Client ID: Run ID: **ManTech01_330003** SeqNo: **4883407** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1015	5.00	1000	0	102	85 - 115	1016	0.0148	20	
Alkalinity, Total (As CaCO3)	1049	5.00	1000	0	105	85 - 115	1048	0.117	20	

DUP Sample ID: **HS18121010-02DUP** Units: **mg/L** Analysis Date: **26-Dec-2018 20:40**
Client ID: **2018-12-17-DGW-NW11-T0-30-35-40** Run ID: **ManTech01_330003** SeqNo: **4883410** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	222.6	5.00					211.9	4.94	20	
Alkalinity, Carbonate (As CaCO3)	U	5.00					0	0	20	
Alkalinity, Total (As CaCO3)	222.6	5.00					211.9	4.94	20	

The following samples were analyzed in this batch: HS18121010-01 HS18121010-02

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS18121010**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
North Carolina	624-2018	31-Dec-2018
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS18121010
Date/Time Received: **18-Dec-2018 11:00**
Received by: **JRM**

Checklist completed by: *Jared R. Makan* eSignature 18-Dec-2018 Date
Reviewed by: *Corey Grandits* eSignature 19-Dec-2018 Date

Matrices: **Water**
Carrier name: **FedEx International Priority**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☐	No ☑	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	1.5c/1.9c UC/C	IR11	
Cooler(s)/Kit(s):	Blue		
Date/Time sample(s) sent to storage:	12/18/2018 14:25		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes: Sample ID differs: COC = 2018-12-17-DGW-MW-To-Control, Container label = 2018-12-17-DGW-NW-To-Control. Logged in per COC.

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Middletown, PA +1 717 944 5541
Spring City, PA +1 610 948 4903
Salt Lake City, UT +1 801 266 7700
South Charleston, WV +1 304 356 3168
York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 192212

ALS Project Manager: | ALS Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order	130-2086-01	Project Name	Exide Column Studies	A	300_W (300 Cl, SO4, [NO3] 48hr HT)
Work Order		Project Number	130-2086	B	TDS_W 2540C (25-40C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK_W 2320B (2320B Alkalinity)
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P	D	HARD (2340B Hardness (calc))
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit	E	ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
				F	ICP_TW (6020A Total Metals (6)+Cations)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021	G	
Phone	(314) 984-8800	Phone	(314) 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1				Groundwa	2.8	3	X	X	X	X	X	X					
2	2018-12-17-DGW-MW11-TO-CONTROL	2018/12/17	12h45	GW		1	X	X	X								
3	2018-12-17-DGW-MW11-TO-30-35-40	2018/12/17	12h45	GW		1	X	X	X								
4																	
5																	
6																	
7																	
8																	
9																	
10																	

HS18121010
Golder Associates
Exide Column Studies

Sampler(s) Please Print & Sign: ONIKPO CLAUDE

Shipment Method:

Required Turnaround Time: (Check Box) ☐ Other ____ ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour

Results Due Date:

Relinquished by: ONIKPO CLAUDE Date: 2018-12-17 Time: 3:30PM Received by:

Relinquished by: Date: 12/18/18 Time: 11:00 Received by (Laboratory): J. Mauney

Logged by (Laboratory): Date: Time: Checked by (Laboratory):

Notes: Exide Column Studies

Cooler ID	Cooler Temp.
Blue	1.5
	1411
	CF04

QC Package: (Check One Box Below)
☐ Level II Std QC ☒ TRRP (Specify)
☐ Low Diff Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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ORIGIN ID:YUXA (514) 383-0990
Audrey Etheves
Golder Associates Ltd
7250 rue du Mile End
3e etage
MONTREAL, PQ H2R3A4
CANADA, CA

Ship Date: 17DEC18
ActWgt: 9.55 KG
CAD: 108680724/INET4042

BILL SENDER
EIN/VAT:

TO Dane Wacasey (281) 530-5656
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

FedEx Express
(US)
J18211808152Gv

AWB

NH SGRA

PKG:YOUR PKG

TRK# 7739 9598 8734 Form 0430

10:30A
INTL PRIORITY

REF:
DESC1:GlaciÈre contenant des bouteilles d'eau
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: Audrey Etheves
T/C: S 167982832
D/T: R 967554812

Ces marchandises, cette technologie ou ce logiciel ont été exportés du Canada conformement a la reglementation sur l'administration des exportations. Toute modification contraire a la loi canadienne est interdite. La Convention de Varsovie peut s'appliquer et elle régit et dans la grande majorité des cas, elle limite la responsabilité de Federal Express pour toute perte, retard ou dommage causé a votre envoi. Sous reserve des conditions et modalités du contrat.

COPIE DU DESTINATAIRE - VEUILLEZ LA GLISSER DANS LA POCHETTE

Après l'impression de cette étiquette :
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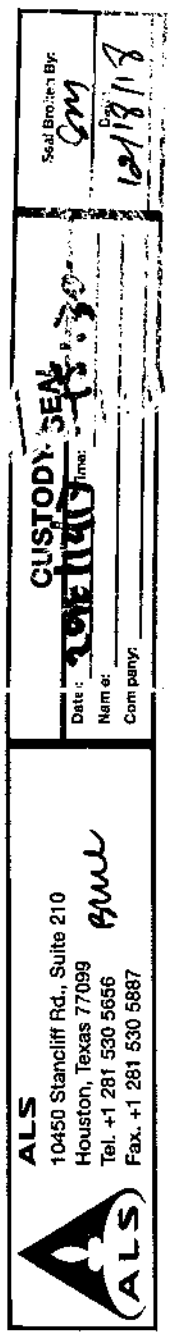
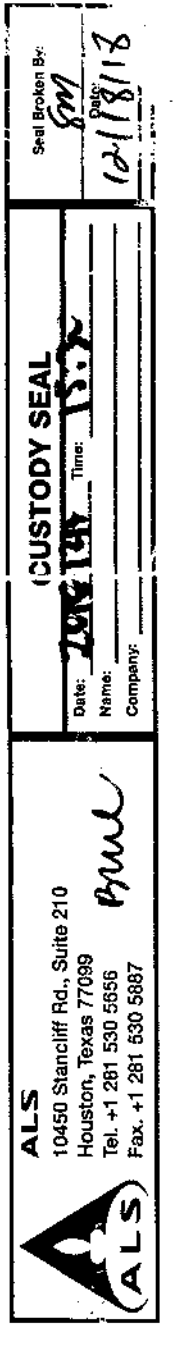
1. Pliez la page imprimée le long de la ligne horizontale.
2. Placez l'étiquette dans la pochette d'expédition et fixez-la à votre paquet.



DEC 18 2018



ORIGIN ID:YUXA
GOODEA LABORATORIES
7250 RUE DU MILE END
3E ETAGE
MONTREAL, PQ H2R3A4
CANADA CA

(514) 383-0890

SHIP DATE: 17DEC18
ACTWGT: 1.66 KG
CAD: 106807/CAFE14042

BILL SENDER

TO DANE WACASEY
ALS HOUSTON LABORATORY
10450 STANCLIFF RD
STE 210
HOUSTON TX 77099
(281) 530-5656
INV:
PO:
REF:
DEPT:

(US)

952J2/E4AF/DCA5

FedEx Express

TRK# 0430 7739 9598 8734

NH SGRA

INTL PRIORITY

10:30A

77099

TX-US IAH

FedEx
TRK# 0430 7739 9598 8734

NH SGRA

QA
INTL PRIORITY CLR
CLR
77099
TX-US
IAH

Après l'impression de cette étiquette :
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1. Pliez la page imprimée le long de la ligne horizontale.
2. Placez l'étiquette dans la pochette d'expédition et fixez-la à votre paquet.

3626018 IND 12/18 547G1/E1TE/5SC1

DEFINITIONS. Dans la présente lettre de transport aérien, « vous », « votre », « vos » et « FedEx » se rapportent à Federal Express Corporation ses filiales, succursales et leurs employés, mandataires et prestataires autorisés. « Vous » et « votre » se rapportent à l'expéditeur, ses employés, donneurs d'ordre et mandataires. Si l'envoi est produit par des Etats-Unis, votre contrat d'expédition est conclu avec la filiale, le succursale ou les prestataires exemptés de FedEx ayant à l'origine adopté du procédé d'expédition. « Colis » s'entend de tout conteneur ou de toute enveloppe dont nous acceptons d'effectuer la livraison, notamment les marchandises faisant du transport par voie aérien par le biais de nos systèmes auto-matisés, complexes, machines ou lignes de transport. « Envoi » s'entend de tous colis nous étant remis au transport sur une même lettre de transport aérien. REMARQUE RELATIVE AU TRANSPORT AÉRIEN. La Convention de Varsovie ne régit pas et peut ne pas régir certains envois. La Convention de Varsovie amendée régit et limite dans la plupart des cas la responsabilité de FedEx en cas de perte, retard ou dommage affectant votre envoi. La Convention de Varsovie amendée limite la responsabilité de FedEx. Par exemple, aux Etats-Unis, la responsabilité est limitée à 9,07 $ par livre (20 $ par kilogramme), à moins qu'une valeur d'expédition supérieure ne soit déclarée comme décrit ci-dessous, auquel cas un supplément pourra être dû. Veuillez consulter votre agent FedEx ou visiter notre site Internet à l'adresse www.fedex.com pour de plus amples informations sur votre envoi. L'interprétation et la mise en application des dispositions relatives aux limites de responsabilité de la Convention de Varsovie peuvent varier d'un pays à l'autre. FedEx se réserve le droit d'organiser l'itinéraire emprunté et les escales à sa convenance. REMARQUE RELATIVE AU TRANSPORT ROUTIER. Les envois transportés uniquement par voie terrestre vers ou depuis un pays ayant ratifié la Convention de Varsovie outre l'convention relative au contrat de transport international de marchandises par route (« CMR ») sont soumis aux termes et conditions de la CMR, dans préjudice de toute autre disposition contenue dans la présente lettre de transport aérien. Conformément aux envois transportés exclusivement par voie terrestre, les délais de la CMR prévalent en cas de conflit entre les dispositions de la CMR et celles de la présente lettre de transport aérien. LIMITATION DE RESPONSABILITE. La responsabilité maximale de FedEx en cas de dommage, perte, retard, mauvaise acheminement, délai de livraison, informations incorrectes ou défaut d'information se rapportant à l'envoi est limitée par la présente. Sauf si un montant supérieur n'est pas régie par la Convention de Varsovie, du CMR ou autre traités internationaux, les dispositions réglementaires, diverses ou diverses. Veuillez vous référer au contrat d'expédition énoncé dans le Guide des Services FedEx en vigueur ou document équivalent afin de déterminer les limites contractuelles. FedEx ne propose pas de responsabilité marchandises et assume très réduite, sauf si vous est possible de payer des frais supplémentaires (par tranche de 100 $US supplémentaires (ou équivalent en monnaie locale du pays d'origine) de valeur d'expédition déclarée. Si la valeur d'expédition déclarée est supérieure aux frais supplémentaires sont acquittés, la responsabilité de FedEx équivaut alors à la valeur la plus faible entre la valeur déclarée et les dommages réels. EXCLUSION DE RESPONSABILITE. FEDEX NE SAURAIT EN AUCUN CAS ETRE TENU POUR RESPONSABLE DE TOUT DOMMAGE DIRECT, INDIRECT ACCESSOIRE, SPECIAL OU CONSECUTIF SURVENU A LA SUITE D'UNE DESCRIPTION DECLAREE (Y COMPRIS, SANS QUE CELA SOIT LIMITATIF DE PERTES DE REVENUS OU BENEFICES) OU A LA VALEUR REELLE DE L'ENVOI, SI CELUI-CI EST INFERIEURE, DUE FEDEX AIT PU OU NON SAVOIR QUE DE TELS DOMMAGES POURRAIENT SURVENIR. FedEx ne saurait en aucun cas être tenu pour responsable de vos agissements ou omissions, y compris, sans que cela soit limitatif, de déclarations incorrectes de marchandises d'emballages, étiquetage ou adressage non adéquats ou insuffisants de l'envoi, n'ont également au créancier du destinataire ou de quiconque pourrait être concerné par cet envoi, suite à la violation par l'une des parties du présent contrat. FedEx ne saurait en aucun cas être tenu responsable de tous dommages, pertes, retards, manques, erreurs de livraison dans la de livraison, informations incorrectes ou défaut d'informations relativement aux envois de liquidités, dossiers ou autres marchandises interdites ou d'événements hors de notre contrôle tels que les catastrophes naturelles (risques sismiques, conditions météorologiques, retards mécaniques, actes de terrorisme, guerre, grèves, désordre public, mesures gouvernementales ou contraintes des autorités publiques, notamment des douanes ou responsables de la santé publique) ayant survenu DEFAUT DE GARANTIE. FedEx n'accorde aucune garantie, expresse ou tacite. RECOURS EN CAS DE PERTE, DOMMAGE OU RETARD. TOUT RECOURS DOIT ETRE EXERCE PAR ECRIT ET DANS DES DELAIS STRICTS. VOIR NOS TARIFS LE GUIDE DES SERVICES FEDEX OU VEUILLEZ CONSULTER LES CONDITIONS STANDARD D'EXPEDITION POUR PLUS D'INFORMATIONS. La Convention de Varsovie prévoit des procédures de recours écrites spécifiques en cas de dommages, retard ou défaut de livraison des envois. En outre, l'interprétation et la mise en application des dispositions relatives aux délais de réclamation de la Convention de Varsovie peuvent varier d'un pays à l'autre. Veuillez vous référer à la Convention pour déterminer les délais de recours applicables à votre envoi. Le choix à dommages-intérêts n'étant, sauf si un recours est formé dans un délai de deux ans, comme spécifié dans la Convention. FedEx n'est pas tenu de rembourser d'un recours avec ou sans toutes les frais d'expédition n'aient été acquittés. Le montant du recours paiement pas être déduit des frais d'expédition. Si le destinataire accepte l'envoi sans noter aucun dommage sur le bulletin de livraison, FedEx considérera alors que la marchandise a été livrée dans de bonnes conditions. Afin que nous puissions répondre aux demandes de dommages, nous vous demandons de mettre à notre disposition les contenus, colonne d'expédition et emballages d'origine il doit être disposition. DROIT IMPERATIF. Dès lors que l'une des dispositions contenues ou citées dans la présente lettre de transport aérien va à l'encontre des lois, lois, dispositions réglementaires, circulaires ou décrets réglementaires, législatifs dispositions restent en vigueur dans la mesure où cela n'est pas annulé. Le fait que l'une des dispositions soit invalide ou inapplicable n'affecte pas les autres parties de la présente lettre de transport aérien. Sauf mention contraire, FEDERAL EXPRESS CORPORATION, 2005 Corporate Avenue, Memphis, TN 38132, USA, est le premier transporteur du présent envoi.

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

January 08, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS18121345**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 4 sample(s) on Dec 24, 2018 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS18121345**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS18121345**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data								
Laboratory Name: ALS Laboratory Group			LRC Date: 01/08/2019					
Project Name: Exide Column Studies			Laboratory Job Number: HS18121345					
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 136084,136086,136175,R330657					
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]	
R1	OI	**Chain-of-custody (C-O-C)**						
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X					
		Were all departures from standard conditions described in an exception report?	X					
R2	OI	**Sample and quality control (QC) identification**						
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X					
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X					
R3	OI	**Test reports**						
		Were all samples prepared and analyzed within holding times?	X					
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X					
		Were calculations checked by a peer or supervisor?	X					
		Were all analyte identifications checked by a peer or supervisor?	X					
		Were sample detection limits reported for all analytes not detected?	X					
		Were all results for soil and sediment samples reported on a dry weight basis?			X			
		Were % moisture (or solids) reported for all soil and sediment samples?			X			
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X			
		If required for the project, TICs reported?			X			
R4	O	**Surrogate recovery data**						
		Were surrogates added prior to extraction?			X			
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X			
R5	OI	**Test reports/summary forms for blank samples**						
		Were appropriate type(s) of blanks analyzed?	X					
		Were blanks analyzed at the appropriate frequency?	X					
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X					
		Were blank concentrations < MQL?	X					
R6	OI	**Laboratory control samples (LCS):**						
		Were all COCs included in the LCS?	X					
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X					
		Were LCSs analyzed at the required frequency?	X					
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X					
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X					
		Was the LCSD RPD within QC limits?	X					
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**						
		Were the project/method specified analytes included in the MS and MSD?	X					
		Were MS/MSD analyzed at the appropriate frequency?	X					
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1	
		Were MS/MSD RPDs within laboratory QC limits?	X					
R8	OI	**Analytical duplicate data**						
		Were appropriate analytical duplicates analyzed for each matrix?			X			
		Were analytical duplicates analyzed at the appropriate frequency?			X			
		Were RPDs or relative standard deviations within the laboratory QC limits?			X			
R9	OI	**Method quantitation limits (MQLs):**						
		Are the MQLs for each method analyte included in the laboratory data package?	X					
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X					
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X					
R10	OI	**Other problems/anomalies**						
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X					
		Were all necessary corrective actions performed for the reported data?	X					
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				2	
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X					

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 01/08/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS18121345				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 136084,136086,136175,R330657				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			3
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		X			4
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports	
Laboratory Name: ALS Laboratory Group	LRC Date: 01/08/2019
Project Name: Exide Column Studies	Laboratory Job Number: HS18121345
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 136084,136086,136175,R330657

ER#[5]	Description
1	Batch 136084, Metals Method SW6020, sample 2018-12-17-DGW-MW11-T0-30-35-40-T, MS and or MSD recovered outside the control limits for Batch 136086, Metals Method SW6020, sample HS18120928-07, MS and MSD were performed on unrelated sample. Batch 136175, Metals Method SW6020, sample 2018-12-17-DGW-MW11-T0-30-35-40-D, MS and or MSD recovered outside the control limits for Calcium, Magnesium and Sodium, however, the result in the parent sample is greater than 4x the spike amount.
2	Batch 136084, Metals Method SW6020, sample 2018-12-17-DGW-MW11-T0-30-35-40- was analyzed at a 5x dilution due to matrix interference.
3	See Run Log and CCB Exceptions Report.
4	Batch 136175, Metals Method SW6020, sample 2018-12-17-DGW-MW11-T0-30-35-40-D, PDS recovered outside the control limit for Potassium, however, the result in the parent sample is greater than 4x the spike amount.

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121345
Start Date: 07-Jan-2019 End Date: 08-Jan-2019

Run ID:ICPMS04_330548
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	07-Jan-2019 12:06	018_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	07-Jan-2019 12:08	019SMPL.d	AS CD FE K PB SB SE
LLICV5	1	07-Jan-2019 12:11	020LICV.d	AS CD FE K PB SB SE
ICB	1	07-Jan-2019 12:13	021_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	07-Jan-2019 12:20	023ICSA.d	AS CD FE K PB SB SE
ICSAB	1	07-Jan-2019 12:23	024ICSB.d	AS CD FE K PB SB SE
CCV 1	1	07-Jan-2019 12:47	032_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	07-Jan-2019 12:49	033_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-136175	1	07-Jan-2019 12:59	035SMPL.d	AS CA CD FE K MG PB SB SE
LCS-136175	1	07-Jan-2019 13:01	036SMPL.d	AS CA CD FE K MG NA PB SB SE
2018-12-17-DGW-MW11-T0-30-35-40-D	1	07-Jan-2019 13:03	037SMPL.d	AS CD FE K PB SB SE
2018-12-17-DGW-MW11-T0-30-35-40-DSD	5	07-Jan-2019 13:05	038SMPL.d	AS K PB SB SE
2018-12-17-DGW-MW11-T0-30-35-40-DMS	1	07-Jan-2019 13:08	039SMPL.d	AS CA CD FE K MG NA PB SB SE
2018-12-17-DGW-MW11-T0-30-35-40-DMSD	1	07-Jan-2019 13:11	040SMPL.d	AS CA CD FE K MG NA PB SB SE
2018-12-17-DGW-MW11-T0-30-35-40-DPDS	1	07-Jan-2019 13:14	041SMPL.d	AS CD FE K PB SB SE
2018-12-17-DGW-MW11-T0-Control-D	1	07-Jan-2019 13:16	042SMPL.d	AS CD FE K PB SB SE
CCV 2	1	07-Jan-2019 13:20	044_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	07-Jan-2019 13:34	047_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	07-Jan-2019 13:59	058_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	07-Jan-2019 14:01	059_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	07-Jan-2019 14:37	070_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	07-Jan-2019 14:39	071_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	07-Jan-2019 15:02	073_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	07-Jan-2019 15:28	083_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	07-Jan-2019 15:30	084_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 7	1	07-Jan-2019 16:41	111_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	07-Jan-2019 16:43	112SMPL.d	AS CD FE K PB SB SE
LLCCV5	1	07-Jan-2019 16:46	113LICV.d	AS CD FE K PB SB SE
ICCB 6	1	07-Jan-2019 16:48	114_ICB.d	AS CA CD FE K MG NA PB SB SE
LLCCV5	1	07-Jan-2019 16:54	116LICV.d	AS CD FE K PB SB SE
CCV 8	1	07-Jan-2019 17:28	128_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	07-Jan-2019 17:30	129_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	07-Jan-2019 18:07	140_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	07-Jan-2019 18:09	141_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	07-Jan-2019 18:32	151_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 10	1	07-Jan-2019 18:37	153_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 11	1	07-Jan-2019 19:00	163_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	07-Jan-2019 19:03	164_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 12	1	07-Jan-2019 19:29	175_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	07-Jan-2019 19:31	176_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 13	1	07-Jan-2019 19:56	187_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 12	1	07-Jan-2019 19:58	188_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 14	1	07-Jan-2019 20:18	197_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 13	1	07-Jan-2019 20:20	198_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 15	1	07-Jan-2019 20:45	209_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 14	1	07-Jan-2019 20:47	210_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 16	1	07-Jan-2019 21:11	221_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 15	1	07-Jan-2019 21:14	222_CCB.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121345

Run ID:ICPMS04_330548
Instrument:ICPMS04
Method:SW6020

CCB 1	Date: 07-Jan-2019 12:49	Seq: 4896973	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	-21.2	18	200	
Sodium	36.2	14	200	

CCB 2	Date: 07-Jan-2019 13:34	Seq: 4897095	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	17.27	12	200	
Potassium	18.56	18	200	
Selenium	1.325	1.1	2	
Sodium	480.8	14	200	

CCB 3	Date: 07-Jan-2019 14:01	Seq: 4897262	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	334.5	14	200	

CCB 4	Date: 07-Jan-2019 14:39	Seq: 4897378	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	-31.19	18	200	
Sodium	230.5	14	200	

CCB 5	Date: 07-Jan-2019 15:30	Seq: 4897510	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	39.36	34	500	
Iron	14.54	12	200	
Potassium	29.2	18	200	
Sodium	8026	14	200	

ICCB 6	Date: 07-Jan-2019 16:48	Seq: 4897833	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	-105.8	14	200	

CCB 7	Date: 07-Jan-2019 17:30	Seq: 4897936	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	-13.31	12	200	
Sodium	-91.1	14	200	

CCB 8	Date: 07-Jan-2019 18:09	Seq: 4898087	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	-14.35	12	200	
Sodium	-81.85	14	200	

CCB 9	Date: 07-Jan-2019 18:32	Seq: 4898099	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	-15.77	12	200	
Sodium	-123.6	14	200	

CCB 10	Date: 07-Jan-2019 19:03	Seq: 4898271	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	-13.51	12	200	
Sodium	-138.2	14	200	

CCB 11	Date: 07-Jan-2019 19:31	Seq: 4898283	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121345
Start Date: 08-Jan-2019 End Date: 08-Jan-2019

Run ID:ICPMS04_330630
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	08-Jan-2019 11:24	018_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	08-Jan-2019 11:26	019SMPL.d	CA MG NA
LLICV5	1	08-Jan-2019 11:28	020LICV.d	CA MG NA
ICB	1	08-Jan-2019 11:30	021_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	08-Jan-2019 11:40	023ICSA.d	CA MG NA
ICSAB	1	08-Jan-2019 11:42	024ICSB.d	CA MG NA
CCV 1	1	08-Jan-2019 12:11	036_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	08-Jan-2019 12:13	037_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	08-Jan-2019 12:42	048_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	08-Jan-2019 12:44	049_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-136175	1	08-Jan-2019 13:05	055SMPL.d	NA
2018-12-17-DGW-MW11-T0-30-35-40-D	50	08-Jan-2019 13:07	056SMPL.d	CA MG NA
2018-12-17-DGW-MW11-T0-30-35-40-DSD	250	08-Jan-2019 13:10	057SMPL.d	CA MG NA
2018-12-17-DGW-MW11-T0-30-35-40-DPDS	50	08-Jan-2019 13:12	058SMPL.d	CA MG NA
2018-12-17-DGW-MW11-T0-Control-D	20	08-Jan-2019 13:14	059SMPL.d	CA MG NA
CCV 3	1	08-Jan-2019 13:16	060_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	08-Jan-2019 13:19	061_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	08-Jan-2019 13:51	072_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	08-Jan-2019 13:53	073_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	08-Jan-2019 14:24	082_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	08-Jan-2019 14:26	083_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	08-Jan-2019 14:55	093_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	08-Jan-2019 14:58	094_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	08-Jan-2019 15:13	100_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	08-Jan-2019 15:15	101_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 8	1	08-Jan-2019 15:48	112_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	08-Jan-2019 15:50	113_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	08-Jan-2019 16:21	124_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	08-Jan-2019 16:23	125_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 10	1	08-Jan-2019 16:57	131_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	08-Jan-2019 17:00	132_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 11	1	08-Jan-2019 17:38	142_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	08-Jan-2019 17:40	143_CCB.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121345

Run ID:ICPMS04_330630
Instrument:ICPMS04
Method:SW6020

ICB	Date: 08-Jan-2019 11:30	Seq: 4898910		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		-51.17	14	200	
CCB 1	Date: 08-Jan-2019 12:13	Seq: 4898966		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		106.5	14	200	
CCB 2	Date: 08-Jan-2019 12:44	Seq: 4899101		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		57.76	14	200	
CCB 3	Date: 08-Jan-2019 13:19	Seq: 4899143		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		85.27	14	200	
CCB 4	Date: 08-Jan-2019 13:53	Seq: 4899209		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		78.87	14	200	
CCB 5	Date: 08-Jan-2019 14:26	Seq: 4899338		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		46.04	14	200	
CCB 6	Date: 08-Jan-2019 14:58	Seq: 4899477		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		53.91	14	200	
CCB 7	Date: 08-Jan-2019 15:15	Seq: 4899486		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		66.89	14	200	
CCB 8	Date: 08-Jan-2019 15:50	Seq: 4899649		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		96.21	14	200	
CCB 9	Date: 08-Jan-2019 16:23	Seq: 4899722		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		290	14	200	
CCB 10	Date: 08-Jan-2019 17:00	Seq: 4899818		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		352.1	14	200	
CCB 11	Date: 08-Jan-2019 17:40	Seq: 4899849		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		426.7	14	200	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121345
Start Date: 03-Jan-2019 End Date: 03-Jan-2019

Run ID:ICPMS05_330405
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	03-Jan-2019 12:23	023_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV5	1	03-Jan-2019 12:25	024LICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	03-Jan-2019 12:27	025SMPL.d	AS CA CD FE K MG NA PB SB SE
ICB	1	03-Jan-2019 12:29	026_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	03-Jan-2019 12:37	028ICSA.d	AS CA CD FE K MG NA PB SB SE
ICSAB	1	03-Jan-2019 12:40	029ICSB.d	AS CA CD FE K MG NA PB SB SE
CCV 1	1	03-Jan-2019 13:07	038_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	03-Jan-2019 13:09	039_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	03-Jan-2019 13:30	047_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	03-Jan-2019 13:32	048_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-136084	1	03-Jan-2019 13:41	050SMPL.d	AS CA CD FE K MG NA PB SB SE
LCS-136084	1	03-Jan-2019 13:43	051SMPL.d	AS CA CD FE K MG NA PB SB SE
2018-12-17-DGW-MW11-T0-30-35-40-T	50	03-Jan-2019 13:44	052SMPL.d	CA MG NA
2018-12-17-DGW-MW11-T0-30-35-40-TSD	250	03-Jan-2019 13:47	053SMPL.d	CA K MG NA
2018-12-17-DGW-MW11-T0-30-35-40-TPDS	50	03-Jan-2019 13:49	054SMPL.d	CA K MG NA
CCV 3	1	03-Jan-2019 13:59	059_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	03-Jan-2019 14:01	060_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	03-Jan-2019 14:25	070_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	03-Jan-2019 14:27	071_CCB.d	AS CA CD FE K MG NA PB SB SE
2018-12-17-DGW-MW11-T0-30-35-40-T	5	03-Jan-2019 14:49	073SMPL.d	AS CD FE K PB SB SE
2018-12-17-DGW-MW11-T0-30-35-40-TSD	25	03-Jan-2019 14:51	074SMPL.d	AS CD FE PB SB SE
2018-12-17-DGW-MW11-T0-30-35-40-TMS	5	03-Jan-2019 14:53	075SMPL.d	AS CA CD FE K MG NA PB SB SE
2018-12-17-DGW-MW11-T0-30-35-40-TMSD	5	03-Jan-2019 14:55	076SMPL.d	AS CA CD FE K MG NA PB SB SE
2018-12-17-DGW-MW11-T0-30-35-40-TPDS	5	03-Jan-2019 14:57	077SMPL.d	AS CD FE PB SB SE
CCV 5	1	03-Jan-2019 15:07	082_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	03-Jan-2019 15:09	083_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	03-Jan-2019 15:35	094_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	03-Jan-2019 15:37	095_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	03-Jan-2019 16:55	104_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	03-Jan-2019 16:57	105_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 8	1	03-Jan-2019 17:29	116_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	03-Jan-2019 17:31	117_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	03-Jan-2019 17:53	128_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	03-Jan-2019 17:55	129_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 10	1	03-Jan-2019 18:51	144_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV5	1	03-Jan-2019 18:53	145LICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	03-Jan-2019 18:55	146SMPL.d	AS CA CD FE K MG NA PB SB SE
ICCB 10	1	03-Jan-2019 18:57	147_ICB.d	AS CA CD FE K MG NA PB SB SE
CCV 11	1	03-Jan-2019 19:14	156_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	03-Jan-2019 19:16	157_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 12	1	03-Jan-2019 19:38	168_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 12	1	03-Jan-2019 19:40	169_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 13	1	03-Jan-2019 20:02	180_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 13	1	03-Jan-2019 20:04	181_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 14	1	03-Jan-2019 20:24	191_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 14	1	03-Jan-2019 20:26	192_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 15	1	03-Jan-2019 20:42	200_CCV.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121345

Run ID:ICPMS05_330405
Instrument:ICPMS05
Method:SW6020

ICB	Date: 03-Jan-2019 12:29	Seq: 4892566	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Cadmium	0.441	0.2	2	
Calcium	49.8	34	500	
Iron	56.99	12	200	
Magnesium	59.59	10	200	
Potassium	51.41	18	200	
Sodium	48.7	14	200	
CCB 5	Date: 03-Jan-2019 15:09	Seq: 4893055	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	39.52	14	200	
CCB 6	Date: 03-Jan-2019 15:37	Seq: 4893095	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	28.73	18	200	
Sodium	59.59	14	200	
CCB 7	Date: 03-Jan-2019 16:57	Seq: 4893397	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	24.89	14	200	
CCB 9	Date: 03-Jan-2019 17:55	Seq: 4893516	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	60.59	14	200	
ICCB 10	Date: 03-Jan-2019 18:57	Seq: 4893662	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Cadmium	0.553	0.2	2	
Calcium	57.43	34	500	
Iron	54.74	12	200	
Magnesium	58.48	10	200	
Potassium	44.76	18	200	
Sodium	43.68	14	200	
CCB 11	Date: 03-Jan-2019 19:16	Seq: 4893672	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.498	0.4	2	
Sodium	20.34	14	200	
CCB 12	Date: 03-Jan-2019 19:40	Seq: 4893684	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	20.45	14	200	
CCB 13	Date: 03-Jan-2019 20:04	Seq: 4893696	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	122.7	14	200	
CCB 14	Date: 03-Jan-2019 20:26	Seq: 4893707	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	18.41	18	200	
Sodium	94.7	14	200	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121345
Start Date: 07-Jan-2019 End Date: 07-Jan-2019

Run ID:ICPMS05_330560
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
LLICV5	1	07-Jan-2019 13:21	020LICV.d	CA MG NA
LLICV2	1	07-Jan-2019 13:23	021SMPL.d	CA MG NA
ICB	1	07-Jan-2019 13:25	022_ICB.d	AS CA CD FE K MG NA PB SB SE
ICV	1	07-Jan-2019 13:31	024_ICV.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	07-Jan-2019 13:53	026ICSA.d	CA MG NA
ICSAB	1	07-Jan-2019 13:55	027ICSB.d	CA MG NA
CCV 1	1	07-Jan-2019 14:25	038_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	07-Jan-2019 14:27	039_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-136086	1	07-Jan-2019 14:29	040SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZSD	250	07-Jan-2019 14:33	042SMPL.d	CA
ZZZZZZPDS	50	07-Jan-2019 14:35	043SMPL.d	CA
2018-12-17-DGW-MW11-T0-Control-T	100	07-Jan-2019 14:37	044SMPL.d	CA MG NA
CCV 2	1	07-Jan-2019 14:49	050_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	07-Jan-2019 14:51	051_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	07-Jan-2019 15:13	062_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	07-Jan-2019 15:15	063_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	07-Jan-2019 15:52	074_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	07-Jan-2019 15:54	075_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	07-Jan-2019 16:16	086_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	07-Jan-2019 16:18	087_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	07-Jan-2019 16:45	098_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	07-Jan-2019 17:02	102_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	07-Jan-2019 17:29	111_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	07-Jan-2019 17:31	112_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 8	1	07-Jan-2019 17:41	117_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	07-Jan-2019 17:43	118_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	07-Jan-2019 18:11	129_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	07-Jan-2019 18:13	130_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	07-Jan-2019 18:39	140_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 10	1	07-Jan-2019 18:47	142_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 11	1	07-Jan-2019 18:59	148_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	07-Jan-2019 19:01	149_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 12	1	07-Jan-2019 19:17	152_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 12	1	07-Jan-2019 19:19	153_CCB.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121345

Run ID:ICPMS05_330560
Instrument:ICPMS05
Method:SW6020

CCB 1	Date: 07-Jan-2019 14:27	Seq: 4897324	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.845	0.4	2	
Calcium	79.08	34	500	

CCB 2	Date: 07-Jan-2019 14:51	Seq: 4897409	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.736	0.4	2	
Calcium	36.41	34	500	
Potassium	37.11	18	200	

CCB 3	Date: 07-Jan-2019 15:15	Seq: 4897473	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.69	0.4	2	
Potassium	48.26	18	200	

CCB 4	Date: 07-Jan-2019 15:54	Seq: 4897522	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.64	0.4	2	
Calcium	64.84	34	500	
Magnesium	19.39	10	200	
Potassium	35.19	18	200	
Sodium	44.86	14	200	

CCB 5	Date: 07-Jan-2019 16:18	Seq: 4897984	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.712	0.4	2	
Magnesium	11.82	10	200	
Potassium	31.5	18	200	
Selenium	1.272	1.1	2	
Sodium	45.74	14	200	

CCB 6	Date: 07-Jan-2019 17:02	Seq: 4897999	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	232.3	14	200	

CCB 7	Date: 07-Jan-2019 17:31	Seq: 4898009	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.415	0.4	2	
Selenium	1.112	1.1	2	
Sodium	291.3	14	200	

CCB 8	Date: 07-Jan-2019 17:43	Seq: 4898015	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.426	0.4	2	
Selenium	1.325	1.1	2	
Sodium	196.2	14	200	

CCB 9	Date: 07-Jan-2019 18:13	Seq: 4898117	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.567	0.4	2	
Sodium	136.9	14	200	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS18121345

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18121345-01	2018-12-17-DGW-MW11-T0-30-35-40-D	Groundwater		17-Dec-2018 12:45	24-Dec-2018 08:29	☐
HS18121345-02	2018-12-17-DGW-MW11-T0-30-35-40-T	Groundwater		17-Dec-2018 12:45	24-Dec-2018 08:29	☐
HS18121345-03	2018-12-17-DGW-MW11-T0-Control-D	Groundwater		17-Dec-2018 12:45	24-Dec-2018 08:29	☐
HS18121345-04	2018-12-17-DGW-MW11-T0-Control-T	Groundwater		17-Dec-2018 12:45	24-Dec-2018 08:29	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 2018-12-17-DGW-MW11-T0-30-35-40-D
Collection Date: 17-Dec-2018 12:45

ANALYTICAL REPORT
WorkOrder:HS18121345
Lab ID:HS18121345-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 31-Dec-2018		Analyst: JCJ
Antimony	**0.00132**	J	**0.000400**	**0.00200**	**mg/L**	1	07-Jan-2019 13:03
Arsenic	**0.000450**	J	**0.000400**	**0.00200**	**mg/L**	1	07-Jan-2019 13:03
Cadmium	**0.0110**		**0.000200**	**0.00200**	**mg/L**	1	07-Jan-2019 13:03
Calcium	**491**		**1.70**	**25.0**	**mg/L**	50	08-Jan-2019 13:07
Iron	**17.9**		**0.0120**	**0.200**	**mg/L**	1	07-Jan-2019 13:03
Lead	**0.00190**	J	**0.000600**	**0.00200**	**mg/L**	1	07-Jan-2019 13:03
Magnesium	**342**		**0.500**	**10.0**	**mg/L**	50	08-Jan-2019 13:07
Potassium	**21.2**		**0.0180**	**0.200**	**mg/L**	1	07-Jan-2019 13:03
Selenium	**0.00111**	J	**0.00110**	**0.00200**	**mg/L**	1	07-Jan-2019 13:03
Sodium	**1,640**		**0.700**	**10.0**	**mg/L**	50	08-Jan-2019 13:07

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 2018-12-17-DGW-MW11-T0-30-35-40-T
Collection Date: 17-Dec-2018 12:45

ANALYTICAL REPORT
WorkOrder:HS18121345
Lab ID:HS18121345-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**2,510**		**2.00**	**2.00**	**mg/L**	1	08-Jan-2019 15:22
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 27-Dec-2018		Analyst: ALR
Antimony	U		0.00200	0.0100	mg/L	5	03-Jan-2019 14:49
Arsenic	U		0.00200	0.0100	mg/L	5	03-Jan-2019 14:49
Cadmium	**0.0107**		**0.00100**	**0.0100**	**mg/L**	5	03-Jan-2019 14:49
Calcium	**487**		**1.70**	**25.0**	**mg/L**	50	03-Jan-2019 13:44
Iron	**21.1**		**0.0600**	**1.00**	**mg/L**	5	03-Jan-2019 14:49
Lead	**0.0362**		**0.00300**	**0.0100**	**mg/L**	5	03-Jan-2019 14:49
Magnesium	**315**		**0.500**	**10.0**	**mg/L**	50	03-Jan-2019 13:44
Potassium	**21.9**		**0.0900**	**1.00**	**mg/L**	5	03-Jan-2019 14:49
Selenium	U		0.00550	0.0100	mg/L	5	03-Jan-2019 14:49
Sodium	**1,570**		**0.700**	**10.0**	**mg/L**	50	03-Jan-2019 13:44

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 2018-12-17-DGW-MW11-T0-Control-D
Collection Date: 17-Dec-2018 12:45

ANALYTICAL REPORT
WorkOrder:HS18121345
Lab ID:HS18121345-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 31-Dec-2018		Analyst: JCJ
Antimony	**0.00261**		**0.000400**	**0.00200**	**mg/L**	1	07-Jan-2019 13:16
Arsenic	**0.000482**	J	**0.000400**	**0.00200**	**mg/L**	1	07-Jan-2019 13:16
Cadmium	**0.00947**		**0.000200**	**0.00200**	**mg/L**	1	07-Jan-2019 13:16
Calcium	**430**		**0.680**	**10.0**	**mg/L**	20	08-Jan-2019 13:14
Iron	**33.3**		**0.0120**	**0.200**	**mg/L**	1	07-Jan-2019 13:16
Lead	**0.00444**		**0.000600**	**0.00200**	**mg/L**	1	07-Jan-2019 13:16
Magnesium	**302**		**0.200**	**4.00**	**mg/L**	20	08-Jan-2019 13:14
Potassium	**19.4**		**0.0180**	**0.200**	**mg/L**	1	07-Jan-2019 13:16
Selenium	**0.00235**		**0.00110**	**0.00200**	**mg/L**	1	07-Jan-2019 13:16
Sodium	**1,440**		**0.280**	**4.00**	**mg/L**	20	08-Jan-2019 13:14

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 2018-12-17-DGW-MW11-T0-Control-T
Collection Date: 17-Dec-2018 12:45

ANALYTICAL REPORT
WorkOrder:HS18121345
Lab ID:HS18121345-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**2,730**		**2.00**	**2.00**	**mg/L**	1	08-Jan-2019 15:22
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 27-Dec-2018		Analyst: ALR
Antimony	**0.000897**	J	**0.000400**	**0.00200**	**mg/L**	1	04-Jan-2019 23:19
Arsenic	**0.00169**	J	**0.000400**	**0.00200**	**mg/L**	1	04-Jan-2019 23:19
Cadmium	**0.00929**		**0.000200**	**0.00200**	**mg/L**	1	04-Jan-2019 23:19
Calcium	**529**		**3.40**	**50.0**	**mg/L**	100	07-Jan-2019 14:37
Iron	**38.0**		**0.0120**	**0.200**	**mg/L**	1	04-Jan-2019 23:19
Lead	**0.0266**		**0.000600**	**0.00200**	**mg/L**	1	04-Jan-2019 23:19
Magnesium	**341**		**1.00**	**20.0**	**mg/L**	100	07-Jan-2019 14:37
Potassium	**21.1**		**0.0180**	**0.200**	**mg/L**	1	04-Jan-2019 23:19
Selenium	**0.00300**		**0.00110**	**0.00200**	**mg/L**	1	04-Jan-2019 23:19
Sodium	**1,720**		**1.40**	**20.0**	**mg/L**	100	07-Jan-2019 14:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121345

Batch ID: 136084 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18121345-02	1	10	10 (mL)	1

Batch ID: 136086 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18121345-04	1	10	10 (mL)	1

Batch ID: 136175 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18121345-01	1	10	10 (mL)	1
HS18121345-03	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121345

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 136084	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS18121345-02	2018-12-17-DGW-MW11-T0-30-35-40-T	17 Dec 2018 12:45		27 Dec 2018 14:00	03 Jan 2019 14:49	5
HS18121345-02	2018-12-17-DGW-MW11-T0-30-35-40-T	17 Dec 2018 12:45		27 Dec 2018 14:00	03 Jan 2019 13:44	50
Batch ID 136086	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS18121345-04	2018-12-17-DGW-MW11-T0-Control-T	17 Dec 2018 12:45		27 Dec 2018 10:30	07 Jan 2019 14:37	100
HS18121345-04	2018-12-17-DGW-MW11-T0-Control-T	17 Dec 2018 12:45		27 Dec 2018 10:30	04 Jan 2019 23:19	1
Batch ID 136175	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS18121345-01	2018-12-17-DGW-MW11-T0-30-35-40-D	17 Dec 2018 12:45		31 Dec 2018 10:00	08 Jan 2019 13:07	50
HS18121345-01	2018-12-17-DGW-MW11-T0-30-35-40-D	17 Dec 2018 12:45		31 Dec 2018 10:00	07 Jan 2019 13:03	1
HS18121345-03	2018-12-17-DGW-MW11-T0-Control-D	17 Dec 2018 12:45		31 Dec 2018 10:00	08 Jan 2019 13:14	20
HS18121345-03	2018-12-17-DGW-MW11-T0-Control-D	17 Dec 2018 12:45		31 Dec 2018 10:00	07 Jan 2019 13:16	1
Batch ID R330657	**Test Name :** HARDNESS, TOTAL AS CACO3 BY SM2340B			**Matrix:** Groundwater		
HS18121345-02	2018-12-17-DGW-MW11-T0-30-35-40-T	17 Dec 2018 12:45			08 Jan 2019 15:22	1
HS18121345-04	2018-12-17-DGW-MW11-T0-Control-T	17 Dec 2018 12:45			08 Jan 2019 15:22	1

WorkOrder: HS18121345
InstrumentID: ICPMS04
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.00100	0.00135	0.000400	0.00200
A	Arsenic	7440-38-2	0.00100	0.000732	0.000400	0.00200
A	Cadmium	7440-43-9	0.00100	0.00101	0.000200	0.00200
A	Calcium	7440-70-2	0.100	0.0776	0.0340	0.500
A	Iron	7439-89-6	0.100	0.0850	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000864	0.000600	0.00200
A	Magnesium	7439-95-4	0.100	0.107	0.0100	0.200
A	Potassium	7440-09-7	0.100	0.0562	0.0180	0.200
A	Selenium	7782-49-2	0.00200	0.00213	0.00110	0.00200
A	Sodium	7440-23-5	0.100	0.102	0.0140	0.200

WorkOrder: HS18121345
InstrumentID: ICPMS05
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.00100	0.000983	0.000400	0.00200
A	Arsenic	7440-38-2	0.00100	0.000927	0.000400	0.00200
A	Cadmium	7440-43-9	0.00100	0.00101	0.000200	0.00200
A	Calcium	7440-70-2	0.100	0.125	0.0340	0.500
A	Iron	7439-89-6	0.100	0.122	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.00100	0.000600	0.00200
A	Magnesium	7439-95-4	0.100	0.116	0.0100	0.200
A	Potassium	7440-09-7	0.100	0.0991	0.0180	0.200
A	Selenium	7782-49-2	0.00100	0.000902	0.00110	0.00200
A	Sodium	7440-23-5	0.100	0.0985	0.0140	0.200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121345

QC BATCH REPORT

Batch ID: 136084 **Instrument: ICPMS05** **Method: SW6020**

MBLK Sample ID: **MBLK-136084** Units: **mg/L** Analysis Date: **03-Jan-2019 13:41**
Client ID: Run ID: **ICPMS05_330405** SeqNo: **4892857** PrepDate: **27-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01242	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	U	0.200								

LCS Sample ID: **LCS-136084** Units: **mg/L** Analysis Date: **03-Jan-2019 13:43**
Client ID: Run ID: **ICPMS05_330405** SeqNo: **4892858** PrepDate: **27-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04861	0.00200	0.05	0	97.2	80 - 120				
Arsenic	0.04885	0.00200	0.05	0	97.7	80 - 120				
Cadmium	0.04979	0.00200	0.05	0	99.6	80 - 120				
Calcium	4.951	0.500	5	0	99.0	80 - 120				
Iron	5.116	0.200	5	0	102	80 - 120				
Lead	0.05173	0.00200	0.05	0	103	80 - 120				
Magnesium	5.188	0.200	5	0	104	80 - 120				
Potassium	5.067	0.200	5	0	101	80 - 120				
Selenium	0.04849	0.00200	0.05	0	97.0	80 - 120				
Sodium	5.312	0.200	5	0	106	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121345

QC BATCH REPORT

Batch ID: 136084 **Instrument: ICPMS05** **Method: SW6020**

MS Sample ID: **HS18121345-02MS** Units: **mg/L** Analysis Date: **03-Jan-2019 14:53**
Client ID: **2018-12-17-DGW-MW11-T0-30-35-40-T** Run ID: **ICPMS05_330405** SeqNo: **4893047** PrepDate: **27-Dec-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05068	0.0100	0.05	0.001304	98.7	80 - 120				
Arsenic	0.04961	0.0100	0.05	0.000567	98.1	80 - 120				
Cadmium	0.06376	0.0100	0.05	0.01066	106	80 - 120				
Calcium	482.2	2.50	5	486.8	-92.0	80 - 120				SO
Iron	26.51	1.00	5	21.13	107	80 - 120				O
Lead	0.08532	0.0100	0.05	0.03622	98.2	80 - 120				
Magnesium	314.7	1.00	5	305.3	188	80 - 120				SO
Potassium	26.76	1.00	5	21.86	98.0	80 - 120				O
Selenium	0.04984	0.0100	0.05	-0.000961	102	80 - 120				
Sodium	1590	1.00	5	1553	746	80 - 120				SEO

MSD Sample ID: **HS18121345-02MSD** Units: **mg/L** Analysis Date: **03-Jan-2019 14:55**
Client ID: **2018-12-17-DGW-MW11-T0-30-35-40-T** Run ID: **ICPMS05_330405** SeqNo: **4893048** PrepDate: **27-Dec-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.0496	0.0100	0.05	0.001304	96.6	80 - 120	0.05068	2.15	20	
Arsenic	0.05003	0.0100	0.05	0.000567	98.9	80 - 120	0.04961	0.847	20	
Cadmium	0.06188	0.0100	0.05	0.01066	102	80 - 120	0.06376	2.99	20	
Calcium	498.5	2.50	5	486.8	234	80 - 120	482.2	3.33	20	SO
Iron	27.13	1.00	5	21.13	120	80 - 120	26.51	2.33	20	O
Lead	0.08692	0.0100	0.05	0.03622	101	80 - 120	0.08532	1.85	20	
Magnesium	320.9	1.00	5	305.3	312	80 - 120	314.7	1.95	20	SO
Potassium	27.18	1.00	5	21.86	106	80 - 120	26.76	1.54	20	O
Selenium	0.0508	0.0100	0.05	-0.000961	104	80 - 120	0.04984	1.91	20	
Sodium	1633	1.00	5	1553	1600	80 - 120	1590	2.65	20	SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121345

QC BATCH REPORT

Batch ID: 136084 **Instrument: ICPMS05** **Method: SW6020**

PDS Sample ID: **HS18121345-02PDS** Units: **mg/L** Analysis Date: **03-Jan-2019 14:57**
Client ID: **2018-12-17-DGW-MW11-T0-30-35-40-T** Run ID: **ICPMS05_330405** SeqNo: **4893049** PrepDate: **27-Dec-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.4685	0.0100	0.5	0	93.7	75 - 125				
Arsenic	0.5028	0.0100	0.5	0	101	75 - 125				
Cadmium	0.5169	0.0100	0.5	0.01066	101	75 - 125				
Iron	73.12	1.00	50	21.13	104	75 - 125				
Lead	0.5209	0.0100	0.5	0.03622	96.9	75 - 125				
Selenium	0.4924	0.0100	0.5	0	98.5	75 - 125				

PDS Sample ID: **HS18121345-02PDS** Units: **mg/L** Analysis Date: **03-Jan-2019 13:49**
Client ID: **2018-12-17-DGW-MW11-T0-30-35-40-T** Run ID: **ICPMS05_330405** SeqNo: **4892861** PrepDate: **27-Dec-2018** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	962.4	25.0	500	487.1	95.1	75 - 125				
Magnesium	810.1	10.0	500	315.5	98.9	75 - 125				
Potassium	531.5	10.0	500	23.21	102	75 - 125				
Sodium	2075	10.0	500	1575	100	75 - 125				

SD Sample ID: **HS18121345-02SD** Units: **mg/L** Analysis Date: **03-Jan-2019 14:51**
Client ID: **2018-12-17-DGW-MW11-T0-30-35-40-T** Run ID: **ICPMS05_330405** SeqNo: **4893046** PrepDate: **27-Dec-2018** DF: **25**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0500					0.001304	0	10	
Arsenic	U	0.0500					0.000567	0	10	
Cadmium	0.01	0.0500					0.01066	0	10	J
Iron	21.57	5.00					21.13	2.07	10	
Lead	0.03984	0.0500					0.03622	0	10	J
Selenium	U	0.0500					-0.000961	0	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121345

QC BATCH REPORT

Batch ID: 136084 **Instrument:** ICPMS05 **Method:** SW6020

SD Sample ID: **HS18121345-02SD** Units: **mg/L** Analysis Date: **03-Jan-2019 13:47**
Client ID: **2018-12-17-DGW-MW11-T0-30-35-40-T** Run ID: **ICPMS05_330405** SeqNo: **4892860** PrepDate: **27-Dec-2018** DF: **250**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	480.1	125					487.1	1.44	10	
Magnesium	327.4	50.0					315.5	3.78	10	
Potassium	24.94	50.0					23.21	0	10	J
Sodium	1662	50.0					1575	5.54	10	

The following samples were analyzed in this batch: HS18121345-02

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121345

QC BATCH REPORT

Batch ID: 136086 **Instrument: ICPMS05** **Method: SW6020**

MBLK Sample ID: **MBLK-136086** Units: **mg/L** Analysis Date: **07-Jan-2019 14:29**
Client ID: Run ID: **ICPMS05_330560** SeqNo: **4897394** PrepDate: **27-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01248	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	U	0.200								

LCS Sample ID: **LCS-136086** Units: **mg/L** Analysis Date: **04-Jan-2019 23:03**
Client ID: Run ID: **ICPMS05_330462** SeqNo: **4896510** PrepDate: **27-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04675	0.00200	0.05	0	93.5	80 - 120				
Arsenic	0.04754	0.00200	0.05	0	95.1	80 - 120				
Cadmium	0.04799	0.00200	0.05	0	96.0	80 - 120				
Calcium	5.048	0.500	5	0	101	80 - 120				
Iron	4.994	0.200	5	0	99.9	80 - 120				
Lead	0.04437	0.00200	0.05	0	88.7	80 - 120				
Magnesium	5.078	0.200	5	0	102	80 - 120				
Potassium	4.931	0.200	5	0	98.6	80 - 120				
Selenium	0.04753	0.00200	0.05	0	95.1	80 - 120				
Sodium	5.129	0.200	5	0	103	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121345

QC BATCH REPORT

Batch ID: 136086 **Instrument: ICPMS05** **Method: SW6020**

MS Sample ID: **HS18120928-07MS** Units: **mg/L** Analysis Date: **04-Jan-2019 23:09**
Client ID: Run ID: **ICPMS05_330462** SeqNo: **4896513** PrepDate: **27-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04558	0.00200	0.05	0.000151	90.9	80 - 120				
Arsenic	0.05182	0.00200	0.05	0.004084	95.5	80 - 120				
Cadmium	0.04849	0.00200	0.05	0.000535	95.9	80 - 120				
Calcium	318.4	0.500	5	315.4	59.8	80 - 120				SEO
Iron	7.913	0.200	5	2.91	100	80 - 120				
Lead	0.04434	0.00200	0.05	0.001336	86.0	80 - 120				
Magnesium	122.3	0.200	5	118.1	83.8	80 - 120				O
Potassium	7.648	0.200	5	2.562	102	80 - 120				
Selenium	0.0471	0.00200	0.05	0.000379	93.4	80 - 120				
Sodium	53.55	0.200	5	49.32	84.6	80 - 120				O

MSD Sample ID: **HS18120928-07MSD** Units: **mg/L** Analysis Date: **04-Jan-2019 23:11**
Client ID: Run ID: **ICPMS05_330462** SeqNo: **4896514** PrepDate: **27-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.0468	0.00200	0.05	0.000151	93.3	80 - 120	0.04558	2.64	20	
Arsenic	0.05151	0.00200	0.05	0.004084	94.9	80 - 120	0.05182	0.586	20	
Cadmium	0.04817	0.00200	0.05	0.000535	95.3	80 - 120	0.04849	0.656	20	
Calcium	313.5	0.500	5	315.4	-37.8	80 - 120	318.4	1.54	20	SEO
Iron	8.243	0.200	5	2.91	107	80 - 120	7.913	4.09	20	
Lead	0.03896	0.00200	0.05	0.001336	75.2	80 - 120	0.04434	12.9	20	S
Magnesium	123.6	0.200	5	118.1	110	80 - 120	122.3	1.07	20	O
Potassium	7.683	0.200	5	2.562	102	80 - 120	7.648	0.464	20	
Selenium	0.04635	0.00200	0.05	0.000379	91.9	80 - 120	0.0471	1.61	20	
Sodium	53.42	0.200	5	49.32	81.9	80 - 120	53.55	0.249	20	O

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121345

QC BATCH REPORT

Batch ID: 136086 **Instrument: ICPMS05** **Method: SW6020**

PDS Sample ID: **HS18120928-07PDS** Units: **mg/L** Analysis Date: **04-Jan-2019 23:13**
Client ID: Run ID: **ICPMS05_330462** SeqNo: **4896515** PrepDate: **27-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.08679	0.00200	0.1	0.000151	86.6	75 - 125				
Arsenic	0.09971	0.00200	0.1	0.004084	95.6	75 - 125				
Cadmium	0.09607	0.00200	0.1	0.000535	95.5	75 - 125				
Iron	12.33	0.200	10	2.91	94.2	75 - 125				
Lead	0.07942	0.00200	0.1	0.001336	78.1	75 - 125				
Magnesium	125.7	0.200	10	118.1	76.7	75 - 125				O
Potassium	12.42	0.200	10	2.562	98.5	75 - 125				
Selenium	0.09367	0.00200	0.1	0.000379	93.3	75 - 125				
Sodium	57.21	0.200	10	49.32	78.9	75 - 125				O

PDS Sample ID: **HS18120928-07PDS** Units: **mg/L** Analysis Date: **07-Jan-2019 14:35**
Client ID: Run ID: **ICPMS05_330560** SeqNo: **4897397** PrepDate: **27-Dec-2018** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	883.5	25.0	500	358.9	105	75 - 125				

SD Sample ID: **HS18120928-07SD** Units: **mg/L** Analysis Date: **04-Jan-2019 23:07**
Client ID: Run ID: **ICPMS05_330462** SeqNo: **4896512** PrepDate: **27-Dec-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000151	0	10	
Arsenic	0.004091	0.0100					0.004084	0	10	J
Cadmium	U	0.0100					0.000535	0	10	
Iron	2.848	1.00					2.91	2.12	10	
Lead	U	0.0100					0.001336	0	10	
Magnesium	122	1.00					118.1	3.28	10	
Potassium	2.632	1.00					2.562	2.72	10	
Selenium	U	0.0100					0.000379	0	10	
Sodium	50.1	1.00					49.32	1.59	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121345

QC BATCH REPORT

Batch ID: 136086 **Instrument: ICPMS05** **Method: SW6020**

SD Sample ID: **HS18120928-07SD** Units: **mg/L** Analysis Date: **07-Jan-2019 14:33**
Client ID: Run ID: **ICPMS05_330560** SeqNo: **4897396** PrepDate: **27-Dec-2018** DF: **250**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	366.4	125					358.9	2.08	10	

The following samples were analyzed in this batch: HS18121345-04

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121345

QC BATCH REPORT

Batch ID: 136175 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLK-136175** Units: **mg/L** Analysis Date: **07-Jan-2019 12:59**
Client ID: Run ID: **ICPMS04_330548** SeqNo: **4896999** PrepDate: **31-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	U	0.200								
Potassium	U	0.200								
Selenium	U	0.00200								

MBLK Sample ID: **MBLK-136175** Units: **mg/L** Analysis Date: **08-Jan-2019 13:05**
Client ID: Run ID: **ICPMS04_330630** SeqNo: **4899137** PrepDate: **31-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	U	0.200								

LCS Sample ID: **LCS-136175** Units: **mg/L** Analysis Date: **07-Jan-2019 13:01**
Client ID: Run ID: **ICPMS04_330548** SeqNo: **4897000** PrepDate: **31-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04804	0.00200	0.05	0	96.1	80 - 120				
Arsenic	0.04866	0.00200	0.05	0	97.3	80 - 120				
Cadmium	0.04747	0.00200	0.05	0	94.9	80 - 120				
Calcium	4.821	0.500	5	0	96.4	80 - 120				
Iron	4.97	0.200	5	0	99.4	80 - 120				
Lead	0.04803	0.00200	0.05	0	96.1	80 - 120				
Magnesium	5.061	0.200	5	0	101	80 - 120				
Potassium	5.086	0.200	5	0	102	80 - 120				
Selenium	0.04802	0.00200	0.05	0	96.0	80 - 120				
Sodium	4.906	0.200	5	0	98.1	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121345

QC BATCH REPORT

Batch ID: 136175 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

MS Sample ID: **HS18121345-01MS** Units: **mg/L** Analysis Date: **07-Jan-2019 13:08**
Client ID: **2018-12-17-DGW-MW11-T0-30-35-40-D** Run ID: **ICPMS04_330548** SeqNo: **4897003** PrepDate: **31-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05074	0.00200	0.05	0.001325	98.8	75 - 125				
Arsenic	0.0489	0.00200	0.05	0.00045	96.9	75 - 125				
Cadmium	0.05972	0.00200	0.05	0.01098	97.5	75 - 125				
Calcium	447.7	0.500	5	463.9	-325	75 - 125				SEO
Iron	23.03	0.200	5	17.9	103	75 - 125				
Lead	0.05057	0.00200	0.05	0.001899	97.4	75 - 125				
Magnesium	289.2	0.200	5	302.2	-260	75 - 125				SEO
Potassium	25.03	0.200	5	21.23	76.1	75 - 125				O
Selenium	0.04778	0.00200	0.05	0.00111	93.3	75 - 125				
Sodium	1455	0.200	5	1503	-968	75 - 125				SEO

MSD Sample ID: **HS18121345-01MSD** Units: **mg/L** Analysis Date: **07-Jan-2019 13:11**
Client ID: **2018-12-17-DGW-MW11-T0-30-35-40-D** Run ID: **ICPMS04_330548** SeqNo: **4897004** PrepDate: **31-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.051	0.00200	0.05	0.001325	99.4	75 - 125	0.05074	0.523	20	
Arsenic	0.04825	0.00200	0.05	0.00045	95.6	75 - 125	0.0489	1.35	20	
Cadmium	0.06114	0.00200	0.05	0.01098	100	75 - 125	0.05972	2.35	20	
Calcium	431.2	0.500	5	463.9	-654	75 - 125	447.7	3.75	20	SEO
Iron	22.35	0.200	5	17.9	89.1	75 - 125	23.03	3	20	
Lead	0.05064	0.00200	0.05	0.001899	97.5	75 - 125	0.05057	0.13	20	
Magnesium	289.7	0.200	5	302.2	-249	75 - 125	289.2	0.182	20	SEO
Potassium	23.96	0.200	5	21.23	54.6	75 - 125	25.03	4.39	20	SO
Selenium	0.04815	0.00200	0.05	0.00111	94.1	75 - 125	0.04778	0.765	20	
Sodium	1460	0.200	5	1503	-864	75 - 125	1455	0.357	20	SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121345

QC BATCH REPORT

Batch ID: 136175 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

PDS Sample ID: **HS18121345-01PDS** Units: **mg/L** Analysis Date: **07-Jan-2019 13:14**
Client ID: **2018-12-17-DGW-MW11-T0-30-35-40-D** Run ID: **ICPMS04_330548** SeqNo: **4897005** PrepDate: **31-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09384	0.00200	0.1	0.001325	92.5	75 - 125				
Arsenic	0.09286	0.00200	0.1	0.00045	92.4	75 - 125				
Cadmium	0.105	0.00200	0.1	0.01098	94.0	75 - 125				
Iron	27.64	0.200	10	17.9	97.4	75 - 125				
Lead	0.1003	0.00200	0.1	0.001899	98.4	75 - 125				
Potassium	27.29	0.200	10	21.23	60.7	75 - 125				S
Selenium	0.09637	0.00200	0.1	0.00111	95.3	75 - 125				

PDS Sample ID: **HS18121345-01PDS** Units: **mg/L** Analysis Date: **08-Jan-2019 13:12**
Client ID: **2018-12-17-DGW-MW11-T0-30-35-40-D** Run ID: **ICPMS04_330630** SeqNo: **4899140** PrepDate: **31-Dec-2018** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	1023	25.0	500	491.1	106	75 - 125				
Magnesium	882.8	10.0	500	342.1	108	75 - 125				
Sodium	2187	10.0	500	1644	109	75 - 125				

SD Sample ID: **HS18121345-01SD** Units: **mg/L** Analysis Date: **07-Jan-2019 13:05**
Client ID: **2018-12-17-DGW-MW11-T0-30-35-40-D** Run ID: **ICPMS04_330548** SeqNo: **4897002** PrepDate: **31-Dec-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.001325	0	10	
Arsenic	U	0.0100					0.00045	0	10	
Lead	U	0.0100					0.001899	0	10	
Potassium	22.31	1.00					21.23	5.09	10	
Selenium	U	0.0100					0.00111	0	10	

SD Sample ID: **HS18121345-01SD** Units: **mg/L** Analysis Date: **08-Jan-2019 13:10**
Client ID: **2018-12-17-DGW-MW11-T0-30-35-40-D** Run ID: **ICPMS04_330630** SeqNo: **4899139** PrepDate: **31-Dec-2018** DF: **250**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	535.9	125					491.1	9.13	10	
Magnesium	351.9	50.0					342.1	2.86	10	
Sodium	1788	50.0					1644	8.76	10	

The following samples were analyzed in this batch: HS18121345-01 HS18121345-03

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS18121345**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS18121345
Date/Time Received: **24-Dec-2018 08:29**
Received by: **PMG**

Checklist completed by: *Jared R. Makan* eSignature 24-Dec-2018 Date
Reviewed by: *Dane J. Wacasey* eSignature 26-Dec-2018 Date

Matrices: **Water**
Carrier name: **ALS Courier**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☐	No ☑	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	3.0c/3.3c UC/C	IR25	
Cooler(s)/Kit(s):	44385		
Date/Time sample(s) sent to storage:	12/24/2018 14:15		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes: All sample IDs differ: COC = 2018-12-17-DGW-"NW11", all containers = 2018-12-17-DGW-"MW11". Samples logged in as "MW11" per Labels.

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336 | Fort Collins, CO +1 970 490 1511 | Everett, WA +1 425 356 2600 | Holland, MI +1 616 399 6070

Chain of Custody Form

Page ____ of ____

COC ID: 192215

Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information			
Purchase Order	130-2006 [illegible]	Project Name	Exide Column Studies	A	[illegible]
Work Order		Project Number	[illegible]	B	TDS_W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK_W 2320B (2320 Alkalinity)
Send Report To	[illegible] White	Invoice Attn	[illegible]	D	HARD (2340B Hardness (calc))
Address	13515 Barrett Parkway Drive Suit	Address	13515 Barrett Parkway Drive Suit	E	[illegible] DISS [illegible] Diss Metal [illegible] Cations [illegible]
				F	[illegible] Total Metals [illegible] Cations
City/State/Zip	[illegible]	City/State/Zip	[illegible]	G	
Phone	(314) 984-8800	Phone	(314) 984 8800	H	
Fax		Fax		I	
e-Mail Address	[illegible]	e-Mail Address	[illegible]	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	~~2018-12-17-DGW-AW11-TD-30-35-40-D~~	~~2018-12-17~~		Groundwater [illegible]			X	X	X	X	X	X					
2	2018-12-17-DGW-AW11-TD-30-35-40-D	2018-12-17	12h45	GW	2, 8	1					X						
3	2018-12-17-DGW-AW11-TD-30-35-40-T	2018-12-17	12h45	GW	2, 8	1				X		X					
4	2018-12-17-DGW-AW11-TD-CONTROL-D	2018-12-17	12h45	GW	2, 8	1					X						
5	2018-12-17-DGW-AW11-TD-CONTROL-T	2018-12-17	12h45	GW	2, 8	1				X		X					
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: CLAUDE ONIKRO [signature]

Shipment Method:

Required Turnaround Time: (Check Box) [ ] Other ____ [ ] STD 10 Wk Days [X] 5 Wk Days [ ] 2 Wk Days [ ] 24 Hour

Results Due Date:

Relinquished by: ONIKRO CLAUDE	Date: 20/12/2018	Time: 10h30	Received by:
Relinquished by:	Date: 12/24/18	Time: 0839	Received by (Laboratory): PJ
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes: Exide Column Studies

Cooler ID	Cooler Temp.
	4°C
24335	3.0
~~1KK~~	~~2.5~~

C/F +0.3

QC Package: (Check One Box Below)
[ ] [illegible]
[ ] [illegible]
[ ] [illegible]
[ ] Other
[X] [illegible]
[ ] [illegible]

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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ORIGIN ID:YUXA (514) 383-0990
Audrey Elheves
Golder Associates Ltd
7250 rue du Mile End
3e étage
MONTREAL, PQ H2R3A4
CANADA, CA

Ship Date: 20DEC18
ActWgt: 38.05 LB
CAD: 106680724/NET4042

BILL SENDER
EIN/VAT:

TO Dane Wacasey (Corey Grandits)
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

(281) 530-5656

FedEx Express

(US)

AWB

E

TRK# 7740 3038 9691 Form 0430

10:30A
INTL PRIORITY

NH SGRA

PKG: YOUR PKG

REF:
DESC1: Glacière contenant des bouteilles d'eaux
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: Audrey Elheves
T/C: S 167982632
D/T: R 967554812

COPIE DU DESTINATAIRE - VEUILLEZ LA GLISSER DANS LA POCHETTE

Après l'impression de cette étiquette :
COPIE DU BORDEREAU FEDEX - VEUILLEZ LA PLACER DERRIÈRE LA COPIE DU DESTINATAIRE
1. Pliez la page imprimée le long de la ligne horizontale.
2. Placez l'étiquette dans la pochette d'expédition et fixez-la à votre paquet.

ALS	CUSTODY SEAL	Seal Broken By:
10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887 44385	Date: 2018/12/20 Time: Name: ONIKPO CLAUDE Company: GOLDER	SM Date: 12/24/18

44385 DEC 2 2 2018

ALS	CUSTODY SEAL	Seal Broken By:
10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887 44385	Date: 2018/12/20 Time: Name: ONIKPO CLAUDE Company: GOLDER	SM Date: 12/24/18

FedEx
TRK# 0430 7740 3038 9691

0A
INTL PRIORITY CLR
CLR
77099
TX-US
IAH

NH SGRA

328995 TNO 12/21 547G1/E1EE/53C1

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

January 08, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS18121346**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 10 sample(s) on Dec 24, 2018 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS18121346**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS18121346**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 01/09/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS18121346				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 136175				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?			X		
		Were analytical duplicates analyzed at the appropriate frequency?			X		
		Were RPDs or relative standard deviations within the laboratory QC limits?			X		
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 01/09/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS18121346				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 136175				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			2
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		X			3
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports	
Laboratory Name: ALS Laboratory Group	LRC Date: 01/09/2019
Project Name: Exide Column Studies	Laboratory Job Number: HS18121346
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 136175

ER#[5]	Description
1	Batch 136175, Metals Method SW6020, sample HS18121345-01, MS and MSD were performed on unrelated sample.
2	See Run Log and CCB Exceptions Report.
3	Batch 136175, Metals Method SW6020, sample HS18121345-01, PDS was performed on unrelated sample.

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121346
Start Date: 07-Jan-2019 End Date: 08-Jan-2019

Run ID:ICPMS04_330548
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	07-Jan-2019 12:06	018_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	07-Jan-2019 12:08	019SMPL.d	AS CA CD FE K MG NA PB SB SE
LLICV5	1	07-Jan-2019 12:11	020LICV.d	AS CA CD FE K MG NA PB SB SE
ICB	1	07-Jan-2019 12:13	021_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	07-Jan-2019 12:20	023ICSA.d	AS CA CD FE K MG NA PB SB SE
ICSAB	1	07-Jan-2019 12:23	024ICSB.d	AS CA CD FE K MG NA PB SB SE
CCV 1	1	07-Jan-2019 12:47	032_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	07-Jan-2019 12:49	033_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-136175	1	07-Jan-2019 12:59	035SMPL.d	AS CA CD FE K MG PB SB SE
LCS-136175	1	07-Jan-2019 13:01	036SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZSD	5	07-Jan-2019 13:05	038SMPL.d	AS K PB SB SE
ZZZZZZMS	1	07-Jan-2019 13:08	039SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZMSD	1	07-Jan-2019 13:11	040SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZPDS	1	07-Jan-2019 13:14	041SMPL.d	AS CD FE K PB SB SE
CCV 2	1	07-Jan-2019 13:20	044_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	07-Jan-2019 13:34	047_CCB.d	AS CA CD FE K MG NA PB SB SE
20181211-DGW-MW3-PV5out-ControlD	1	07-Jan-2019 13:39	049SMPL.d	AS CA CD FE K MG NA PB SB SE
20181211-DGW-MW3-PV5out-30D	1	07-Jan-2019 13:41	050SMPL.d	AS CA CD FE K MG PB SB SE
20181211-DGW-MW3-PV5out-35D	1	07-Jan-2019 13:43	051SMPL.d	AS CA CD FE K MG PB SB SE
20181211-DGW-MW3-PV5out-40D	1	07-Jan-2019 13:45	052SMPL.d	AS CA CD FE K MG PB SB SE
20181214-DGW-MW3-PV5mid-ControlD	1	07-Jan-2019 13:48	053SMPL.d	AS CA CD FE K MG PB SB SE
20181214-DGW-MW3-PV5mid-30D	1	07-Jan-2019 13:50	054SMPL.d	AS CA CD FE K MG NA PB SB SE
20181214-DGW-MW3-PV5mid-35D	1	07-Jan-2019 13:52	055SMPL.d	AS CA CD FE K MG PB SB SE
20181214-DGW-MW3-PV5mid-40D	1	07-Jan-2019 13:54	056SMPL.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	07-Jan-2019 13:59	058_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	07-Jan-2019 14:01	059_CCB.d	AS CA CD FE K MG NA PB SB SE
20181214-DGW-MW3-PV5inlet-ControlD	1	07-Jan-2019 14:14	060SMPL.d	AS CD FE K MG PB SB SE
20181214-DGW-MW3-PV5inlet-30-35-40D	1	07-Jan-2019 14:16	061SMPL.d	AS CD FE K MG NA PB SB SE
CCV 4	1	07-Jan-2019 14:37	070_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	07-Jan-2019 14:39	071_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	07-Jan-2019 15:02	073_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	07-Jan-2019 15:28	083_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	07-Jan-2019 15:30	084_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 7	1	07-Jan-2019 16:41	111_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	07-Jan-2019 16:43	112SMPL.d	AS CA CD FE K MG NA PB SB SE
LLCCV5	1	07-Jan-2019 16:46	113LICV.d	AS CA CD FE K MG NA PB SB SE
ICCB 6	1	07-Jan-2019 16:48	114_ICB.d	AS CA CD FE K MG NA PB SB SE
LLCCV5	1	07-Jan-2019 16:54	116LICV.d	AS CA CD FE K MG NA PB SB SE
CCV 8	1	07-Jan-2019 17:28	128_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	07-Jan-2019 17:30	129_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	07-Jan-2019 18:07	140_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	07-Jan-2019 18:09	141_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	07-Jan-2019 18:32	151_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 10	1	07-Jan-2019 18:37	153_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 11	1	07-Jan-2019 19:00	163_CCV.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121346

Run ID:ICPMS04_330548
Instrument:ICPMS04
Method:SW6020

CCB 1	Date: 07-Jan-2019 12:49	Seq: 4896973	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	-21.2	18	200	
Sodium	36.2	14	200	
CCB 2	**Date: 07-Jan-2019 13:34**	**Seq: 4897095**	**D/F: 1**	**Units: ug/L**
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	17.27	12	200	
Potassium	18.56	18	200	
Selenium	1.325	1.1	2	
Sodium	480.8	14	200	
CCB 3	**Date: 07-Jan-2019 14:01**	**Seq: 4897262**	**D/F: 1**	**Units: ug/L**
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	334.5	14	200	
CCB 4	**Date: 07-Jan-2019 14:39**	**Seq: 4897378**	**D/F: 1**	**Units: ug/L**
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	-31.19	18	200	
Sodium	230.5	14	200	
CCB 5	**Date: 07-Jan-2019 15:30**	**Seq: 4897510**	**D/F: 1**	**Units: ug/L**
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	39.36	34	500	
Iron	14.54	12	200	
Potassium	29.2	18	200	
Sodium	8026	14	200	
ICCB 6	**Date: 07-Jan-2019 16:48**	**Seq: 4897833**	**D/F: 1**	**Units: ug/L**
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	-105.8	14	200	
CCB 7	**Date: 07-Jan-2019 17:30**	**Seq: 4897936**	**D/F: 1**	**Units: ug/L**
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	-13.31	12	200	
Sodium	-91.1	14	200	
CCB 8	**Date: 07-Jan-2019 18:09**	**Seq: 4898087**	**D/F: 1**	**Units: ug/L**
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	-14.35	12	200	
Sodium	-81.85	14	200	
CCB 9	**Date: 07-Jan-2019 18:32**	**Seq: 4898099**	**D/F: 1**	**Units: ug/L**
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	-15.77	12	200	
Sodium	-123.6	14	200	
CCB 10	**Date: 07-Jan-2019 19:03**	**Seq: 4898271**	**D/F: 1**	**Units: ug/L**
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	-13.51	12	200	
Sodium	-138.2	14	200	
CCB 11	**Date: 07-Jan-2019 19:31**	**Seq: 4898283**	**D/F: 1**	**Units: ug/L**
Analyte	**Result**	**MDL**	**Report Limit**	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121346
Start Date: 08-Jan-2019 End Date: 08-Jan-2019

Run ID:ICPMS04_330630
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	08-Jan-2019 11:24	018_ICV.d	CA NA
LLICV2	1	08-Jan-2019 11:26	019SMPL.d	CA NA
LLICV5	1	08-Jan-2019 11:28	020LICV.d	CA NA
ICB	1	08-Jan-2019 11:30	021_ICB.d	CA NA
ICSA	1	08-Jan-2019 11:40	023ICSA.d	CA NA
ICSAB	1	08-Jan-2019 11:42	024ICSB.d	CA NA
CCV 1	1	08-Jan-2019 12:11	036_CCV.d	CA NA
CCB 1	1	08-Jan-2019 12:13	037_CCB.d	CA NA
CCV 2	1	08-Jan-2019 12:42	048_CCV.d	CA NA
CCB 2	1	08-Jan-2019 12:44	049_CCB.d	CA NA
MBLK-136175	1	08-Jan-2019 13:05	055SMPL.d	NA
ZZZZZZSD	250	08-Jan-2019 13:10	057SMPL.d	CA MG NA
ZZZZZZPDS	50	08-Jan-2019 13:12	058SMPL.d	CA MG NA
CCV 3	1	08-Jan-2019 13:16	060_CCV.d	CA NA
CCB 3	1	08-Jan-2019 13:19	061_CCB.d	CA NA
20181211-DGW-MW3-PV5out-30D	10	08-Jan-2019 13:31	063SMPL.d	NA
20181211-DGW-MW3-PV5out-35D	10	08-Jan-2019 13:33	064SMPL.d	NA
20181211-DGW-MW3-PV5out-40D	10	08-Jan-2019 13:35	065SMPL.d	NA
20181214-DGW-MW3-PV5mid-ControlD	10	08-Jan-2019 13:38	066SMPL.d	NA
20181214-DGW-MW3-PV5mid-35D	10	08-Jan-2019 13:40	067SMPL.d	NA
20181214-DGW-MW3-PV5inlet-ControlD	10	08-Jan-2019 13:42	068SMPL.d	CA NA
20181214-DGW-MW3-PV5inlet-30-35-40D	10	08-Jan-2019 13:44	069SMPL.d	CA
CCV 4	1	08-Jan-2019 13:51	072_CCV.d	CA NA
CCB 4	1	08-Jan-2019 13:53	073_CCB.d	CA NA
CCV 5	1	08-Jan-2019 14:24	082_CCV.d	CA NA
CCB 5	1	08-Jan-2019 14:26	083_CCB.d	CA NA
CCV 6	1	08-Jan-2019 14:55	093_CCV.d	CA NA
CCB 6	1	08-Jan-2019 14:58	094_CCB.d	CA NA
CCV 7	1	08-Jan-2019 15:13	100_CCV.d	CA NA
CCB 7	1	08-Jan-2019 15:15	101_CCB.d	CA NA
CCV 8	1	08-Jan-2019 15:48	112_CCV.d	CA NA
CCB 8	1	08-Jan-2019 15:50	113_CCB.d	CA NA
CCV 9	1	08-Jan-2019 16:21	124_CCV.d	CA NA
CCB 9	1	08-Jan-2019 16:23	125_CCB.d	CA NA
CCV 10	1	08-Jan-2019 16:57	131_CCV.d	CA NA
CCB 10	1	08-Jan-2019 17:00	132_CCB.d	CA NA

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121346

Run ID:ICPMS04_330630
Instrument:ICPMS04
Method:SW6020

ICB	Date: 08-Jan-2019 11:30	Seq: 4898910		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		-51.17	14	200	
CCB 1	Date: 08-Jan-2019 12:13	Seq: 4898966		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		106.5	14	200	
CCB 2	Date: 08-Jan-2019 12:44	Seq: 4899101		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		57.76	14	200	
CCB 3	Date: 08-Jan-2019 13:19	Seq: 4899143		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		85.27	14	200	
CCB 4	Date: 08-Jan-2019 13:53	Seq: 4899209		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		78.87	14	200	
CCB 5	Date: 08-Jan-2019 14:26	Seq: 4899338		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		46.04	14	200	
CCB 6	Date: 08-Jan-2019 14:58	Seq: 4899477		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		53.91	14	200	
CCB 7	Date: 08-Jan-2019 15:15	Seq: 4899486		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		66.89	14	200	
CCB 8	Date: 08-Jan-2019 15:50	Seq: 4899649		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		96.21	14	200	
CCB 9	Date: 08-Jan-2019 16:23	Seq: 4899722		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		290	14	200	
CCB 10	Date: 08-Jan-2019 17:00	Seq: 4899818		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		352.1	14	200	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS18121346

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18121346-01	20181211-DGW-MW3-PV5out-ControlD	Groundwater		11-Dec-2018 09:30	24-Dec-2018 08:29	☐
HS18121346-02	20181211-DGW-MW3-PV5out-30D	Groundwater		11-Dec-2018 09:30	24-Dec-2018 08:29	☐
HS18121346-03	20181211-DGW-MW3-PV5out-35D	Groundwater		11-Dec-2018 09:30	24-Dec-2018 08:29	☐
HS18121346-04	20181211-DGW-MW3-PV5out-40D	Groundwater		11-Dec-2018 09:30	24-Dec-2018 08:29	☐
HS18121346-05	20181214-DGW-MW3-PV5mid-ControlD	Groundwater		14-Dec-2018 07:30	24-Dec-2018 08:29	☐
HS18121346-06	20181214-DGW-MW3-PV5mid-30D	Groundwater		14-Dec-2018 07:30	24-Dec-2018 08:29	☐
HS18121346-07	20181214-DGW-MW3-PV5mid-35D	Groundwater		14-Dec-2018 07:30	24-Dec-2018 08:29	☐
HS18121346-08	20181214-DGW-MW3-PV5mid-40D	Groundwater		14-Dec-2018 07:30	24-Dec-2018 08:29	☐
HS18121346-09	20181214-DGW-MW3-PV5inlet-ControlD	Groundwater		14-Dec-2018 08:00	24-Dec-2018 08:29	☐
HS18121346-10	20181214-DGW-MW3-PV5inlet-30-35-40D	Groundwater		14-Dec-2018 08:00	24-Dec-2018 08:29	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181211-DGW-MW3-PV5out-ControlD
Collection Date: 11-Dec-2018 09:30

ANALYTICAL REPORT
WorkOrder:HS18121346
Lab ID:HS18121346-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 31-Dec-2018		Analyst: JCJ
Antimony	**0.000409**	J	**0.000400**	**0.00200**	**mg/L**	1	07-Jan-2019 13:39
Arsenic	**0.00213**		**0.000400**	**0.00200**	**mg/L**	1	07-Jan-2019 13:39
Cadmium	U		0.000200	0.00200	mg/L	1	07-Jan-2019 13:39
Calcium	**102**		**0.0340**	**0.500**	**mg/L**	1	07-Jan-2019 13:39
Iron	U		0.0120	0.200	mg/L	1	07-Jan-2019 13:39
Lead	U		0.000600	0.00200	mg/L	1	07-Jan-2019 13:39
Magnesium	**18.6**		**0.0100**	**0.200**	**mg/L**	1	07-Jan-2019 13:39
Potassium	**2.01**		**0.0180**	**0.200**	**mg/L**	1	07-Jan-2019 13:39
Selenium	**0.00160**	J	**0.00110**	**0.00200**	**mg/L**	1	07-Jan-2019 13:39
Sodium	**170**		**0.0140**	**0.200**	**mg/L**	1	07-Jan-2019 13:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181211-DGW-MW3-PV5out-30D
Collection Date: 11-Dec-2018 09:30

ANALYTICAL REPORT
WorkOrder:HS18121346
Lab ID:HS18121346-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 31-Dec-2018		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	07-Jan-2019 13:41
Arsenic	U		0.000400	0.00200	mg/L	1	07-Jan-2019 13:41
Cadmium	U		0.000200	0.00200	mg/L	1	07-Jan-2019 13:41
Calcium	**9.94**		**0.0340**	**0.500**	**mg/L**	1	07-Jan-2019 13:41
Iron	**0.0924**	J	**0.0120**	**0.200**	**mg/L**	1	07-Jan-2019 13:41
Lead	U		0.000600	0.00200	mg/L	1	07-Jan-2019 13:41
Magnesium	**13.9**		**0.0100**	**0.200**	**mg/L**	1	07-Jan-2019 13:41
Potassium	**2.11**		**0.0180**	**0.200**	**mg/L**	1	07-Jan-2019 13:41
Selenium	**0.00128**	J	**0.00110**	**0.00200**	**mg/L**	1	07-Jan-2019 13:41
Sodium	**210**		**0.140**	**2.00**	**mg/L**	10	08-Jan-2019 13:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181211-DGW-MW3-PV5out-35D
Collection Date: 11-Dec-2018 09:30

ANALYTICAL REPORT
WorkOrder:HS18121346
Lab ID:HS18121346-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 31-Dec-2018		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	07-Jan-2019 13:43
Arsenic	U		0.000400	0.00200	mg/L	1	07-Jan-2019 13:43
Cadmium	U		0.000200	0.00200	mg/L	1	07-Jan-2019 13:43
Calcium	**6.80**		**0.0340**	**0.500**	**mg/L**	1	07-Jan-2019 13:43
Iron	U		0.0120	0.200	mg/L	1	07-Jan-2019 13:43
Lead	U		0.000600	0.00200	mg/L	1	07-Jan-2019 13:43
Magnesium	**12.9**		**0.0100**	**0.200**	**mg/L**	1	07-Jan-2019 13:43
Potassium	**2.12**		**0.0180**	**0.200**	**mg/L**	1	07-Jan-2019 13:43
Selenium	U		0.00110	0.00200	mg/L	1	07-Jan-2019 13:43
Sodium	**209**		**0.140**	**2.00**	**mg/L**	10	08-Jan-2019 13:33

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181211-DGW-MW3-PV5out-40D
Collection Date: 11-Dec-2018 09:30

ANALYTICAL REPORT
WorkOrder:HS18121346
Lab ID:HS18121346-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 31-Dec-2018		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	07-Jan-2019 13:45
Arsenic	U		0.000400	0.00200	mg/L	1	07-Jan-2019 13:45
Cadmium	U		0.000200	0.00200	mg/L	1	07-Jan-2019 13:45
Calcium	**1.72**		**0.0340**	**0.500**	**mg/L**	1	07-Jan-2019 13:45
Iron	**0.0126**	J	**0.0120**	**0.200**	**mg/L**	1	07-Jan-2019 13:45
Lead	U		0.000600	0.00200	mg/L	1	07-Jan-2019 13:45
Magnesium	**11.9**		**0.0100**	**0.200**	**mg/L**	1	07-Jan-2019 13:45
Potassium	**2.10**		**0.0180**	**0.200**	**mg/L**	1	07-Jan-2019 13:45
Selenium	**0.00111**	J	**0.00110**	**0.00200**	**mg/L**	1	07-Jan-2019 13:45
Sodium	**194**		**0.140**	**2.00**	**mg/L**	10	08-Jan-2019 13:35

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181214-DGW-MW3-PV5mid-ControlD
Collection Date: 14-Dec-2018 07:30

ANALYTICAL REPORT
WorkOrder:HS18121346
Lab ID:HS18121346-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 31-Dec-2018		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	07-Jan-2019 13:48
Arsenic	**0.00180**	J	**0.000400**	**0.00200**	**mg/L**	1	07-Jan-2019 13:48
Cadmium	U		0.000200	0.00200	mg/L	1	07-Jan-2019 13:48
Calcium	**114**		**0.0340**	**0.500**	**mg/L**	1	07-Jan-2019 13:48
Iron	**0.0155**	J	**0.0120**	**0.200**	**mg/L**	1	07-Jan-2019 13:48
Lead	U		0.000600	0.00200	mg/L	1	07-Jan-2019 13:48
Magnesium	**20.7**		**0.0100**	**0.200**	**mg/L**	1	07-Jan-2019 13:48
Potassium	**2.02**		**0.0180**	**0.200**	**mg/L**	1	07-Jan-2019 13:48
Selenium	**0.00228**		**0.00110**	**0.00200**	**mg/L**	1	07-Jan-2019 13:48
Sodium	**208**		**0.140**	**2.00**	**mg/L**	10	08-Jan-2019 13:38

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181214-DGW-MW3-PV5mid-30D
Collection Date: 14-Dec-2018 07:30

ANALYTICAL REPORT
WorkOrder:HS18121346
Lab ID:HS18121346-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 31-Dec-2018		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	07-Jan-2019 13:50
Arsenic	U		0.000400	0.00200	mg/L	1	07-Jan-2019 13:50
Cadmium	U		0.000200	0.00200	mg/L	1	07-Jan-2019 13:50
Calcium	**13.9**		**0.0340**	**0.500**	**mg/L**	1	07-Jan-2019 13:50
Iron	U		0.0120	0.200	mg/L	1	07-Jan-2019 13:50
Lead	U		0.000600	0.00200	mg/L	1	07-Jan-2019 13:50
Magnesium	**16.2**		**0.0100**	**0.200**	**mg/L**	1	07-Jan-2019 13:50
Potassium	**1.91**		**0.0180**	**0.200**	**mg/L**	1	07-Jan-2019 13:50
Selenium	**0.00154**	J	**0.00110**	**0.00200**	**mg/L**	1	07-Jan-2019 13:50
Sodium	**179**		**0.0140**	**0.200**	**mg/L**	1	07-Jan-2019 13:50

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181214-DGW-MW3-PV5mid-35D
Collection Date: 14-Dec-2018 07:30

ANALYTICAL REPORT
WorkOrder:HS18121346
Lab ID:HS18121346-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 31-Dec-2018		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	07-Jan-2019 13:52
Arsenic	U		0.000400	0.00200	mg/L	1	07-Jan-2019 13:52
Cadmium	U		0.000200	0.00200	mg/L	1	07-Jan-2019 13:52
Calcium	**14.2**		**0.0340**	**0.500**	**mg/L**	1	07-Jan-2019 13:52
Iron	**0.0146**	J	**0.0120**	**0.200**	**mg/L**	1	07-Jan-2019 13:52
Lead	U		0.000600	0.00200	mg/L	1	07-Jan-2019 13:52
Magnesium	**17.0**		**0.0100**	**0.200**	**mg/L**	1	07-Jan-2019 13:52
Potassium	**1.95**		**0.0180**	**0.200**	**mg/L**	1	07-Jan-2019 13:52
Selenium	**0.00131**	J	**0.00110**	**0.00200**	**mg/L**	1	07-Jan-2019 13:52
Sodium	**212**		**0.140**	**2.00**	**mg/L**	10	08-Jan-2019 13:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181214-DGW-MW3-PV5mid-40D
Collection Date: 14-Dec-2018 07:30

ANALYTICAL REPORT
WorkOrder:HS18121346
Lab ID:HS18121346-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 31-Dec-2018		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	07-Jan-2019 13:54
Arsenic	U		0.000400	0.00200	mg/L	1	07-Jan-2019 13:54
Cadmium	U		0.000200	0.00200	mg/L	1	07-Jan-2019 13:54
Calcium	**11.4**		**0.0340**	**0.500**	**mg/L**	1	07-Jan-2019 13:54
Iron	U		0.0120	0.200	mg/L	1	07-Jan-2019 13:54
Lead	U		0.000600	0.00200	mg/L	1	07-Jan-2019 13:54
Magnesium	**15.2**		**0.0100**	**0.200**	**mg/L**	1	07-Jan-2019 13:54
Potassium	**1.88**		**0.0180**	**0.200**	**mg/L**	1	07-Jan-2019 13:54
Selenium	**0.00111**	J	**0.00110**	**0.00200**	**mg/L**	1	07-Jan-2019 13:54
Sodium	**173**		**0.0140**	**0.200**	**mg/L**	1	07-Jan-2019 13:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181214-DGW-MW3-PV5inlet-ControlD
Collection Date: 14-Dec-2018 08:00

ANALYTICAL REPORT
WorkOrder:HS18121346
Lab ID:HS18121346-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 31-Dec-2018		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	07-Jan-2019 14:14
Arsenic	**0.0114**		**0.000400**	**0.00200**	**mg/L**	1	07-Jan-2019 14:14
Cadmium	U		0.000200	0.00200	mg/L	1	07-Jan-2019 14:14
Calcium	**115**		**0.340**	**5.00**	**mg/L**	10	08-Jan-2019 13:42
Iron	**0.0201**	J	**0.0120**	**0.200**	**mg/L**	1	07-Jan-2019 14:14
Lead	U		0.000600	0.00200	mg/L	1	07-Jan-2019 14:14
Magnesium	**20.3**		**0.0100**	**0.200**	**mg/L**	1	07-Jan-2019 14:14
Potassium	**1.91**		**0.0180**	**0.200**	**mg/L**	1	07-Jan-2019 14:14
Selenium	**0.00168**	J	**0.00110**	**0.00200**	**mg/L**	1	07-Jan-2019 14:14
Sodium	**221**		**0.140**	**2.00**	**mg/L**	10	08-Jan-2019 13:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181214-DGW-MW3-PV5inlet-30-35-40D
Collection Date: 14-Dec-2018 08:00

ANALYTICAL REPORT
WorkOrder:HS18121346
Lab ID:HS18121346-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 31-Dec-2018		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	07-Jan-2019 14:16
Arsenic	**0.0128**		**0.000400**	**0.00200**	**mg/L**	1	07-Jan-2019 14:16
Cadmium	U		0.000200	0.00200	mg/L	1	07-Jan-2019 14:16
Calcium	**106**		**0.340**	**5.00**	**mg/L**	10	08-Jan-2019 13:44
Iron	U		0.0120	0.200	mg/L	1	07-Jan-2019 14:16
Lead	U		0.000600	0.00200	mg/L	1	07-Jan-2019 14:16
Magnesium	**19.0**		**0.0100**	**0.200**	**mg/L**	1	07-Jan-2019 14:16
Potassium	**1.81**		**0.0180**	**0.200**	**mg/L**	1	07-Jan-2019 14:16
Selenium	**0.00153**	J	**0.00110**	**0.00200**	**mg/L**	1	07-Jan-2019 14:16
Sodium	**174**		**0.0140**	**0.200**	**mg/L**	1	07-Jan-2019 14:16

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121346

Batch ID: 136175 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18121346-01	1	10	10 (mL)	1
HS18121346-02	1	10	10 (mL)	1
HS18121346-03	1	10	10 (mL)	1
HS18121346-04	1	10	10 (mL)	1
HS18121346-05	1	10	10 (mL)	1
HS18121346-06	1	10	10 (mL)	1
HS18121346-07	1	10	10 (mL)	1
HS18121346-08	1	10	10 (mL)	1
HS18121346-09	1	10	10 (mL)	1
HS18121346-10	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121346

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 136175	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS18121346-01	20181211-DGW-MW3-PV5out-ControlD	11 Dec 2018 09:30		31 Dec 2018 10:00	07 Jan 2019 13:39	1
HS18121346-02	20181211-DGW-MW3-PV5out-30D	11 Dec 2018 09:30		31 Dec 2018 10:00	08 Jan 2019 13:31	10
HS18121346-02	20181211-DGW-MW3-PV5out-30D	11 Dec 2018 09:30		31 Dec 2018 10:00	07 Jan 2019 13:41	1
HS18121346-03	20181211-DGW-MW3-PV5out-35D	11 Dec 2018 09:30		31 Dec 2018 10:00	08 Jan 2019 13:33	10
HS18121346-03	20181211-DGW-MW3-PV5out-35D	11 Dec 2018 09:30		31 Dec 2018 10:00	07 Jan 2019 13:43	1
HS18121346-04	20181211-DGW-MW3-PV5out-40D	11 Dec 2018 09:30		31 Dec 2018 10:00	08 Jan 2019 13:35	10
HS18121346-04	20181211-DGW-MW3-PV5out-40D	11 Dec 2018 09:30		31 Dec 2018 10:00	07 Jan 2019 13:45	1
HS18121346-05	20181214-DGW-MW3-PV5mid-ControlD	14 Dec 2018 07:30		31 Dec 2018 10:00	08 Jan 2019 13:38	10
HS18121346-05	20181214-DGW-MW3-PV5mid-ControlD	14 Dec 2018 07:30		31 Dec 2018 10:00	07 Jan 2019 13:48	1
HS18121346-06	20181214-DGW-MW3-PV5mid-30D	14 Dec 2018 07:30		31 Dec 2018 10:00	07 Jan 2019 13:50	1
HS18121346-07	20181214-DGW-MW3-PV5mid-35D	14 Dec 2018 07:30		31 Dec 2018 10:00	08 Jan 2019 13:40	10
HS18121346-07	20181214-DGW-MW3-PV5mid-35D	14 Dec 2018 07:30		31 Dec 2018 10:00	07 Jan 2019 13:52	1
HS18121346-08	20181214-DGW-MW3-PV5mid-40D	14 Dec 2018 07:30		31 Dec 2018 10:00	07 Jan 2019 13:54	1
HS18121346-09	20181214-DGW-MW3-PV5inlet-ControlD	14 Dec 2018 08:00		31 Dec 2018 10:00	08 Jan 2019 13:42	10
HS18121346-09	20181214-DGW-MW3-PV5inlet-ControlD	14 Dec 2018 08:00		31 Dec 2018 10:00	07 Jan 2019 14:14	1
HS18121346-10	20181214-DGW-MW3-PV5inlet-30-35-40D	14 Dec 2018 08:00		31 Dec 2018 10:00	08 Jan 2019 13:44	10
HS18121346-10	20181214-DGW-MW3-PV5inlet-30-35-40D	14 Dec 2018 08:00		31 Dec 2018 10:00	07 Jan 2019 14:16	1

WorkOrder: HS18121346
InstrumentID: ICPMS04
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.00100	0.00135	0.000400	0.00200
A	Arsenic	7440-38-2	0.00100	0.000732	0.000400	0.00200
A	Cadmium	7440-43-9	0.00100	0.00101	0.000200	0.00200
A	Calcium	7440-70-2	0.100	0.0776	0.0340	0.500
A	Iron	7439-89-6	0.100	0.0850	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000864	0.000600	0.00200
A	Magnesium	7439-95-4	0.100	0.107	0.0100	0.200
A	Potassium	7440-09-7	0.100	0.0562	0.0180	0.200
A	Selenium	7782-49-2	0.00200	0.00213	0.00110	0.00200
A	Sodium	7440-23-5	0.100	0.102	0.0140	0.200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121346

QC BATCH REPORT

Batch ID: 136175 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLK-136175** Units: **mg/L** Analysis Date: **07-Jan-2019 12:59**
Client ID: Run ID: **ICPMS04_330548** SeqNo: **4896999** PrepDate: **31-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	U	0.200								
Potassium	U	0.200								
Selenium	U	0.00200								

MBLK Sample ID: **MBLK-136175** Units: **mg/L** Analysis Date: **08-Jan-2019 13:05**
Client ID: Run ID: **ICPMS04_330630** SeqNo: **4899137** PrepDate: **31-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	U	0.200								

LCS Sample ID: **LCS-136175** Units: **mg/L** Analysis Date: **07-Jan-2019 13:01**
Client ID: Run ID: **ICPMS04_330548** SeqNo: **4897000** PrepDate: **31-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04804	0.00200	0.05	0	96.1	80 - 120				
Arsenic	0.04866	0.00200	0.05	0	97.3	80 - 120				
Cadmium	0.04747	0.00200	0.05	0	94.9	80 - 120				
Calcium	4.821	0.500	5	0	96.4	80 - 120				
Iron	4.97	0.200	5	0	99.4	80 - 120				
Lead	0.04803	0.00200	0.05	0	96.1	80 - 120				
Magnesium	5.061	0.200	5	0	101	80 - 120				
Potassium	5.086	0.200	5	0	102	80 - 120				
Selenium	0.04802	0.00200	0.05	0	96.0	80 - 120				
Sodium	4.906	0.200	5	0	98.1	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121346

QC BATCH REPORT

Batch ID: 136175 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

MS Sample ID: **HS18121345-01MS** Units: **mg/L** Analysis Date: **07-Jan-2019 13:08**
Client ID: Run ID: **ICPMS04_330548** SeqNo: **4897003** PrepDate: **31-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05074	0.00200	0.05	0.001325	98.8	75 - 125				
Arsenic	0.0489	0.00200	0.05	0.00045	96.9	75 - 125				
Cadmium	0.05972	0.00200	0.05	0.01098	97.5	75 - 125				
Calcium	447.7	0.500	5	463.9	-325	75 - 125				SEO
Iron	23.03	0.200	5	17.9	103	75 - 125				
Lead	0.05057	0.00200	0.05	0.001899	97.4	75 - 125				
Magnesium	289.2	0.200	5	302.2	-260	75 - 125				SEO
Potassium	25.03	0.200	5	21.23	76.1	75 - 125				O
Selenium	0.04778	0.00200	0.05	0.00111	93.3	75 - 125				
Sodium	1455	0.200	5	1503	-968	75 - 125				SEO

MSD Sample ID: **HS18121345-01MSD** Units: **mg/L** Analysis Date: **07-Jan-2019 13:11**
Client ID: Run ID: **ICPMS04_330548** SeqNo: **4897004** PrepDate: **31-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.051	0.00200	0.05	0.001325	99.4	75 - 125	0.05074	0.523	20	
Arsenic	0.04825	0.00200	0.05	0.00045	95.6	75 - 125	0.0489	1.35	20	
Cadmium	0.06114	0.00200	0.05	0.01098	100	75 - 125	0.05972	2.35	20	
Calcium	431.2	0.500	5	463.9	-654	75 - 125	447.7	3.75	20	SEO
Iron	22.35	0.200	5	17.9	89.1	75 - 125	23.03	3	20	
Lead	0.05064	0.00200	0.05	0.001899	97.5	75 - 125	0.05057	0.13	20	
Magnesium	289.7	0.200	5	302.2	-249	75 - 125	289.2	0.182	20	SEO
Potassium	23.96	0.200	5	21.23	54.6	75 - 125	25.03	4.39	20	SO
Selenium	0.04815	0.00200	0.05	0.00111	94.1	75 - 125	0.04778	0.765	20	
Sodium	1460	0.200	5	1503	-864	75 - 125	1455	0.357	20	SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121346

QC BATCH REPORT

Batch ID: 136175 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

PDS Sample ID: **HS18121345-01PDS** Units: **mg/L** Analysis Date: **07-Jan-2019 13:14**
Client ID: Run ID: **ICPMS04_330548** SeqNo: **4897005** PrepDate: **31-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09384	0.00200	0.1	0.001325	92.5	75 - 125				
Arsenic	0.09286	0.00200	0.1	0.00045	92.4	75 - 125				
Cadmium	0.105	0.00200	0.1	0.01098	94.0	75 - 125				
Iron	27.64	0.200	10	17.9	97.4	75 - 125				
Lead	0.1003	0.00200	0.1	0.001899	98.4	75 - 125				
Potassium	27.29	0.200	10	21.23	60.7	75 - 125				S
Selenium	0.09637	0.00200	0.1	0.00111	95.3	75 - 125				

PDS Sample ID: **HS18121345-01PDS** Units: **mg/L** Analysis Date: **08-Jan-2019 13:12**
Client ID: Run ID: **ICPMS04_330630** SeqNo: **4899140** PrepDate: **31-Dec-2018** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	1023	25.0	500	491.1	106	75 - 125				
Magnesium	882.8	10.0	500	342.1	108	75 - 125				
Sodium	2187	10.0	500	1644	109	75 - 125				

SD Sample ID: **HS18121345-01SD** Units: **mg/L** Analysis Date: **07-Jan-2019 13:05**
Client ID: Run ID: **ICPMS04_330548** SeqNo: **4897002** PrepDate: **31-Dec-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.001325	0	10	
Arsenic	U	0.0100					0.00045	0	10	
Lead	U	0.0100					0.001899	0	10	
Potassium	22.31	1.00					21.23	5.09	10	
Selenium	U	0.0100					0.00111	0	10	

SD Sample ID: **HS18121345-01SD** Units: **mg/L** Analysis Date: **08-Jan-2019 13:10**
Client ID: Run ID: **ICPMS04_330630** SeqNo: **4899139** PrepDate: **31-Dec-2018** DF: **250**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	535.9	125					491.1	9.13	10	
Magnesium	351.9	50.0					342.1	2.86	10	
Sodium	1788	50.0					1644	8.76	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121346

QC BATCH REPORT

Batch ID: 136175	Instrument: ICPMS04	Method: SW6020 (dissolved) (DISSOLVED)

The following samples were analyzed in this batch:

HS18121346-01	HS18121346-02	HS18121346-03	HS18121346-04
HS18121346-05	HS18121346-06	HS18121346-07	HS18121346-08
HS18121346-09	HS18121346-10		

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS18121346**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS18121346

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS18121346-01	20181211-DGW-MW3-PV5out-ControlD	Login	12/24/2018 2:21:45 PM	JRM	MET025

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS18121346
Date/Time Received: **24-Dec-2018 08:29**
Received by: **PMG**

Checklist completed by: *Jared R. Makan* eSignature 24-Dec-2018 Date
Reviewed by: *Dane J. Wacasey* eSignature 26-Dec-2018 Date

Matrices: **Water**
Carrier name: **ALS Courier**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☐	No ☑	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	3.0c/3.3c UC/C	IR25	
Cooler(s)/Kit(s):	44385		
Date/Time sample(s) sent to storage:	12/24/2018 14:15		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes: Sample IDs differs: COC = 20181214-DGW-"MW3"-PV5mid-30D, container = 20181214-DGW-"NW3"-PV5mid-30D. Sample logged in as "MW3" per COC.

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070

Chain of Custody Form

Page ____ of ____

COC ID: 143453

HS18121346 WV

Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information			
Purchase Order	130-2086-01	Project Name	Exide Columns Studies	A	
Work Order		Project Number	130-2086	B	
Company Name	Golder Associates	Bill To Company	Golder Associates	C	
Send Report To	Emily White.	Invoice Attn	Tammy Kurzmack, Exide AP.	D	
Address	13515 Barrett Parkway Drive, Suit.	Address	13515 Barrett Parkway Drive, Suit.	E	ICP_DISS (6020A Diss Metals(6) + Cat-Fld, FH(6),
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	F	
Phone	(314) 984-8800.	Phone	(314) 984-8800	G	
Fax		Fax		H	
e-Mail Address	ewhite@golder.com.	e-Mail Address	Tammy_Kurzmack@golder.com.	I	
				J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20181211-DGW-MW3-PVSout-control D	2018/12/11	9:30	GW		1					X						
2	20181211-DGW-MW3-PVSout-30D.	2018/12/11	9:30	GW		1					X						
3	20181211-DGW-MW3-PVSout-35D	2018/12/11	9:30	GW		1					X						
4	20181211-DGW-MW3-PVSout-40D	2018/12/11	9:30	GW		1					X						
5	20181214-DGW-MW3-PVSmid-control D	2018/12/14	7:30	GW		1					X						
6	20181214-DGW-MW3-PVSmid-30D	2018/12/14	7:30	GW		1					X						
7	20181214-DGW-MW3-PVSmid-35D	2018/12/14	7:30	GW		1					X						
8	20181214-DGW-MW3-PVSmid-40D	2018/12/14	7:30	GW		1					X						
9	20181214-DGW-MW3-PVSinlet-control D	2018/12/14	8:00	GW		1					X						
10	20181214-DGW-MW3-PVSinlet-30-35-40D	2018/12/14	8:00	GW		1					X						

Sampler(s) Please Print & Sign: Jasmine Chambers

Shipment Method:

Required Turnaround Time: (Check Box) ☐ STD 10 Wk Days ☐ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other ____

Results Due Date:

Relinquished by: Jasmine Chambers	Date: 2018/12/14	Time: 12:30	Received by:	Notes:
Relinquished by:	Date: 12/24/18	Time: 10:30 08:29	Received by (Laboratory):	
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	

Cooler ID	Cooler Temp
46375	4/C 3.0

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Date ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other ____

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental. 12 x 25
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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2 of 2 FD-3

ORIGIN ID:YUXA (514) 383-0990
Audrey Etheves
Golder Associates Ltd
7250 rue du Mile End
3e etage
MONTREAL, PQ H2R3A4
CANADA, CA

Ship Date: 20DEC18
ActWgt: 38.05 LB
CAD: 108680724/INET4042

BILL SENDER
EIN/VAT:

TO Dane Wacasey (Corey Grandits) (281) 530-5656
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

FedEx Express
(US)
AWB
J18211808152Ouv

NH SGRA

PKG:YOUR PKG

TRK# 7740 3038 9691

Form
0430

10:30A
INTL PRIORITY

REF:
DESC1:GlaciËre contenant des bouteilles d'eaux
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: Audrey Etheves
T/C: S 167982832
D/T: R 967554812

Ces marchandises, cette technologie ou ce logiciel ont ete exportes du Canada conformement a la reglementation sur l'administration des exportations. Toute modification contraire a la loi canadienne est interdite. La Convention de Varsovie peut s'appliquer et elle regit, et dans la grande majorite des cas, elle limite la responsabilite de Federal Express pour toute perte, retard ou dommage cause a votre envoi. Sous reserve des conditions et modalites du contrat.

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CUSTODY SEAL
Seal Broken By: SMC
Date: 12/21/18
Date: 20181221 Time: 1000
Name: ONUKPO CLAUDE
Company: GOLDER

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
44385

DEC 22 2018

CUSTODY SEAL
Seal Broken By: SMC
Date: 12/21/18
Date: 20181221 Time: 1000
Name: ONUKPO CLAUDE
Company: GOLDER

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
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44385

FedEx
TRK# 7740 3038 9691
0430

INTL PRIORITY CLR
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CLR
77099
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NH SGRA

328995 TND 12/21 5476/FIFF/53C1

ORIGIN ID:YUXA (514) 383-0990
AUDREY ETHEVES
GOLDER ASSOCIATES LTD
7250 RUE DU MILE END
3E ETAGE
MONTREAL, PQ H2R3A4
CANADA CA

SHIP DATE: 20DEC18
ACTWGT: 38.05 LB
CAD: 108680724/INET4042

BILL SENDER

TO **DANE WACASEY** (Corey Garnhelts)
ALS HOUSTON LABORATORY
10450 STANCLIFF RD
STE 210
HOUSTON TX 77099 **(US)**
(281) 530-5656 REF:
INV:
PO: DEPT:

552J2/E4AF/DCA5

J182118081602uv

FedEx Express

TRK# 0430 **7740 3038 9691**

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DEFINITIONS. Dans la présente lettre de transport aérien, « nous », « notre », « nos » et « FedEx » se rapportent à Federal Express Corporation, ses filiales, succursales et leurs employés, mandataires et prestataires externes. « Vous » et « votre » se rapportent à l'expéditeur, ses employés, donneurs d'ordre et mandataires. Si l'envoi ne provient pas des États-Unis, votre contrat d'expédition est conclu avec la filiale, la succursale ou les prestataires externes de FedEx ayant à l'origine accepté de procéder à l'expédition. « Colis » s'entend de tout contenant ou de toute enveloppe dont nous acceptons d'effectuer la livraison, notamment les marchandises remises au transport par vos soins par le biais de nos systèmes automatisés, comptoirs, manifestes ou lettres de transport. « Envoi » s'entend de tout colis nous étant remis au transport sur une même lettre de transport aérien. REMARQUE RELATIVE AU TRANSPORT AERIEN. La Convention de Varsovie amendée est applicable à tout envoi aérien international. La Convention de Varsovie amendée régit et limite dans la plupart des cas la responsabilité de FedEx en cas de perte, retard ou dommage affectant votre envoi. La Convention de Varsovie amendée limite la responsabilité de FedEx. Par exemple, aux États-Unis, la responsabilité est limitée à 9,07 $ par livre (20 $ par kilogramme), à moins qu'une valeur d'expédition supérieure ne soit déclarée comme décrit ci-dessous, tout frais supplémentaire étant alors à votre charge. L'interprétation et la mise en application des dispositions relatives aux limites de responsabilité de la Convention de Varsovie peuvent varier d'un pays à l'autre. FedEx se réserve le droit d'organiser l'itinéraire emprunté et les escales à sa convenance. REMARQUE RELATIVE AU TRANSPORT ROUTIER. Les envois transportés uniquement par voie terrestre vers ou depuis un pays ayant ratifié la Convention de Varsovie ou la Convention relative au contrat de transport international de marchandises par route (« CMR ») sont soumis aux termes et conditions de la CMR, sans préjudice de toute autre disposition contraire de la présente lettre de transport aérien. Concernant les envois transportés exclusivement par voie terrestre, les clauses de la CMR prévalent en cas de conflit entre les dispositions de la CMR et celles de la présente lettre de transport aérien. LIMITATION DE RESPONSABILITE. La responsabilité maximale de FedEx en cas de dommage, perte, retard, manque, erreur de livraison, défaut de livraison, informations incorrectes ou défaut d'informations relatives à l'envoi est limitée par le présent Contrat et conforme aux termes et conditions du contrat d'expédition, si ladite responsabilité n'est pas régie par la Convention de Varsovie, la CMR ou autres traités internationaux, lois, dispositions réglementaires, décrets ou clauses. Veuillez vous référer au contrat d'expédition énoncé dans le Guide des Services FedEx en vigueur ou document équivalent afin de déterminer les limites contractuelles. FedEx ne propose pas de responsabilité marchandise ni assurance tout risque, mais il vous est possible de payer des frais supplémentaires par tranche de 100 $US supplémentaires (ou équivalent en monnaie locale du pays d'origine) de valeur d'expédition déclarée. Si la valeur d'expédition déclarée est supérieure et des frais supplémentaires sont acquittés, la responsabilité de FedEx équivaut alors à la valeur la plus faible entre la valeur déclarée et les dommages réels. EXCLUSION DE RESPONSABILITE. FEDEX NE SAURAIT EN AUCUN CAS ETRE TENU POUR RESPONSABLE DE TOUT DOMMAGE DIRECT, INDIRECT, ACCESSOIRE, SPECIAL OU CONSECUTIF SUPERIEUR A LA VALEUR D'EXPEDITION DECLAREE (Y COMPRIS, SANS QUE CELA SOIT LIMITATIF DE PERTES DE REVENUS OU BENEFICES) OU A LA VALEUR REELLE DE L'ENVOI, SI CELLE-CI EST INFERIEURE, QUE FEDEX AIT PU OU NON SAVOIR QUE DE TELS DOMMAGES POURRAIENT SURVENIR). FedEx ne saurait en aucun cas être tenu pour responsable de vos agissements ou omissions, y compris, sans que cela soit limitatif, de déclarations incorrectes de marchandises, d'emballages, vétusté, marquage ou adresses non adaptés ou insuffisants de l'envoi, ni des agissements ou omissions du destinataire ou de quiconque pourrait être concerné par cet envoi, ni de la violation par l'une des parties des clauses du présent contrat. FedEx ne saurait en aucun cas être tenu pour responsable de tous dommages, pertes, retards, manques, erreurs de livraison, défauts de livraison, informations incorrectes ou défaut d'informations relativement aux envois de liquidités, devises ou autres marchandises interdites ni d'événements hors de notre contrôle tels que les catastrophes naturelles, risques aériens, conditions météorologiques, retards mécaniques, actes de terrorisme, guerre, grèves, désordre public, ni des agissements ou omissions des autorités publiques (notamment des douanes ou responsables de la santé publique) ayant autorité. DEFAUT DE GARANTIE. Nous n'accordons aucune garantie, expresse ou tacite. RECOURS EN CAS DE PERTE, DOMMAGE OU RETARD. TOUT RECOURS DOIT ETRE EXERCE PAR ECRIT ET DANS DES DELAIS STRICTS. VOIR NOS TARIFS, LE GUIDE DES SERVICES FEDEX EN VIGUEUR OU LES CONDITIONS STANDARD D'EXPEDITION POUR PLUS D'INFORMATIONS. La Convention de Varsovie prévoit des procédures de recours écrites spécifiques en cas de dommages, retard ou défaut de livraison des envois. En outre, l'interprétation et la mise en application des dispositions relatives aux voies de recours de la Convention de Varsovie peuvent varier d'un pays à l'autre. Veuillez vous référer à la Convention pour déterminer les délais de recours applicables à votre envoi. Le droit à dommages-intérêts s'éteint, sauf si un recours est formé dans un délai de deux ans, comme spécifié dans la Convention. FedEx n'est pas tenu de répondre à un recours avant que tous les frais d'expédition n'aient été acquittés. Le montant du recours peut ne pas être déduit des frais d'expédition. Si la destinataire accepte l'envoi sans noter aucun dommage sur le bulletin de livraison. FedEx considérera alors que la marchandise a été livrée dans de bonnes conditions. Afin que nous puissions répondre aux demandes de dommages, nous vous demandons de mettre à notre disposition les contenus, cartons d'expédition et emballages d'origine à des fins d'inspection. DROIT IMPERATIF. Dès lors que l'une des dispositions contenues ou citées dans la présente lettre de transport aérien va à l'encontre des traités, lois, dispositions réglementaires, clauses ou décrets internationaux, lesdites dispositions restent en vigueur dans le cadre du présent contrat dans la mesure où celui-ci n'est pas annulé. Le fait que l'une des dispositions soit invalide ou inapplicable n'affecte pas les autres parties de la présente lettre de transport aérien. Sauf indication contraire, FEDERAL EXPRESS CORPORATION, 2005 Corporate Avenue, Memphis, TN 38132, USA, est le premier transporteur du présent envoi.

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

January 08, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS18121347**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 10 sample(s) on Dec 24, 2018 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS18121347**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS18121347**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 01/08/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS18121347				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 136084,R330657				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?			X		
		Were analytical duplicates analyzed at the appropriate frequency?			X		
		Were RPDs or relative standard deviations within the laboratory QC limits?			X		
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 01/08/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS18121347				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 136084,R330657				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			2
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports		
Laboratory Name: ALS Laboratory Group		LRC Date: 01/08/2019
Project Name: Exide Column Studies		Laboratory Job Number: HS18121347
Reviewer Name: Dane Wacasey		Prep Batch Number(s): 136084,R330657
ER#[5]	**Description**	
1	Batch 136084, Metals Method SW6020, sample HS18121345-02, MS and MSD were performed on unrelated sample.	
2	See Run Log and CCB Exceptions Report.	

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121347
Start Date: 02-Jan-2019 End Date: 03-Jan-2019

Run ID:ICPMS05_330333
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
CCB 22	1	02-Jan-2019 23:27	265_CCB.d	AS CA CD FE K MG NA PB SB SE
20181211-DGW-MW3-PV5out-40T	1	02-Jan-2019 23:29	266SMPL.d	AS CA CD FE K MG PB SB SE
20181214-DGW-MW3-PV5mid-ControlT	1	02-Jan-2019 23:31	267SMPL.d	AS CA CD FE K MG PB SB SE
20181214-DGW-MW3-PV5mid-30T	1	02-Jan-2019 23:33	268SMPL.d	AS CA CD FE K MG PB SB SE
20181214-DGW-MW3-PV5mid-35T	1	02-Jan-2019 23:35	269SMPL.d	AS CA CD FE K MG PB SB SE
20181214-DGW-MW3-PV5mid-40T	1	02-Jan-2019 23:37	270SMPL.d	AS CA CD FE K MG PB SB SE
20181214-DGW-MW3-PV5inlet-ControlT	1	02-Jan-2019 23:39	271SMPL.d	AS CA CD FE K MG PB SB SE
20181214-DGW-MW3-PV5inlet-30-35-40T	1	02-Jan-2019 23:41	272SMPL.d	AS CA CD FE K MG PB SB SE
CCV 23	1	02-Jan-2019 23:49	276_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 23	1	02-Jan-2019 23:51	277_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 24	1	02-Jan-2019 23:53	278_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 24	1	02-Jan-2019 23:55	279_CCB.d	AS CA CD FE K MG NA PB SB SE
LLCCV5	1	02-Jan-2019 23:57	280LICV.d	AS CA CD FE K MG PB SB SE
LLCCV2	1	02-Jan-2019 23:59	281SMPL.d	AS CA CD FE K MG PB SB SE
ICSA	1	03-Jan-2019 00:01	282ICSA.d	AS CA CD FE K MG PB SB SE
ICSAB	1	03-Jan-2019 00:03	283ICSB.d	AS CA CD FE K MG PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121347

Run ID:ICPMS05_330333
Instrument:ICPMS05
Method:SW6020

	Magnesium	39.28	10	200	

CCB 22 Date: 02-Jan-2019 23:27 Seq: 4892196 D/F: 1 Units: ug/L

Analyte	Result	MDL	Report Limit
Magnesium	14.14	10	200

CCB 23 Date: 02-Jan-2019 23:51 Seq: 4892208 D/F: 1 Units: ug/L

Analyte	Result	MDL	Report Limit
Potassium	-20.58	18	200

CCB 24 Date: 02-Jan-2019 23:55 Seq: 4892210 D/F: 1 Units: ug/L

Analyte	Result	MDL	Report Limit
Potassium	-25.32	18	200

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121347
Start Date: 03-Jan-2019 End Date: 03-Jan-2019

Run ID:ICPMS05_330405
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	03-Jan-2019 12:23	023_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV5	1	03-Jan-2019 12:25	024LICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	03-Jan-2019 12:27	025SMPL.d	AS CA CD FE K MG NA PB SB SE
ICB	1	03-Jan-2019 12:29	026_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	03-Jan-2019 12:37	028ICSA.d	AS CA CD FE K MG NA PB SB SE
ICSAB	1	03-Jan-2019 12:40	029ICSB.d	AS CA CD FE K MG NA PB SB SE
CCV 1	1	03-Jan-2019 13:07	038_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	03-Jan-2019 13:09	039_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	03-Jan-2019 13:30	047_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	03-Jan-2019 13:32	048_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-136084	1	03-Jan-2019 13:41	050SMPL.d	AS CA CD FE K MG NA PB SB SE
LCS-136084	1	03-Jan-2019 13:43	051SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZSD	250	03-Jan-2019 13:47	053SMPL.d	CA K MG NA
ZZZZZZPDS	50	03-Jan-2019 13:49	054SMPL.d	CA K MG NA
20181211-DGW-MW3-PV5out-ControlT	20	03-Jan-2019 13:51	055SMPL.d	NA
20181211-DGW-MW3-PV5out-30T	20	03-Jan-2019 13:53	056SMPL.d	NA
20181211-DGW-MW3-PV5out-35T	20	03-Jan-2019 13:55	057SMPL.d	NA
CCV 3	1	03-Jan-2019 13:59	059_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	03-Jan-2019 14:01	060_CCB.d	AS CA CD FE K MG NA PB SB SE
20181211-DGW-MW3-PV5out-40T	20	03-Jan-2019 14:09	062SMPL.d	NA
20181214-DGW-MW3-PV5mid-ControlT	20	03-Jan-2019 14:11	063SMPL.d	NA
20181214-DGW-MW3-PV5mid-30T	20	03-Jan-2019 14:13	064SMPL.d	NA
20181214-DGW-MW3-PV5mid-35T	20	03-Jan-2019 14:15	065SMPL.d	NA
20181214-DGW-MW3-PV5mid-40T	20	03-Jan-2019 14:17	066SMPL.d	NA
20181214-DGW-MW3-PV5inlet-ControlT	20	03-Jan-2019 14:19	067SMPL.d	NA
20181214-DGW-MW3-PV5inlet-30-35-40T	20	03-Jan-2019 14:21	068SMPL.d	NA
CCV 4	1	03-Jan-2019 14:25	070_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	03-Jan-2019 14:27	071_CCB.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZSD	25	03-Jan-2019 14:51	074SMPL.d	AS CD FE PB SB SE
ZZZZZZMS	5	03-Jan-2019 14:53	075SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZMSD	5	03-Jan-2019 14:55	076SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZPDS	5	03-Jan-2019 14:57	077SMPL.d	AS CD FE PB SB SE
CCV 5	1	03-Jan-2019 15:07	082_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	03-Jan-2019 15:09	083_CCB.d	AS CA CD FE K MG NA PB SB SE
20181211-DGW-MW3-PV5out-ControlT	1	03-Jan-2019 15:27	090SMPL.d	AS CA CD FE K MG PB SB SE
20181211-DGW-MW3-PV5out-30T	1	03-Jan-2019 15:29	091SMPL.d	AS CA CD FE K MG PB SB SE
20181211-DGW-MW3-PV5out-35T	1	03-Jan-2019 15:31	092SMPL.d	AS CA CD FE K MG PB SB SE
CCV 6	1	03-Jan-2019 15:35	094_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	03-Jan-2019 15:37	095_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	03-Jan-2019 16:55	104_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	03-Jan-2019 16:57	105_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 8	1	03-Jan-2019 17:29	116_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	03-Jan-2019 17:31	117_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	03-Jan-2019 17:53	128_CCV.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121347

Run ID:ICPMS05_330405
Instrument:ICPMS05
Method:SW6020

ICB	Date: 03-Jan-2019 12:29	Seq: 4892566	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Cadmium	0.441	0.2	2	
Calcium	49.8	34	500	
Iron	56.99	12	200	
Magnesium	59.59	10	200	
Potassium	51.41	18	200	
Sodium	48.7	14	200	
CCB 5	Date: 03-Jan-2019 15:09	Seq: 4893055	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	39.52	14	200	
CCB 6	Date: 03-Jan-2019 15:37	Seq: 4893095	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	28.73	18	200	
Sodium	59.59	14	200	
CCB 7	Date: 03-Jan-2019 16:57	Seq: 4893397	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	24.89	14	200	
CCB 9	Date: 03-Jan-2019 17:55	Seq: 4893516	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	60.59	14	200	
ICCB 10	Date: 03-Jan-2019 18:57	Seq: 4893662	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Cadmium	0.553	0.2	2	
Calcium	57.43	34	500	
Iron	54.74	12	200	
Magnesium	58.48	10	200	
Potassium	44.76	18	200	
Sodium	43.68	14	200	
CCB 11	Date: 03-Jan-2019 19:16	Seq: 4893672	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.498	0.4	2	
Sodium	20.34	14	200	
CCB 12	Date: 03-Jan-2019 19:40	Seq: 4893684	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	20.45	14	200	
CCB 13	Date: 03-Jan-2019 20:04	Seq: 4893696	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	122.7	14	200	
CCB 14	Date: 03-Jan-2019 20:26	Seq: 4893707	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	18.41	18	200	
Sodium	94.7	14	200	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS18121347

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18121347-01	20181211-DGW-MW3-PV5out-ControlT	Groundwater		11-Dec-2018 09:30	24-Dec-2018 08:29	☐
HS18121347-02	20181211-DGW-MW3-PV5out-30T	Groundwater		11-Dec-2018 09:30	24-Dec-2018 08:29	☐
HS18121347-03	20181211-DGW-MW3-PV5out-35T	Groundwater		11-Dec-2018 09:30	24-Dec-2018 08:29	☐
HS18121347-04	20181211-DGW-MW3-PV5out-40T	Groundwater		11-Dec-2018 09:30	24-Dec-2018 08:29	☐
HS18121347-05	20181214-DGW-MW3-PV5mid-ControlT	Groundwater		14-Dec-2018 07:30	24-Dec-2018 08:29	☐
HS18121347-06	20181214-DGW-MW3-PV5mid-30T	Groundwater		14-Dec-2018 07:30	24-Dec-2018 08:29	☐
HS18121347-07	20181214-DGW-MW3-PV5mid-35T	Groundwater		14-Dec-2018 07:30	24-Dec-2018 08:29	☐
HS18121347-08	20181214-DGW-MW3-PV5mid-40T	Groundwater		14-Dec-2018 07:30	24-Dec-2018 08:29	☐
HS18121347-09	20181214-DGW-MW3-PV5inlet-ControlT	Groundwater		14-Dec-2018 08:00	24-Dec-2018 08:29	☐
HS18121347-10	20181214-DGW-MW3-PV5inlet-30-35-40T	Groundwater		14-Dec-2018 08:00	24-Dec-2018 08:29	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181211-DGW-MW3-PV5out-ControlT
Collection Date: 11-Dec-2018 09:30

ANALYTICAL REPORT
WorkOrder:HS18121347
Lab ID:HS18121347-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**356**		**2.00**	**2.00**	**mg/L**	1	08-Jan-2019 15:22
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 27-Dec-2018		Analyst: ALR
Antimony	U		0.000400	0.00200	mg/L	1	03-Jan-2019 15:27
Arsenic	**0.00266**		**0.000400**	**0.00200**	**mg/L**	1	03-Jan-2019 15:27
Cadmium	U		0.000200	0.00200	mg/L	1	03-Jan-2019 15:27
Calcium	**108**		**0.0340**	**0.500**	**mg/L**	1	03-Jan-2019 15:27
Iron	**0.110**	J	**0.0120**	**0.200**	**mg/L**	1	03-Jan-2019 15:27
Lead	U		0.000600	0.00200	mg/L	1	03-Jan-2019 15:27
Magnesium	**21.0**		**0.0100**	**0.200**	**mg/L**	1	03-Jan-2019 15:27
Potassium	**2.30**		**0.0180**	**0.200**	**mg/L**	1	03-Jan-2019 15:27
Selenium	U		0.00110	0.00200	mg/L	1	03-Jan-2019 15:27
Sodium	**200**		**0.280**	**4.00**	**mg/L**	20	03-Jan-2019 13:51

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181211-DGW-MW3-PV5out-30T
Collection Date: 11-Dec-2018 09:30

ANALYTICAL REPORT
WorkOrder:HS18121347
Lab ID:HS18121347-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**86.3**		**2.00**	**2.00**	**mg/L**	1	08-Jan-2019 15:22
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 27-Dec-2018		Analyst: ALR
Antimony	U		0.000400	0.00200	mg/L	1	03-Jan-2019 15:29
Arsenic	U		0.000400	0.00200	mg/L	1	03-Jan-2019 15:29
Cadmium	U		0.000200	0.00200	mg/L	1	03-Jan-2019 15:29
Calcium	**11.3**		**0.0340**	**0.500**	**mg/L**	1	03-Jan-2019 15:29
Iron	**0.0801**	J	**0.0120**	**0.200**	**mg/L**	1	03-Jan-2019 15:29
Lead	U		0.000600	0.00200	mg/L	1	03-Jan-2019 15:29
Magnesium	**14.1**		**0.0100**	**0.200**	**mg/L**	1	03-Jan-2019 15:29
Potassium	**2.23**		**0.0180**	**0.200**	**mg/L**	1	03-Jan-2019 15:29
Selenium	U		0.00110	0.00200	mg/L	1	03-Jan-2019 15:29
Sodium	**194**		**0.280**	**4.00**	**mg/L**	20	03-Jan-2019 13:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181211-DGW-MW3-PV5out-35T
Collection Date: 11-Dec-2018 09:30

ANALYTICAL REPORT
WorkOrder:HS18121347
Lab ID:HS18121347-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**73.6**		**2.00**	**2.00**	**mg/L**	1	08-Jan-2019 15:22
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 27-Dec-2018		Analyst: ALR
Antimony	U		0.000400	0.00200	mg/L	1	03-Jan-2019 15:31
Arsenic	U		0.000400	0.00200	mg/L	1	03-Jan-2019 15:31
Cadmium	U		0.000200	0.00200	mg/L	1	03-Jan-2019 15:31
Calcium	**7.69**		**0.0340**	**0.500**	**mg/L**	1	03-Jan-2019 15:31
Iron	U		0.0120	0.200	mg/L	1	03-Jan-2019 15:31
Lead	U		0.000600	0.00200	mg/L	1	03-Jan-2019 15:31
Magnesium	**13.2**		**0.0100**	**0.200**	**mg/L**	1	03-Jan-2019 15:31
Potassium	**2.35**		**0.0180**	**0.200**	**mg/L**	1	03-Jan-2019 15:31
Selenium	U		0.00110	0.00200	mg/L	1	03-Jan-2019 15:31
Sodium	**195**		**0.280**	**4.00**	**mg/L**	20	03-Jan-2019 13:55

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181211-DGW-MW3-PV5out-40T
Collection Date: 11-Dec-2018 09:30

ANALYTICAL REPORT
WorkOrder:HS18121347
Lab ID:HS18121347-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**53.5**		**2.00**	**2.00**	**mg/L**	1	08-Jan-2019 15:22
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 27-Dec-2018		Analyst: ALR
Antimony	U		0.000400	0.00200	mg/L	1	02-Jan-2019 23:29
Arsenic	U		0.000400	0.00200	mg/L	1	02-Jan-2019 23:29
Cadmium	U		0.000200	0.00200	mg/L	1	02-Jan-2019 23:29
Calcium	**1.81**		**0.0340**	**0.500**	**mg/L**	1	02-Jan-2019 23:29
Iron	U		0.0120	0.200	mg/L	1	02-Jan-2019 23:29
Lead	U		0.000600	0.00200	mg/L	1	02-Jan-2019 23:29
Magnesium	**11.9**		**0.0100**	**0.200**	**mg/L**	1	02-Jan-2019 23:29
Potassium	**2.21**		**0.0180**	**0.200**	**mg/L**	1	02-Jan-2019 23:29
Selenium	U		0.00110	0.00200	mg/L	1	02-Jan-2019 23:29
Sodium	**196**		**0.280**	**4.00**	**mg/L**	20	03-Jan-2019 14:09

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181214-DGW-MW3-PV5mid-ControlT
Collection Date: 14-Dec-2018 07:30

ANALYTICAL REPORT
WorkOrder:HS18121347
Lab ID:HS18121347-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**370**		**2.00**	**2.00**	**mg/L**	1	08-Jan-2019 15:22
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 27-Dec-2018		Analyst: ALR
Antimony	U		0.000400	0.00200	mg/L	1	02-Jan-2019 23:31
Arsenic	**0.00240**		**0.000400**	**0.00200**	**mg/L**	1	02-Jan-2019 23:31
Cadmium	U		0.000200	0.00200	mg/L	1	02-Jan-2019 23:31
Calcium	**114**		**0.0340**	**0.500**	**mg/L**	1	02-Jan-2019 23:31
Iron	**0.104**	J	**0.0120**	**0.200**	**mg/L**	1	02-Jan-2019 23:31
Lead	U		0.000600	0.00200	mg/L	1	02-Jan-2019 23:31
Magnesium	**20.7**		**0.0100**	**0.200**	**mg/L**	1	02-Jan-2019 23:31
Potassium	**2.16**		**0.0180**	**0.200**	**mg/L**	1	02-Jan-2019 23:31
Selenium	U		0.00110	0.00200	mg/L	1	02-Jan-2019 23:31
Sodium	**203**		**0.280**	**4.00**	**mg/L**	20	03-Jan-2019 14:11

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181214-DGW-MW3-PV5mid-30T
Collection Date: 14-Dec-2018 07:30

ANALYTICAL REPORT
WorkOrder:HS18121347
Lab ID:HS18121347-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**112**		**2.00**	**2.00**	**mg/L**	1	08-Jan-2019 15:22
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 27-Dec-2018		Analyst: ALR
Antimony	U		0.000400	0.00200	mg/L	1	02-Jan-2019 23:33
Arsenic	U		0.000400	0.00200	mg/L	1	02-Jan-2019 23:33
Cadmium	U		0.000200	0.00200	mg/L	1	02-Jan-2019 23:33
Calcium	**16.5**		**0.0340**	**0.500**	**mg/L**	1	02-Jan-2019 23:33
Iron	**0.774**		**0.0120**	**0.200**	**mg/L**	1	02-Jan-2019 23:33
Lead	U		0.000600	0.00200	mg/L	1	02-Jan-2019 23:33
Magnesium	**17.3**		**0.0100**	**0.200**	**mg/L**	1	02-Jan-2019 23:33
Potassium	**2.10**		**0.0180**	**0.200**	**mg/L**	1	02-Jan-2019 23:33
Selenium	U		0.00110	0.00200	mg/L	1	02-Jan-2019 23:33
Sodium	**196**		**0.280**	**4.00**	**mg/L**	20	03-Jan-2019 14:13

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181214-DGW-MW3-PV5mid-35T
Collection Date: 14-Dec-2018 07:30

ANALYTICAL REPORT
WorkOrder:HS18121347
Lab ID:HS18121347-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**112**		**2.00**	**2.00**	**mg/L**	1	08-Jan-2019 15:22
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 27-Dec-2018		Analyst: ALR
Antimony	U		0.000400	0.00200	mg/L	1	02-Jan-2019 23:35
Arsenic	U		0.000400	0.00200	mg/L	1	02-Jan-2019 23:35
Cadmium	U		0.000200	0.00200	mg/L	1	02-Jan-2019 23:35
Calcium	**16.2**		**0.0340**	**0.500**	**mg/L**	1	02-Jan-2019 23:35
Iron	**0.505**		**0.0120**	**0.200**	**mg/L**	1	02-Jan-2019 23:35
Lead	U		0.000600	0.00200	mg/L	1	02-Jan-2019 23:35
Magnesium	**17.4**		**0.0100**	**0.200**	**mg/L**	1	02-Jan-2019 23:35
Potassium	**2.10**		**0.0180**	**0.200**	**mg/L**	1	02-Jan-2019 23:35
Selenium	U		0.00110	0.00200	mg/L	1	02-Jan-2019 23:35
Sodium	**201**		**0.280**	**4.00**	**mg/L**	20	03-Jan-2019 14:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181214-DGW-MW3-PV5mid-40T
Collection Date: 14-Dec-2018 07:30

ANALYTICAL REPORT
WorkOrder:HS18121347
Lab ID:HS18121347-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**105**		**2.00**	**2.00**	**mg/L**	1	08-Jan-2019 15:22
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 27-Dec-2018		Analyst: ALR
Antimony	U		0.000400	0.00200	mg/L	1	02-Jan-2019 23:37
Arsenic	U		0.000400	0.00200	mg/L	1	02-Jan-2019 23:37
Cadmium	U		0.000200	0.00200	mg/L	1	02-Jan-2019 23:37
Calcium	**14.4**		**0.0340**	**0.500**	**mg/L**	1	02-Jan-2019 23:37
Iron	**0.583**		**0.0120**	**0.200**	**mg/L**	1	02-Jan-2019 23:37
Lead	U		0.000600	0.00200	mg/L	1	02-Jan-2019 23:37
Magnesium	**16.8**		**0.0100**	**0.200**	**mg/L**	1	02-Jan-2019 23:37
Potassium	**2.10**		**0.0180**	**0.200**	**mg/L**	1	02-Jan-2019 23:37
Selenium	U		0.00110	0.00200	mg/L	1	02-Jan-2019 23:37
Sodium	**199**		**0.280**	**4.00**	**mg/L**	20	03-Jan-2019 14:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181214-DGW-MW3-PV5inlet-ControlT
Collection Date: 14-Dec-2018 08:00

ANALYTICAL REPORT
WorkOrder:HS18121347
Lab ID:HS18121347-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**369**		**2.00**	**2.00**	**mg/L**	1	08-Jan-2019 15:22
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 27-Dec-2018		Analyst: ALR
Antimony	**0.000616**	J	**0.000400**	**0.00200**	**mg/L**	1	02-Jan-2019 23:39
Arsenic	**0.0230**		**0.000400**	**0.00200**	**mg/L**	1	02-Jan-2019 23:39
Cadmium	U		0.000200	0.00200	mg/L	1	02-Jan-2019 23:39
Calcium	**113**		**0.0340**	**0.500**	**mg/L**	1	02-Jan-2019 23:39
Iron	**2.01**		**0.0120**	**0.200**	**mg/L**	1	02-Jan-2019 23:39
Lead	U		0.000600	0.00200	mg/L	1	02-Jan-2019 23:39
Magnesium	**21.0**		**0.0100**	**0.200**	**mg/L**	1	02-Jan-2019 23:39
Potassium	**2.11**		**0.0180**	**0.200**	**mg/L**	1	02-Jan-2019 23:39
Selenium	U		0.00110	0.00200	mg/L	1	02-Jan-2019 23:39
Sodium	**199**		**0.280**	**4.00**	**mg/L**	20	03-Jan-2019 14:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181214-DGW-MW3-PV5inlet-30-35-40T
Collection Date: 14-Dec-2018 08:00

ANALYTICAL REPORT
WorkOrder:HS18121347
Lab ID:HS18121347-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**367**		**2.00**	**2.00**	**mg/L**	1	08-Jan-2019 15:22
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 27-Dec-2018		Analyst: ALR
Antimony	U		0.000400	0.00200	mg/L	1	02-Jan-2019 23:41
Arsenic	**0.0828**		**0.000400**	**0.00200**	**mg/L**	1	02-Jan-2019 23:41
Cadmium	U		0.000200	0.00200	mg/L	1	02-Jan-2019 23:41
Calcium	**113**		**0.0340**	**0.500**	**mg/L**	1	02-Jan-2019 23:41
Iron	**13.1**		**0.0120**	**0.200**	**mg/L**	1	02-Jan-2019 23:41
Lead	U		0.000600	0.00200	mg/L	1	02-Jan-2019 23:41
Magnesium	**20.5**		**0.0100**	**0.200**	**mg/L**	1	02-Jan-2019 23:41
Potassium	**1.96**		**0.0180**	**0.200**	**mg/L**	1	02-Jan-2019 23:41
Selenium	U		0.00110	0.00200	mg/L	1	02-Jan-2019 23:41
Sodium	**201**		**0.280**	**4.00**	**mg/L**	20	03-Jan-2019 14:21

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121347

Batch ID: 136084 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18121347-01	1	10	10 (mL)	1
HS18121347-02	1	10	10 (mL)	1
HS18121347-03	1	10	10 (mL)	1
HS18121347-04	1	10	10 (mL)	1
HS18121347-05	1	10	10 (mL)	1
HS18121347-06	1	10	10 (mL)	1
HS18121347-07	1	10	10 (mL)	1
HS18121347-08	1	10	10 (mL)	1
HS18121347-09	1	10	10 (mL)	1
HS18121347-10	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121347

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 136084	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS18121347-01	20181211-DGW-MW3-PV5out-ControlT	11 Dec 2018 09:30		27 Dec 2018 14:00	03 Jan 2019 15:27	1
HS18121347-01	20181211-DGW-MW3-PV5out-ControlT	11 Dec 2018 09:30		27 Dec 2018 14:00	03 Jan 2019 13:51	20
HS18121347-02	20181211-DGW-MW3-PV5out-30T	11 Dec 2018 09:30		27 Dec 2018 14:00	03 Jan 2019 15:29	1
HS18121347-02	20181211-DGW-MW3-PV5out-30T	11 Dec 2018 09:30		27 Dec 2018 14:00	03 Jan 2019 13:53	20
HS18121347-03	20181211-DGW-MW3-PV5out-35T	11 Dec 2018 09:30		27 Dec 2018 14:00	03 Jan 2019 15:31	1
HS18121347-03	20181211-DGW-MW3-PV5out-35T	11 Dec 2018 09:30		27 Dec 2018 14:00	03 Jan 2019 13:55	20
HS18121347-04	20181211-DGW-MW3-PV5out-40T	11 Dec 2018 09:30		27 Dec 2018 14:00	03 Jan 2019 14:09	20
HS18121347-04	20181211-DGW-MW3-PV5out-40T	11 Dec 2018 09:30		27 Dec 2018 14:00	02 Jan 2019 23:29	1
HS18121347-05	20181214-DGW-MW3-PV5mid-ControlT	14 Dec 2018 07:30		27 Dec 2018 14:00	03 Jan 2019 14:11	20
HS18121347-05	20181214-DGW-MW3-PV5mid-ControlT	14 Dec 2018 07:30		27 Dec 2018 14:00	02 Jan 2019 23:31	1
HS18121347-06	20181214-DGW-MW3-PV5mid-30T	14 Dec 2018 07:30		27 Dec 2018 14:00	03 Jan 2019 14:13	20
HS18121347-06	20181214-DGW-MW3-PV5mid-30T	14 Dec 2018 07:30		27 Dec 2018 14:00	02 Jan 2019 23:33	1
HS18121347-07	20181214-DGW-MW3-PV5mid-35T	14 Dec 2018 07:30		27 Dec 2018 14:00	03 Jan 2019 14:15	20
HS18121347-07	20181214-DGW-MW3-PV5mid-35T	14 Dec 2018 07:30		27 Dec 2018 14:00	02 Jan 2019 23:35	1
HS18121347-08	20181214-DGW-MW3-PV5mid-40T	14 Dec 2018 07:30		27 Dec 2018 14:00	03 Jan 2019 14:17	20
HS18121347-08	20181214-DGW-MW3-PV5mid-40T	14 Dec 2018 07:30		27 Dec 2018 14:00	02 Jan 2019 23:37	1
HS18121347-09	20181214-DGW-MW3-PV5inlet-ControlT	14 Dec 2018 08:00		27 Dec 2018 14:00	03 Jan 2019 14:19	20
HS18121347-09	20181214-DGW-MW3-PV5inlet-ControlT	14 Dec 2018 08:00		27 Dec 2018 14:00	02 Jan 2019 23:39	1
HS18121347-10	20181214-DGW-MW3-PV5inlet-30-35-40T	14 Dec 2018 08:00		27 Dec 2018 14:00	03 Jan 2019 14:21	20
HS18121347-10	20181214-DGW-MW3-PV5inlet-30-35-40T	14 Dec 2018 08:00		27 Dec 2018 14:00	02 Jan 2019 23:41	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121347

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R330657	**Test Name :** HARDNESS, TOTAL AS CACO3 BY SM2340B			**Matrix:** Groundwater		
HS18121347-01	20181211-DGW-MW3-PV5out-ControlT	11 Dec 2018 09:30			08 Jan 2019 15:22	1
HS18121347-02	20181211-DGW-MW3-PV5out-30T	11 Dec 2018 09:30			08 Jan 2019 15:22	1
HS18121347-03	20181211-DGW-MW3-PV5out-35T	11 Dec 2018 09:30			08 Jan 2019 15:22	1
HS18121347-04	20181211-DGW-MW3-PV5out-40T	11 Dec 2018 09:30			08 Jan 2019 15:22	1
HS18121347-05	20181214-DGW-MW3-PV5mid-ControlT	14 Dec 2018 07:30			08 Jan 2019 15:22	1
HS18121347-06	20181214-DGW-MW3-PV5mid-30T	14 Dec 2018 07:30			08 Jan 2019 15:22	1
HS18121347-07	20181214-DGW-MW3-PV5mid-35T	14 Dec 2018 07:30			08 Jan 2019 15:22	1
HS18121347-08	20181214-DGW-MW3-PV5mid-40T	14 Dec 2018 07:30			08 Jan 2019 15:22	1
HS18121347-09	20181214-DGW-MW3-PV5inlet-ControlT	14 Dec 2018 08:00			08 Jan 2019 15:22	1
HS18121347-10	20181214-DGW-MW3-PV5inlet-30-35-40T	14 Dec 2018 08:00			08 Jan 2019 15:22	1

WorkOrder: HS18121347
InstrumentID: ICPMS05
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.00100	0.000983	0.000400	0.00200
A	Arsenic	7440-38-2	0.00100	0.000927	0.000400	0.00200
A	Cadmium	7440-43-9	0.00100	0.00101	0.000200	0.00200
A	Calcium	7440-70-2	0.100	0.125	0.0340	0.500
A	Iron	7439-89-6	0.100	0.122	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.00100	0.000600	0.00200
A	Magnesium	7439-95-4	0.100	0.116	0.0100	0.200
A	Potassium	7440-09-7	0.100	0.0991	0.0180	0.200
A	Selenium	7782-49-2	0.00100	0.000902	0.00110	0.00200
A	Sodium	7440-23-5	0.100	0.0985	0.0140	0.200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121347

QC BATCH REPORT

Batch ID: 136084 **Instrument: ICPMS05** **Method: SW6020**

MBLK Sample ID: **MBLK-136084** Units: **mg/L** Analysis Date: **03-Jan-2019 13:41**
Client ID: Run ID: **ICPMS05_330405** SeqNo: **4892857** PrepDate: **27-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01242	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	U	0.200								

LCS Sample ID: **LCS-136084** Units: **mg/L** Analysis Date: **03-Jan-2019 13:43**
Client ID: Run ID: **ICPMS05_330405** SeqNo: **4892858** PrepDate: **27-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04861	0.00200	0.05	0	97.2	80 - 120				
Arsenic	0.04885	0.00200	0.05	0	97.7	80 - 120				
Cadmium	0.04979	0.00200	0.05	0	99.6	80 - 120				
Calcium	4.951	0.500	5	0	99.0	80 - 120				
Iron	5.116	0.200	5	0	102	80 - 120				
Lead	0.05173	0.00200	0.05	0	103	80 - 120				
Magnesium	5.188	0.200	5	0	104	80 - 120				
Potassium	5.067	0.200	5	0	101	80 - 120				
Selenium	0.04849	0.00200	0.05	0	97.0	80 - 120				
Sodium	5.312	0.200	5	0	106	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121347

QC BATCH REPORT

Batch ID: 136084 **Instrument: ICPMS05** **Method: SW6020**

MS Sample ID: **HS18121345-02MS** Units: **mg/L** Analysis Date: **03-Jan-2019 14:53**
Client ID: Run ID: **ICPMS05_330405** SeqNo: **4893047** PrepDate: **27-Dec-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05068	0.0100	0.05	0.001304	98.7	80 - 120				
Arsenic	0.04961	0.0100	0.05	0.000567	98.1	80 - 120				
Cadmium	0.06376	0.0100	0.05	0.01066	106	80 - 120				
Calcium	482.2	2.50	5	486.8	-92.0	80 - 120				SO
Iron	26.51	1.00	5	21.13	107	80 - 120				O
Lead	0.08532	0.0100	0.05	0.03622	98.2	80 - 120				
Magnesium	314.7	1.00	5	305.3	188	80 - 120				SO
Potassium	26.76	1.00	5	21.86	98.0	80 - 120				O
Selenium	0.04984	0.0100	0.05	-0.000961	102	80 - 120				
Sodium	1590	1.00	5	1553	746	80 - 120				SEO

MSD Sample ID: **HS18121345-02MSD** Units: **mg/L** Analysis Date: **03-Jan-2019 14:55**
Client ID: Run ID: **ICPMS05_330405** SeqNo: **4893048** PrepDate: **27-Dec-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.0496	0.0100	0.05	0.001304	96.6	80 - 120	0.05068	2.15	20	
Arsenic	0.05003	0.0100	0.05	0.000567	98.9	80 - 120	0.04961	0.847	20	
Cadmium	0.06188	0.0100	0.05	0.01066	102	80 - 120	0.06376	2.99	20	
Calcium	498.5	2.50	5	486.8	234	80 - 120	482.2	3.33	20	SO
Iron	27.13	1.00	5	21.13	120	80 - 120	26.51	2.33	20	O
Lead	0.08692	0.0100	0.05	0.03622	101	80 - 120	0.08532	1.85	20	
Magnesium	320.9	1.00	5	305.3	312	80 - 120	314.7	1.95	20	SO
Potassium	27.18	1.00	5	21.86	106	80 - 120	26.76	1.54	20	O
Selenium	0.0508	0.0100	0.05	-0.000961	104	80 - 120	0.04984	1.91	20	
Sodium	1633	1.00	5	1553	1600	80 - 120	1590	2.65	20	SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121347

QC BATCH REPORT

Batch ID: 136084 **Instrument: ICPMS05** **Method: SW6020**

PDS Sample ID: **HS18121345-02PDS** Units: **mg/L** Analysis Date: **03-Jan-2019 14:57**
Client ID: Run ID: **ICPMS05_330405** SeqNo: **4893049** PrepDate: **27-Dec-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.4685	0.0100	0.5	0	93.7	75 - 125				
Arsenic	0.5028	0.0100	0.5	0	101	75 - 125				
Cadmium	0.5169	0.0100	0.5	0.01066	101	75 - 125				
Iron	73.12	1.00	50	21.13	104	75 - 125				
Lead	0.5209	0.0100	0.5	0.03622	96.9	75 - 125				
Selenium	0.4924	0.0100	0.5	0	98.5	75 - 125				

PDS Sample ID: **HS18121345-02PDS** Units: **mg/L** Analysis Date: **03-Jan-2019 13:49**
Client ID: Run ID: **ICPMS05_330405** SeqNo: **4892861** PrepDate: **27-Dec-2018** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	962.4	25.0	500	487.1	95.1	75 - 125				
Magnesium	810.1	10.0	500	315.5	98.9	75 - 125				
Potassium	531.5	10.0	500	23.21	102	75 - 125				
Sodium	2075	10.0	500	1575	100	75 - 125				

SD Sample ID: **HS18121345-02SD** Units: **mg/L** Analysis Date: **03-Jan-2019 14:51**
Client ID: Run ID: **ICPMS05_330405** SeqNo: **4893046** PrepDate: **27-Dec-2018** DF: **25**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0500					0.001304	0	10	
Arsenic	U	0.0500					0.000567	0	10	
Cadmium	0.01	0.0500					0.01066	0	10	J
Iron	21.57	5.00					21.13	2.07	10	
Lead	0.03984	0.0500					0.03622	0	10	J
Selenium	U	0.0500					-0.000961	0	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121347

QC BATCH REPORT

Batch ID: 136084 **Instrument: ICPMS05** **Method: SW6020**

SD Sample ID: **HS18121345-02SD** Units: **mg/L** Analysis Date: **03-Jan-2019 13:47**
Client ID: Run ID: **ICPMS05_330405** SeqNo: **4892860** PrepDate: **27-Dec-2018** DF: **250**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	480.1	125					487.1	1.44	10	
Magnesium	327.4	50.0					315.5	3.78	10	
Potassium	24.94	50.0					23.21	0	10	J
Sodium	1662	50.0					1575	5.54	10	

The following samples were analyzed in this batch:

HS18121347-01	HS18121347-02	HS18121347-03	HS18121347-04
HS18121347-05	HS18121347-06	HS18121347-07	HS18121347-08
HS18121347-09	HS18121347-10		

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS18121347**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS18121347

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS18121347-01	20181211-DGW-MW3-PV5out-ControlT	Login	12/24/2018 3:08:13 PM	JRM	MET025
HS18121347-02	20181211-DGW-MW3-PV5out-30T	Login	12/24/2018 3:08:13 PM	JRM	MET025
HS18121347-03	20181211-DGW-MW3-PV5out-35T	Login	12/24/2018 3:08:13 PM	JRM	MET025
HS18121347-04	20181211-DGW-MW3-PV5out-40T	Login	12/24/2018 3:08:13 PM	JRM	MET025
HS18121347-05	20181214-DGW-MW3-PV5mid-ControlT	Login	12/24/2018 3:08:13 PM	JRM	MET025
HS18121347-06	20181214-DGW-MW3-PV5mid-30T	Login	12/24/2018 3:08:13 PM	JRM	MET025
HS18121347-07	20181214-DGW-MW3-PV5mid-35T	Login	12/24/2018 3:08:13 PM	JRM	MET025
HS18121347-08	20181214-DGW-MW3-PV5mid-40T	Login	12/24/2018 3:08:13 PM	JRM	MET025
HS18121347-09	20181214-DGW-MW3-PV5inlet-ControlT	Login	12/24/2018 3:08:13 PM	JRM	MET025
HS18121347-10	20181214-DGW-MW3-PV5inlet-30-35-40T	Login	12/24/2018 3:08:13 PM	JRM	MET025

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS18121347
Date/Time Received: **24-Dec-2018 08:29**
Received by: **PMG**

Checklist completed by: *Jared R. Makan* eSignature 24-Dec-2018 Date
Reviewed by: *Dane J. Wacasey* eSignature 26-Dec-2018 Date

Matrices: **Water**
Carrier name: **ALS Courier**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	3.0c/3.3c UC/C	IR25	
Cooler(s)/Kit(s):	44385		
Date/Time sample(s) sent to storage:	12/24/2018 15:10		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070

Chain of Custody For

Page ____ of ____

COC ID: 192214

ALS Project Manager:

HS18121347
Golder Associates
Exide Column Studies

Customer Information		Project Information	
Purchase Order	[illegible]	Project Name	Exide Column Studies
Work Order		Project Number	[illegible]
Company Name	Golder Associates	Bill To Company	Golder Associates
Send Report To	[illegible]	Invoice Attn	[illegible] Exide [illegible]
Address	[illegible]	Address	[illegible] Parkway Drive, Suit[illegible]
City/State/Zip	Ballwin MO 63021	City/State/Zip	Ballwin MO 63021
Phone	(314) 984-8800	Phone	(314) 984-8800
Fax		Fax	
e-Mail Address	[illegible]@golder.com	e-Mail Address	[illegible]@golder.com

	Analyses
A	300_W [illegible]
B	TDS_W [illegible]
C	ALK_W [illegible] Alkalinity
D	HARD [illegible]
E	ICP [illegible] Diss Metals [illegible]
F	ICP [illegible] Total Metals [illegible]
G	
H	
I	
J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20181211-DGW-MW3-PUS out-control	2018/12/11	9:30	Groundwater	[illegible]	1	X	X	X	X	X	X					
2	20181211-DGW-MW3-PUS out-30T	2018/12/11	9:30			1				X	X	X					
3	20181211-DGW-MW3-PUS out-35T	2018/12/11	9:30			1				X	X	X					
4	20181211-DGW-MW3-PUS out-40T	2018/12/11	9:30			1				X	X	X					
5	20181214-DGW-MW3-PUS mid-control	2018/12/14	9:30			1				X	X	X					
6	20181214-DGW-MW3-PUS mid-30T	2018/12/14	9:30			1				X	X	X					
7	20181214-DGW-MW3-PUS mid-35T	2018/12/14	9:30			1				X	X	X					
8	20181214-DGW-MW3-PUS mid-40T	2018/12/14	9:30			1				X	X	X					
9	20181214-DGW-MW3-PUS inlet control	2018/12/14	8:00			1				X	X	X					
10	20181214-DGW-MW3-PUS inlet [illegible] 40T	2018/12/14	8:00			1											

Sampler(s) Please Print & Sign: [signature]

Shipment Method:

Required Turnaround Time: (Check Box) ☐ Other ____ ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour

Results Due Date:

Relinquished by: [signature] Date: 2018/12/19 Time: 16:30 Received by:

Relinquished by: Date: 20 Time: 10:30 Received by (Laboratory):

Logged by (Laboratory): Date: 12/20/18 Time: 08:21 Checked by (Laboratory): PJ

Notes: Exide Column Studies

Cooler ID	Cooler Temp.
	4C
WU385	3.3

QC Package: (Check One Box Below)
☐ Level II Std QC ☒ [illegible]
☐ Level III Std QC/Raw Data ☐ [illegible]
☐ Level IV SW846/CLP
☐ Other

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

IR # 25
CF +0.3

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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ORIGIN ID:YUXA (514) 383-0990
Audrey Elneves
Golder Associates Ltd
7250 rue du Mile End
3e etage
MONTREAL, PQ H2R 3A4
CANADA, CA

Ship Date: 20DEC18
ActWgt: 38.05 LB
CAD: 108680724/INET4042

BILL SENDER
EIN/VAT:

To Dane Wacasey (Corey Grandits)
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

(281) 530-5656

(US)

FedEx Express

AWB

E

J18211800152cv

TRK# 7740 3038 9691 Form 0430

NH SGRA

PKG: YOUR PKG

10:30A
INTL PRIORITY

REF:
DESC1: Glacière contenant des bouteilles d'eaux
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: Audrey Elneves
T/C: S 167982832
D/T: R 967554812

[illegible]

COPIE DU DESTINATAIRE - VEUILLEZ LA GLISSER DANS LA POCHETTE

Après l'impression de cette étiquette :
COPIE DU BORDEREAU FEDEX - VEUILLEZ LA PLACER DERRIÈRE LA COPIE DU DESTINATAIRE
1. Pliez la page imprimée le long de la ligne horizontale.
2. Placez l'étiquette dans la pochette d'expédition et fixez-la à votre paquet

ALS 10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887 44385	**CUSTODY SEAL** Date: 2018/12/20 Time: Name: ONIKPO CLAUDE Company: GOLDER	Seal Broken By: SM Date: 12/24/18

44385 DEC 2 2 2018

ALS 10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887 44385	**CUSTODY SEAL** Date: 2018/12/20 Time: Name: ONIKPO CLAUDE Company: GOLDER	Seal Broken By: SM Date: 12/24/18

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TRK# 0430 7740 3038 9691

0A
INTL PRIORITY CLR
CLR
77099
TX-US
IAH

328995 IND 12/21 547G1/E1EF/53C3

NH SGRA

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

January 08, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS18121348**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 2 sample(s) on Dec 24, 2018 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS18121348**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS18121348**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 01/09/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS18121348				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 136175				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?			X		
		Were analytical duplicates analyzed at the appropriate frequency?			X		
		Were RPDs or relative standard deviations within the laboratory QC limits?			X		
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 01/09/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS18121348				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 136175				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			2
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		X			3
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports	
Laboratory Name: ALS Laboratory Group	LRC Date: 01/09/2019
Project Name: Exide Column Studies	Laboratory Job Number: HS18121348
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 136175

ER#[5]	Description
1	Batch 136175, Metals Method SW6020, sample HS18121345-01, MS and MSD were performed on unrelated sample.
2	See Run Log and CCB Exceptions Report.
3	Batch 136175, Metals Method SW6020, sample HS18121345-01, PDS was performed on unrelated sample.

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121348
Start Date: 07-Jan-2019 End Date: 08-Jan-2019

Run ID:ICPMS04_330548
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	07-Jan-2019 12:06	018_ICV.d	AS CD FE K MG PB SB SE
LLICV2	1	07-Jan-2019 12:08	019SMPL.d	AS CD FE K MG PB SB SE
LLICV5	1	07-Jan-2019 12:11	020LICV.d	AS CD FE K MG PB SB SE
ICB	1	07-Jan-2019 12:13	021_ICB.d	AS CD FE K MG PB SB SE
ICSA	1	07-Jan-2019 12:20	023ICSA.d	AS CD FE K MG PB SB SE
ICSAB	1	07-Jan-2019 12:23	024ICSB.d	AS CD FE K MG PB SB SE
CCV 1	1	07-Jan-2019 12:47	032_CCV.d	AS CD FE K MG PB SB SE
CCB 1	1	07-Jan-2019 12:49	033_CCB.d	AS CD FE K MG PB SB SE
MBLK-136175	1	07-Jan-2019 12:59	035SMPL.d	AS CA CD FE K MG PB SB SE
LCS-136175	1	07-Jan-2019 13:01	036SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZSD	5	07-Jan-2019 13:05	038SMPL.d	AS K PB SB SE
ZZZZZZMS	1	07-Jan-2019 13:08	039SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZMSD	1	07-Jan-2019 13:11	040SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZPDS	1	07-Jan-2019 13:14	041SMPL.d	AS CD FE K PB SB SE
CCV 2	1	07-Jan-2019 13:20	044_CCV.d	AS CD FE K MG PB SB SE
CCB 2	1	07-Jan-2019 13:34	047_CCB.d	AS CD FE K MG PB SB SE
CCV 3	1	07-Jan-2019 13:59	058_CCV.d	AS CD FE K MG PB SB SE
CCB 3	1	07-Jan-2019 14:01	059_CCB.d	AS CD FE K MG PB SB SE
2018-11-27-DGW-MW3-T0-ControlD	1	07-Jan-2019 14:19	062SMPL.d	AS CD FE K MG PB SB SE
2018-11-27-DGW-MW3-T0-30-35-40D	1	07-Jan-2019 14:21	063SMPL.d	AS CD FE K MG PB SB SE
CCV 4	1	07-Jan-2019 14:37	070_CCV.d	AS CD FE K MG PB SB SE
CCB 4	1	07-Jan-2019 14:39	071_CCB.d	AS CD FE K MG PB SB SE
CCV 5	1	07-Jan-2019 15:02	073_CCV.d	AS CD FE K MG PB SB SE
CCV 6	1	07-Jan-2019 15:28	083_CCV.d	AS CD FE K MG PB SB SE
CCB 5	1	07-Jan-2019 15:30	084_CCB.d	AS CD FE K MG PB SB SE
ICCV 7	1	07-Jan-2019 16:41	111_ICV.d	AS CD FE K MG PB SB SE
LLCCV2	1	07-Jan-2019 16:43	112SMPL.d	AS CD FE K MG PB SB SE
LLCCV5	1	07-Jan-2019 16:46	113LICV.d	AS CD FE K MG PB SB SE
ICCB 6	1	07-Jan-2019 16:48	114_ICB.d	AS CD FE K MG PB SB SE
LLCCV5	1	07-Jan-2019 16:54	116LICV.d	AS CD FE K MG PB SB SE
CCV 8	1	07-Jan-2019 17:28	128_CCV.d	AS CD FE K MG PB SB SE
CCB 7	1	07-Jan-2019 17:30	129_CCB.d	AS CD FE K MG PB SB SE
CCV 9	1	07-Jan-2019 18:07	140_CCV.d	AS CD FE K MG PB SB SE
CCB 8	1	07-Jan-2019 18:09	141_CCB.d	AS CD FE K MG PB SB SE
CCB 9	1	07-Jan-2019 18:32	151_CCB.d	AS CD FE K MG PB SB SE
CCV 10	1	07-Jan-2019 18:37	153_CCV.d	AS CD FE K MG PB SB SE
CCV 11	1	07-Jan-2019 19:00	163_CCV.d	AS CD FE K MG PB SB SE
CCB 10	1	07-Jan-2019 19:03	164_CCB.d	AS CD FE K MG PB SB SE
CCV 12	1	07-Jan-2019 19:29	175_CCV.d	AS CD FE K MG PB SB SE
CCB 11	1	07-Jan-2019 19:31	176_CCB.d	AS CD FE K MG PB SB SE
CCV 13	1	07-Jan-2019 19:56	187_CCV.d	AS CD FE K MG PB SB SE
CCB 12	1	07-Jan-2019 19:58	188_CCB.d	AS CD FE K MG PB SB SE
CCV 14	1	07-Jan-2019 20:18	197_CCV.d	AS CD FE K MG PB SB SE
CCB 13	1	07-Jan-2019 20:20	198_CCB.d	AS CD FE K MG PB SB SE
CCV 15	1	07-Jan-2019 20:45	209_CCV.d	AS CD FE K MG PB SB SE
CCB 14	1	07-Jan-2019 20:47	210_CCB.d	AS CD FE K MG PB SB SE
CCV 16	1	07-Jan-2019 21:11	221_CCV.d	AS CD FE K MG PB SB SE
CCB 15	1	07-Jan-2019 21:14	222_CCB.d	AS CD FE K MG PB SB SE
CCV 17	1	07-Jan-2019 21:38	233_CCV.d	AS CD FE K MG PB SB SE
CCB 16	1	07-Jan-2019 21:41	234_CCB.d	AS CD FE K MG PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121348

Run ID:ICPMS04_330548
Instrument:ICPMS04
Method:SW6020

CCB 1	Date: 07-Jan-2019 12:49	Seq: 4896973	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	-21.2	18	200	
Sodium	36.2	14	200	

CCB 2	Date: 07-Jan-2019 13:34	Seq: 4897095	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	17.27	12	200	
Potassium	18.56	18	200	
Selenium	1.325	1.1	2	
Sodium	480.8	14	200	

CCB 3	Date: 07-Jan-2019 14:01	Seq: 4897262	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	334.5	14	200	

CCB 4	Date: 07-Jan-2019 14:39	Seq: 4897378	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	-31.19	18	200	
Sodium	230.5	14	200	

CCB 5	Date: 07-Jan-2019 15:30	Seq: 4897510	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	39.36	34	500	
Iron	14.54	12	200	
Potassium	29.2	18	200	
Sodium	8026	14	200	

ICCB 6	Date: 07-Jan-2019 16:48	Seq: 4897833	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	-105.8	14	200	

CCB 7	Date: 07-Jan-2019 17:30	Seq: 4897936	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	-13.31	12	200	
Sodium	-91.1	14	200	

CCB 8	Date: 07-Jan-2019 18:09	Seq: 4898087	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	-14.35	12	200	
Sodium	-81.85	14	200	

CCB 9	Date: 07-Jan-2019 18:32	Seq: 4898099	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	-15.77	12	200	
Sodium	-123.6	14	200	

CCB 10	Date: 07-Jan-2019 19:03	Seq: 4898271	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	-13.51	12	200	
Sodium	-138.2	14	200	

CCB 11	Date: 07-Jan-2019 19:31	Seq: 4898283	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121348
Start Date: 08-Jan-2019 End Date: 08-Jan-2019

Run ID:ICPMS04_330630
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	08-Jan-2019 11:24	018_ICV.d	CA NA
LLICV2	1	08-Jan-2019 11:26	019SMPL.d	CA NA
LLICV5	1	08-Jan-2019 11:28	020LICV.d	CA NA
ICB	1	08-Jan-2019 11:30	021_ICB.d	CA NA
ICSA	1	08-Jan-2019 11:40	023ICSA.d	CA NA
ICSAB	1	08-Jan-2019 11:42	024ICSB.d	CA NA
CCV 1	1	08-Jan-2019 12:11	036_CCV.d	CA NA
CCB 1	1	08-Jan-2019 12:13	037_CCB.d	CA NA
CCV 2	1	08-Jan-2019 12:42	048_CCV.d	CA NA
CCB 2	1	08-Jan-2019 12:44	049_CCB.d	CA NA
MBLK-136175	1	08-Jan-2019 13:05	055SMPL.d	NA
ZZZZZZSD	250	08-Jan-2019 13:10	057SMPL.d	CA MG NA
ZZZZZZPDS	50	08-Jan-2019 13:12	058SMPL.d	CA MG NA
CCV 3	1	08-Jan-2019 13:16	060_CCV.d	CA NA
CCB 3	1	08-Jan-2019 13:19	061_CCB.d	CA NA
2018-11-27-DGW-MW3-T0-ControlD	10	08-Jan-2019 13:47	070SMPL.d	CA NA
CCV 4	1	08-Jan-2019 13:51	072_CCV.d	CA NA
CCB 4	1	08-Jan-2019 13:53	073_CCB.d	CA NA
2018-11-27-DGW-MW3-T0-30-35-40D	10	08-Jan-2019 14:08	075SMPL.d	CA NA
CCV 5	1	08-Jan-2019 14:24	082_CCV.d	CA NA
CCB 5	1	08-Jan-2019 14:26	083_CCB.d	CA NA
CCV 6	1	08-Jan-2019 14:55	093_CCV.d	CA NA
CCB 6	1	08-Jan-2019 14:58	094_CCB.d	CA NA
CCV 7	1	08-Jan-2019 15:13	100_CCV.d	CA NA
CCB 7	1	08-Jan-2019 15:15	101_CCB.d	CA NA
CCV 8	1	08-Jan-2019 15:48	112_CCV.d	CA NA
CCB 8	1	08-Jan-2019 15:50	113_CCB.d	CA NA
CCV 9	1	08-Jan-2019 16:21	124_CCV.d	CA NA
CCB 9	1	08-Jan-2019 16:23	125_CCB.d	CA NA
CCV 10	1	08-Jan-2019 16:57	131_CCV.d	CA NA
CCB 10	1	08-Jan-2019 17:00	132_CCB.d	CA NA

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121348

Run ID:ICPMS04_330630
Instrument:ICPMS04
Method:SW6020

ICB	Date: 08-Jan-2019 11:30	Seq: 4898910		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		-51.17	14	200	
CCB 1	Date: 08-Jan-2019 12:13	Seq: 4898966		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		106.5	14	200	
CCB 2	Date: 08-Jan-2019 12:44	Seq: 4899101		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		57.76	14	200	
CCB 3	Date: 08-Jan-2019 13:19	Seq: 4899143		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		85.27	14	200	
CCB 4	Date: 08-Jan-2019 13:53	Seq: 4899209		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		78.87	14	200	
CCB 5	Date: 08-Jan-2019 14:26	Seq: 4899338		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		46.04	14	200	
CCB 6	Date: 08-Jan-2019 14:58	Seq: 4899477		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		53.91	14	200	
CCB 7	Date: 08-Jan-2019 15:15	Seq: 4899486		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		66.89	14	200	
CCB 8	Date: 08-Jan-2019 15:50	Seq: 4899649		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		96.21	14	200	
CCB 9	Date: 08-Jan-2019 16:23	Seq: 4899722		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		290	14	200	
CCB 10	Date: 08-Jan-2019 17:00	Seq: 4899818		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		352.1	14	200	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS18121348

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18121348-01	2018-11-27-DGW-MW3-T0-ControlD	Groundwater		27-Nov-2018 14:30	24-Dec-2018 08:29	☐
HS18121348-02	2018-11-27-DGW-MW3-T0-30-35-40D	Groundwater		27-Nov-2018 14:30	24-Dec-2018 08:29	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 2018-11-27-DGW-MW3-T0-ControlD
Collection Date: 27-Nov-2018 14:30

ANALYTICAL REPORT
WorkOrder:HS18121348
Lab ID:HS18121348-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 31-Dec-2018		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	07-Jan-2019 14:19
Arsenic	**0.0284**		**0.000400**	**0.00200**	**mg/L**	1	07-Jan-2019 14:19
Cadmium	U		0.000200	0.00200	mg/L	1	07-Jan-2019 14:19
Calcium	**108**		**0.340**	**5.00**	**mg/L**	10	08-Jan-2019 13:47
Iron	**2.92**		**0.0120**	**0.200**	**mg/L**	1	07-Jan-2019 14:19
Lead	U		0.000600	0.00200	mg/L	1	07-Jan-2019 14:19
Magnesium	**20.2**		**0.0100**	**0.200**	**mg/L**	1	07-Jan-2019 14:19
Potassium	**1.75**		**0.0180**	**0.200**	**mg/L**	1	07-Jan-2019 14:19
Selenium	**0.00170**	J	**0.00110**	**0.00200**	**mg/L**	1	07-Jan-2019 14:19
Sodium	**196**		**0.140**	**2.00**	**mg/L**	10	08-Jan-2019 13:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 2018-11-27-DGW-MW3-T0-30-35-40D
Collection Date: 27-Nov-2018 14:30

ANALYTICAL REPORT
WorkOrder:HS18121348
Lab ID:HS18121348-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 31-Dec-2018		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	07-Jan-2019 14:21
Arsenic	**0.0370**		**0.000400**	**0.00200**	**mg/L**	1	07-Jan-2019 14:21
Cadmium	U		0.000200	0.00200	mg/L	1	07-Jan-2019 14:21
Calcium	**108**		**0.340**	**5.00**	**mg/L**	10	08-Jan-2019 14:08
Iron	**3.41**		**0.0120**	**0.200**	**mg/L**	1	07-Jan-2019 14:21
Lead	U		0.000600	0.00200	mg/L	1	07-Jan-2019 14:21
Magnesium	**23.2**		**0.0100**	**0.200**	**mg/L**	1	07-Jan-2019 14:21
Potassium	**2.27**		**0.0180**	**0.200**	**mg/L**	1	07-Jan-2019 14:21
Selenium	**0.00265**		**0.00110**	**0.00200**	**mg/L**	1	07-Jan-2019 14:21
Sodium	**190**		**0.140**	**2.00**	**mg/L**	10	08-Jan-2019 14:08

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121348

Batch ID: 136175 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18121348-01	1	10	10 (mL)	1
HS18121348-02	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121348

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 136175	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS18121348-01	2018-11-27-DGW-MW3-T0-ControlD	27 Nov 2018 14:30		31 Dec 2018 10:00	08 Jan 2019 13:47	10
HS18121348-01	2018-11-27-DGW-MW3-T0-ControlD	27 Nov 2018 14:30		31 Dec 2018 10:00	07 Jan 2019 14:19	1
HS18121348-02	2018-11-27-DGW-MW3-T0-30-35-40D	27 Nov 2018 14:30		31 Dec 2018 10:00	08 Jan 2019 14:08	10
HS18121348-02	2018-11-27-DGW-MW3-T0-30-35-40D	27 Nov 2018 14:30		31 Dec 2018 10:00	07 Jan 2019 14:21	1

WorkOrder: HS18121348
InstrumentID: ICPMS04
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.00100	0.00135	0.000400	0.00200
A	Arsenic	7440-38-2	0.00100	0.000732	0.000400	0.00200
A	Cadmium	7440-43-9	0.00100	0.00101	0.000200	0.00200
A	Calcium	7440-70-2	0.100	0.0776	0.0340	0.500
A	Iron	7439-89-6	0.100	0.0850	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000864	0.000600	0.00200
A	Magnesium	7439-95-4	0.100	0.107	0.0100	0.200
A	Potassium	7440-09-7	0.100	0.0562	0.0180	0.200
A	Selenium	7782-49-2	0.00200	0.00213	0.00110	0.00200
A	Sodium	7440-23-5	0.100	0.102	0.0140	0.200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121348

QC BATCH REPORT

Batch ID: 136175 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLK-136175** Units: **mg/L** Analysis Date: **07-Jan-2019 12:59**
Client ID: Run ID: **ICPMS04_330548** SeqNo: **4896999** PrepDate: **31-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	U	0.200								
Potassium	U	0.200								
Selenium	U	0.00200								

MBLK Sample ID: **MBLK-136175** Units: **mg/L** Analysis Date: **08-Jan-2019 13:05**
Client ID: Run ID: **ICPMS04_330630** SeqNo: **4899137** PrepDate: **31-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	U	0.200								

LCS Sample ID: **LCS-136175** Units: **mg/L** Analysis Date: **07-Jan-2019 13:01**
Client ID: Run ID: **ICPMS04_330548** SeqNo: **4897000** PrepDate: **31-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04804	0.00200	0.05	0	96.1	80 - 120				
Arsenic	0.04866	0.00200	0.05	0	97.3	80 - 120				
Cadmium	0.04747	0.00200	0.05	0	94.9	80 - 120				
Calcium	4.821	0.500	5	0	96.4	80 - 120				
Iron	4.97	0.200	5	0	99.4	80 - 120				
Lead	0.04803	0.00200	0.05	0	96.1	80 - 120				
Magnesium	5.061	0.200	5	0	101	80 - 120				
Potassium	5.086	0.200	5	0	102	80 - 120				
Selenium	0.04802	0.00200	0.05	0	96.0	80 - 120				
Sodium	4.906	0.200	5	0	98.1	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121348

QC BATCH REPORT

Batch ID: 136175 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

MS Sample ID: **HS18121345-01MS** Units: **mg/L** Analysis Date: **07-Jan-2019 13:08**
Client ID: Run ID: **ICPMS04_330548** SeqNo: **4897003** PrepDate: **31-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05074	0.00200	0.05	0.001325	98.8	75 - 125				
Arsenic	0.0489	0.00200	0.05	0.00045	96.9	75 - 125				
Cadmium	0.05972	0.00200	0.05	0.01098	97.5	75 - 125				
Calcium	447.7	0.500	5	463.9	-325	75 - 125				SEO
Iron	23.03	0.200	5	17.9	103	75 - 125				
Lead	0.05057	0.00200	0.05	0.001899	97.4	75 - 125				
Magnesium	289.2	0.200	5	302.2	-260	75 - 125				SEO
Potassium	25.03	0.200	5	21.23	76.1	75 - 125				O
Selenium	0.04778	0.00200	0.05	0.00111	93.3	75 - 125				
Sodium	1455	0.200	5	1503	-968	75 - 125				SEO

MSD Sample ID: **HS18121345-01MSD** Units: **mg/L** Analysis Date: **07-Jan-2019 13:11**
Client ID: Run ID: **ICPMS04_330548** SeqNo: **4897004** PrepDate: **31-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.051	0.00200	0.05	0.001325	99.4	75 - 125	0.05074	0.523	20	
Arsenic	0.04825	0.00200	0.05	0.00045	95.6	75 - 125	0.0489	1.35	20	
Cadmium	0.06114	0.00200	0.05	0.01098	100	75 - 125	0.05972	2.35	20	
Calcium	431.2	0.500	5	463.9	-654	75 - 125	447.7	3.75	20	SEO
Iron	22.35	0.200	5	17.9	89.1	75 - 125	23.03	3	20	
Lead	0.05064	0.00200	0.05	0.001899	97.5	75 - 125	0.05057	0.13	20	
Magnesium	289.7	0.200	5	302.2	-249	75 - 125	289.2	0.182	20	SEO
Potassium	23.96	0.200	5	21.23	54.6	75 - 125	25.03	4.39	20	SO
Selenium	0.04815	0.00200	0.05	0.00111	94.1	75 - 125	0.04778	0.765	20	
Sodium	1460	0.200	5	1503	-864	75 - 125	1455	0.357	20	SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121348

QC BATCH REPORT

Batch ID: 136175 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

PDS Sample ID: **HS18121345-01PDS** Units: **mg/L** Analysis Date: **07-Jan-2019 13:14**
Client ID: Run ID: **ICPMS04_330548** SeqNo: **4897005** PrepDate: **31-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09384	0.00200	0.1	0.001325	92.5	75 - 125				
Arsenic	0.09286	0.00200	0.1	0.00045	92.4	75 - 125				
Cadmium	0.105	0.00200	0.1	0.01098	94.0	75 - 125				
Iron	27.64	0.200	10	17.9	97.4	75 - 125				
Lead	0.1003	0.00200	0.1	0.001899	98.4	75 - 125				
Potassium	27.29	0.200	10	21.23	60.7	75 - 125				S
Selenium	0.09637	0.00200	0.1	0.00111	95.3	75 - 125				

PDS Sample ID: **HS18121345-01PDS** Units: **mg/L** Analysis Date: **08-Jan-2019 13:12**
Client ID: Run ID: **ICPMS04_330630** SeqNo: **4899140** PrepDate: **31-Dec-2018** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	1023	25.0	500	491.1	106	75 - 125				
Magnesium	882.8	10.0	500	342.1	108	75 - 125				
Sodium	2187	10.0	500	1644	109	75 - 125				

SD Sample ID: **HS18121345-01SD** Units: **mg/L** Analysis Date: **07-Jan-2019 13:05**
Client ID: Run ID: **ICPMS04_330548** SeqNo: **4897002** PrepDate: **31-Dec-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.001325	0	10	
Arsenic	U	0.0100					0.00045	0	10	
Lead	U	0.0100					0.001899	0	10	
Potassium	22.31	1.00					21.23	5.09	10	
Selenium	U	0.0100					0.00111	0	10	

SD Sample ID: **HS18121345-01SD** Units: **mg/L** Analysis Date: **08-Jan-2019 13:10**
Client ID: Run ID: **ICPMS04_330630** SeqNo: **4899139** PrepDate: **31-Dec-2018** DF: **250**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	535.9	125					491.1	9.13	10	
Magnesium	351.9	50.0					342.1	2.86	10	
Sodium	1788	50.0					1644	8.76	10	

The following samples were analyzed in this batch: HS18121348-01 HS18121348-02

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS18121348**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS18121348

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS18121348-01	2018-11-27-DGW-MW3-T0-ControlD	Login	12/24/2018 3:19:36 PM	JRM	MET025
HS18121348-02	2018-11-27-DGW-MW3-T0-30-35-40D	Login	12/24/2018 3:19:36 PM	JRM	MET025

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS18121348
Date/Time Received: **24-Dec-2018 08:29**
Received by: **PMG**

Checklist completed by: *Jared R. Makan* eSignature 24-Dec-2018 Date
Reviewed by: *Dane J. Wacasey* eSignature 26-Dec-2018 Date

Matrices: **Water**
Carrier name: **ALS Courier**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	3.0c/3.3c UC/C	IR25	
Cooler(s)/Kit(s):	44385		
Date/Time sample(s) sent to storage:	12/24/2018 14:15		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070

Chain of Custody Form

Page 1 of 1

COC ID: 192206

HS18121348

Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information		
Purchase Order	130-2086-0	Project Name	Exide Column Studies	A
Work Order		Project Number	130-2086	B
Company Name	Golder Associates	Bill To Company	Golder Associates	C
Send Report To	Emily Ansle	Invoice Attn	Tammy Kurzmack Exide AP	D
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive Suit	E
City/State/Zip	Ballwin MO 63021	City/State/Zip	Ballwin MO 63021	G
Phone	(314) 984-8800	Phone	(314) 984-8800	H
Fax		Fax		I
e-Mail Address	[illegible]	e-Mail Address	Tammy_Kurzmack@golder.com	J

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	[illegible]			Ground Water		3	X	X	X	X	X	X					
2	EXIDE-1-24-DGW-MW3-TC-CONTROL	2018/11/27	14:30	GW		1					X						
3	EXIDE-W-27-DGW-MW3-TC-30-55-40	2018/11/27	14:30	GW		1					X						
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Giovanna Llanos

Shipment Method:

Required Turnaround Time: (Check Box) [ ] 10 Work Days [X] 5 Work Days [ ] 3 Work Days [ ] 24 Hour [ ] Other

Results Due Date:

Relinquished by: Giovanna Llanos Date: 12-28-18 Time: 10:30

Relinquished by:

Received by:

Received by (Laboratory):

Logged by (Laboratory): Date: 12/24/18 Time: 08:29

Checked by (Laboratory):

Notes: Exide Column Studies

Cooler ID	Cooler Temp.
401381	3.0

QC Package: (Check One Box Below)

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

1L x 25

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Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

ORIGIN ID:YUXA (514) 383-0990
Audrey Etheves
Golder Associates Ltd
7250 rue du Mile End
3e etage
MONTREAL, PQ H2R3A4
CANADA, CA

Ship Date: 20DEC18
ActWgt: 38.05 LB
CAD: 108680724/NET4042

BILL SENDER
EIN/VAT:

TO Dane Wacasey (Corey Granelits) (281) 530-5656
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

FedEx Express
(US)
AWB
J182160815/20ur

NH SGRA

PKG:YOUR PKG

TRK# 7740 3038 9691 Form 0430

10:30A
INTL PRIORITY

REF:
DESC1:GlaciÊre contenant des bouteilles d'eaux
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: Audrey Etheves
T/C: S 167982832
D/T: R 967564812

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CUSTODY SEAL
Seal Broken By:
Date: 2018/12/22 Time:
Name: ONTARIO CLAUDE
Company: GOLDER

44385

DEC 22 2018

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Seal Broken By:
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January 08, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS18121350**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 4 sample(s) on Dec 24, 2018 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS18121350**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS18121350**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data								
Laboratory Name: ALS Laboratory Group			LRC Date: 01/08/2019					
Project Name: Exide Column Studies			Laboratory Job Number: HS18121350					
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 136174,136175,R330657					
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]	
R1	OI	**Chain-of-custody (C-O-C)**						
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X					
		Were all departures from standard conditions described in an exception report?	X					
R2	OI	**Sample and quality control (QC) identification**						
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X					
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X					
R3	OI	**Test reports**						
		Were all samples prepared and analyzed within holding times?	X					
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X					
		Were calculations checked by a peer or supervisor?	X					
		Were all analyte identifications checked by a peer or supervisor?	X					
		Were sample detection limits reported for all analytes not detected?	X					
		Were all results for soil and sediment samples reported on a dry weight basis?			X			
		Were % moisture (or solids) reported for all soil and sediment samples?			X			
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X			
		If required for the project, TICs reported?			X			
R4	O	**Surrogate recovery data**						
		Were surrogates added prior to extraction?			X			
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X			
R5	OI	**Test reports/summary forms for blank samples**						
		Were appropriate type(s) of blanks analyzed?	X					
		Were blanks analyzed at the appropriate frequency?	X					
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X					
		Were blank concentrations < MQL?	X					
R6	OI	**Laboratory control samples (LCS):**						
		Were all COCs included in the LCS?	X					
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X					
		Were LCSs analyzed at the required frequency?	X					
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X					
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X					
		Was the LCSD RPD within QC limits?	X					
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**						
		Were the project/method specified analytes included in the MS and MSD?	X					
		Were MS/MSD analyzed at the appropriate frequency?	X					
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1	
		Were MS/MSD RPDs within laboratory QC limits?	X					
R8	OI	**Analytical duplicate data**						
		Were appropriate analytical duplicates analyzed for each matrix?			X			
		Were analytical duplicates analyzed at the appropriate frequency?			X			
		Were RPDs or relative standard deviations within the laboratory QC limits?			X			
R9	OI	**Method quantitation limits (MQLs):**						
		Are the MQLs for each method analyte included in the laboratory data package?	X					
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X					
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X					
R10	OI	**Other problems/anomalies**						
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X					
		Were all necessary corrective actions performed for the reported data?	X					
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X					
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X					

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 01/08/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS18121350				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 136174,136175,R330657				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			2
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		X			3
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports	
Laboratory Name: ALS Laboratory Group	LRC Date: 01/08/2019
Project Name: Exide Column Studies	Laboratory Job Number: HS18121350
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 136174,136175,R330657

ER#[5]	Description
1	Batch 136174, Metals Method SW6020, sample HS18121098-03, MS and MSD were performed on unrelated sample. Batch 136175, Metals Method SW6020, sample HS18121345-01, MS and MSD were performed on unrelated sample.
2	See Run Log and CCB Exceptions Report.
3	Batch 136175, Metals Method SW6020, sample HS18121345-01, PDS was performed on unrelated sample

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121350
Start Date: 07-Jan-2019 End Date: 08-Jan-2019

Run ID:ICPMS04_330548
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	07-Jan-2019 12:06	018_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	07-Jan-2019 12:08	019SMPL.d	AS CD FE K MG PB SB SE
LLICV5	1	07-Jan-2019 12:11	020LICV.d	AS CD FE K MG PB SB SE
ICB	1	07-Jan-2019 12:13	021_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	07-Jan-2019 12:20	023ICSA.d	AS CD FE K MG PB SB SE
ICSAB	1	07-Jan-2019 12:23	024ICSB.d	AS CD FE K MG PB SB SE
CCV 1	1	07-Jan-2019 12:47	032_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	07-Jan-2019 12:49	033_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-136175	1	07-Jan-2019 12:59	035SMPL.d	AS CA CD FE K MG PB SB SE
LCS-136175	1	07-Jan-2019 13:01	036SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZSD	5	07-Jan-2019 13:05	038SMPL.d	AS K PB SB SE
ZZZZZZMS	1	07-Jan-2019 13:08	039SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZMSD	1	07-Jan-2019 13:11	040SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZPDS	1	07-Jan-2019 13:14	041SMPL.d	AS CD FE K PB SB SE
CCV 2	1	07-Jan-2019 13:20	044_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	07-Jan-2019 13:34	047_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	07-Jan-2019 13:59	058_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	07-Jan-2019 14:01	059_CCB.d	AS CA CD FE K MG NA PB SB SE
20181213-FD-T0-ControlD	1	07-Jan-2019 14:23	064SMPL.d	AS CD FE K MG PB SB SE
20181213-FD-T0-30-35-40D	1	07-Jan-2019 14:25	065SMPL.d	AS CD FE K MG PB SB SE
CCV 4	1	07-Jan-2019 14:37	070_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	07-Jan-2019 14:39	071_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	07-Jan-2019 15:02	073_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	07-Jan-2019 15:28	083_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	07-Jan-2019 15:30	084_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 7	1	07-Jan-2019 16:41	111_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	07-Jan-2019 16:43	112SMPL.d	AS CD FE K MG PB SB SE
LLCCV5	1	07-Jan-2019 16:46	113LICV.d	AS CD FE K MG PB SB SE
ICCB 6	1	07-Jan-2019 16:48	114_ICB.d	AS CA CD FE K MG NA PB SB SE
LLCCV5	1	07-Jan-2019 16:54	116LICV.d	AS CD FE K MG PB SB SE
CCV 8	1	07-Jan-2019 17:28	128_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	07-Jan-2019 17:30	129_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	07-Jan-2019 18:07	140_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	07-Jan-2019 18:09	141_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	07-Jan-2019 18:32	151_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 10	1	07-Jan-2019 18:37	153_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 11	1	07-Jan-2019 19:00	163_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	07-Jan-2019 19:03	164_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 12	1	07-Jan-2019 19:29	175_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	07-Jan-2019 19:31	176_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 13	1	07-Jan-2019 19:56	187_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 12	1	07-Jan-2019 19:58	188_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 14	1	07-Jan-2019 20:18	197_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 13	1	07-Jan-2019 20:20	198_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 15	1	07-Jan-2019 20:45	209_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 14	1	07-Jan-2019 20:47	210_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 16	1	07-Jan-2019 21:11	221_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 15	1	07-Jan-2019 21:14	222_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 17	1	07-Jan-2019 21:38	233_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 16	1	07-Jan-2019 21:41	234_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 18	1	07-Jan-2019 22:05	245_CCV.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121350

Run ID:ICPMS04_330548
Instrument:ICPMS04
Method:SW6020

CCB 1	Date: 07-Jan-2019 12:49	Seq: 4896973	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	-21.2	18	200	
Sodium	36.2	14	200	
CCB 2	Date: 07-Jan-2019 13:34	Seq: 4897095	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	17.27	12	200	
Potassium	18.56	18	200	
Selenium	1.325	1.1	2	
Sodium	480.8	14	200	
CCB 3	Date: 07-Jan-2019 14:01	Seq: 4897262	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	334.5	14	200	
CCB 4	Date: 07-Jan-2019 14:39	Seq: 4897378	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	-31.19	18	200	
Sodium	230.5	14	200	
CCB 5	Date: 07-Jan-2019 15:30	Seq: 4897510	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	39.36	34	500	
Iron	14.54	12	200	
Potassium	29.2	18	200	
Sodium	8026	14	200	
ICCB 6	Date: 07-Jan-2019 16:48	Seq: 4897833	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	-105.8	14	200	
CCB 7	Date: 07-Jan-2019 17:30	Seq: 4897936	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	-13.31	12	200	
Sodium	-91.1	14	200	
CCB 8	Date: 07-Jan-2019 18:09	Seq: 4898087	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	-14.35	12	200	
Sodium	-81.85	14	200	
CCB 9	Date: 07-Jan-2019 18:32	Seq: 4898099	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	-15.77	12	200	
Sodium	-123.6	14	200	
CCB 10	Date: 07-Jan-2019 19:03	Seq: 4898271	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	-13.51	12	200	
Sodium	-138.2	14	200	
CCB 11	Date: 07-Jan-2019 19:31	Seq: 4898283	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121350
Start Date: 08-Jan-2019 End Date: 08-Jan-2019

Run ID:ICPMS04_330630
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	08-Jan-2019 11:24	018_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	08-Jan-2019 11:26	019SMPL.d	CA NA
LLICV5	1	08-Jan-2019 11:28	020LICV.d	CA NA
ICB	1	08-Jan-2019 11:30	021_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	08-Jan-2019 11:40	023ICSA.d	CA NA
ICSAB	1	08-Jan-2019 11:42	024ICSB.d	CA NA
CCV 1	1	08-Jan-2019 12:11	036_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	08-Jan-2019 12:13	037_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	08-Jan-2019 12:42	048_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	08-Jan-2019 12:44	049_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-136175	1	08-Jan-2019 13:05	055SMPL.d	NA
ZZZZZZSD	250	08-Jan-2019 13:10	057SMPL.d	CA MG NA
ZZZZZZPDS	50	08-Jan-2019 13:12	058SMPL.d	CA MG NA
CCV 3	1	08-Jan-2019 13:16	060_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	08-Jan-2019 13:19	061_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	08-Jan-2019 13:51	072_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	08-Jan-2019 13:53	073_CCB.d	AS CA CD FE K MG NA PB SB SE
20181213-FD-T0-ControlD	10	08-Jan-2019 14:10	076SMPL.d	CA NA
20181213-FD-T0-30-35-40D	10	08-Jan-2019 14:13	077SMPL.d	CA NA
CCV 5	1	08-Jan-2019 14:24	082_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	08-Jan-2019 14:26	083_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	08-Jan-2019 14:55	093_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	08-Jan-2019 14:58	094_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	08-Jan-2019 15:13	100_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	08-Jan-2019 15:15	101_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 8	1	08-Jan-2019 15:48	112_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	08-Jan-2019 15:50	113_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	08-Jan-2019 16:21	124_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	08-Jan-2019 16:23	125_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 10	1	08-Jan-2019 16:57	131_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	08-Jan-2019 17:00	132_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 11	1	08-Jan-2019 17:38	142_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	08-Jan-2019 17:40	143_CCB.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121350

Run ID:ICPMS04_330630
Instrument:ICPMS04
Method:SW6020

ICB	Date: 08-Jan-2019 11:30	Seq: 4898910		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		-51.17	14	200	
CCB 1	Date: 08-Jan-2019 12:13	Seq: 4898966		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		106.5	14	200	
CCB 2	Date: 08-Jan-2019 12:44	Seq: 4899101		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		57.76	14	200	
CCB 3	Date: 08-Jan-2019 13:19	Seq: 4899143		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		85.27	14	200	
CCB 4	Date: 08-Jan-2019 13:53	Seq: 4899209		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		78.87	14	200	
CCB 5	Date: 08-Jan-2019 14:26	Seq: 4899338		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		46.04	14	200	
CCB 6	Date: 08-Jan-2019 14:58	Seq: 4899477		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		53.91	14	200	
CCB 7	Date: 08-Jan-2019 15:15	Seq: 4899486		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		66.89	14	200	
CCB 8	Date: 08-Jan-2019 15:50	Seq: 4899649		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		96.21	14	200	
CCB 9	Date: 08-Jan-2019 16:23	Seq: 4899722		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		290	14	200	
CCB 10	Date: 08-Jan-2019 17:00	Seq: 4899818		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		352.1	14	200	
CCB 11	Date: 08-Jan-2019 17:40	Seq: 4899849		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		426.7	14	200	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121350
Start Date: 04-Jan-2019 End Date: 05-Jan-2019

Run ID:ICPMS05_330462
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	04-Jan-2019 11:28	023_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV5	1	04-Jan-2019 11:30	024LICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	04-Jan-2019 11:32	025SMPL.d	AS CA CD FE K MG NA PB SB SE
ICB	1	04-Jan-2019 11:44	028_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	04-Jan-2019 12:12	030ICSA.d	AS CA CD FE K MG NA PB SB SE
ICSAB	1	04-Jan-2019 12:14	031ICSB.d	AS CA CD FE K MG NA PB SB SE
CCV 1	1	04-Jan-2019 12:41	040_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	04-Jan-2019 12:43	041_CCB.d	AS CA CD FE K MG NA PB SB SE
LLCCV5	1	04-Jan-2019 14:44	076LICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	04-Jan-2019 14:46	077SMPL.d	AS CA CD FE K MG NA PB SB SE
ICCB 2	1	04-Jan-2019 14:48	078_ICB.d	AS CA CD FE K MG NA PB SB SE
ICCV 2	1	04-Jan-2019 15:07	080_ICV.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	04-Jan-2019 15:25	086_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	04-Jan-2019 15:27	087_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	04-Jan-2019 15:44	095_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	04-Jan-2019 15:46	096_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-136174	1	04-Jan-2019 16:01	099SMPL.d	AS CA CD FE K MG PB SB SE
LCS-136174	1	04-Jan-2019 16:03	100SMPL.d	AS CA CD FE K MG PB SB SE
CCV 5	1	04-Jan-2019 16:17	107_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	04-Jan-2019 16:19	108_CCB.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZSD	5	04-Jan-2019 16:25	110SMPL.d	AS CD FE K MG SB SE
ZZZZZZMS	1	04-Jan-2019 16:27	111SMPL.d	AS CA CD FE K MG NA SB SE
ZZZZZZMSD	1	04-Jan-2019 16:29	112SMPL.d	AS CA CD FE K MG NA SB SE
ZZZZZZPDS	1	04-Jan-2019 16:31	113SMPL.d	AS CD FE K MG SB SE
CCB 6	1	04-Jan-2019 16:45	120_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	04-Jan-2019 16:53	122_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	04-Jan-2019 17:08	128_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	04-Jan-2019 17:10	129_CCB.d	AS CA CD FE K MG NA PB SB SE
20181213-FD-T0-ControlT	1	04-Jan-2019 17:21	133SMPL.d	AS CD FE K MG SB SE
20181213-FD-T0-30-35-40T	1	04-Jan-2019 17:23	134SMPL.d	AS CD FE K MG SB SE
CCV 8	1	04-Jan-2019 17:31	138_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	04-Jan-2019 17:33	139_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	04-Jan-2019 18:07	141_CCV.d	AS CA CD FE K MG NA PB SB SE
MBLK-136174	1	04-Jan-2019 18:10	142SMPL.d	NA
LCS-136174	1	04-Jan-2019 18:12	143SMPL.d	NA
ZZZZZZSD	250	04-Jan-2019 18:16	145SMPL.d	NA
ZZZZZZPDS	50	04-Jan-2019 18:18	146SMPL.d	NA
20181213-FD-T0-ControlT	20	04-Jan-2019 18:20	147SMPL.d	CA NA
20181213-FD-T0-30-35-40T	50	04-Jan-2019 18:22	148SMPL.d	CA NA
CCV 10	1	04-Jan-2019 18:26	150_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	04-Jan-2019 18:28	151_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 11	1	04-Jan-2019 19:10	165_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV5	1	04-Jan-2019 19:12	166LICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	04-Jan-2019 19:14	167SMPL.d	AS CA CD FE K MG NA PB SB SE
ICCB 10	1	04-Jan-2019 19:16	168_ICB.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZSD	5	04-Jan-2019 19:24	172SMPL.d	PB
ZZZZZZMS	1	04-Jan-2019 19:26	173SMPL.d	PB
ZZZZZZMSD	1	04-Jan-2019 19:28	174SMPL.d	PB
ZZZZZZPDS	1	04-Jan-2019 19:30	175SMPL.d	PB
CCV 12	1	04-Jan-2019 19:32	176_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	04-Jan-2019 19:34	177_CCB.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121350

Run ID:ICPMS05_330462
Instrument:ICPMS05
Method:SW6020

ICB	Date: 04-Jan-2019 11:44	Seq: 4894385		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Potassium	-23.42	18	200	
CCB 1	Date: 04-Jan-2019 12:43	Seq: 4894650		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Potassium	-27.51	18	200	
	Sodium	20.25	14	200	
CCB 3	Date: 04-Jan-2019 15:27	Seq: 4894999		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Calcium	71.98	34	500	
	Magnesium	21.06	10	200	
	Sodium	163.1	14	200	
CCB 4	Date: 04-Jan-2019 15:46	Seq: 4895008		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Calcium	34.89	34	500	
	Magnesium	13.92	10	200	
	Sodium	113.3	14	200	
CCB 5	Date: 04-Jan-2019 16:19	Seq: 4895335		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	108.8	14	200	
CCB 6	Date: 04-Jan-2019 16:45	Seq: 4895347		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	108.4	14	200	
CCB 7	Date: 04-Jan-2019 17:10	Seq: 4895356		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	62.43	14	200	
CCB 8	Date: 04-Jan-2019 17:33	Seq: 4895376		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Calcium	41.59	34	500	
	Magnesium	11	10	200	
	Sodium	125	14	200	
CCB 9	Date: 04-Jan-2019 18:28	Seq: 4895655		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	17.67	14	200	
ICCB 10	Date: 04-Jan-2019 19:16	Seq: 4895704		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Potassium	-34.36	18	200	
CCB 11	Date: 04-Jan-2019 19:34	Seq: 4895713		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Calcium	55.21	34	500	
	Potassium	-31.86	18	200	
	Sodium	78.02	14	200	
CCB 12	Date: 04-Jan-2019 19:52	Seq: 4895722		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS18121350

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18121350-01	20181213-FD-T0-ControlT	Groundwater		13-Dec-2018 13:00	24-Dec-2018 08:29	☐
HS18121350-02	20181213-FD-T0-30-35-40T	Groundwater		13-Dec-2018 13:00	24-Dec-2018 08:29	☐
HS18121350-03	20181213-FD-T0-ControlD	Groundwater		13-Dec-2018 13:00	24-Dec-2018 08:29	☐
HS18121350-04	20181213-FD-T0-30-35-40D	Groundwater		13-Dec-2018 13:00	24-Dec-2018 08:29	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181213-FD-T0-ControlT
Collection Date: 13-Dec-2018 13:00

ANALYTICAL REPORT
WorkOrder:HS18121350
Lab ID:HS18121350-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**492**		**2.00**	**2.00**	**mg/L**	1	08-Jan-2019 15:22
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 31-Dec-2018		Analyst: ALR
Antimony	**0.0328**		**0.000400**	**0.00200**	**mg/L**	1	04-Jan-2019 17:21
Arsenic	**0.00138**	J	**0.000400**	**0.00200**	**mg/L**	1	04-Jan-2019 17:21
Cadmium	U		0.000200	0.00200	mg/L	1	04-Jan-2019 17:21
Calcium	**195**		**0.680**	**10.0**	**mg/L**	20	04-Jan-2019 18:20
Iron	**0.0244**	J	**0.0120**	**0.200**	**mg/L**	1	04-Jan-2019 17:21
Lead	**0.00138**	J	**0.000600**	**0.00200**	**mg/L**	1	04-Jan-2019 19:45
Magnesium	**1.25**		**0.0100**	**0.200**	**mg/L**	1	04-Jan-2019 17:21
Potassium	**11.8**		**0.0180**	**0.200**	**mg/L**	1	04-Jan-2019 17:21
Selenium	**0.00658**		**0.00110**	**0.00200**	**mg/L**	1	04-Jan-2019 17:21
Sodium	**259**		**0.280**	**4.00**	**mg/L**	20	04-Jan-2019 18:20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181213-FD-T0-30-35-40T
Collection Date: 13-Dec-2018 13:00

ANALYTICAL REPORT
WorkOrder:HS18121350
Lab ID:HS18121350-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**577**		**2.00**	**2.00**	**mg/L**	1	08-Jan-2019 15:22
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 31-Dec-2018		Analyst: ALR
Antimony	**0.0354**		**0.000400**	**0.00200**	**mg/L**	1	04-Jan-2019 17:23
Arsenic	**0.00157**	J	**0.000400**	**0.00200**	**mg/L**	1	04-Jan-2019 17:23
Cadmium	U		0.000200	0.00200	mg/L	1	04-Jan-2019 17:23
Calcium	**229**		**1.70**	**25.0**	**mg/L**	50	04-Jan-2019 18:22
Iron	**0.0281**	J	**0.0120**	**0.200**	**mg/L**	1	04-Jan-2019 17:23
Lead	**0.00143**	J	**0.000600**	**0.00200**	**mg/L**	1	04-Jan-2019 19:47
Magnesium	**1.33**		**0.0100**	**0.200**	**mg/L**	1	04-Jan-2019 17:23
Potassium	**11.9**		**0.0180**	**0.200**	**mg/L**	1	04-Jan-2019 17:23
Selenium	**0.00696**		**0.00110**	**0.00200**	**mg/L**	1	04-Jan-2019 17:23
Sodium	**287**		**0.700**	**10.0**	**mg/L**	50	04-Jan-2019 18:22

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181213-FD-T0-ControlD
Collection Date: 13-Dec-2018 13:00

ANALYTICAL REPORT
WorkOrder:HS18121350
Lab ID:HS18121350-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 31-Dec-2018		Analyst: JCJ
Antimony	**0.0351**		**0.000400**	**0.00200**	**mg/L**	1	07-Jan-2019 14:23
Arsenic	**0.00112**	J	**0.000400**	**0.00200**	**mg/L**	1	07-Jan-2019 14:23
Cadmium	U		0.000200	0.00200	mg/L	1	07-Jan-2019 14:23
Calcium	**209**		**0.340**	**5.00**	**mg/L**	10	08-Jan-2019 14:10
Iron	**0.0147**	J	**0.0120**	**0.200**	**mg/L**	1	07-Jan-2019 14:23
Lead	U		0.000600	0.00200	mg/L	1	07-Jan-2019 14:23
Magnesium	**1.19**		**0.0100**	**0.200**	**mg/L**	1	07-Jan-2019 14:23
Potassium	**11.1**		**0.0180**	**0.200**	**mg/L**	1	07-Jan-2019 14:23
Selenium	**0.00639**		**0.00110**	**0.00200**	**mg/L**	1	07-Jan-2019 14:23
Sodium	**270**		**0.140**	**2.00**	**mg/L**	10	08-Jan-2019 14:10

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181213-FD-T0-30-35-40D
Collection Date: 13-Dec-2018 13:00

ANALYTICAL REPORT
WorkOrder:HS18121350
Lab ID:HS18121350-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 31-Dec-2018		Analyst: JCJ
Antimony	**0.0346**		**0.000400**	**0.00200**	**mg/L**	1	07-Jan-2019 14:25
Arsenic	**0.00121**	J	**0.000400**	**0.00200**	**mg/L**	1	07-Jan-2019 14:25
Cadmium	U		0.000200	0.00200	mg/L	1	07-Jan-2019 14:25
Calcium	**197**		**0.340**	**5.00**	**mg/L**	10	08-Jan-2019 14:13
Iron	U		0.0120	0.200	mg/L	1	07-Jan-2019 14:25
Lead	U		0.000600	0.00200	mg/L	1	07-Jan-2019 14:25
Magnesium	**1.17**		**0.0100**	**0.200**	**mg/L**	1	07-Jan-2019 14:25
Potassium	**10.6**		**0.0180**	**0.200**	**mg/L**	1	07-Jan-2019 14:25
Selenium	**0.00627**		**0.00110**	**0.00200**	**mg/L**	1	07-Jan-2019 14:25
Sodium	**249**		**0.140**	**2.00**	**mg/L**	10	08-Jan-2019 14:13

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121350

Batch ID: 136174 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18121350-01	1	10	10 (mL)	1
HS18121350-02	1	10	10 (mL)	1

Batch ID: 136175 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18121350-03	1	10	10 (mL)	1
HS18121350-04	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121350

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 136174	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS18121350-01	20181213-FD-T0-ControlT	13 Dec 2018 13:00		31 Dec 2018 10:00	04 Jan 2019 19:45	1
HS18121350-01	20181213-FD-T0-ControlT	13 Dec 2018 13:00		31 Dec 2018 10:00	04 Jan 2019 18:20	20
HS18121350-01	20181213-FD-T0-ControlT	13 Dec 2018 13:00		31 Dec 2018 10:00	04 Jan 2019 17:21	1
HS18121350-02	20181213-FD-T0-30-35-40T	13 Dec 2018 13:00		31 Dec 2018 10:00	04 Jan 2019 19:47	1
HS18121350-02	20181213-FD-T0-30-35-40T	13 Dec 2018 13:00		31 Dec 2018 10:00	04 Jan 2019 18:22	50
HS18121350-02	20181213-FD-T0-30-35-40T	13 Dec 2018 13:00		31 Dec 2018 10:00	04 Jan 2019 17:23	1
Batch ID 136175	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS18121350-03	20181213-FD-T0-ControlD	13 Dec 2018 13:00		31 Dec 2018 10:00	08 Jan 2019 14:10	10
HS18121350-03	20181213-FD-T0-ControlD	13 Dec 2018 13:00		31 Dec 2018 10:00	07 Jan 2019 14:23	1
HS18121350-04	20181213-FD-T0-30-35-40D	13 Dec 2018 13:00		31 Dec 2018 10:00	08 Jan 2019 14:13	10
HS18121350-04	20181213-FD-T0-30-35-40D	13 Dec 2018 13:00		31 Dec 2018 10:00	07 Jan 2019 14:25	1
Batch ID R330657	**Test Name :** HARDNESS, TOTAL AS CACO3 BY SM2340B			**Matrix:** Groundwater		
HS18121350-01	20181213-FD-T0-ControlT	13 Dec 2018 13:00			08 Jan 2019 15:22	1
HS18121350-02	20181213-FD-T0-30-35-40T	13 Dec 2018 13:00			08 Jan 2019 15:22	1

WorkOrder: HS18121350
InstrumentID: ICPMS04
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.00100	0.00135	0.000400	0.00200
A	Arsenic	7440-38-2	0.00100	0.000732	0.000400	0.00200
A	Cadmium	7440-43-9	0.00100	0.00101	0.000200	0.00200
A	Calcium	7440-70-2	0.100	0.0776	0.0340	0.500
A	Iron	7439-89-6	0.100	0.0850	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000864	0.000600	0.00200
A	Magnesium	7439-95-4	0.100	0.107	0.0100	0.200
A	Potassium	7440-09-7	0.100	0.0562	0.0180	0.200
A	Selenium	7782-49-2	0.00200	0.00213	0.00110	0.00200
A	Sodium	7440-23-5	0.100	0.102	0.0140	0.200

WorkOrder: HS18121350
InstrumentID: ICPMS05
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.00100	0.000983	0.000400	0.00200
A	Arsenic	7440-38-2	0.00100	0.000927	0.000400	0.00200
A	Cadmium	7440-43-9	0.00100	0.00101	0.000200	0.00200
A	Calcium	7440-70-2	0.100	0.125	0.0340	0.500
A	Iron	7439-89-6	0.100	0.122	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.00100	0.000600	0.00200
A	Magnesium	7439-95-4	0.100	0.116	0.0100	0.200
A	Potassium	7440-09-7	0.100	0.0991	0.0180	0.200
A	Selenium	7782-49-2	0.00100	0.000902	0.00110	0.00200
A	Sodium	7440-23-5	0.100	0.0985	0.0140	0.200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121350

QC BATCH REPORT

Batch ID: 136174 **Instrument: ICPMS05** **Method: SW6020**

MBLK Sample ID: **MBLK-136174** Units: **mg/L** Analysis Date: **04-Jan-2019 16:01**
Client ID: Run ID: **ICPMS05_330462** SeqNo: **4895326** PrepDate: **31-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01057	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								

MBLK Sample ID: **MBLK-136174** Units: **mg/L** Analysis Date: **04-Jan-2019 18:10**
Client ID: Run ID: **ICPMS05_330462** SeqNo: **4895646** PrepDate: **31-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	U	0.200								

LCS Sample ID: **LCS-136174** Units: **mg/L** Analysis Date: **04-Jan-2019 16:03**
Client ID: Run ID: **ICPMS05_330462** SeqNo: **4895327** PrepDate: **31-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04777	0.00200	0.05	0	95.5	80 - 120				
Arsenic	0.0483	0.00200	0.05	0	96.6	80 - 120				
Cadmium	0.04753	0.00200	0.05	0	95.1	80 - 120				
Calcium	5.209	0.500	5	0	104	80 - 120				
Iron	5.113	0.200	5	0	102	80 - 120				
Lead	0.0484	0.00200	0.05	0	96.8	80 - 120				
Magnesium	5.261	0.200	5	0	105	80 - 120				
Potassium	4.909	0.200	5	0	98.2	80 - 120				
Selenium	0.04903	0.00200	0.05	0	98.1	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121350

QC BATCH REPORT

Batch ID: 136174 **Instrument: ICPMS05** **Method: SW6020**

LCS Sample ID: **LCS-136174** Units: **mg/L** Analysis Date: **04-Jan-2019 18:12**
Client ID: Run ID: **ICPMS05_330462** SeqNo: **4895647** PrepDate: **31-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	5.205	0.200	5	0	104	80 - 120				

MS Sample ID: **HS18121098-03MS** Units: **mg/L** Analysis Date: **04-Jan-2019 16:27**
Client ID: Run ID: **ICPMS05_330462** SeqNo: **4895338** PrepDate: **31-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04977	0.00200	0.05	0.000015	99.5	80 - 120				
Arsenic	0.05398	0.00200	0.05	0.004169	99.6	80 - 120				
Cadmium	0.04739	0.00200	0.05	0.00013	94.5	80 - 120				
Calcium	191.2	0.500	5	179.1	242	80 - 120				SEO
Iron	25.44	0.200	5	19.72	115	80 - 120				
Magnesium	24.12	0.200	5	18.8	106	80 - 120				
Potassium	9.631	0.200	5	4.44	104	80 - 120				
Selenium	0.05009	0.00200	0.05	0.00034	99.5	80 - 120				
Sodium	299.7	0.200	5	292	155	80 - 120				SEO

MS Sample ID: **HS18121098-03MS** Units: **mg/L** Analysis Date: **04-Jan-2019 19:26**
Client ID: Run ID: **ICPMS05_330462** SeqNo: **4895709** PrepDate: **31-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.0462	0.00200	0.05	0.000099	92.2	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121350

QC BATCH REPORT

Batch ID: 136174 **Instrument: ICPMS05** **Method: SW6020**

MSD Sample ID: **HS18121098-03MSD** Units: **mg/L** Analysis Date: **04-Jan-2019 16:29**
Client ID: Run ID: **ICPMS05_330462** SeqNo: **4895339** PrepDate: **31-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05176	0.00200	0.05	0.000015	103	80 - 120	0.04977	3.93	20	
Arsenic	0.05552	0.00200	0.05	0.004169	103	80 - 120	0.05398	2.81	20	
Cadmium	0.0492	0.00200	0.05	0.00013	98.1	80 - 120	0.04739	3.74	20	
Calcium	191.4	0.500	5	179.1	247	80 - 120	191.2	0.137	20	SEO
Iron	25.85	0.200	5	19.72	123	80 - 120	25.44	1.59	20	S
Magnesium	24.51	0.200	5	18.8	114	80 - 120	24.12	1.61	20	
Potassium	9.48	0.200	5	4.44	101	80 - 120	9.631	1.59	20	
Selenium	0.05101	0.00200	0.05	0.00034	101	80 - 120	0.05009	1.82	20	
Sodium	304.2	0.200	5	292	244	80 - 120	299.7	1.48	20	SEO

MSD Sample ID: **HS18121098-03MSD** Units: **mg/L** Analysis Date: **04-Jan-2019 19:28**
Client ID: Run ID: **ICPMS05_330462** SeqNo: **4895710** PrepDate: **31-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.04636	0.00200	0.05	0.000099	92.5	80 - 120	0.0462	0.361	20	

PDS Sample ID: **HS18121098-03PDS** Units: **mg/L** Analysis Date: **04-Jan-2019 16:31**
Client ID: Run ID: **ICPMS05_330462** SeqNo: **4895340** PrepDate: **31-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1027	0.00200	0.1	0.000015	103	75 - 125				
Arsenic	0.1131	0.00200	0.1	0.004169	109	75 - 125				
Cadmium	0.1048	0.00200	0.1	0.00013	105	75 - 125				
Iron	31.06	0.200	10	19.72	113	75 - 125				
Magnesium	29.39	0.200	10	18.8	106	75 - 125				
Potassium	14.76	0.200	10	4.44	103	75 - 125				
Selenium	0.1093	0.00200	0.1	0.00034	109	75 - 125				

PDS Sample ID: **HS18121098-03PDS** Units: **mg/L** Analysis Date: **04-Jan-2019 19:30**
Client ID: Run ID: **ICPMS05_330462** SeqNo: **4895711** PrepDate: **31-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.0911	0.00200	0.1	0.000099	91.0	75 - 125				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121350

QC BATCH REPORT

Batch ID: 136174 **Instrument: ICPMS05** **Method: SW6020**

PDS Sample ID: **HS18121098-03PDS** Units: **mg/L** Analysis Date: **04-Jan-2019 18:18**
Client ID: Run ID: **ICPMS05_330462** SeqNo: **4895650** PrepDate: **31-Dec-2018** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	848.9	10.0	500	307.7	108	75 - 125				

SD Sample ID: **HS18121098-03SD** Units: **mg/L** Analysis Date: **04-Jan-2019 16:25**
Client ID: Run ID: **ICPMS05_330462** SeqNo: **4895337** PrepDate: **31-Dec-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0	0	10	
Arsenic	0.00381	0.0100					0.004169	0	10	J
Cadmium	U	0.0100					0	0	10	
Iron	19.35	1.00					19.72	1.86	10	
Magnesium	18.34	1.00					18.8	2.44	10	
Potassium	4.31	1.00					4.44	2.94	10	
Selenium	U	0.0100					0	0	10	

SD Sample ID: **HS18121098-03SD** Units: **mg/L** Analysis Date: **04-Jan-2019 19:24**
Client ID: Run ID: **ICPMS05_330462** SeqNo: **4895708** PrepDate: **31-Dec-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Lead	U	0.0100					0.000099	0	10	

SD Sample ID: **HS18121098-03SD** Units: **mg/L** Analysis Date: **04-Jan-2019 18:16**
Client ID: Run ID: **ICPMS05_330462** SeqNo: **4895649** PrepDate: **31-Dec-2018** DF: **250**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Sodium	330.4	50.0					307.7	7.4	10	

The following samples were analyzed in this batch: HS18121350-01 HS18121350-02

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121350

QC BATCH REPORT

Batch ID: 136175 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLK-136175** Units: **mg/L** Analysis Date: **07-Jan-2019 12:59**
Client ID: Run ID: **ICPMS04_330548** SeqNo: **4896999** PrepDate: **31-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	U	0.200								
Potassium	U	0.200								
Selenium	U	0.00200								

MBLK Sample ID: **MBLK-136175** Units: **mg/L** Analysis Date: **08-Jan-2019 13:05**
Client ID: Run ID: **ICPMS04_330630** SeqNo: **4899137** PrepDate: **31-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	U	0.200								

LCS Sample ID: **LCS-136175** Units: **mg/L** Analysis Date: **07-Jan-2019 13:01**
Client ID: Run ID: **ICPMS04_330548** SeqNo: **4897000** PrepDate: **31-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04804	0.00200	0.05	0	96.1	80 - 120				
Arsenic	0.04866	0.00200	0.05	0	97.3	80 - 120				
Cadmium	0.04747	0.00200	0.05	0	94.9	80 - 120				
Calcium	4.821	0.500	5	0	96.4	80 - 120				
Iron	4.97	0.200	5	0	99.4	80 - 120				
Lead	0.04803	0.00200	0.05	0	96.1	80 - 120				
Magnesium	5.061	0.200	5	0	101	80 - 120				
Potassium	5.086	0.200	5	0	102	80 - 120				
Selenium	0.04802	0.00200	0.05	0	96.0	80 - 120				
Sodium	4.906	0.200	5	0	98.1	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121350

QC BATCH REPORT

Batch ID: 136175 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

MS Sample ID: **HS18121345-01MS** Units: **mg/L** Analysis Date: **07-Jan-2019 13:08**
Client ID: Run ID: **ICPMS04_330548** SeqNo: **4897003** PrepDate: **31-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05074	0.00200	0.05	0.001325	98.8	75 - 125				
Arsenic	0.0489	0.00200	0.05	0.00045	96.9	75 - 125				
Cadmium	0.05972	0.00200	0.05	0.01098	97.5	75 - 125				
Calcium	447.7	0.500	5	463.9	-325	75 - 125				SEO
Iron	23.03	0.200	5	17.9	103	75 - 125				
Lead	0.05057	0.00200	0.05	0.001899	97.4	75 - 125				
Magnesium	289.2	0.200	5	302.2	-260	75 - 125				SEO
Potassium	25.03	0.200	5	21.23	76.1	75 - 125				O
Selenium	0.04778	0.00200	0.05	0.00111	93.3	75 - 125				
Sodium	1455	0.200	5	1503	-968	75 - 125				SEO

MSD Sample ID: **HS18121345-01MSD** Units: **mg/L** Analysis Date: **07-Jan-2019 13:11**
Client ID: Run ID: **ICPMS04_330548** SeqNo: **4897004** PrepDate: **31-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.051	0.00200	0.05	0.001325	99.4	75 - 125	0.05074	0.523	20	
Arsenic	0.04825	0.00200	0.05	0.00045	95.6	75 - 125	0.0489	1.35	20	
Cadmium	0.06114	0.00200	0.05	0.01098	100	75 - 125	0.05972	2.35	20	
Calcium	431.2	0.500	5	463.9	-654	75 - 125	447.7	3.75	20	SEO
Iron	22.35	0.200	5	17.9	89.1	75 - 125	23.03	3	20	
Lead	0.05064	0.00200	0.05	0.001899	97.5	75 - 125	0.05057	0.13	20	
Magnesium	289.7	0.200	5	302.2	-249	75 - 125	289.2	0.182	20	SEO
Potassium	23.96	0.200	5	21.23	54.6	75 - 125	25.03	4.39	20	SO
Selenium	0.04815	0.00200	0.05	0.00111	94.1	75 - 125	0.04778	0.765	20	
Sodium	1460	0.200	5	1503	-864	75 - 125	1455	0.357	20	SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121350

QC BATCH REPORT

Batch ID: 136175 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

PDS Sample ID: **HS18121345-01PDS** Units: **mg/L** Analysis Date: **07-Jan-2019 13:14**
Client ID: Run ID: **ICPMS04_330548** SeqNo: **4897005** PrepDate: **31-Dec-2018** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09384	0.00200	0.1	0.001325	92.5	75 - 125				
Arsenic	0.09286	0.00200	0.1	0.00045	92.4	75 - 125				
Cadmium	0.105	0.00200	0.1	0.01098	94.0	75 - 125				
Iron	27.64	0.200	10	17.9	97.4	75 - 125				
Lead	0.1003	0.00200	0.1	0.001899	98.4	75 - 125				
Potassium	27.29	0.200	10	21.23	60.7	75 - 125				S
Selenium	0.09637	0.00200	0.1	0.00111	95.3	75 - 125				

PDS Sample ID: **HS18121345-01PDS** Units: **mg/L** Analysis Date: **08-Jan-2019 13:12**
Client ID: Run ID: **ICPMS04_330630** SeqNo: **4899140** PrepDate: **31-Dec-2018** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	1023	25.0	500	491.1	106	75 - 125				
Magnesium	882.8	10.0	500	342.1	108	75 - 125				
Sodium	2187	10.0	500	1644	109	75 - 125				

SD Sample ID: **HS18121345-01SD** Units: **mg/L** Analysis Date: **07-Jan-2019 13:05**
Client ID: Run ID: **ICPMS04_330548** SeqNo: **4897002** PrepDate: **31-Dec-2018** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.001325	0	10	
Arsenic	U	0.0100					0.00045	0	10	
Lead	U	0.0100					0.001899	0	10	
Potassium	22.31	1.00					21.23	5.09	10	
Selenium	U	0.0100					0.00111	0	10	

SD Sample ID: **HS18121345-01SD** Units: **mg/L** Analysis Date: **08-Jan-2019 13:10**
Client ID: Run ID: **ICPMS04_330630** SeqNo: **4899139** PrepDate: **31-Dec-2018** DF: **250**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	535.9	125					491.1	9.13	10	
Magnesium	351.9	50.0					342.1	2.86	10	
Sodium	1788	50.0					1644	8.76	10	

The following samples were analyzed in this batch: HS18121350-03 HS18121350-04

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS18121350**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS18121350

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS18121350-01	20181213-FD-T0-ControlT	Login	12/24/2018 3:38:46 PM	JRM	MET025
HS18121350-02	20181213-FD-T0-30-35-40T	Login	12/24/2018 3:38:46 PM	JRM	MET025
HS18121350-03	20181213-FD-T0-ControlD	Login	12/24/2018 3:38:46 PM	JRM	MET025
HS18121350-04	20181213-FD-T0-30-35-40D	Login	12/24/2018 3:38:46 PM	JRM	MET025

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS18121350
Date/Time Received: **24-Dec-2018 08:29**
Received by: **PMG**

Checklist completed by: *Jared R. Makan* eSignature 24-Dec-2018 Date
Reviewed by: *Dane J. Wacasey* eSignature 26-Dec-2018 Date

Matrices: **Water**
Carrier name: **ALS Courier**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☐	No ☑	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	3.0c/3.3c UC/C	IR25	
Cooler(s)/Kit(s):	44385		
Date/Time sample(s) sent to storage:	12/24/2018 15:45		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070

Chain of Custody Fo

Page ____ of ____

COC ID: 19221

HS18121350

Golder Associates
Exice Column Studies

ALS Project Manager:

Customer Information		Project Information	
Purchase Order	[illegible]	Project Name	Exice Column Studies
Work Order		Project Number	1664-2486
Company Name	Golder Associates	Bill To Company	Golder Associates
Send Report To	Emily White	Invoice Attn	Tammy Kinzenbaw Exice AP
Address	13515 Barrett Parkway Drive Suit	Address	13515 Barrett Parkway Drive Suit
City/State/Zip	Ballwin MO 63021	City/State/Zip	Ballwin MO 63021
Phone	(314) 984-8536	Phone	(314) 984-8536
Fax		Fax	
e-Mail Address	[illegible]	e-Mail Address	Tammy_Kinzenbaw@golder.com

A: [illegible]
B: TKN, Ammonia, Nitrate/Nitrite, TDS
C: ALK_W 2320B (Total Alkalinity)
D: [illegible]
E: [illegible]
F: [illegible]
G:
H:
I:
J:

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20181213-FD-TC-CONTROLT	2018/12/13	[illegible]	[illegible]		1	X	X	X	X	X	X					
2	20181213-FD-TC-3C-35-40CT	2018/12/13	15:00	GW	2,8	1				X	X	X					
3	20181213-FD-TC-CONTROLD	2018/12/13	13:00	GW	2,8	1					X						
4	20181213-FD-TC-3C-35-40CD	2018/12/13	13:00	GW	2,8	1					X						
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: [illegible]

Shipment Method:

Required Turnaround Time: (Check Box) ☐ [illegible] ☐ STD 5 Work Days ☒ [illegible] ☐ [illegible] ☐ 24 Hour

Results Due Date:

Relinquished by: [illegible] Date: 12/12/18 Time: [illegible]
Relinquished by: Date: 12/20 Time: 10:30
Received by:
Received by (Laboratory):

Notes: Exice Column Studies

Logged by (Laboratory): Date: 12/24/18 Time: 08:20
Checked by (Laboratory):

Cooler ID	Cooler Temp.
44585	3.0

QC Package: (Check One Box Below)
☐ [illegible] ☒ [illegible]
☐ [illegible] ☐ [illegible]

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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[illegible]

ORIGIN ID:YUXA (514) 383-0990
Audrey Etheves
Golder Associates Ltd
7250 rue du Mile End
3e etage
MONTREAL, PQ H2R3A4
CANADA, CA

Ship Date: 20DEC18
ActWgt: 36.05 LB
CAD: 108680724/INET4042

BILL SENDER
EIN/VAT:

TO Dane Wacasey (Corey Grandits)
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

(281) 530-5656

FedEx Express

(US)

E

AWB

NH SGRA

PKG:YOUR PKG

TRK# 7740 3038 9691 Form 0430

10:30A
INTL PRIORITY

REF:
DESC1: Glacière contenant des bouteilles d'eaux
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: Audrey Etheves
T/C: S 167982832
D/T: R 967554812

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2. Placez l'étiquette dans la pochette d'expédition et fixez-la à votre paquet.

ALS 10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887 — 44385	**CUSTODY SEAL** Date: 2018/12/22 Time: Name: ONIKPO CLAUDE Company: GOLDER	Seal Broken By: SM Date: 12/24/18 2018/

44385 DEC 2 2 2018

ALS 10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887 — 44385	**CUSTODY SEAL** Date: 2018/12/20 Time: Name: ONIKPO CLAUDE Company: GOLDER	Seal Broken By: SM Date: 12/24/18

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NH SGRA

328995 INB 12/21 547G1/F1FF/53C1

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

January 07, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS18121485**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 4 sample(s) on Dec 28, 2018 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DAYNA.FISHER
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS18121485**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS18121485**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 01/07/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS18121485				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): R330134, R330518, R330572				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?		X			1
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?	X				
		Were surrogate percent recoveries in all samples within the laboratory QC limits?	X				
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	X				
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?	X				
		Were analytical duplicates analyzed at the appropriate frequency?	X				
		Were RPDs or relative standard deviations within the laboratory QC limits?	X				
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 01/07/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS18121485				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): R330134, R330518, R330572				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			2
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?			X		
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports	
Laboratory Name: ALS Laboratory Group	LRC Date: 01/07/2019
Project Name: Exide Column Studies	Laboratory Job Number: HS18121485
Reviewer Name: Dane Wacasey	Prep Batch Number(s): R330134, R330518, R330572

ER#[5]	Description
1	Samples were received with limited holding time remaining for Nitrogen, Nitrate (As N) Method. The analysis was performed as soon as possible after sample receipt. Results are flagged with "H" and should be considered estimated.
2	See Run Log and CCB Exceptions Report.

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121485
Start Date: 28-Dec-2018 End Date: 28-Dec-2018

Run ID:ICS3K2_330134
Instrument:ICS3K2
Method:E300

Sample No.	D/F	Time	FileID	Analytes
CCB 1	1	28-Dec-2018 00:21		CL NO3N SO4
WBLKW2-122718	1	28-Dec-2018 00:43		CL NO3N SO4
WLCSW2-122718	1	28-Dec-2018 01:04		CL NO3N SO4
WLCSDW2-122718	1	28-Dec-2018 01:26		CL NO3N SO4
ZZZZZZMS	1	28-Dec-2018 02:09		CL NO3N SO4
ZZZZZZMSD	1	28-Dec-2018 02:31		CL NO3N SO4
CCV 1	1	28-Dec-2018 04:18		CL NO3N SO4
CCB 2	1	28-Dec-2018 04:40		CL NO3N SO4
ZZZZZZMS	1	28-Dec-2018 06:28		CL NO3N SO4
ZZZZZZMSD	1	28-Dec-2018 06:49		CL NO3N SO4
CCB 3	1	28-Dec-2018 08:59		CL NO3N SO4
2018-12-26-FD-PV5out-CONTROL	1	28-Dec-2018 10:01		CL NO3N
2018-12-26-FD-PV5out-40	1	28-Dec-2018 10:34		CL NO3N
2018-12-26-FD-PV5out-30	1	28-Dec-2018 11:10		NO3N
2018-12-26-FD-PV5out-35	1	28-Dec-2018 11:31		CL NO3N
2018-12-26-FD-PV5out-35	20	28-Dec-2018 13:47		SO4
2018-12-26-FD-PV5out-40	20	28-Dec-2018 14:09		SO4
2018-12-26-FD-PV5out-CONTROL	20	28-Dec-2018 14:31		SO4
CCV 2	1	28-Dec-2018 14:52		CL NO3N SO4
CCB 4	1	28-Dec-2018 15:14		CL NO3N SO4
2018-12-26-FD-PV5out-30	20	28-Dec-2018 15:57		SO4
2018-12-26-FD-PV5out-30	1	28-Dec-2018 16:26		CL
CCB 5	1	28-Dec-2018 18:57		CL NO3N SO4

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121485

Run ID:ICS3K2_330134
Instrument:ICS3K2
Method:E300

CCB 3	Date: 28-Dec-2018 08:59	Seq: 4886095	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	291	200	500	
Nitrogen, Nitrate (As N)	78	30	100	

CCB 5	Date: 28-Dec-2018 18:57	Seq: 4888207	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	290	200	500	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS18121485

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18121485-01	2018-12-26-FD-PV5out-30	Water		26-Dec-2018 10:02	28-Dec-2018 09:15	☐
HS18121485-02	2018-12-26-FD-PV5out-35	Water		26-Dec-2018 10:04	28-Dec-2018 09:15	☐
HS18121485-03	2018-12-26-FD-PV5out-40	Water		26-Dec-2018 10:05	28-Dec-2018 09:15	☐
HS18121485-04	2018-12-26-FD-PV5out-CONTROL	Water		26-Dec-2018 10:00	28-Dec-2018 09:15	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 2018-12-26-FD-PV5out-30
Collection Date: 26-Dec-2018 10:02

ANALYTICAL REPORT
WorkOrder:HS18121485
Lab ID:HS18121485-01
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**24.9**		**0.200**	**0.500**	**mg/L**	1	28-Dec-2018 16:26
Nitrogen, Nitrate (As N)	**0.0780**	JH	**0.0300**	**0.100**	**mg/L**	1	28-Dec-2018 11:10
Sulfate	**703**		**4.00**	**10.0**	**mg/L**	20	28-Dec-2018 15:57
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: JHD
Total Dissolved Solids (Residue, Filterable)	**1,430**		**5.00**	**10.0**	**mg/L**	1	02-Jan-2019 18:30
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**13.1**		**5.00**	**5.00**	**mg/L**	1	04-Jan-2019 21:04
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	04-Jan-2019 21:04
Alkalinity, Total (As CaCO3)	**13.1**		**5.00**	**5.00**	**mg/L**	1	04-Jan-2019 21:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 2018-12-26-FD-PV5out-35
Collection Date: 26-Dec-2018 10:04

ANALYTICAL REPORT
WorkOrder:HS18121485
Lab ID:HS18121485-02
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**28.3**		**0.200**	**0.500**	**mg/L**	1	28-Dec-2018 11:31
Nitrogen, Nitrate (As N)	U	H	0.0300	0.100	mg/L	1	28-Dec-2018 11:31
Sulfate	**812**		**4.00**	**10.0**	**mg/L**	20	28-Dec-2018 13:47
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: JHD
Total Dissolved Solids (Residue, Filterable)	**1,460**		**5.00**	**10.0**	**mg/L**	1	02-Jan-2019 18:30
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**15.9**		**5.00**	**5.00**	**mg/L**	1	04-Jan-2019 21:12
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	04-Jan-2019 21:12
Alkalinity, Total (As CaCO3)	**15.9**		**5.00**	**5.00**	**mg/L**	1	04-Jan-2019 21:12

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 2018-12-26-FD-PV5out-40
Collection Date: 26-Dec-2018 10:05

ANALYTICAL REPORT
WorkOrder:HS18121485
Lab ID:HS18121485-03
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**27.6**		**0.200**	**0.500**	**mg/L**	1	28-Dec-2018 10:34
Nitrogen, Nitrate (As N)	U	H	0.0300	0.100	mg/L	1	28-Dec-2018 10:34
Sulfate	**828**		**4.00**	**10.0**	**mg/L**	20	28-Dec-2018 14:09
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: JHD
Total Dissolved Solids (Residue, Filterable)	**1,450**		**5.00**	**10.0**	**mg/L**	1	02-Jan-2019 18:30
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**11.8**		**5.00**	**5.00**	**mg/L**	1	04-Jan-2019 21:19
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	04-Jan-2019 21:19
Alkalinity, Total (As CaCO3)	**11.8**		**5.00**	**5.00**	**mg/L**	1	04-Jan-2019 21:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 2018-12-26-FD-PV5out-CONTROL
Collection Date: 26-Dec-2018 10:00

ANALYTICAL REPORT
WorkOrder:HS18121485
Lab ID:HS18121485-04
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**28.3**		**0.200**	**0.500**	**mg/L**	1	28-Dec-2018 10:01
Nitrogen, Nitrate (As N)	U	H	0.0300	0.100	mg/L	1	28-Dec-2018 10:01
Sulfate	**926**		**4.00**	**10.0**	**mg/L**	20	28-Dec-2018 14:31
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: JHD
Total Dissolved Solids (Residue, Filterable)	**1,470**		**5.00**	**10.0**	**mg/L**	1	02-Jan-2019 18:30
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**28.0**		**5.00**	**5.00**	**mg/L**	1	04-Jan-2019 21:26
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	04-Jan-2019 21:26
Alkalinity, Total (As CaCO3)	**28.0**		**5.00**	**5.00**	**mg/L**	1	04-Jan-2019 21:26

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121485

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R330134	**Test Name :** ANIONS BY E300.0			**Matrix:** Water		
HS18121485-01	2018-12-26-FD-PV5out-30	26 Dec 2018 10:02			28 Dec 2018 16:26	1
HS18121485-01	2018-12-26-FD-PV5out-30	26 Dec 2018 10:02			28 Dec 2018 15:57	20
HS18121485-01	2018-12-26-FD-PV5out-30	26 Dec 2018 10:02			28 Dec 2018 11:10	1
HS18121485-02	2018-12-26-FD-PV5out-35	26 Dec 2018 10:04			28 Dec 2018 13:47	20
HS18121485-02	2018-12-26-FD-PV5out-35	26 Dec 2018 10:04			28 Dec 2018 11:31	1
HS18121485-03	2018-12-26-FD-PV5out-40	26 Dec 2018 10:05			28 Dec 2018 14:09	20
HS18121485-03	2018-12-26-FD-PV5out-40	26 Dec 2018 10:05			28 Dec 2018 10:34	1
HS18121485-04	2018-12-26-FD-PV5out-CONTROL	26 Dec 2018 10:00			28 Dec 2018 14:31	20
HS18121485-04	2018-12-26-FD-PV5out-CONTROL	26 Dec 2018 10:00			28 Dec 2018 10:01	1
Batch ID R330518	**Test Name :** ALKALINITY BY SM2320B			**Matrix:** Water		
HS18121485-01	2018-12-26-FD-PV5out-30	26 Dec 2018 10:02			04 Jan 2019 21:04	1
HS18121485-02	2018-12-26-FD-PV5out-35	26 Dec 2018 10:04			04 Jan 2019 21:12	1
HS18121485-03	2018-12-26-FD-PV5out-40	26 Dec 2018 10:05			04 Jan 2019 21:19	1
HS18121485-04	2018-12-26-FD-PV5out-CONTROL	26 Dec 2018 10:00			04 Jan 2019 21:26	1
Batch ID R330572	**Test Name :** TOTAL DISSOLVED SOLIDS BY SM2540C			**Matrix:** Water		
HS18121485-01	2018-12-26-FD-PV5out-30	26 Dec 2018 10:02			02 Jan 2019 18:30	1
HS18121485-02	2018-12-26-FD-PV5out-35	26 Dec 2018 10:04			02 Jan 2019 18:30	1
HS18121485-03	2018-12-26-FD-PV5out-40	26 Dec 2018 10:05			02 Jan 2019 18:30	1
HS18121485-04	2018-12-26-FD-PV5out-CONTROL	26 Dec 2018 10:00			02 Jan 2019 18:30	1

WorkOrder: HS18121485
InstrumentID: ICS3K2
Test Code: 300_W
Test Number: E300
Test Name: Anions by E300.0

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Chloride	16887-00-6	0.500	0.580	0.200	0.500
A	Nitrogen, Nitrate (As N)	14797-55-8	0.100	0.126	0.0300	0.100
A	Sulfate	14808-79-8	0.500	0.644	0.200	0.500

WorkOrder: HS18121485
InstrumentID: ManTech01
Test Code: ALK_W 2320B
Test Number: SM2320B
Test Name: Alkalinity by SM2320B

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Alkalinity, Bicarbonate (As CaCO3)	ALK-Bicarb	5.00	3.49	5.00	5.00
A	Alkalinity, Carbonate (As CaCO3)	ALK-Carb	5.00	3.49	5.00	5.00
A	Alkalinity, Total (As CaCO3)	ALK	5.00	3.49	5.00	5.00

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121485

QC BATCH REPORT

Batch ID: R330134 **Instrument: ICS3K2** **Method: E300**

MBLK Sample ID: **WBLKW2-122718** Units: **mg/L** Analysis Date: **28-Dec-2018 00:43**
Client ID: Run ID: **ICS3K2_330134** SeqNo: **4886067** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	0.500								
Nitrogen, Nitrate (As N)	U	0.100								
Sulfate	U	0.500								

LCS Sample ID: **WLCSW2-122718** Units: **mg/L** Analysis Date: **28-Dec-2018 01:04**
Client ID: Run ID: **ICS3K2_330134** SeqNo: **4886068** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.7	0.500	20	0	98.5	90 - 110				
Nitrogen, Nitrate (As N)	3.889	0.100	4	0	97.2	90 - 110				
Sulfate	19.12	0.500	20	0	95.6	90 - 110				

LCSD Sample ID: **WLCSDW2-122718** Units: **mg/L** Analysis Date: **28-Dec-2018 01:26**
Client ID: Run ID: **ICS3K2_330134** SeqNo: **4886069** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.81	0.500	20	0	99.1	90 - 110	19.7	0.557	20	
Nitrogen, Nitrate (As N)	3.87	0.100	4	0	96.8	90 - 110	3.889	0.49	20	
Sulfate	19.14	0.500	20	0	95.7	90 - 110	19.12	0.105	20	

MS Sample ID: **HS18121463-01MS** Units: **mg/L** Analysis Date: **28-Dec-2018 02:09**
Client ID: Run ID: **ICS3K2_330134** SeqNo: **4886071** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.28	0.500	10	9.582	96.9	80 - 120				
Nitrogen, Nitrate (As N)	2.209	0.100	2	0.341	93.4	80 - 120				
Sulfate	50.14	0.500	10	40.54	96.0	80 - 120				O

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121485

QC BATCH REPORT

Batch ID: R330134 **Instrument: ICS3K2** **Method: E300**

MS Sample ID: **HS18121431-01MS** Units: **mg/L** Analysis Date: **28-Dec-2018 06:28**
Client ID: Run ID: **ICS3K2_330134** SeqNo: **4886088** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	14.23	0.500	10	4.397	98.3	80 - 120				
Nitrogen, Nitrate (As N)	2.265	0.100	2	0.38	94.2	80 - 120				
Sulfate	15.23	0.500	10	5.341	98.9	80 - 120				

MSD Sample ID: **HS18121463-01MSD** Units: **mg/L** Analysis Date: **28-Dec-2018 02:31**
Client ID: Run ID: **ICS3K2_330134** SeqNo: **4886072** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.58	0.500	10	9.582	99.9	80 - 120	19.28	1.54	20	
Nitrogen, Nitrate (As N)	2.257	0.100	2	0.341	95.8	80 - 120	2.209	2.15	20	
Sulfate	51.1	0.500	10	40.54	106	80 - 120	50.14	1.89	20	O

MSD Sample ID: **HS18121431-01MSD** Units: **mg/L** Analysis Date: **28-Dec-2018 06:49**
Client ID: Run ID: **ICS3K2_330134** SeqNo: **4886089** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	14.41	0.500	10	4.397	100	80 - 120	14.23	1.24	20	
Nitrogen, Nitrate (As N)	2.293	0.100	2	0.38	95.6	80 - 120	2.265	1.23	20	
Sulfate	15.34	0.500	10	5.341	100.0	80 - 120	15.23	0.707	20	

The following samples were analyzed in this batch: HS18121485-01 HS18121485-02 HS18121485-03 HS18121485-04

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121485

QC BATCH REPORT

Batch ID: R330518 **Instrument: ManTech01** **Method: SM2320B**

MBLK Sample ID: **WBLKW1-190104** Units: **mg/L** Analysis Date: **04-Jan-2019 19:48**
Client ID: Run ID: **ManTech01_330518** SeqNo: **4895920** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	U	5.00								
Alkalinity, Carbonate (As CaCO3)	U	5.00								
Alkalinity, Total (As CaCO3)	U	5.00								

LCS Sample ID: **WLCS1-190104** Units: **mg/L** Analysis Date: **04-Jan-2019 19:57**
Client ID: Run ID: **ManTech01_330518** SeqNo: **4895921** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1030	5.00	1000	0	103	85 - 115				
Alkalinity, Total (As CaCO3)	1053	5.00	1000	0	105	85 - 115				

LCSD Sample ID: **WLCSD1-190104** Units: **mg/L** Analysis Date: **04-Jan-2019 20:06**
Client ID: Run ID: **ManTech01_330518** SeqNo: **4895922** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1046	5.00	1000	0	105	85 - 115	1030	1.51	20	
Alkalinity, Total (As CaCO3)	1066	5.00	1000	0	107	85 - 115	1053	1.27	20	

DUP Sample ID: **HS18121254-25DUP** Units: **mg/L** Analysis Date: **04-Jan-2019 20:41**
Client ID: Run ID: **ManTech01_330518** SeqNo: **4895928** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	175.2	5.00					176.9	0.96	20	
Alkalinity, Carbonate (As CaCO3)	U	5.00					0	0	20	
Alkalinity, Total (As CaCO3)	175.2	5.00					176.9	0.96	20	

The following samples were analyzed in this batch: HS18121485-01 HS18121485-02 HS18121485-03 HS18121485-04

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS18121485

QC BATCH REPORT

Batch ID: R330572 **Instrument: Balance1** **Method: M2540C**

MBLK Sample ID: **WBLK-010219** Units: **mg/L** Analysis Date: **02-Jan-2019 18:30**
Client ID: Run ID: **Balance1_330572** SeqNo: **4897235** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	U	10.0								

LCS Sample ID: **WLCS-010219** Units: **mg/L** Analysis Date: **02-Jan-2019 18:30**
Client ID: Run ID: **Balance1_330572** SeqNo: **4897236** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	1002	10.0	1000	0	100	85 - 115				

DUP Sample ID: **HS18121485-03DUP** Units: **mg/L** Analysis Date: **02-Jan-2019 18:30**
Client ID: **2018-12-26-FD-PV5out-40** Run ID: **Balance1_330572** SeqNo: **4897233** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	1452	10.0					1452	0	5	

The following samples were analyzed in this batch: HS18121485-01 HS18121485-02 HS18121485-03 HS18121485-04

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS18121485**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS18121485
Date/Time Received: **28-Dec-2018 09:15**
Received by: **JRM**

Checklist completed by: *Nilesh D. Ranchod* eSignature — 28-Dec-2018 Date
Reviewed by: *Dane J. Wacasey* eSignature — 31-Dec-2018 Date

Matrices: **Water**
Carrier name: **ALS Courier**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	1.3C / 1.6C UC/C	IR # 25	
Cooler(s)/Kit(s):	44558		
Date/Time sample(s) sent to storage:	12/28/2018 9:49am		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes: Samples received with limited holding time for nitrate (as N). Samples delivered to analyst upon receipt.

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070

Chain of Custody Form

Page 1 of 1

COC ID: 192211

HS18121485

Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information			
Purchase Order	130-2086-06	Project Name	Exide Column Studies	A	300_W (300 Cl, SO4, [NO3 48hr HT])
Work Order		Project Number	130-2086	B	TDS_W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK_W 2320B (2320B Alkalinity)
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P	D	HARD (2340B Hardness (calc))
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit	E	ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
				F	ICP_TW (6020A Total Metals (6)+Cations)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021	G	
Phone	(314) 984-8800	Phone	(314) 984-8800	H	
Fax		Fax		I	
e-Mail Address	evhite@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	.			Groundwa	2,8	3	X	X	X	X	X	X					
2	2018-12-26-FD-PW5 out-30	2018-12-26	10h02	GW		1	X	X	X								
3	2018-12-26-FD-PW5 out-35	2018-12-26	10h04	GW		1	X	X	X								
4	2018-12-26-FD-PW5 out-40	2018-12-26	10h05	GW		1	X	X	X								
5	2018-12-26-FD-PW5 out-CONTROL	2018-12-26	10h00	GW		1	X	X	X								
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: BETTINA EMICE

Shipment Method: Fedex

Required Turnaround Time: (Check Box) ☐ Other ☐ STD 10 Work Days ☒ 5 Work Days ☐ 2 Work Days ☐ 24 Hour

Results Due Date:

Relinquished by: CLAUDE ONIKPO Date: 2018-12-26 Time: 2:00PM

Relinquished by: Date: 12/28/18 Time: 07:15

Received by:

Received by (Laboratory):

Logged by (Laboratory): Date: Time:

Checked by (Laboratory):

Notes: Exide Column Studies

Cooler ID	Cooler Temp.
446558	1.3

QC Package: (Check One Box Below)

☐ Level II Std QC ☒ TRRP Checklist
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846 CLP
☐ Other

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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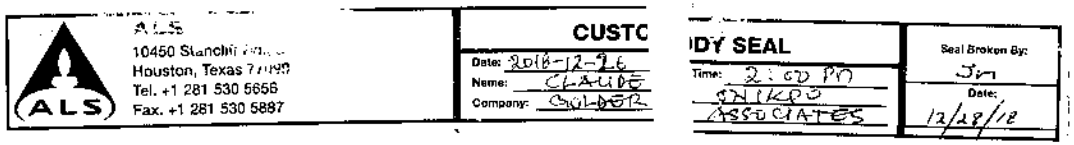
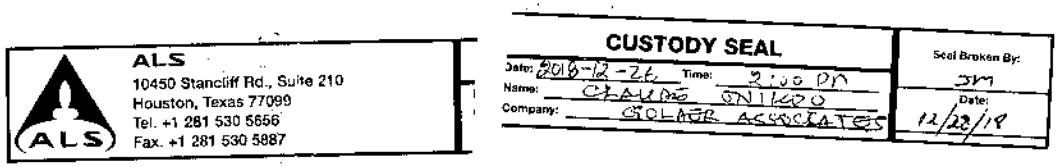

ALS
10450 Stancliff Rd.
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CUSTC
Date: 2018-12-26
Name: CLAUDE
Company: GOLDER
DY SEAL
Time: 2:00 PM
GNIKPO
ASSOCIATES
Seal Broken By:
JM
Date:
12/28/18


ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CUSTODY SEAL
Date: 2018-12-26 Time: 2:00 PM
Name: CLAUDE GNIKPO
Company: GOLDER ASSOCIATES
Seal Broken By:
JM
Date:
12/28/18

ORIGIN ID:YULA (514) 804-1053
AURELIE BUIDIN
GOLDER ASSOCIATES LTD
1470 MAZURETTE

MONTREAL, PQ H4N1H2
CANADA CA

SHIP DATE: 26DEC18
ACTWGT: 40.00 LB
CAD: 106580724/INET4042
DIMS: 25x14x14 IN

BILL RECIPIENT

TO DANE WACASEY
ALS HOUSTON LABORATORY
10450 STANCLIFF RD
STE 210
HOUSTON TX 77099 (US)
(281) 530-5656 REF:
INV
PO: DEPT.

552J2/E4AF/DCA5

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January 10, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19010061**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 4 sample(s) on Jan 03, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19010061**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS19010061**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 01/10/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19010061				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): R330470,R330518,R330730				
#[1]	A[2]	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	X				
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?	X				
		Were analytical duplicates analyzed at the appropriate frequency?	X				
		Were RPDs or relative standard deviations within the laboratory QC limits?	X				
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 01/10/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19010061				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): R330470,R330518,R330730				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			1
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?			X		
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports		
Laboratory Name: ALS Laboratory Group		LRC Date: 01/10/2019
Project Name: Exide Column Studies		Laboratory Job Number: HS19010061
Reviewer Name: Dane Wacasey		Prep Batch Number(s): R330470,R330518,R330730
ER#[5]	**Description**	
1	See Run Log and CCB Exceptions Report.	

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010061
Start Date: 03-Jan-2019 End Date: 04-Jan-2019

Run ID:ICS3K2_330470
Instrument:ICS3K2
Method:E300

Sample No.	D/F	Time	FileID	Analytes
CCV 1	1	03-Jan-2019 15:26		CL NO3N SO4
CCB 1	1	03-Jan-2019 15:48		CL NO3N SO4
WBLKW1-010319	1	03-Jan-2019 16:10		CL NO3N SO4
WLCSW1-010319	1	03-Jan-2019 16:31		CL NO3N SO4
WLCSDW1-010319	1	03-Jan-2019 16:53		CL NO3N SO4
2019-01-02-DGWMW11-PV5out-30	2	03-Jan-2019 17:14		NO3N
2019-01-02-DGWMW11-PV5out-30	10	03-Jan-2019 17:36		CL
2019-01-02-DGWMW11-PV5out-35	2	03-Jan-2019 18:19		NO3N
2019-01-02-DGWMW11-PV5out-35	10	03-Jan-2019 18:51		CL
2019-01-02-DGWMW11-PV5out-40	10	03-Jan-2019 19:12		CL NO3N
CCB 2	1	03-Jan-2019 20:17		CL NO3N SO4
2019-01-02-DGWMW11-PV5out-Control	10	03-Jan-2019 20:39		CL NO3N
2019-01-02-DGWMW11-PV5out-ControlMS	50	03-Jan-2019 21:43		CL NO3N SO4
2019-01-02-DGWMW11-PV5out-ControlMSD	50	03-Jan-2019 22:05		CL NO3N SO4
CCV 2	1	04-Jan-2019 00:14		CL NO3N SO4
CCB 3	1	04-Jan-2019 00:36		CL NO3N SO4
CCV 3	1	04-Jan-2019 08:52		CL NO3N SO4
CCB 4	1	04-Jan-2019 09:14		CL NO3N SO4
2019-01-02-DGWMW11-PV5out-30	100	04-Jan-2019 11:22		SO4
2019-01-02-DGWMW11-PV5out-35	100	04-Jan-2019 11:44		SO4
2019-01-02-DGWMW11-PV5out-40	100	04-Jan-2019 12:05		SO4
2019-01-02-DGWMW11-PV5out-Control	100	04-Jan-2019 12:37		SO4
CCB 5	1	04-Jan-2019 14:22		CL NO3N SO4

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010061

Run ID:ICS3K2_330470
Instrument:ICS3K2
Method:E300

CCB 2	Date: 03-Jan-2019 20:17	Seq: 4894493	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Nitrogen, Nitrate (As N)	77	30	100	
Sulfate	549	200	500	

CCB 4	Date: 04-Jan-2019 09:14	Seq: 4896229	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sulfate	551	200	500	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19010061

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19010061-01	2019-01-02-DGW-MW11-PV5out-30	Groundwater		02-Jan-2019 08:00	03-Jan-2019 09:15	☐
HS19010061-02	2019-01-02-DGW-MW11-PV5out-35	Groundwater		02-Jan-2019 08:00	03-Jan-2019 09:15	☐
HS19010061-03	2019-01-02-DGW-MW11-PV5out-40	Groundwater		02-Jan-2019 08:00	03-Jan-2019 09:15	☐
HS19010061-04	2019-01-02-DGW-MW11-PV5out-Control	Groundwater		02-Jan-2019 08:00	03-Jan-2019 09:15	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 2019-01-02-DGW-MW11-PV5out-30
Collection Date: 02-Jan-2019 08:00

ANALYTICAL REPORT
WorkOrder:HS19010061
Lab ID:HS19010061-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**228**		**2.00**	**5.00**	**mg/L**	10	03-Jan-2019 17:36
Nitrogen, Nitrate (As N)	U		0.0600	0.200	mg/L	2	03-Jan-2019 17:14
Sulfate	**5,170**		**20.0**	**50.0**	**mg/L**	100	04-Jan-2019 11:22
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: MZD
Total Dissolved Solids (Residue, Filterable)	**5,150**		**5.00**	**10.0**	**mg/L**	1	08-Jan-2019 11:00
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**93.1**		**5.00**	**5.00**	**mg/L**	1	04-Jan-2019 22:27
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	04-Jan-2019 22:27
Alkalinity, Total (As CaCO3)	**93.1**		**5.00**	**5.00**	**mg/L**	1	04-Jan-2019 22:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 2019-01-02-DGW-MW11-PV5out-35
Collection Date: 02-Jan-2019 08:00

ANALYTICAL REPORT
WorkOrder:HS19010061
Lab ID:HS19010061-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**231**		**2.00**	**5.00**	**mg/L**	10	03-Jan-2019 18:51
Nitrogen, Nitrate (As N)	U		0.0600	0.200	mg/L	2	03-Jan-2019 18:19
Sulfate	**5,140**		**20.0**	**50.0**	**mg/L**	100	04-Jan-2019 11:44
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: MZD
Total Dissolved Solids (Residue, Filterable)	**7,680**		**5.00**	**10.0**	**mg/L**	1	08-Jan-2019 11:00
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**72.3**		**5.00**	**5.00**	**mg/L**	1	04-Jan-2019 22:34
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	04-Jan-2019 22:34
Alkalinity, Total (As CaCO3)	**72.3**		**5.00**	**5.00**	**mg/L**	1	04-Jan-2019 22:34

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 2019-01-02-DGW-MW11-PV5out-40
Collection Date: 02-Jan-2019 08:00

ANALYTICAL REPORT
WorkOrder:HS19010061
Lab ID:HS19010061-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**229**		**2.00**	**5.00**	**mg/L**	10	03-Jan-2019 19:12
Nitrogen, Nitrate (As N)	U		0.300	1.00	mg/L	10	03-Jan-2019 19:12
Sulfate	**5,080**		**20.0**	**50.0**	**mg/L**	100	04-Jan-2019 12:05
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: MZD
Total Dissolved Solids (Residue, Filterable)	**8,810**		**5.00**	**10.0**	**mg/L**	1	08-Jan-2019 11:00
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**90.3**		**5.00**	**5.00**	**mg/L**	1	04-Jan-2019 22:40
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	04-Jan-2019 22:40
Alkalinity, Total (As CaCO3)	**90.3**		**5.00**	**5.00**	**mg/L**	1	04-Jan-2019 22:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 2019-01-02-DGW-MW11-PV5out-Control
Collection Date: 02-Jan-2019 08:00

ANALYTICAL REPORT
WorkOrder:HS19010061
Lab ID:HS19010061-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**211**		**2.00**	**5.00**	**mg/L**	10	03-Jan-2019 20:39
Nitrogen, Nitrate (As N)	U		0.300	1.00	mg/L	10	03-Jan-2019 20:39
Sulfate	**5,410**		**20.0**	**50.0**	**mg/L**	100	04-Jan-2019 12:37
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: MZD
Total Dissolved Solids (Residue, Filterable)	**9,730**		**5.00**	**10.0**	**mg/L**	1	08-Jan-2019 11:00
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**224**		**5.00**	**5.00**	**mg/L**	1	04-Jan-2019 22:47
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	04-Jan-2019 22:47
Alkalinity, Total (As CaCO3)	**224**		**5.00**	**5.00**	**mg/L**	1	04-Jan-2019 22:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010061

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R330470	**Test Name :** ANIONS BY E300.0				**Matrix:** Groundwater	
HS19010061-01	2019-01-02-DGW-MW11-PV5out-30	02 Jan 2019 08:00			04 Jan 2019 11:22	100
HS19010061-01	2019-01-02-DGW-MW11-PV5out-30	02 Jan 2019 08:00			03 Jan 2019 17:36	10
HS19010061-01	2019-01-02-DGW-MW11-PV5out-30	02 Jan 2019 08:00			03 Jan 2019 17:14	2
HS19010061-02	2019-01-02-DGW-MW11-PV5out-35	02 Jan 2019 08:00			04 Jan 2019 11:44	100
HS19010061-02	2019-01-02-DGW-MW11-PV5out-35	02 Jan 2019 08:00			03 Jan 2019 18:51	10
HS19010061-02	2019-01-02-DGW-MW11-PV5out-35	02 Jan 2019 08:00			03 Jan 2019 18:19	2
HS19010061-03	2019-01-02-DGW-MW11-PV5out-40	02 Jan 2019 08:00			04 Jan 2019 12:05	100
HS19010061-03	2019-01-02-DGW-MW11-PV5out-40	02 Jan 2019 08:00			03 Jan 2019 19:12	10
HS19010061-04	2019-01-02-DGW-MW11-PV5out-Control	02 Jan 2019 08:00			04 Jan 2019 12:37	100
HS19010061-04	2019-01-02-DGW-MW11-PV5out-Control	02 Jan 2019 08:00			03 Jan 2019 20:39	10
Batch ID R330518	**Test Name :** ALKALINITY BY SM2320B				**Matrix:** Groundwater	
HS19010061-01	2019-01-02-DGW-MW11-PV5out-30	02 Jan 2019 08:00			04 Jan 2019 22:27	1
HS19010061-02	2019-01-02-DGW-MW11-PV5out-35	02 Jan 2019 08:00			04 Jan 2019 22:34	1
HS19010061-03	2019-01-02-DGW-MW11-PV5out-40	02 Jan 2019 08:00			04 Jan 2019 22:40	1
HS19010061-04	2019-01-02-DGW-MW11-PV5out-Control	02 Jan 2019 08:00			04 Jan 2019 22:47	1
Batch ID R330730	**Test Name :** TOTAL DISSOLVED SOLIDS BY SM2540C				**Matrix:** Groundwater	
HS19010061-01	2019-01-02-DGW-MW11-PV5out-30	02 Jan 2019 08:00			08 Jan 2019 11:00	1
HS19010061-02	2019-01-02-DGW-MW11-PV5out-35	02 Jan 2019 08:00			08 Jan 2019 11:00	1
HS19010061-03	2019-01-02-DGW-MW11-PV5out-40	02 Jan 2019 08:00			08 Jan 2019 11:00	1
HS19010061-04	2019-01-02-DGW-MW11-PV5out-Control	02 Jan 2019 08:00			08 Jan 2019 11:00	1

WorkOrder: HS19010061
InstrumentID: ICS3K2
Test Code: 300_W
Test Number: E300
Test Name: Anions by E300.0

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Chloride	16887-00-6	0.500	0.578	0.200	0.500
A	Nitrogen, Nitrate (As N)	14797-55-8	0.100	0.117	0.0300	0.100
A	Sulfate	14808-79-8	0.500	0.651	0.200	0.500

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010061

QC BATCH REPORT

Batch ID: R330470 **Instrument: ICS3K2** **Method: E300**

MBLK Sample ID: **WBLKW1-010319** Units: **mg/L** Analysis Date: **03-Jan-2019 16:10**
Client ID: Run ID: **ICS3K2_330470** SeqNo: **4894483** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	0.500								
Nitrogen, Nitrate (As N)	U	0.100								
Sulfate	U	0.500								

LCS Sample ID: **WLCSW1-010319** Units: **mg/L** Analysis Date: **03-Jan-2019 16:31**
Client ID: Run ID: **ICS3K2_330470** SeqNo: **4894484** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.6	0.500	20	0	98.0	90 - 110				
Nitrogen, Nitrate (As N)	3.846	0.100	4	0	96.2	90 - 110				
Sulfate	18.98	0.500	20	0	94.9	90 - 110				

LCSD Sample ID: **WLCSDW1-010319** Units: **mg/L** Analysis Date: **03-Jan-2019 16:53**
Client ID: Run ID: **ICS3K2_330470** SeqNo: **4894485** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.45	0.500	20	0	97.3	90 - 110	19.6	0.748	20	
Nitrogen, Nitrate (As N)	3.812	0.100	4	0	95.3	90 - 110	3.846	0.888	20	
Sulfate	19	0.500	20	0	95.0	90 - 110	18.98	0.121	20	

MS Sample ID: **HS19010061-04MS** Units: **mg/L** Analysis Date: **03-Jan-2019 21:43**
Client ID: **2019-01-02-DGWMW11-PV5out-Control** Run ID: **ICS3K2_330470** SeqNo: **4894496** PrepDate: DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	696.2	25.0	500	205.4	98.2	80 - 120				
Nitrogen, Nitrate (As N)	93.24	5.00	100	0	93.2	80 - 120				
Sulfate	5908	25.0	500	5346	113	80 - 120				EO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010061

QC BATCH REPORT

Batch ID: R330470 **Instrument:** ICS3K2 **Method:** E300

MSD Sample ID: **HS19010061-04MSD** Units: **mg/L** Analysis Date: **03-Jan-2019 22:05**
Client ID: **2019-01-02-DGWMW11-PV5out-Control** Run ID: **ICS3K2_330470** SeqNo: **4894497** PrepDate: DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	696.6	25.0	500	205.4	98.2	80 - 120	696.2	0.0603	20	
Nitrogen, Nitrate (As N)	92.22	5.00	100	0	92.2	80 - 120	93.24	1.1	20	
Sulfate	5869	25.0	500	5346	105	80 - 120	5908	0.664	20	EO

The following samples were analyzed in this batch: HS19010061-01 HS19010061-02 HS19010061-03 HS19010061-04

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010061

QC BATCH REPORT

Batch ID: R330518 **Instrument: ManTech01** **Method: SM2320B**

MBLK Sample ID: **WBLKW1-190104** Units: **mg/L** Analysis Date: **04-Jan-2019 19:48**
Client ID: Run ID: **ManTech01_330518** SeqNo: **4895920** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	U	5.00								
Alkalinity, Carbonate (As CaCO3)	U	5.00								
Alkalinity, Total (As CaCO3)	U	5.00								

LCS Sample ID: **WLCS1-190104** Units: **mg/L** Analysis Date: **04-Jan-2019 19:57**
Client ID: Run ID: **ManTech01_330518** SeqNo: **4895921** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1030	5.00	1000	0	103	85 - 115				
Alkalinity, Total (As CaCO3)	1053	5.00	1000	0	105	85 - 115				

LCSD Sample ID: **WLCSD1-190104** Units: **mg/L** Analysis Date: **04-Jan-2019 20:06**
Client ID: Run ID: **ManTech01_330518** SeqNo: **4895922** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1046	5.00	1000	0	105	85 - 115	1030	1.51	20	
Alkalinity, Total (As CaCO3)	1066	5.00	1000	0	107	85 - 115	1053	1.27	20	

DUP Sample ID: **HS18121254-25DUP** Units: **mg/L** Analysis Date: **04-Jan-2019 20:41**
Client ID: Run ID: **ManTech01_330518** SeqNo: **4895928** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	175.2	5.00					176.9	0.96	20	
Alkalinity, Carbonate (As CaCO3)	U	5.00					0	0	20	
Alkalinity, Total (As CaCO3)	175.2	5.00					176.9	0.96	20	

The following samples were analyzed in this batch: HS19010061-01 HS19010061-02 HS19010061-03 HS19010061-04

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010061

QC BATCH REPORT

Batch ID: R330730 **Instrument: Balance1** **Method: M2540C**

MBLK Sample ID: **WBLK-010819** Units: **mg/L** Analysis Date: **08-Jan-2019 11:00**
Client ID: Run ID: **Balance1_330730** SeqNo: **4901402** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	U	10.0								

LCS Sample ID: **WLCS3** Units: **mg/L** Analysis Date: **08-Jan-2019 11:00**
Client ID: Run ID: **Balance1_330730** SeqNo: **4901406** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	1026	10.0	1000	0	103	85 - 115				

LCS Sample ID: **WLCS2** Units: **mg/L** Analysis Date: **08-Jan-2019 11:00**
Client ID: Run ID: **Balance1_330730** SeqNo: **4901405** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	1044	10.0	1000	0	104	85 - 115				

LCS Sample ID: **WLCS1** Units: **mg/L** Analysis Date: **08-Jan-2019 11:00**
Client ID: Run ID: **Balance1_330730** SeqNo: **4901404** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	1046	10.0	1000	0	105	85 - 115				

LCS Sample ID: **WLCS-010819** Units: **mg/L** Analysis Date: **08-Jan-2019 11:00**
Client ID: Run ID: **Balance1_330730** SeqNo: **4901403** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	992	10.0	1000	0	99.2	85 - 115				

DUP Sample ID: **HS19010155-01DUP** Units: **mg/L** Analysis Date: **08-Jan-2019 11:00**
Client ID: Run ID: **Balance1_330730** SeqNo: **4901401** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	524	10.0					472	10.4	5	R

The following samples were analyzed in this batch: HS19010061-01 HS19010061-02 HS19010061-03 HS19010061-04

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19010061**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19010061

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19010061-01	2019-01-02-DGWMW11-PV5out-30	Login	1/3/2019 10:16:10 AM	NDR	WET371

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19010061

Date/Time Received: **03-Jan-2019 09:15**
Received by: **NDR**

Checklist completed by: *Nilesh D. Ranchod* eSignature — 3-Jan-2019 Date

Reviewed by: *Dane J. Wacasey* eSignature — 7-Jan-2019 Date

Matrices: **Water**

Carrier name: **FedEx International Priority**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	1.5C / 1.9C UC/C	IR # 11	
Cooler(s)/Kit(s):	42939		
Date/Time sample(s) sent to storage:	01/03/2019 10:30am		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070

Chain of Custody Form

Page 1 of 1

COC ID: 143459

HS19010061

Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information	
Purchase Order	130-2086-06	Project Name	Exide Column studies
Work Order		Project Number	130-2086
Company Name	Golder Associates	Bill To Company	Golder Associates
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide NP
Address	13515 Barrett Parkway Drive	Address	13515 Barrett Parkway Drive
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021
Phone	(314) 984-8806	Phone	(314) 984-8800
Fax		Fax	
e-Mail Address	ewhite@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com

	A	300_W (300 Cl, SO4 [*NO3 * 48hr AT*])																		
	B	TDS_W 2540C (2540C TDS)																		
	C	ALK_W 2320B																		
	D	HARD (2340B (calc))																		
	E	ICP_DISS (6020A)																		
	F	ICP_TW (6020A)																		
	G																			
	H																			
	I																			
	J																			

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	~~2019-01-02~~																
2	2019-01-02-DGWMW11-PVSout-30	2019-01-02	08:00AM	GW	~~HNO3~~	1	X	X	X								
3	2019-01-02-DGWMW11-PVSout-35	2019-01-02	↓	GW	~~HNO3~~	1	X	X	X								
4	2019-01-02-DGWMW11-PVSout-40	2019-01-02		GW	~~HNO3~~	1	X	X	X								
5	2019-01-02-DGWMW11-PVSout-Control	2019-01-02		GW	~~HNO3~~	1	X	X	X								
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: BETTINA EMILE

Shipment Method: FedEx

Required Turnaround Time: (Check Box) ☐ Other ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
Bettina Emile	2019-01-02	08:00 AM	
Relinquished by:	Date:	Time:	Received by (Laboratory):
	1/3/19	07:15	NR

Logged by (Laboratory): Date: Time: Checked by (Laboratory):

Notes:

Cooler ID	Cooler Temp
42989	1.5
N/A	N/A

QC Package: (Check One Box Below)
☐ Level II Std QC ☒ TRRP Checklist
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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ORIGIN ID:YUXA (514) 383-0990
Audrey Etheves
Golder Associates Ltd
7250 rue du Mile End
3e etage
MONTREAL, PQ H2R3A4
CANADA, CA

Ship Date: 02JAN19
ActWgt: 30.00 LB
CAD: 108680724/INET4042

BILL RECIPIENT
EIN/VAT:

TO Dane Wacasey (281) 530-5656
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

FedEx Express
(US)
AWB
J1E21808152000

NH SGRA

PKG:YOUR PKG

TRK# 7740 9186 8677 Form 0430

10:30A
INTL PRIORITY

REF:
DESC1:GlaciÈre contenant 4 bouteilles d'eau
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: Audrey Etheves
T/C: R 967554812
D/T: R 967554812

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Houston, Texas 77099
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Fax. +1 281 530 5887

CUSTODY SEAL
Date: 02-01-19 Time: 01:30 PM
Name: Bethany Emile
Company: Golder Associates

Seal Broken By: Gm
Date: 01/03/19

JAN 03 2019

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

CUSTODY SEAL
Date: 02-01-19 Time: 01:30 PM
Name: Bethany Emile
Company: Golder Associates

Seal Broken By: Gm
Date: 01/03/19

ORIGIN ID:YUXA (514) 383-0930
GUNTER ESSOUDRY
FEDEX EXPRESS, LTD
7250 RUE DU MILE END
3E ETAGE
MONTREAL, PQ H2R3A4
CANADA CA

SHIP DATE: 02JAN19
ACTWGT: 1.00 LB
CAD: 10868307/CAFE4042

BILL RECIPIENT

TO DANE WACASEY
ALS HOUSTON LABORATORY
10450 STANCLIFF RD
STE 210
HOUSTON TX 77099 (US)
(281) 530-5656
INV:
PO: REF:
DEPT:

552J2/D74C/DCA5

FedEx Express

TRK# 7740 9186 8677
0430

NH SGRA

INTL PRIORITY

10:30A

77099

TX-US IAH

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2. Placez l'étiquette dans la pochette d'expédition et fixez-la à votre paquet.

DÉFINITIONS : Dans la présente lettre de transport aérien, « nous », « notre » et « nos » et « FedEx » se rapportent à Federal Express Corporation, ses filiales, succursales et leurs employés, mandataires et prestataires externes. « Vous » et « votre » se rapportent à l'expéditeur, ses employés, donneurs d'ordre et mandataires. Si l'envoi ne prévoit pas des États-Unis comme unique destination ou comme destination finale, le successeur ou les prestataires externes de FedEx ayant à l'origine accepté de procéder à l'expédition. « Colis » désigne de tous contenus du ou des enveloppes dont nous acceptons d'effectuer le transport, notamment les marchandises remises au transporteur aux fins par la base de nos systèmes automatisés, ordinateurs, connexes ou liaisons de transport. « Envoi » désigne de tous colis remis simultanément au transporteur sur une même lettre de transport aérien. REMARQUE RELATIVE AU TRANSPORT AÉRIEN : La Convention de Varsovie amendée est applicable à tout envoi aérien international. La Convention de Varsovie amendée régit et limite dans la plupart des cas la responsabilité de FedEx en cas de perte, retard ou dommage affectant votre envoi. La Convention de Varsovie amendée limite la responsabilité de FedEx. Par exemple, aux États-Unis, la responsabilité est limitée à 9,07 $ par livre (20 $ par kilogramme), à moins qu'une valeur déclaration supérieure ne soit déclarée comme décrit ci-dessous, tout frais supplémentaire étant alors à votre charge. L'interprétation et la mise en application des dispositions relatives aux limites de responsabilité de la Convention de Varsovie peuvent varier d'un pays à l'autre. FedEx se réserve le droit d'organiser l'itinéraire emprunté et les escales à sa convenance. REMARQUE RELATIVE AU TRANSPORT ROUTIER : Les envois transportés uniquement par voie terrestre vers ou depuis un pays ayant ratifié la Convention de Varsovie ou la Convention relative au contrat de transport international de marchandises par route (« CMR ») sont soumis aux limites et conditions de la CMR, sans préjudice de toute autre disposition contenue dans la présente lettre de transport aérien. Considérant les envois transportés exclusivement par voie terrestre, les clauses de la CMR prévalent en cas de conflit entre les dispositions de la CMR et celles de la présente lettre de transport aérien. LIMITATION DE RESPONSABILITÉ : La responsabilité maximale de FedEx en cas de dommage, perte, retard, manque à gagner de livraison, défaut de livraison, informations incorrectes ou défaut d'informations relatives à l'envoi est limitée par le présent Contrat et conformément aux termes et conditions du contrat d'expédition, à moins que la plus faible responsabilité n'est pas régie par la Convention de Varsovie, la CMR ou autres traités internationaux, lois, dispositions réglementaires, décrets ou décrets. Veuillez vous référer au contrat d'expédition ci-inclus dans le Guide des Services FedEx en vigueur ou prochainement équivalent afin de déterminer les limites correspondantes. FedEx ne propose pas de responsabilité marchandises et assurance tous risques, mais il vous est possible de payer des frais supplémentaires par tranche de 100 $ US supplémentaires (ou équivalent en monnaie locale du pays d'origine) de valeur d'expédition déclarée. Si la valeur d'expédition déclarée est supérieure à 100 $ des frais supplémentaires sont acquittés la responsabilité de FedEx dépend alors de la valeur la plus faible entre la valeur déclarée et les dommages réels. EXCLUSION DE RESPONSABILITÉ : FEDEX NE SAURAIT EN AUCUN CAS ÊTRE TENU POUR RESPONSABLE DE TOUT DOMMAGE DIRECT, INDIRECT, ACCESSOIRE, SPÉCIAL OU CONSÉCUTIF (L'EXPÉDITEUR DÉCLARERA Y COMPRIS, SANS QUE CELA SOIT LIMITATIF DE PERTES DE REVENUS OU BÉNÉFICES) OU À LA VALEUR RÉELLE DE L'ENVOI, SI CELLE-CI EST INFÉRIEURE, QUE FEDEX AIT PU OU NON SAVOIR QUE DE TELS DOMMAGES POURRAIENT SURVENIR. FedEx ne saurait en aucun cas être tenu pour responsable de vos agissements ou omissions, y compris, sans que cela soit limitatif, de déclarations incorrectes de marchandises, d'un colisage, rétribution, emballage ou adhésion non adéquats ou inadaptés de l'envoi, reçus également au omissions du destinataire ou de quiconque pour atteinte contestée par cet envoi, à de la violation par l'une des parties des clauses du présent contrat. FedEx ne saurait en aucun cas être tenu pour responsable de tous dommages pertes, retards, manques, erreurs de livraison, défaut de livraison, informations incorrectes ou défaut d'informations relatives à l'envoi, devant ou suivre marchandises interdites et d'être prises hors de notre contrôle tels que les catastrophes naturelles, risques aériens, conditions météorologiques, retards mécaniques, actes de terrorisme, guerre, grèves, désordre public, ni des agissements ou omissions des autorités publiques notamment des douanes ou services publics ou ayant autorité.
DÉFAUT DE GARANTIE : Nous n'accordons aucune garantie, expresse ou tacite. RECOURS EN CAS DE PERTE, DOMMAGE OU RETARD : TOUT RECOURS DOIT ÊTRE EXERCÉ PAR ÉCRIT ET DANS DES DÉLAIS STRICTS. VOIR NOS TARIFS ET LE GUIDE DES SERVICES FEDEX EN VIGUEUR OU LES CONDITIONS STANDARD D'EXPÉDITION POUR EN LES DÉFINITIONS. La Convention de Varsovie prévoit des procédures de recours écrites applicables en cas de dommages, retard ou défaut de livraison des envois. En outre, l'interprétation et la mise en application des dispositions relatives aux voies de recours de la Convention de Varsovie peuvent varier d'un pays à l'autre. Veuillez vous référer à la Convention pour déterminer les délais de recours applicables à votre envoi. Le choix à dommages intérêts pénaux, sauf si un recours est formé dans un délai de deux ans, comme spécifié dans la Convention. FedEx n'est pas tenu de répondre à un recours avant que tous les frais d'expédition aient été acquittés. Le montant du recours pour ne pas être déduit des frais d'expédition. Si le destinataire accepte l'envoi sans noter aucun dommage sur le bulletin de livraison, FedEx considérera alors que la marchandise a été livrée dans de bonnes conditions. Afin que nous puissions répondre aux demandes de dommages, nous vous demandons de mettre à notre disposition les conteneurs, cartons d'expédition et emballages d'origine dans les cinq jours. DROIT INFÉRATIF : Dès lors que l'une des dispositions contenues ou citées dans la présente lettre de transport aérien est à l'encontre des traités, lois, dispositions réglementaires, usages ou décrets internationaux, lesdites dispositions restent en vigueur dans la limite du présent contrat dans la mesure où celle-ci n'est pas annulé. Le fait que l'une des dispositions soit invalide ou inapplicable n'affecte pas les autres parties de la présente lettre de transport aérien. Sauf indication contraire, FEDERAL EXPRESS CORPORATION, 2005 Corporate Avenue, Memphis, TN 38132 USA, est le premier transporteur du présent envoi.

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

January 11, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19010105**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 1 sample(s) on Jan 03, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19010105**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS19010105**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 01/11/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19010105				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 136374,136375				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	X				
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?			X		
		Were analytical duplicates analyzed at the appropriate frequency?			X		
		Were RPDs or relative standard deviations within the laboratory QC limits?			X		
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 01/11/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19010105				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 136374,136375				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			1
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports	
Laboratory Name: ALS Laboratory Group	LRC Date: 01/11/2019
Project Name: Exide Column Studies	Laboratory Job Number: HS19010105
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 136374,136375

ER#[5]	Description
1	See Run Log and CCB Exceptions Report.

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010105
Start Date: 11-Jan-2019 End Date: 11-Jan-2019

Run ID:ICPMS04_330820
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	11-Jan-2019 05:53	014_ICV.d	AS CD PB SB SE
LLICV2	1	11-Jan-2019 05:55	015SMPL.d	AS CD PB SB SE
LLICV5	1	11-Jan-2019 05:57	016LICV.d	AS CD PB SB SE
ICB	1	11-Jan-2019 05:59	017_ICB.d	AS CD PB SB SE
ICSA	1	11-Jan-2019 06:02	018ICSA.d	AS CD PB SB SE
ICSAB	1	11-Jan-2019 06:04	019ICSB.d	AS CD PB SB SE
CCV 1	1	11-Jan-2019 06:32	031_CCV.d	AS CD PB SB SE
CCB 1	1	11-Jan-2019 06:34	032_CCB.d	AS CD PB SB SE
CCV 2	1	11-Jan-2019 06:59	043_CCV.d	AS CD PB SB SE
CCB 2	1	11-Jan-2019 07:01	044_CCB.d	AS CD PB SB SE
CCV 3	1	11-Jan-2019 07:26	055_CCV.d	AS CD PB SB SE
CCB 3	1	11-Jan-2019 07:28	056_CCB.d	AS CD PB SB SE
CCV 4	1	11-Jan-2019 07:53	067_CCV.d	AS CD PB SB SE
CCB 4	1	11-Jan-2019 07:55	068_CCB.d	AS CD PB SB SE
CCV 5	1	11-Jan-2019 08:21	079_CCV.d	AS CD PB SB SE
CCB 5	1	11-Jan-2019 08:24	080_CCB.d	AS CD PB SB SE
CCV 6	1	11-Jan-2019 08:48	091_CCV.d	AS CD PB SB SE
CCB 6	1	11-Jan-2019 08:51	092_CCB.d	AS CD PB SB SE
CCV 7	1	11-Jan-2019 09:15	103_CCV.d	AS CD PB SB SE
CCB 7	1	11-Jan-2019 09:18	104_CCB.d	AS CD PB SB SE
CCB 8	1	11-Jan-2019 09:45	116_CCB.d	AS CD PB SB SE
CCV 8	1	11-Jan-2019 09:57	121_CCV.d	AS CD PB SB SE
CCV 9	1	11-Jan-2019 10:25	133_CCV.d	AS CD PB SB SE
CCB 9	1	11-Jan-2019 10:27	134_CCB.d	AS CD PB SB SE
CCV 10	1	11-Jan-2019 10:52	145_CCV.d	AS CD PB SB SE
CCB 10	1	11-Jan-2019 10:54	146_CCB.d	AS CD PB SB SE
MBLK-136375	1	11-Jan-2019 10:56	147SMPL.d	AS CD PB SE
LCS-136375	1	11-Jan-2019 10:59	148SMPL.d	AS CD PB SE
ZZZZZZSD	5	11-Jan-2019 11:03	150SMPL.d	CD PB SE
ZZZZZZMS	1	11-Jan-2019 11:05	151SMPL.d	AS CD PB SE
ZZZZZZMSD	1	11-Jan-2019 11:08	152SMPL.d	AS CD PB SE
ZZZZZZPDS	1	11-Jan-2019 11:10	153SMPL.d	AS CD PB SE
CCV 11	1	11-Jan-2019 11:19	157_CCV.d	AS CD PB SB SE
CCB 11	1	11-Jan-2019 11:21	158_CCB.d	AS CD PB SB SE
DGW-MW-11	1	11-Jan-2019 11:34	160SMPL.d	AS CD PB SB SE
CCV 12	1	11-Jan-2019 11:39	162_CCV.d	AS CD PB SB SE
CCB 12	1	11-Jan-2019 11:41	163_CCB.d	AS CD PB SB SE
ICCV 13	1	11-Jan-2019 12:31	182_ICV.d	AS CD PB SB SE
LLCCV5	1	11-Jan-2019 12:33	183LICV.d	AS CD PB SB SE
LLCCV2	1	11-Jan-2019 12:35	184SMPL.d	AS CD PB SB SE
ICCB 13	1	11-Jan-2019 12:38	185_ICV.d	AS CD PB SB SE
CCV 14	1	11-Jan-2019 13:14	197_CCV.d	AS CD PB SB SE
CCB 14	1	11-Jan-2019 13:16	198_CCB.d	AS CD PB SB SE
MBLKF1-136374	1	11-Jan-2019 13:21	199SMPL.d	AS CD PB SB SE
MBLKF2-136374	1	11-Jan-2019 13:24	200SMPL.d	AS CD PB SB SE
MBLK-136374	1	11-Jan-2019 13:26	201SMPL.d	AS CD PB SB SE
LCS-136374	1	11-Jan-2019 13:28	202SMPL.d	AS CD PB SB SE
DGW-MW-11	1	11-Jan-2019 13:30	203SMPL.d	AS CD PB SB SE
DGW-MW-11SD	5	11-Jan-2019 13:33	204SMPL.d	AS CD PB SB SE
DGW-MW-11MS	1	11-Jan-2019 13:35	205SMPL.d	AS CD PB SB SE
DGW-MW-11MSD	1	11-Jan-2019 13:37	206SMPL.d	AS CD PB SB SE

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010105
Start Date: 11-Jan-2019 End Date: 11-Jan-2019

Run ID:ICPMS04_330820
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
DGW-MW-11PDS	1	11-Jan-2019 13:39	207SMPL.d	AS CD PB SB SE
CCV 15	1	11-Jan-2019 13:44	209_CCV.d	AS CD PB SB SE
CCB 15	1	11-Jan-2019 13:46	210_CCB.d	AS CD PB SB SE
CCV 16	1	11-Jan-2019 14:17	221_CCV.d	AS CD PB SB SE
CCB 16	1	11-Jan-2019 14:30	224_CCB.d	AS CD PB SB SE
CCV 17	1	11-Jan-2019 14:56	235_CCV.d	AS CD PB SB SE
CCB 17	1	11-Jan-2019 14:58	236_CCB.d	AS CD PB SB SE
CCV 18	1	11-Jan-2019 15:25	247_CCV.d	AS CD PB SB SE
CCB 18	1	11-Jan-2019 15:27	248_CCB.d	AS CD PB SB SE
DGW-MW-11SD	100	11-Jan-2019 15:48	251SMPL.d	
DGW-MW-11PDS	20	11-Jan-2019 15:50	252SMPL.d	
CCV 19	1	11-Jan-2019 16:06	259_CCV.d	AS CD PB SB SE
CCB 19	1	11-Jan-2019 16:08	260_CCB.d	AS CD PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010105

Run ID:ICPMS04_330820
Instrument:ICPMS04
Method:SW6020

CCB 8	Date: 11-Jan-2019 09:45	Seq: 4904361	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.41	0.4	2	
Cadmium	3.928	0.2	2	

CCB 9	Date: 11-Jan-2019 10:27	Seq: 4904520	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Cadmium	0.83	0.2	2	

CCB 10	Date: 11-Jan-2019 10:54	Seq: 4904587	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Arsenic	-0.426	0.4	2	
Cadmium	0.727	0.2	2	
Selenium	-1.19	1.1	2	

CCB 11	Date: 11-Jan-2019 11:21	Seq: 4904599	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Arsenic	-0.43	0.4	2	
Cadmium	0.725	0.2	2	

CCB 12	Date: 11-Jan-2019 11:41	Seq: 4904673	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Arsenic	-0.43	0.4	2	
Cadmium	0.728	0.2	2	

CCB 14	Date: 11-Jan-2019 13:16	Seq: 4904880	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Cadmium	0.703	0.2	2	

CCB 15	Date: 11-Jan-2019 13:46	Seq: 4904920	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Cadmium	0.566	0.2	2	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19010105

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19010105-01	DGW-MW-11	Groundwater		02-Jan-2019 17:15	03-Jan-2019 09:15	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: DGW-MW-11
Collection Date: 02-Jan-2019 17:15

ANALYTICAL REPORT
WorkOrder:HS19010105
Lab ID:HS19010105-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 08-Jan-2019		Analyst: RPM
Antimony	**0.00224**		**0.000400**	**0.00200**	**mg/L**	1	11-Jan-2019 11:34
Arsenic	U		0.000400	0.00200	mg/L	1	11-Jan-2019 11:34
Cadmium	**0.00953**		**0.000200**	**0.00200**	**mg/L**	1	11-Jan-2019 11:34
Lead	**0.0276**		**0.000600**	**0.00200**	**mg/L**	1	11-Jan-2019 11:34
Selenium	U		0.00110	0.00200	mg/L	1	11-Jan-2019 11:34
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 08-Jan-2019		Analyst: RPM
Antimony	**0.00202**		**0.000400**	**0.00200**	**mg/L**	1	11-Jan-2019 13:30
Arsenic	U		0.000400	0.00200	mg/L	1	11-Jan-2019 13:30
Cadmium	**0.00913**		**0.000200**	**0.00200**	**mg/L**	1	11-Jan-2019 13:30
Lead	**0.00207**		**0.000600**	**0.00200**	**mg/L**	1	11-Jan-2019 13:30
Selenium	U		0.00110	0.00200	mg/L	1	11-Jan-2019 13:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010105

Batch ID: 136374 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19010105-01	1	10	10 (mL)	1

Batch ID: 136375 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19010105-01	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010105

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 136374	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS19010105-01	DGW-MW-11	02 Jan 2019 17:15		08 Jan 2019 08:00	11 Jan 2019 13:30	1
Batch ID 136375	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19010105-01	DGW-MW-11	02 Jan 2019 17:15		08 Jan 2019 08:00	11 Jan 2019 11:34	1

WorkOrder: HS19010105
InstrumentID: ICPMS04
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000521	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000340	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000553	0.000200	0.00200
A	Lead	7439-92-1	0.00100	0.000916	0.000600	0.00200
A	Selenium	7782-49-2	0.00250	0.00274	0.00110	0.00200

WorkOrder: HS19010105
InstrumentID: ICPMS04
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000521	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000340	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000553	0.000200	0.00200
A	Lead	7439-92-1	0.00100	0.000916	0.000600	0.00200
A	Selenium	7782-49-2	0.00250	0.00274	0.00110	0.00200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010105

QC BATCH REPORT

Batch ID: 136374 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLKF2-136374** Units: **mg/L** Analysis Date: **11-Jan-2019 13:24**
Client ID: Run ID: **ICPMS04_330820** SeqNo: **4904910** PrepDate: **08-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Lead	U	0.00200								
Selenium	U	0.00200								

MBLK Sample ID: **MBLKF1-136374** Units: **mg/L** Analysis Date: **11-Jan-2019 13:21**
Client ID: Run ID: **ICPMS04_330820** SeqNo: **4904909** PrepDate: **08-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Lead	U	0.00200								
Selenium	U	0.00200								

MBLK Sample ID: **MBLK-136374** Units: **mg/L** Analysis Date: **11-Jan-2019 13:26**
Client ID: Run ID: **ICPMS04_330820** SeqNo: **4904911** PrepDate: **08-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Lead	U	0.00200								
Selenium	U	0.00200								

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010105

QC BATCH REPORT

Batch ID: 136374 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

LCS Sample ID: **LCS-136374** Units: **mg/L** Analysis Date: **11-Jan-2019 13:28**
Client ID: Run ID: **ICPMS04_330820** SeqNo: **4904912** PrepDate: **08-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04986	0.00200	0.05	0	99.7	80 - 120				
Arsenic	0.05013	0.00200	0.05	0	100	80 - 120				
Cadmium	0.05029	0.00200	0.05	0	101	80 - 120				
Lead	0.05143	0.00200	0.05	0	103	80 - 120				
Selenium	0.0513	0.00200	0.05	0	103	80 - 120				

MS Sample ID: **HS19010105-01MS** Units: **mg/L** Analysis Date: **11-Jan-2019 13:35**
Client ID: **DGW-MW-11** Run ID: **ICPMS04_330820** SeqNo: **4904915** PrepDate: **08-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05379	0.00200	0.05	0.002021	104	75 - 125				
Arsenic	0.05128	0.00200	0.05	0.000224	102	75 - 125				
Cadmium	0.0584	0.00200	0.05	0.009133	98.5	75 - 125				
Lead	0.05178	0.00200	0.05	0.002072	99.4	75 - 125				
Selenium	0.05327	0.00200	0.05	0.000253	106	75 - 125				

MSD Sample ID: **HS19010105-01MSD** Units: **mg/L** Analysis Date: **11-Jan-2019 13:37**
Client ID: **DGW-MW-11** Run ID: **ICPMS04_330820** SeqNo: **4904916** PrepDate: **08-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05293	0.00200	0.05	0.002021	102	75 - 125	0.05379	1.61	20	
Arsenic	0.04952	0.00200	0.05	0.000224	98.6	75 - 125	0.05128	3.5	20	
Cadmium	0.0598	0.00200	0.05	0.009133	101	75 - 125	0.0584	2.36	20	
Lead	0.05214	0.00200	0.05	0.002072	100	75 - 125	0.05178	0.695	20	
Selenium	0.04785	0.00200	0.05	0.000253	95.2	75 - 125	0.05327	10.7	20	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010105

QC BATCH REPORT

Batch ID: 136374 **Instrument:** ICPMS04 **Method:** SW6020 (dissolved) (DISSOLVED)

PDS Sample ID: **HS19010105-01PDS** Units: **mg/L** Analysis Date: **11-Jan-2019 13:39**
Client ID: **DGW-MW-11** Run ID: **ICPMS04_330820** SeqNo: **4904917** PrepDate: **08-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1041	0.00200	0.1	0.002021	102	75 - 125				
Arsenic	0.1066	0.00200	0.1	0.000224	106	75 - 125				
Cadmium	0.1178	0.00200	0.1	0.009133	109	75 - 125				
Lead	0.1073	0.00200	0.1	0.002072	105	75 - 125				
Selenium	0.1057	0.00200	0.1	0.000253	105	75 - 125				

SD Sample ID: **HS19010105-01SD** Units: **mg/L** Analysis Date: **11-Jan-2019 13:33**
Client ID: **DGW-MW-11** Run ID: **ICPMS04_330820** SeqNo: **4904914** PrepDate: **08-Jan-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	0.002006	0.0100					0.002021	0	10	J
Arsenic	U	0.0100					0.000224	0	10	
Cadmium	0.009146	0.0100					0.009133	0	10	J
Lead	U	0.0100					0.002072	0	10	
Selenium	U	0.0100					0.000253	0	10	

The following samples were analyzed in this batch: HS19010105-01

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010105

QC BATCH REPORT

Batch ID: 136375 **Instrument: ICPMS04** **Method: SW6020**

MBLK Sample ID: **MBLK-136375** Units: **mg/L** Analysis Date: **11-Jan-2019 10:56**
Client ID: Run ID: **ICPMS04_330820** SeqNo: **4904588** PrepDate: **08-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Lead	U	0.00200								
Selenium	U	0.00200								

LCS Sample ID: **LCS-136375** Units: **mg/L** Analysis Date: **11-Jan-2019 10:59**
Client ID: Run ID: **ICPMS04_330820** SeqNo: **4904589** PrepDate: **08-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05061	0.00200	0.05	0	101	80 - 120				
Cadmium	0.05387	0.00200	0.05	0	108	80 - 120				
Lead	0.05374	0.00200	0.05	0	107	80 - 120				
Selenium	0.05104	0.00200	0.05	0	102	80 - 120				

MS Sample ID: **HS18121459-01MS** Units: **mg/L** Analysis Date: **11-Jan-2019 11:05**
Client ID: Run ID: **ICPMS04_330820** SeqNo: **4904592** PrepDate: **08-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.07237	0.00200	0.05	0.01989	105	80 - 120				
Cadmium	0.05278	0.00200	0.05	0.000229	105	80 - 120				
Lead	0.05412	0.00200	0.05	0.001545	105	80 - 120				
Selenium	0.04896	0.00200	0.05	0.000494	96.9	80 - 120				

MSD Sample ID: **HS18121459-01MSD** Units: **mg/L** Analysis Date: **11-Jan-2019 11:08**
Client ID: Run ID: **ICPMS04_330820** SeqNo: **4904593** PrepDate: **08-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.07609	0.00200	0.05	0.01989	112	80 - 120	0.07237	5.01	20	
Cadmium	0.05281	0.00200	0.05	0.000229	105	80 - 120	0.05278	0.0587	20	
Lead	0.05451	0.00200	0.05	0.001545	106	80 - 120	0.05412	0.718	20	
Selenium	0.05146	0.00200	0.05	0.000494	102	80 - 120	0.04896	4.98	20	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010105

QC BATCH REPORT

Batch ID: 136375 **Instrument: ICPMS04** **Method: SW6020**

PDS Sample ID: **HS18121459-01PDS** Units: **mg/L** Analysis Date: **11-Jan-2019 11:10**
Client ID: Run ID: **ICPMS04_330820** SeqNo: **4904594** PrepDate: **08-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.123	0.00200	0.1	0.01989	103	75 - 125				
Cadmium	0.1102	0.00200	0.1	0.000229	110	75 - 125				
Lead	0.1081	0.00200	0.1	0.001545	107	75 - 125				
Selenium	0.1008	0.00200	0.1	0.000494	100	75 - 125				

SD Sample ID: **HS18121459-01SD** Units: **mg/L** Analysis Date: **11-Jan-2019 11:03**
Client ID: Run ID: **ICPMS04_330820** SeqNo: **4904591** PrepDate: **08-Jan-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Cadmium	U	0.0100					0.000229	0	10	
Lead	U	0.0100					0.001545	0	10	
Selenium	U	0.0100					0.000494	0	10	

The following samples were analyzed in this batch: HS19010105-01

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19010105**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19010105
Date/Time Received: **03-Jan-2019 09:15**
Received by: **NDR**

Checklist completed by: *Nilesh D. Ranchod* eSignature — 3-Jan-2019 Date
Reviewed by: *Dane J. Wacasey* eSignature — 7-Jan-2019 Date

Matrices: **Water**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	0.8C / 1.2C UC/C	IR # 11	
Cooler(s)/Kit(s):	RED		
Date/Time sample(s) sent to storage:	01/03/2019 5:00PM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070

Chain of Custody Form

Page 1 of 1

COC ID: 191820

HS19010105

Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information	
Purchase Order	130-2086-01	Project Name	Exide Column Studies
Work Order		Project Number	130-2086
Company Name	Golder Associates	Bill To Company	Golder Associates
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021
Phone	(314) 984-8800	Phone	(314) 984-8800
Fax		Fax	
e-Mail Address	ewhite@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com

A	300_W (300 Cl, SO4, [*NO3* *48hr HT*])
B	TDS_W 2540C (2540C TDS)
C	ALK_W 2320B (2320B Alkalinity)
D	HARD (2340B Hardness (calc))
E	ICP_DISS (6020A Diss Metals ~~(6)+Cations~~ - FldFltr)
F	ICP_TW (6020A Total Metals ~~(6)+Cations~~)
G	
H	
I	
J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	DGW-MW-11	01/02/19	1715	Groundwa	2,8	32	X	X	X	X	X	X					
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Emily White Emily White

Shipment Method: FedEx

Required Turnaround Time: (Check Box) ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other

Results Due Date:

Relinquished by: Emily White Emily White — Date: 01/04/19 Time: 850

Relinquished by: — Date: 1/3/19 Time: 09:15

Received by:

Received by (Laboratory):

Checked by (Laboratory):

Logged by (Laboratory):

Date: Time:

Notes: Exide Column Studies

Cooler ID	Cooler Temp.
RED	0.9
N/A	11

QC Package: (Check One Box Below)

- ☐ Level II Std QC
- ☐ Level III Std QC/Raw Data
- ☐ Level IV SW846/CLP
- ☐ Other
- ☒ TRRP Checklist
- ☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

CN +0.4

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

Red

CUSTODY SEAL
Date: 01/02/19 Time: 1530
Name: Emily Udd
Company: Golder

Seal Broken By: SM
Date: 01/03/19

Red JAN 0 3 2019

Must Deliver Next Business Day
Time and Tempature Sensitive!

Red

ORIGIN ID:33RA (314) 304-1326
EMIL WHITE
GOLDER ASSOCIATES
2727 5TH STREET

FRISCO, TX 75034
UNITED STATES US

SHIP DATE: 19NOV18
ACTWGT: 1.00 LB MAN
CAD: 900130/CAFE3211
DIMS: 19x16x13 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: EXIDE COLUMN STUDIES - BD 82260 - DW

RMA:

FedEx Express

FedEx
TRK# 0221 4380 9534 7755

THU - 03 JAN 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US IAH

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

January 21, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19010551**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 10 sample(s) on Jan 12, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19010551**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS19010551**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 01/21/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19010551				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 136658,R331360				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?			X		
		Were analytical duplicates analyzed at the appropriate frequency?			X		
		Were RPDs or relative standard deviations within the laboratory QC limits?			X		
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 01/21/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19010551				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 136658,R331360				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			2
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports		
Laboratory Name: ALS Laboratory Group		LRC Date: 01/21/2019
Project Name: Exide Column Studies		Laboratory Job Number: HS19010551
Reviewer Name: Dane Wacasey		Prep Batch Number(s): 136658,R331360
ER#[5]	**Description**	
1	Batch 136658, Metals Method SW6020, sample 20181220-DGW-MW3-PV10out-ControlT, MS and or MSD recovered outside the control limits for Magnesium and Calcium, however, the result in the parent sample is greater than 4x the spike amount.	
2	See Run Log and CCB Exceptions Report.	

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010551
Start Date: 17-Jan-2019 End Date: 17-Jan-2019

Run ID:ICPMS04_331185
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	17-Jan-2019 11:56	018_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	17-Jan-2019 11:58	019SMPL.d	AS CA CD FE K MG PB SB SE
LLICV5	1	17-Jan-2019 12:00	020LICV.d	AS CA CD FE K MG PB SB SE
ICB	1	17-Jan-2019 12:02	021_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	17-Jan-2019 12:13	023ICSA.d	AS CA CD FE K MG PB SB SE
ICSAB	1	17-Jan-2019 12:15	024ICSB.d	AS CA CD FE K MG PB SB SE
CCV 1	1	17-Jan-2019 12:45	036_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	17-Jan-2019 12:47	037_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	17-Jan-2019 13:16	048_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	17-Jan-2019 13:18	049_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	17-Jan-2019 13:49	060_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	17-Jan-2019 13:51	061_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	17-Jan-2019 14:20	072_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	17-Jan-2019 14:22	073_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	17-Jan-2019 14:57	084_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	17-Jan-2019 14:59	085_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	17-Jan-2019 15:22	094_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	17-Jan-2019 15:25	095_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-136658	1	17-Jan-2019 15:50	097SMPL.d	AS CA CD FE K MG NA PB SB SE
LCS-136658	1	17-Jan-2019 15:52	098SMPL.d	AS CA CD FE K MG NA PB SB SE
20181220-DGW-MW3-PV10out-ControlT	1	17-Jan-2019 15:55	099SMPL.d	AS CA CD FE K MG PB SB SE
20181220-DGW-MW3-PV10out-ControlTSD	5	17-Jan-2019 15:57	100SMPL.d	AS CA CD FE K MG PB SB SE
20181220-DGW-MW3-PV10out-ControlTMS	1	17-Jan-2019 15:59	101SMPL.d	AS CA CD FE K MG NA PB SB SE
20181220-DGW-MW3-PV10out-ControlTMSD	1	17-Jan-2019 16:01	102SMPL.d	AS CA CD FE K MG NA PB SB SE
20181220-DGW-MW3-PV10out-ControlTPDS	1	17-Jan-2019 16:04	103SMPL.d	AS CA FE K MG SB
20181220-DGW-MW3-PV10out-30T	1	17-Jan-2019 16:06	104SMPL.d	AS CA CD FE K MG PB SB SE
CCV 7	1	17-Jan-2019 16:10	106_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	17-Jan-2019 16:13	107_CCB.d	AS CA CD FE K MG NA PB SB SE
20181220-DGW-MW3-PV10out-35T	1	17-Jan-2019 16:20	108SMPL.d	AS CA CD FE K MG PB SB SE
20181220-DGW-MW3-PV10out-40T	1	17-Jan-2019 16:23	109SMPL.d	AS CA CD FE K MG PB SB SE
20181220-DGW-MW3-PV10inlet-ControlT	1	17-Jan-2019 16:25	110SMPL.d	AS CA CD FE K MG PB SB SE
20181220-DGW-MW3-PV10inlet-30-35-40T	1	17-Jan-2019 16:27	111SMPL.d	AS CA CD FE K MG PB SB SE
20181221-DGW-MW3-PV10mid-ControlT	1	17-Jan-2019 16:29	112SMPL.d	AS CA CD FE K MG PB SB SE
20181221-DGW-MW3-PV10mid-30T	1	17-Jan-2019 16:32	113SMPL.d	AS CA CD FE K MG PB SB SE
20181221-DGW-MW3-PV10mid-35T	1	17-Jan-2019 16:34	114SMPL.d	AS CA CD FE K MG PB SB SE
20181221-DGW-MW3-PV10mid-40T	1	17-Jan-2019 16:36	115SMPL.d	AS CA CD FE K MG PB SB SE
CCV 8	1	17-Jan-2019 16:43	118_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	17-Jan-2019 16:45	119_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	17-Jan-2019 17:17	131_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	17-Jan-2019 17:22	133_CCV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	17-Jan-2019 18:08	153SMPL.d	AS CA CD FE K MG PB SB SE
LLCCV5	1	17-Jan-2019 18:11	154LICV.d	AS CA CD FE K MG PB SB SE
ICCB 10	1	17-Jan-2019 18:13	155_ICB.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010551

Run ID:ICPMS04_331185
Instrument:ICPMS04
Method:SW6020

CCB 1	Date: 17-Jan-2019 12:47	Seq: 4912113	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.784	0.4	2	
Potassium	-35.93	18	200	
Sodium	32.19	14	200	

CCB 2	Date: 17-Jan-2019 13:18	Seq: 4912198	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.868	0.4	2	
Potassium	-20.9	18	200	
Sodium	24.25	14	200	

CCB 3	Date: 17-Jan-2019 13:51	Seq: 4912594	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.943	0.4	2	
Potassium	-18.16	18	200	
Sodium	19.18	14	200	

CCB 4	Date: 17-Jan-2019 14:22	Seq: 4912606	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.774	0.4	2	

CCB 5	Date: 17-Jan-2019 14:59	Seq: 4912833	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.598	0.4	2	
Sodium	19.86	14	200	

CCB 6	Date: 17-Jan-2019 15:25	Seq: 4912843	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.489	0.4	2	

CCB 7	Date: 17-Jan-2019 16:13	Seq: 4912990	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.653	0.4	2	
Iron	21.34	12	200	
Sodium	62.56	14	200	

CCB 8	Date: 17-Jan-2019 16:45	Seq: 4913072	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.44	0.4	2	
Iron	16.88	12	200	
Selenium	1.239	1.1	2	
Sodium	80.23	14	200	

CCB 9	Date: 17-Jan-2019 17:17	Seq: 4913239	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.353	0.4	2	
Calcium	38.36	34	500	
Iron	16.83	12	200	
Magnesium	15.12	10	200	
Potassium	19.39	18	200	
Sodium	101.6	14	200	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010551
Start Date: 18-Jan-2019 End Date: 18-Jan-2019

Run ID:ICPMS04_331292
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	18-Jan-2019 11:51	018_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	18-Jan-2019 11:53	019SMPL.d	NA
LLICV5	1	18-Jan-2019 11:55	020LICV.d	NA
ICB	1	18-Jan-2019 11:58	021_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	18-Jan-2019 12:07	023ICSA.d	NA
ICSAB	1	18-Jan-2019 12:09	024ICSB.d	NA
CCV 1	1	18-Jan-2019 12:39	036_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	18-Jan-2019 12:42	037_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	18-Jan-2019 13:10	048_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	18-Jan-2019 13:13	049_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	18-Jan-2019 13:19	051_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	18-Jan-2019 13:44	061_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	18-Jan-2019 13:47	062_CCB.d	AS CA CD FE K MG NA PB SB SE
20181220-DGW-MW3-PV10out-ControlT	10	18-Jan-2019 14:10	071SMPL.d	NA
20181220-DGW-MW3-PV10out-ControlTSD	50	18-Jan-2019 14:13	072SMPL.d	NA
CCV 5	1	18-Jan-2019 14:15	073_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	18-Jan-2019 14:17	074_CCB.d	AS CA CD FE K MG NA PB SB SE
20181220-DGW-MW3-PV10out-ControlTPDS	10	18-Jan-2019 14:36	076SMPL.d	NA
20181220-DGW-MW3-PV10out-30T	10	18-Jan-2019 14:38	077SMPL.d	NA
20181220-DGW-MW3-PV10out-35T	10	18-Jan-2019 14:40	078SMPL.d	NA
20181220-DGW-MW3-PV10out-40T	10	18-Jan-2019 14:42	079SMPL.d	NA
20181220-DGW-MW3-PV10inlet-ControlT	10	18-Jan-2019 14:45	080SMPL.d	NA
20181220-DGW-MW3-PV10inlet-30-35-40T	10	18-Jan-2019 14:47	081SMPL.d	NA
20181221-DGW-MW3-PV10mid-ControlT	10	18-Jan-2019 14:49	082SMPL.d	NA
20181221-DGW-MW3-PV10mid-30T	10	18-Jan-2019 14:51	083SMPL.d	NA
CCV 6	1	18-Jan-2019 14:56	085_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	18-Jan-2019 14:58	086_CCB.d	AS CA CD FE K MG NA PB SB SE
20181221-DGW-MW3-PV10mid-35T	10	18-Jan-2019 15:02	087SMPL.d	NA
20181221-DGW-MW3-PV10mid-40T	10	18-Jan-2019 15:05	088SMPL.d	NA
CCV 7	1	18-Jan-2019 15:25	097_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	18-Jan-2019 15:27	098_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	18-Jan-2019 15:56	110_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 8	1	18-Jan-2019 16:17	112_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	18-Jan-2019 16:41	122_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	18-Jan-2019 16:43	123_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 10	1	18-Jan-2019 17:47	143_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	18-Jan-2019 17:49	144SMPL.d	NA
LLCCV5	1	18-Jan-2019 17:52	145LICV.d	NA
ICCB 9	1	18-Jan-2019 17:54	146_ICB.d	AS CA CD FE K MG NA PB SB SE
CCV 11	1	18-Jan-2019 18:28	158_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	18-Jan-2019 18:30	159_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 12	1	18-Jan-2019 18:59	170_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	18-Jan-2019 19:01	171_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 13	1	18-Jan-2019 19:25	180_CCV.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010551

Run ID:ICPMS04_331292
Instrument:ICPMS04
Method:SW6020

CCB 1	Date: 18-Jan-2019 12:42	Seq: 4914346		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	53.46	14	200	
CCB 2	Date: 18-Jan-2019 13:13	Seq: 4914467		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	49.32	14	200	
CCB 3	Date: 18-Jan-2019 13:47	Seq: 4914527		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	101.6	14	200	
CCB 4	Date: 18-Jan-2019 14:17	Seq: 4914695		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	104.8	14	200	
CCB 5	Date: 18-Jan-2019 14:58	Seq: 4914980		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	90.97	14	200	
CCB 6	Date: 18-Jan-2019 15:27	Seq: 4914992		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	84.66	14	200	
CCB 7	Date: 18-Jan-2019 15:56	Seq: 4915022		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	75.83	14	200	
CCB 8	Date: 18-Jan-2019 16:43	Seq: 4915172		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	84.46	14	200	
CCB 10	Date: 18-Jan-2019 18:30	Seq: 4915298		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	-19.19	14	200	
CCB 13	Date: 18-Jan-2019 19:55	Seq: 4916037		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	121.4	14	200	
CCB 14	Date: 18-Jan-2019 20:22	Seq: 4916049		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	80.48	14	200	
CCB 15	Date: 18-Jan-2019 20:44	Seq: 4916134		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	40.3	14	200	
CCB 16	Date: 18-Jan-2019 21:00	Seq: 4916141		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	27.99	14	200	
CCB 20	Date: 18-Jan-2019 22:47	Seq: 4916184		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	18.15	14	200	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19010551

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19010551-01	20181220-DGW-MW3-PV10out-ControlT	Groundwater		20-Dec-2018 08:00	12-Jan-2019 09:35	☐
HS19010551-02	20181220-DGW-MW3-PV10out-30T	Groundwater		20-Dec-2018 08:00	12-Jan-2019 09:35	☐
HS19010551-03	20181220-DGW-MW3-PV10out-35T	Groundwater		20-Dec-2018 08:00	12-Jan-2019 09:35	☐
HS19010551-04	20181220-DGW-MW3-PV10out-40T	Groundwater		20-Dec-2018 08:00	12-Jan-2019 09:35	☐
HS19010551-05	20181220-DGW-MW3-PV10inlet-ControlT	Groundwater		20-Dec-2018 08:15	12-Jan-2019 09:35	☐
HS19010551-06	20181220-DGW-MW3-PV10inlet-30-35-40T	Groundwater		20-Dec-2018 08:15	12-Jan-2019 09:35	☐
HS19010551-07	20181221-DGW-MW3-PV10mid-ControlT	Groundwater		21-Dec-2018 16:00	12-Jan-2019 09:35	☐
HS19010551-08	20181221-DGW-MW3-PV10mid-30T	Groundwater		21-Dec-2018 16:00	12-Jan-2019 09:35	☐
HS19010551-09	20181221-DGW-MW3-PV10mid-35T	Groundwater		21-Dec-2018 16:00	12-Jan-2019 09:35	☐
HS19010551-10	20181221-DGW-MW3-PV10mid-40T	Groundwater		21-Dec-2018 16:00	12-Jan-2019 09:35	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181220-DGW-MW3-PV10out-ControlT
Collection Date: 20-Dec-2018 08:00

ANALYTICAL REPORT
WorkOrder:HS19010551
Lab ID:HS19010551-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**354**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Jan-2019		Analyst: JCJ
Antimony	**0.000550**	J	**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 15:55
Arsenic	**0.00210**		**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 15:55
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 15:55
Calcium	**107**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 15:55
Iron	**0.114**	J	**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 15:55
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 15:55
Magnesium	**21.2**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 15:55
Potassium	**2.11**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 15:55
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 15:55
Sodium	**207**		**0.140**	**2.00**	**mg/L**	10	18-Jan-2019 14:10

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181220-DGW-MW3-PV10out-30T
Collection Date: 20-Dec-2018 08:00

ANALYTICAL REPORT
WorkOrder:HS19010551
Lab ID:HS19010551-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**96.5**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Jan-2019		Analyst: JCJ
Antimony	**0.00306**		**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 16:06
Arsenic	U		0.000400	0.00200	mg/L	1	17-Jan-2019 16:06
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 16:06
Calcium	**10.1**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 16:06
Iron	**0.0371**	J	**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 16:06
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 16:06
Magnesium	**17.3**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 16:06
Potassium	**2.40**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 16:06
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 16:06
Sodium	**207**		**0.140**	**2.00**	**mg/L**	10	18-Jan-2019 14:38

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181220-DGW-MW3-PV10out-35T
Collection Date: 20-Dec-2018 08:00

ANALYTICAL REPORT
WorkOrder:HS19010551
Lab ID:HS19010551-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**86.6**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Jan-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 16:20
Arsenic	U		0.000400	0.00200	mg/L	1	17-Jan-2019 16:20
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 16:20
Calcium	**9.44**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 16:20
Iron	**0.0245**	J	**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 16:20
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 16:20
Magnesium	**15.3**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 16:20
Potassium	**2.29**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 16:20
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 16:20
Sodium	**207**		**0.140**	**2.00**	**mg/L**	10	18-Jan-2019 14:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181220-DGW-MW3-PV10out-40T
Collection Date: 20-Dec-2018 08:00

ANALYTICAL REPORT
WorkOrder:HS19010551
Lab ID:HS19010551-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**84.3**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Jan-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 16:23
Arsenic	U		0.000400	0.00200	mg/L	1	17-Jan-2019 16:23
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 16:23
Calcium	**9.03**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 16:23
Iron	**0.0237**	J	**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 16:23
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 16:23
Magnesium	**15.0**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 16:23
Potassium	**2.34**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 16:23
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 16:23
Sodium	**202**		**0.140**	**2.00**	**mg/L**	10	18-Jan-2019 14:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181220-DGW-MW3-PV10inlet-ControlT
Collection Date: 20-Dec-2018 08:15

ANALYTICAL REPORT
WorkOrder:HS19010551
Lab ID:HS19010551-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**357**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Jan-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 16:25
Arsenic	**0.0543**		**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 16:25
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 16:25
Calcium	**108**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 16:25
Iron	**7.82**		**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 16:25
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 16:25
Magnesium	**21.3**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 16:25
Potassium	**2.18**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 16:25
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 16:25
Sodium	**208**		**0.140**	**2.00**	**mg/L**	10	18-Jan-2019 14:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181220-DGW-MW3-PV10inlet-30-35-40T
Collection Date: 20-Dec-2018 08:15

ANALYTICAL REPORT
WorkOrder:HS19010551
Lab ID:HS19010551-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**368**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Jan-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 16:27
Arsenic	**0.0170**		**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 16:27
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 16:27
Calcium	**110**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 16:27
Iron	**0.905**		**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 16:27
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 16:27
Magnesium	**22.7**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 16:27
Potassium	**2.47**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 16:27
Selenium	**0.00186**	J	**0.00110**	**0.00200**	**mg/L**	1	17-Jan-2019 16:27
Sodium	**208**		**0.140**	**2.00**	**mg/L**	10	18-Jan-2019 14:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181221-DGW-MW3-PV10mid-ControlT
Collection Date: 21-Dec-2018 16:00

ANALYTICAL REPORT
WorkOrder:HS19010551
Lab ID:HS19010551-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**342**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Jan-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 16:29
Arsenic	**0.00287**		**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 16:29
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 16:29
Calcium	**104**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 16:29
Iron	**0.167**	J	**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 16:29
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 16:29
Magnesium	**20.0**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 16:29
Potassium	**1.88**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 16:29
Selenium	**0.00147**	J	**0.00110**	**0.00200**	**mg/L**	1	17-Jan-2019 16:29
Sodium	**202**		**0.140**	**2.00**	**mg/L**	10	18-Jan-2019 14:49

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181221-DGW-MW3-PV10mid-30T
Collection Date: 21-Dec-2018 16:00

ANALYTICAL REPORT
WorkOrder:HS19010551
Lab ID:HS19010551-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**111**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Jan-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 16:32
Arsenic	U		0.000400	0.00200	mg/L	1	17-Jan-2019 16:32
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 16:32
Calcium	**14.2**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 16:32
Iron	**0.213**		**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 16:32
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 16:32
Magnesium	**18.3**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 16:32
Potassium	**2.31**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 16:32
Selenium	**0.00111**	J	**0.00110**	**0.00200**	**mg/L**	1	17-Jan-2019 16:32
Sodium	**207**		**0.140**	**2.00**	**mg/L**	10	18-Jan-2019 14:51

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181221-DGW-MW3-PV10mid-35T
Collection Date: 21-Dec-2018 16:00

ANALYTICAL REPORT
WorkOrder:HS19010551
Lab ID:HS19010551-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**112**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Jan-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 16:34
Arsenic	U		0.000400	0.00200	mg/L	1	17-Jan-2019 16:34
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 16:34
Calcium	**14.7**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 16:34
Iron	**0.503**		**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 16:34
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 16:34
Magnesium	**18.4**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 16:34
Potassium	**2.33**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 16:34
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 16:34
Sodium	**213**		**0.140**	**2.00**	**mg/L**	10	18-Jan-2019 15:02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181221-DGW-MW3-PV10mid-40T
Collection Date: 21-Dec-2018 16:00

ANALYTICAL REPORT
WorkOrder:HS19010551
Lab ID:HS19010551-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**107**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Jan-2019		Analyst: JCJ
Antimony	**0.000553**	J	**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 16:36
Arsenic	**0.000402**	J	**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 16:36
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 16:36
Calcium	**13.5**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 16:36
Iron	**2.16**		**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 16:36
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 16:36
Magnesium	**17.9**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 16:36
Potassium	**2.58**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 16:36
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 16:36
Sodium	**210**		**0.140**	**2.00**	**mg/L**	10	18-Jan-2019 15:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010551

Batch ID: 136658 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19010551-01	1	10	10 (mL)	1
HS19010551-02	1	10	10 (mL)	1
HS19010551-03	1	10	10 (mL)	1
HS19010551-04	1	10	10 (mL)	1
HS19010551-05	1	10	10 (mL)	1
HS19010551-06	1	10	10 (mL)	1
HS19010551-07	1	10	10 (mL)	1
HS19010551-08	1	10	10 (mL)	1
HS19010551-09	1	10	10 (mL)	1
HS19010551-10	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010551

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 136658	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19010551-01	20181220-DGW-MW3-PV10out-ControlT	20 Dec 2018 08:00		15 Jan 2019 09:00	18 Jan 2019 14:10	10
HS19010551-01	20181220-DGW-MW3-PV10out-ControlT	20 Dec 2018 08:00		15 Jan 2019 09:00	17 Jan 2019 15:55	1
HS19010551-02	20181220-DGW-MW3-PV10out-30T	20 Dec 2018 08:00		15 Jan 2019 09:00	18 Jan 2019 14:38	10
HS19010551-02	20181220-DGW-MW3-PV10out-30T	20 Dec 2018 08:00		15 Jan 2019 09:00	17 Jan 2019 16:06	1
HS19010551-03	20181220-DGW-MW3-PV10out-35T	20 Dec 2018 08:00		15 Jan 2019 09:00	18 Jan 2019 14:40	10
HS19010551-03	20181220-DGW-MW3-PV10out-35T	20 Dec 2018 08:00		15 Jan 2019 09:00	17 Jan 2019 16:20	1
HS19010551-04	20181220-DGW-MW3-PV10out-40T	20 Dec 2018 08:00		15 Jan 2019 09:00	18 Jan 2019 14:42	10
HS19010551-04	20181220-DGW-MW3-PV10out-40T	20 Dec 2018 08:00		15 Jan 2019 09:00	17 Jan 2019 16:23	1
HS19010551-05	20181220-DGW-MW3-PV10inlet-ControlT	20 Dec 2018 08:15		15 Jan 2019 09:00	18 Jan 2019 14:45	10
HS19010551-05	20181220-DGW-MW3-PV10inlet-ControlT	20 Dec 2018 08:15		15 Jan 2019 09:00	17 Jan 2019 16:25	1
HS19010551-06	20181220-DGW-MW3-PV10inlet-30-35-40T	20 Dec 2018 08:15		15 Jan 2019 09:00	18 Jan 2019 14:47	10
HS19010551-06	20181220-DGW-MW3-PV10inlet-30-35-40T	20 Dec 2018 08:15		15 Jan 2019 09:00	17 Jan 2019 16:27	1
HS19010551-07	20181221-DGW-MW3-PV10mid-ControlT	21 Dec 2018 16:00		15 Jan 2019 09:00	18 Jan 2019 14:49	10
HS19010551-07	20181221-DGW-MW3-PV10mid-ControlT	21 Dec 2018 16:00		15 Jan 2019 09:00	17 Jan 2019 16:29	1
HS19010551-08	20181221-DGW-MW3-PV10mid-30T	21 Dec 2018 16:00		15 Jan 2019 09:00	18 Jan 2019 14:51	10
HS19010551-08	20181221-DGW-MW3-PV10mid-30T	21 Dec 2018 16:00		15 Jan 2019 09:00	17 Jan 2019 16:32	1
HS19010551-09	20181221-DGW-MW3-PV10mid-35T	21 Dec 2018 16:00		15 Jan 2019 09:00	18 Jan 2019 15:02	10
HS19010551-09	20181221-DGW-MW3-PV10mid-35T	21 Dec 2018 16:00		15 Jan 2019 09:00	17 Jan 2019 16:34	1
HS19010551-10	20181221-DGW-MW3-PV10mid-40T	21 Dec 2018 16:00		15 Jan 2019 09:00	18 Jan 2019 15:05	10
HS19010551-10	20181221-DGW-MW3-PV10mid-40T	21 Dec 2018 16:00		15 Jan 2019 09:00	17 Jan 2019 16:36	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010551

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R331360	**Test Name :** HARDNESS, TOTAL AS CACO3 BY SM2340B			**Matrix:** Groundwater		
HS19010551-01	20181220-DGW-MW3-PV10out-ControlT	20 Dec 2018 08:00			19 Jan 2019 15:58	1
HS19010551-02	20181220-DGW-MW3-PV10out-30T	20 Dec 2018 08:00			19 Jan 2019 15:58	1
HS19010551-03	20181220-DGW-MW3-PV10out-35T	20 Dec 2018 08:00			19 Jan 2019 15:58	1
HS19010551-04	20181220-DGW-MW3-PV10out-40T	20 Dec 2018 08:00			19 Jan 2019 15:58	1
HS19010551-05	20181220-DGW-MW3-PV10inlet-ControlT	20 Dec 2018 08:15			19 Jan 2019 15:58	1
HS19010551-06	20181220-DGW-MW3-PV10inlet-30-35-40T	20 Dec 2018 08:15			19 Jan 2019 15:58	1
HS19010551-07	20181221-DGW-MW3-PV10mid-ControlT	21 Dec 2018 16:00			19 Jan 2019 15:58	1
HS19010551-08	20181221-DGW-MW3-PV10mid-30T	21 Dec 2018 16:00			19 Jan 2019 15:58	1
HS19010551-09	20181221-DGW-MW3-PV10mid-35T	21 Dec 2018 16:00			19 Jan 2019 15:58	1
HS19010551-10	20181221-DGW-MW3-PV10mid-40T	21 Dec 2018 16:00			19 Jan 2019 15:58	1

WorkOrder: HS19010551
InstrumentID: ICPMS04
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000521	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000340	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000553	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0523	0.0340	0.500
A	Iron	7439-89-6	0.0250	0.0205	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000916	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0700	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0418	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00274	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0556	0.0140	0.200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010551

QC BATCH REPORT

Batch ID: 136658 **Instrument: ICPMS04** **Method: SW6020**

MBLK Sample ID: **MBLK-136658** Units: **mg/L** Analysis Date: **17-Jan-2019 15:50**
Client ID: Run ID: **ICPMS04_331185** SeqNo: **4912979** PrepDate: **15-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01146	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	U	0.200								

LCS Sample ID: **LCS-136658** Units: **mg/L** Analysis Date: **17-Jan-2019 15:52**
Client ID: Run ID: **ICPMS04_331185** SeqNo: **4912980** PrepDate: **15-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05503	0.00200	0.05	0	110	80 - 120				
Arsenic	0.05102	0.00200	0.05	0	102	80 - 120				
Cadmium	0.0504	0.00200	0.05	0	101	80 - 120				
Calcium	5.108	0.500	5	0	102	80 - 120				
Iron	5.205	0.200	5	0	104	80 - 120				
Lead	0.05017	0.00200	0.05	0	100	80 - 120				
Magnesium	5.627	0.200	5	0	113	80 - 120				
Potassium	5.184	0.200	5	0	104	80 - 120				
Selenium	0.05326	0.00200	0.05	0	107	80 - 120				
Sodium	5.293	0.200	5	0	106	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010551

QC BATCH REPORT

Batch ID: 136658 **Instrument: ICPMS04** **Method: SW6020**

MS Sample ID: **HS19010551-01MS** Units: **mg/L** Analysis Date: **17-Jan-2019 15:59**
Client ID: **20181220-DGW-MW3-PV10out-ControlT** Run ID: **ICPMS04_331185** SeqNo: **4912983** PrepDate: **15-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05143	0.00200	0.05	0.00055	102	80 - 120				
Arsenic	0.05043	0.00200	0.05	0.002097	96.7	80 - 120				
Cadmium	0.04834	0.00200	0.05	0.000113	96.4	80 - 120				
Calcium	112.8	0.500	5	107.1	115	80 - 120				O
Iron	4.852	0.200	5	0.1145	94.7	80 - 120				
Lead	0.048	0.00200	0.05	0.00017	95.6	80 - 120				
Magnesium	24.82	0.200	5	21.18	72.8	80 - 120				SO
Potassium	6.833	0.200	5	2.113	94.4	80 - 120				
Selenium	0.05086	0.00200	0.05	0.000579	101	80 - 120				
Sodium	189.2	0.200	5	193.1	-77.0	80 - 120				SEO

MSD Sample ID: **HS19010551-01MSD** Units: **mg/L** Analysis Date: **17-Jan-2019 16:01**
Client ID: **20181220-DGW-MW3-PV10out-ControlT** Run ID: **ICPMS04_331185** SeqNo: **4912984** PrepDate: **15-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05268	0.00200	0.05	0.00055	104	80 - 120	0.05143	2.41	20	
Arsenic	0.04917	0.00200	0.05	0.002097	94.2	80 - 120	0.05043	2.52	20	
Cadmium	0.04967	0.00200	0.05	0.000113	99.1	80 - 120	0.04834	2.73	20	
Calcium	110.1	0.500	5	107.1	59.6	80 - 120	112.8	2.51	20	SO
Iron	5.148	0.200	5	0.1145	101	80 - 120	4.852	5.93	20	
Lead	0.04836	0.00200	0.05	0.00017	96.4	80 - 120	0.048	0.747	20	
Magnesium	25.27	0.200	5	21.18	81.8	80 - 120	24.82	1.79	20	O
Potassium	6.741	0.200	5	2.113	92.6	80 - 120	6.833	1.35	20	
Selenium	0.0478	0.00200	0.05	0.000579	94.4	80 - 120	0.05086	6.2	20	
Sodium	199	0.200	5	193.1	118	80 - 120	189.2	5.02	20	EO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010551

QC BATCH REPORT

Batch ID: 136658 **Instrument: ICPMS04** **Method: SW6020**

PDS Sample ID: **HS19010551-01PDS** Units: **mg/L** Analysis Date: **17-Jan-2019 16:04**
Client ID: **20181220-DGW-MW3-PV10out-ControlT** Run ID: **ICPMS04_331185** SeqNo: **4912985** PrepDate: **15-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1224	0.00200	0.1	0.00055	122	75 - 125				
Arsenic	0.125	0.00200	0.1	0.002097	123	75 - 125				
Calcium	118	0.500	10	107.1	109	75 - 125				O
Iron	12.59	0.200	10	0.1145	125	75 - 125				
Magnesium	32.97	0.200	10	21.18	118	75 - 125				
Potassium	13.97	0.200	10	2.113	119	75 - 125				

PDS Sample ID: **HS19010551-01PDS** Units: **mg/L** Analysis Date: **18-Jan-2019 14:36**
Client ID: **20181220-DGW-MW3-PV10out-ControlT** Run ID: **ICPMS04_331292** SeqNo: **4914970** PrepDate: **15-Jan-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	316.6	2.00	100	207.4	109	75 - 125				

SD Sample ID: **HS19010551-01SD** Units: **mg/L** Analysis Date: **17-Jan-2019 15:57**
Client ID: **20181220-DGW-MW3-PV10out-ControlT** Run ID: **ICPMS04_331185** SeqNo: **4912982** PrepDate: **15-Jan-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.00055	0	10	
Arsenic	U	0.0100					0.002097	0	10	
Cadmium	U	0.0100					0.000113	0	10	
Calcium	110	2.50					107.1	2.72	10	
Iron	0.3196	1.00					0.1145	0	10	J
Lead	U	0.0100					0.00017	0	10	
Magnesium	22.56	1.00					21.18	6.55	10	
Potassium	2.213	1.00					2.113	4.71	10	
Selenium	U	0.0100					0.000579	0	10	

SD Sample ID: **HS19010551-01SD** Units: **mg/L** Analysis Date: **18-Jan-2019 14:13**
Client ID: **20181220-DGW-MW3-PV10out-ControlT** Run ID: **ICPMS04_331292** SeqNo: **4914693** PrepDate: **15-Jan-2019** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Sodium	211.6	10.0					207.4	2.03	10	

The following samples were analyzed in this batch:

HS19010551-01	HS19010551-02	HS19010551-03	HS19010551-04
HS19010551-05	HS19010551-06	HS19010551-07	HS19010551-08
HS19010551-09	HS19010551-10		

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19010551**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19010551
Date/Time Received: **12-Jan-2019 09:35**
Received by: **JRM**

Checklist completed by: *Jared R. Makan* eSignature 14-Jan-2019 Date
Reviewed by: *Dane J. Wacasey* eSignature 17-Jan-2019 Date

Matrices: **Water**
Carrier name: **FedEx International Priority**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	13.6c/13.9c UC/C	IR25	
Cooler(s)/Kit(s):	43811		
Date/Time sample(s) sent to storage:	01/12/2019 15:00		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070

Chain of Custody Form

Page ____ of ____

COC ID: 194448

HS19010551

Golder Associates
Exide Column Studies

Customer Information		Project Information		ALS Project Manager:	
Purchase Order	130-2086-06	Project Name	Exide Column Studies	A	300_W (300 Cl, SO4, [*NO3* *48hr HT*])
Work Order		Project Number	130-2086	B	TDS_W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK_W 2320B (2320B Alkalinity)
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P	D	HARD (2340B Hardness (calc))
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit	E	ICP_TW (6020A Total Metals (6)+Cations)
				F	ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021	G	
Phone	(314) 984-8800	Phone	(314) 984-8800	H	
Fax		Fax		I	
e-Mail Address	Emily_White@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20181220-DGW-MW3-PV10out-control T	2018/12/20	8:00	GW	2 X	1				X	X						
2	20181220-DGW-MW3-PV10out-30T	"	"	"	2	1				X	X						
3	20181220-DGW-MW3-PV10out-35T	"	"	"	2	1				X	X						
4	20181220-DGW-MW3-PV10out-40T	"	"	"	2	1				X	X						
5	20181220-DGW-MW3-PV10inlet-control T	2018/12/20	8:15	"	2	1				X	X						
6	20181220-DGW-MW3-PV10inlet-30-35-40T	"	8:15	"	2	1				X	X						
7	20181221-DGW-MW3-PV10mid-control T	2018/12/21	16:00	"	2	1				X	X						
8	20181221-DGW-MW3-PV10mid-30T	"	"	"	2	1				X	X						
9	20181221-DGW-MW3-PV10mid-35T	"	"	"	2	1				X	X						
10	20181221-DGW-MW3-PV10mid-40T	"	"	"	2	1				X	X						

Sampler(s) Please Print & Sign: Bethina Emile

Shipment Method:

Required Turnaround Time: (Check Box) ☐ STD 10 WK Days ☒ 5 WK Days ☐ 2 WK Days ☐ 24 Hour ☐ Other ____

Results Due Date:

Relinquished by: Jovanne Llanos — Date: 2019/01/11 — Time: 3:00pm

Received by:

Relinquished by: — Date: — Time:

Received by (Laboratory):

Logged by (Laboratory): — Date: — Time:

Checked by (Laboratory):

Notes: Exide Column Studies

Cooler ID	Cooler Temp.

QC Package: (Check One Box Below)

☐ Level II Std QC
☐ Level III Std QC/Raw Data
☐ Level IV SW846/CLP
☐ Other
☒ TRRP Checklist
☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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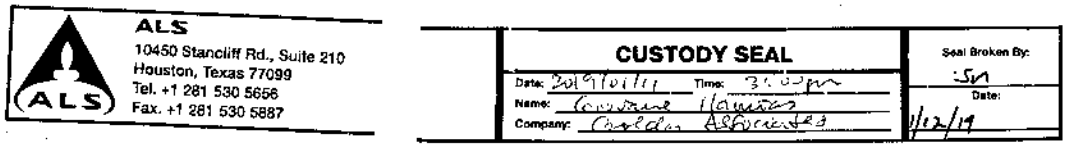
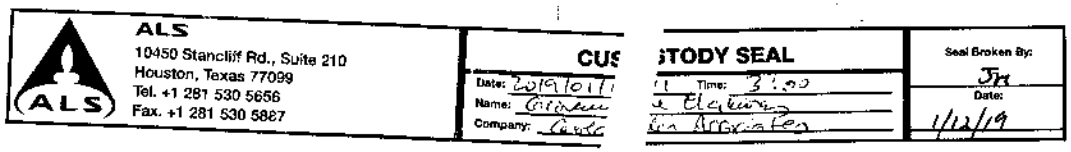

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CUSTODY SEAL
Date: 2019/01/11
Time: 3:00pm
Name: Courtney Hamilton
Company: Golder Associates
Seal Broken By:
SM
Date:
1/12/19


ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CUS
Date: 2019/01/1
Name:
Company:
STODY SEAL
Time: 3:00
Seal Broken By:
JM
Date:
1/12/19

ORIGIN ID:YUXA (514) 383-0980
AUDREY ETHEVES
GOLDER ASSOCIATES LTD
7250 RUE DU MILE END
BUREAU 400
MONTREAL, PQ H2R3A4
CANADA CA

SHIP DATE: 11JAN19
ACTWGT: 2.60 LB
CAD: 10888972/INET4042

BILL RECIPIENT

TO **DANE WACASEY**
ALS HOUSTON LABORATORY
10450 STANCLIFF RD
STE 210
HOUSTON TX 77099 (US)
(281) 530-5656
INV:
PO: REF:

DEPT

552J/2/0174/DDA5

FedEx Express

J1E211905160Zv

TRK# 7741 7166 8422
0430

XO SGRA

SATURDAY 12:00P
INTL PRIORITY

77099
TX-US IAH

Après l'impression de cette étiquette :
COPIE DU DESTINATAIRE - VEUILLEZ LA PLACER DEVANT LA POCHETTE
1. Pliez la page imprimée le long de la ligne horizontale.
2. Placez l'étiquette dans la pochette d'expédition et fixez-la à votre paquet.

DÉFINITIONS Dans la présente lettre de transport aérien, « nous », « notre », « nos » et « FedEx » se rapportent à Federal Express Corporation, ses filiales, succursales et leurs employés, mandataires et préposés. « Vous », « votre » et « vos » se rapportent à l'expéditeur, ses employés, donneurs d'ordre et mandataires. Si l'envoi ne provient pas des États-Unis, votre contrat d'expédition est conclu avec la filiale, la succursale ou les prestataires locaux de FedEx ayant à l'origine accepté de procéder à l'expédition. « Colis » désigne de tout emballage ou de toute enveloppe contenus, envois ou documents appartenant aux marchandises remises au transport par vous ou par le biais de nos systèmes automatisés, ordinateurs, machines, outillages, etc. « Envoi » désigne tout colis ou tous colis remis à FedEx au transport sur une même lettre de transport aérien. REMARQUE RELATIVE AU TRANSPORT AÉRIEN. La Convention de Varsovie s'applique à tout envoi aérien international. La Convention de Varsovie s'applique et limite dans la plupart des cas la responsabilité de FedEx en cas de perte, retard ou dommage affectant votre envoi. La Convention de Varsovie, amendée limite la responsabilité de FedEx. Par exemple, aux États-Unis, la responsabilité est limitée à 9,07 $ par livre (20 $ par kilogramme) à moins qu'une valeur d'expédition supérieure n'ait été déclarée commercialement à l'origine, moyennant supplémentaire dûment stipulé à voie d'origine. L'interprétation et la mise en application des dispositions relatives aux limites de responsabilité de la Convention de Varsovie peuvent varier d'un pays à l'autre. FedEx se réserve le droit d'organiser l'itinéraire emprunté de la manière qu'elle estime la plus convenance. REMARQUE RELATIVE AU TRANSPORT ROUTIER. Les envois transportés uniquement par voie terrestre vers ou depuis un pays ayant ratifié la Convention de Varsovie ou la Convention relative au contrat de transport international de marchandises par route (« CMR ») sont soumis aux termes et conditions de la CMR, sans préjudice de toute autre disposition contenue dans la présente lettre de transport aérien. Conformément aux envois transportés exclusivement par voie terrestre, les dispositions de la CMR privilégient en cas de conflit entre les dispositions de la CMR et celles de la présente lettre de transport aérien. LIMITATION DE RESPONSABILITÉ. La responsabilité maximale de FedEx en cas de dommage, perte, retard, manque, avarie de fonctionnement, défaut de livraison, information incorrecte ou défaut d'information est limitée à la somme est limitée par le présent Contrat et conformément aux termes et conditions du contrat d'expédition, si cette responsabilité n'est pas régie par la Convention de Varsovie, la CMR ou autres traités internationaux, lois, dispositions réglementaires, décrets ou clauses. Veuillez vous référer au coût d'expédition énoncé dans le Guide des Services FedEx en vigueur au document équivalent afin de déterminer les limites correspondantes. FedEx ne propose pas de responsabilité marchandise et assurance tout risque, mais il vous est possible de payer des frais supplémentaires par tranche de 100 $US supplémentaires (ou équivalent en montant locale du pays d'origine) de valeur d'expédition déclarée. Si la valeur d'expédition déclarée est supérieure à ces frais supplémentaires aux paiements, la responsabilité de FedEx demeure alors à la valeur la plus faible entre : la valeur déclarée et la valeur réelle du colis. EXCLUSION DE RESPONSABILITÉ. FEDEX NE SAURAIT ÉVALUER EN AUCUN CAS LTRS, TOUT POUR RESPONSABILITÉ OF TOUT DOMMAGE DIRECT, INDIRECT ACCESSOIRE, SPÉCIAL OU CONSÉCUTIF SURVENU À LA VALEUR D'EXPÉDITION DÉCLARÉE (Y COMPRIS, SANS QUE CELA SOIT LIMITATIF DE PERTES DE REVENUS OU BÉNÉFICES) OU À LA VALEUR RÉELLE DE L'ENVOI, SI CELLE-CI EST INFÉRIEURE, QUE CE PRÉJUGE AIT PU OU NON SAVOIR QUE DE TELS DOMMAGES POURRAIENT SURVENIR. FedEx ne saurait en aucun cas être tenu pour responsable de vos agissements ou omissions, y compris, sans que cela soit limitatif, de déclarations incorrectes de marchandises d'emballage, réexpédition, marquage ou adresses non adaptés ou inadéquats de l'envoi, ne pas agissements ou omissions du destinataire ou de quiconque pourrait être concerné par ces envois, ou de la violation par l'une des parties des clauses du présent contrat. FedEx ne saurait en aucun cas être tenu pour responsable de tous dommages, pertes, retards, manques, erreurs de livraison, défauts de livraison, informations incorrectes ou défaut d'information relativement aux envois de liquides, devises ou autres marchandises interdites et d'événements hors du motif contrôle tels que les catastrophes naturelles, risques aériens, conditions météorologiques, retards mécaniques, actes de terrorisme, guerre, grèves, désordre public, ni des agissements ou omissions des autorités publiques (notamment des douanes ou, représentées de la santé publique) ayant autrui.
DÉFAUT DE GARANTIE. Nous n'accordons aucune garantie expresse ou tacite. RECOURS EN CAS DE PERTE, DOMMAGE OU RETARD. TOUT RECOURS DOIT ÊTRE EXERCÉ PAR ECRIT ET DANS DES DÉLAIS STRICTS. VOIR NOS TARIFS. LE GUIDE DES SERVICES FEDEX EN VIGUEUR OU LES CONDITIONS STANDARD D'EXPÉDITION POUR PLUS D'INFORMATIONS. La Convention de Varsovie prévoit des procédures de recours écrites spécifiques en cas de dommages, retard ou défaut de livraison des envois. En outre l'interprétation et la mise en application des dispositions relatives aux voies de recours de la Convention de Varsovie peuvent varier d'un pays à l'autre. Veuillez vous référer à la Convention pour déterminer les délais de recours applicables à votre envoi. Le droit à dommages intérêts d'envoi, aussi et un recours sera formé dans un délai de deux ans, comme spécifié dans la Convention. FedEx n'est pas tenu de répondre à un recours avant que tous les frais d'expédition aient été acquittés. La marche du recours peut ne pas être celle des frais d'expédition. Si le destinataire accepte l'envoi sans mener aucun dommage sur le bulletin de livraison, FedEx considérera alors que la marchandise a été livrée dans de bonnes conditions. Afin que nous puissions répondre aux demandes de dommages, nous vous demandons de mettre à notre disposition les contenus, contenu d'expédition et emballages d'origine à des fins d'inspection. DROIT JURISPRUDENTIEL. Dès lors que l'une des dispositions additionnel du présent sera à la présente lettre de transport aérien ou à l'encontre des traités, législations réglementaires, décrets ou décrets internationaux, territoires dispositions restent en vigueur dans le cadre du présent contrat dans la mesure où cela n'est pas annulé. Le fait que l'une des dispositions soit exigée ou inapplicable n'affecte pas les autres parties de la présente lettre de transport aérien. Tout indivisible contrat, FEDERAL EXPRESS CORPORATION, 2005 Corporate Avenue, Memphis, TN 38132, USA, est le premier transporteur du présent envoi.

ORIGIN ID:YUXA (514) 383-0990
Audrey Etheves
Golder Associates Ltd
7250 rue du Mile End
3e etage
MONTREAL, PQ H2R3A4
CANADA, CA

Ship Date: 11JAN19
ActWgt: 22.60 LB
CAD: 108680724/INET4042

BILL RECIPIENT
EIN/VAT:

TO Dane Wacasey (281) 530-5656
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099 (US)
UNITED STATES, US

FedEx Express

J18211806152dav

AWB

X0 SGRA

PKG:YOUR PKG

TRK# 7741 7166 8422 Form 0430

SATURDAY 12:00P
INTL PRIORITY

REF:
DESC1:Bouteille d'eau
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: Audrey Etheves
T/C: R 967554812
D/T: R 967554812

Ces marchandises, cette technologie ou ce logiciel ont été exportés du Canada conformément à la réglementation sur l'administration des exportations. Toute modification contraire à la loi canadienne est interdite. La Convention de Varsovie peut s'appliquer et elle régit, et dans la grande majorité des cas, elle limite la responsabilité de Federal Express pour toute perte, retard ou dommage causé à votre envoi. Sous réserve des conditions et modalités du contrat.

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10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

January 21, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19010552**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 10 sample(s) on Jan 12, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19010552**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS19010552**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data								
Laboratory Name: ALS Laboratory Group			LRC Date: 01/21/2019					
Project Name: Exide Column Studies			Laboratory Job Number: HS19010552					
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 136657					
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]	
R1	OI	**Chain-of-custody (C-O-C)**						
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X					
		Were all departures from standard conditions described in an exception report?	X					
R2	OI	**Sample and quality control (QC) identification**						
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X					
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X					
R3	OI	**Test reports**						
		Were all samples prepared and analyzed within holding times?	X					
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X					
		Were calculations checked by a peer or supervisor?	X					
		Were all analyte identifications checked by a peer or supervisor?	X					
		Were sample detection limits reported for all analytes not detected?	X					
		Were all results for soil and sediment samples reported on a dry weight basis?			X			
		Were % moisture (or solids) reported for all soil and sediment samples?			X			
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X			
		If required for the project, TICs reported?			X			
R4	O	**Surrogate recovery data**						
		Were surrogates added prior to extraction?			X			
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X			
R5	OI	**Test reports/summary forms for blank samples**						
		Were appropriate type(s) of blanks analyzed?	X					
		Were blanks analyzed at the appropriate frequency?	X					
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X					
		Were blank concentrations < MQL?	X					
R6	OI	**Laboratory control samples (LCS):**						
		Were all COCs included in the LCS?	X					
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X					
		Were LCSs analyzed at the required frequency?	X					
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X					
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X					
		Was the LCSD RPD within QC limits?	X					
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**						
		Were the project/method specified analytes included in the MS and MSD?	X					
		Were MS/MSD analyzed at the appropriate frequency?	X					
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1	
		Were MS/MSD RPDs within laboratory QC limits?	X					
R8	OI	**Analytical duplicate data**						
		Were appropriate analytical duplicates analyzed for each matrix?			X			
		Were analytical duplicates analyzed at the appropriate frequency?			X			
		Were RPDs or relative standard deviations within the laboratory QC limits?			X			
R9	OI	**Method quantitation limits (MQLs):**						
		Are the MQLs for each method analyte included in the laboratory data package?	X					
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X					
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X					
R10	OI	**Other problems/anomalies**						
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X					
		Were all necessary corrective actions performed for the reported data?	X					
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X					
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X					

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 01/21/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19010552				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 136657				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			2
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		X			3
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports		
Laboratory Name: ALS Laboratory Group		LRC Date: 01/21/2019
Project Name: Exide Column Studies		Laboratory Job Number: HS19010552
Reviewer Name: Dane Wacasey		Prep Batch Number(s): 136657
ER#[5]	**Description**	
1	Batch 136657, Metals Method SW6020, sample 20181220-DGW-MW3-PV10out-ControlD, MS and or MSD recovered outside the control limits for Calcium and Sodium, however, the results in the parent sample is greater than 4x the spike amount.	
2	See Run Log and CCB Exceptions Report.	
3	Batch 136657, Metals Method SW6020, sample 20181220-DGW-MW3-PV10out-ControlD, PDS recovered outside the control limit for Calcium, however, the result in the parent sample is greater than 4x the spike amount.	

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010552
Start Date: 17-Jan-2019 End Date: 18-Jan-2019

Run ID:ICPMS05_331226
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	17-Jan-2019 14:36	016_ICV.d	AS CA CD FE K MG PB SB SE
LLICV2	1	17-Jan-2019 14:38	017SMPL.d	AS CA CD FE K MG PB SB SE
LLICV5	1	17-Jan-2019 14:40	018LICV.d	AS CA CD FE K MG PB SB SE
ICB	1	17-Jan-2019 14:42	019_ICB.d	AS CA CD FE K MG PB SB SE
LLICV2	1	17-Jan-2019 14:50	021SMPL.d	AS CA CD FE K MG PB SB SE
ICSA	1	17-Jan-2019 14:55	023ICSA.d	AS CA CD FE K MG PB SB SE
ICSAB	1	17-Jan-2019 14:57	024ICSB.d	AS CA CD FE K MG PB SB SE
CCV 1	1	17-Jan-2019 15:17	033_CCV.d	AS CA CD FE K MG PB SB SE
CCB 1	1	17-Jan-2019 15:19	034_CCB.d	AS CA CD FE K MG PB SB SE
CCV 2	1	17-Jan-2019 15:43	045_CCV.d	AS CA CD FE K MG PB SB SE
CCB 2	1	17-Jan-2019 15:45	046_CCB.d	AS CA CD FE K MG PB SB SE
CCV 3	1	17-Jan-2019 16:07	057_CCV.d	AS CA CD FE K MG PB SB SE
CCB 3	1	17-Jan-2019 16:09	058_CCB.d	AS CA CD FE K MG PB SB SE
CCV 4	1	17-Jan-2019 16:30	069_CCV.d	AS CA CD FE K MG PB SB SE
CCB 4	1	17-Jan-2019 16:32	070_CCB.d	AS CA CD FE K MG PB SB SE
ICCV 5	1	17-Jan-2019 17:25	086_ICV.d	AS CA CD FE K MG PB SB SE
LLCCV5	1	17-Jan-2019 17:27	087LICV.d	AS CA CD FE K MG PB SB SE
LLCCV2	1	17-Jan-2019 17:29	088SMPL.d	AS CA CD FE K MG PB SB SE
ICCB 5	1	17-Jan-2019 17:31	089_ICB.d	AS CA CD FE K MG PB SB SE
MBLK-136657	1	17-Jan-2019 17:35	091SMPL.d	AS CA CD FE K MG NA PB SB SE
LCS-136657	1	17-Jan-2019 17:37	092SMPL.d	AS CA CD FE K MG NA PB SB SE
20181220-DGW-MW3-PV10out-ControlD	1	17-Jan-2019 17:39	093SMPL.d	AS CA CD FE K MG PB SB SE
20181220-DGW-MW3-PV10out-ControlDSD	5	17-Jan-2019 17:41	094SMPL.d	AS CA CD FE K MG PB SB SE
20181220-DGW-MW3-PV10out-ControlDMS	1	17-Jan-2019 17:43	095SMPL.d	AS CA CD FE K MG NA PB SB SE
20181220-DGW-MW3-PV10out-ControlDMSD	1	17-Jan-2019 17:45	096SMPL.d	AS CA CD FE K MG NA PB SB SE
20181220-DGW-MW3-PV10out-ControlDPDS	1	17-Jan-2019 17:47	097SMPL.d	AS CA CD FE K MG PB SB SE
CCV 6	1	17-Jan-2019 17:49	098_CCV.d	AS CA CD FE K MG PB SB SE
CCB 6	1	17-Jan-2019 17:51	099_CCB.d	AS CA CD FE K MG PB SB SE
20181220-DGW-MW3-PV10out-30D	1	17-Jan-2019 17:53	100SMPL.d	AS CA CD FE K MG PB SB SE
20181220-DGW-MW3-PV10out-35D	1	17-Jan-2019 17:55	101SMPL.d	AS CA CD FE K MG PB SB SE
20181220-DGW-MW3-PV10out-40D	1	17-Jan-2019 17:57	102SMPL.d	AS CA CD FE K MG PB SB SE
20181220-DGW-MW3-PV10inlet-ControlD	1	17-Jan-2019 17:59	103SMPL.d	AS CA CD FE K MG PB SB SE
20181220-DGW-MW3-PV10inlet-30-35-40D	1	17-Jan-2019 18:01	104SMPL.d	AS CA CD FE K MG PB SB SE
20181221-DGW-MW3-PV10mid-ControlD	1	17-Jan-2019 18:03	105SMPL.d	AS CA CD FE K MG PB SB SE
20181221-DGW-MW3-PV10mid-30D	1	17-Jan-2019 18:05	106SMPL.d	AS CA CD FE K MG PB SB SE
20181221-DGW-MW3-PV10mid-35D	1	17-Jan-2019 18:07	107SMPL.d	AS CA CD FE K MG PB SB SE
20181221-DGW-MW3-PV10mid-40D	1	17-Jan-2019 18:09	108SMPL.d	AS CA CD FE K MG PB SB SE
CCV 7	1	17-Jan-2019 18:13	110_CCV.d	AS CA CD FE K MG PB SB SE
CCB 7	1	17-Jan-2019 18:15	111_CCB.d	AS CA CD FE K MG PB SB SE
CCV 8	1	17-Jan-2019 18:44	122_CCV.d	AS CA CD FE K MG PB SB SE
CCB 8	1	17-Jan-2019 18:46	123_CCB.d	AS CA CD FE K MG PB SB SE
CCV 9	1	17-Jan-2019 19:35	127_CCV.d	AS CA CD FE K MG PB SB SE
CCB 9	1	17-Jan-2019 19:37	128_CCB.d	AS CA CD FE K MG PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010552

Run ID:ICPMS05_331226
Instrument:ICPMS05
Method:SW6020

CCB 1	Date: 17-Jan-2019 15:19	Seq: 4913166		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	23.9	14	200	
CCB 2	Date: 17-Jan-2019 15:45	Seq: 4913178		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Potassium	18.11	18	200	
CCB 4	Date: 17-Jan-2019 16:32	Seq: 4913202		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	21.06	14	200	
CCB 6	Date: 17-Jan-2019 17:51	Seq: 4913321		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.562	0.4	2	
	Sodium	62.85	14	200	
CCB 7	Date: 17-Jan-2019 18:15	Seq: 4913333		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.28	0.4	2	
	Sodium	139.2	14	200	
CCB 8	Date: 17-Jan-2019 18:46	Seq: 4913379		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.165	0.4	2	
	Sodium	161.7	14	200	
CCB 9	Date: 17-Jan-2019 19:37	Seq: 4913469		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.09	0.4	2	
	Sodium	43.07	14	200	
CCB 10	Date: 17-Jan-2019 19:51	Seq: 4913476		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.185	0.4	2	
	Sodium	30.5	14	200	
CCB 11	Date: 17-Jan-2019 20:11	Seq: 4913501		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.05	0.4	2	
	Sodium	73.53	14	200	
CCB 12	Date: 17-Jan-2019 20:27	Seq: 4913509		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.213	0.4	2	
	Sodium	71.63	14	200	
ICCB 13	Date: 17-Jan-2019 20:55	Seq: 4913525		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	-17.5	14	200	
CCB 14	Date: 17-Jan-2019 21:09	Seq: 4913544		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.406	0.4	2	
	Potassium	32.06	18	200	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010552
Start Date: 18-Jan-2019 End Date: 19-Jan-2019

Run ID:ICPMS05_331295
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
LLICV5	1	18-Jan-2019 12:07	018LICV.d	NA
ICB	1	18-Jan-2019 12:09	019_ICB.d	NA
ICV	1	18-Jan-2019 12:11	020_ICV.d	NA
ICSA	1	18-Jan-2019 12:14	021ICSA.d	NA
ICSAB	1	18-Jan-2019 12:16	022ICSB.d	NA
LLICV2	1	18-Jan-2019 12:27	024SMPL.d	NA
CCB 1	1	18-Jan-2019 12:55	037_CCB.d	NA
CCV 1	1	18-Jan-2019 13:04	039_CCV.d	NA
CCV 2	1	18-Jan-2019 13:20	046_CCV.d	NA
CCB 2	1	18-Jan-2019 13:22	047_CCB.d	NA
ICCV 3	1	18-Jan-2019 14:05	065_ICV.d	NA
LLCCV2	1	18-Jan-2019 14:09	067SMPL.d	NA
ICCB 3	1	18-Jan-2019 14:11	068_ICB.d	NA
LLCCV5	1	18-Jan-2019 14:25	070LICV.d	NA
CCV 4	1	18-Jan-2019 15:08	084_CCV.d	NA
CCB 4	1	18-Jan-2019 15:10	085_CCB.d	NA
ICCV 5	1	18-Jan-2019 15:50	102_ICV.d	NA
LLCCV5	1	18-Jan-2019 15:52	103LICV.d	NA
LLCCV2	1	18-Jan-2019 15:54	104SMPL.d	NA
ICCB 5	1	18-Jan-2019 15:55	105_ICB.d	NA
CCV 6	1	18-Jan-2019 16:58	115_CCV.d	NA
CCB 6	1	18-Jan-2019 17:00	116_CCB.d	NA
CCB 7	1	18-Jan-2019 17:23	127_CCB.d	NA
CCV 7	1	18-Jan-2019 17:31	129_CCV.d	NA
20181220-DGW-MW3-PV10out-ControlD	20	18-Jan-2019 17:37	131SMPL.d	NA
20181220-DGW-MW3-PV10out-ControlDSD	100	18-Jan-2019 17:39	132SMPL.d	NA
20181220-DGW-MW3-PV10out-ControlDPDS	20	18-Jan-2019 17:41	133SMPL.d	NA
20181220-DGW-MW3-PV10out-30D	20	18-Jan-2019 17:43	134SMPL.d	NA
20181220-DGW-MW3-PV10out-35D	20	18-Jan-2019 17:45	135SMPL.d	NA
20181220-DGW-MW3-PV10out-40D	20	18-Jan-2019 17:47	136SMPL.d	NA
20181220-DGW-MW3-PV10inlet-ControlD	20	18-Jan-2019 17:49	137SMPL.d	NA
20181220-DGW-MW3-PV10inlet-30-35-40D	20	18-Jan-2019 17:51	138SMPL.d	NA
CCV 8	1	18-Jan-2019 17:53	139_CCV.d	NA
CCB 8	1	18-Jan-2019 17:55	140_CCB.d	NA
20181221-DGW-MW3-PV10mid-ControlD	20	18-Jan-2019 17:57	141SMPL.d	NA
20181221-DGW-MW3-PV10mid-30D	20	18-Jan-2019 17:59	142SMPL.d	NA
20181221-DGW-MW3-PV10mid-35D	20	18-Jan-2019 18:01	143SMPL.d	NA
20181221-DGW-MW3-PV10mid-40D	20	18-Jan-2019 18:03	144SMPL.d	NA
CCV 9	1	18-Jan-2019 18:17	151_CCV.d	NA
CCB 9	1	18-Jan-2019 18:19	152_CCB.d	NA
CCV 10	1	18-Jan-2019 18:41	163_CCV.d	NA
CCB 10	1	18-Jan-2019 18:43	164_CCB.d	NA
CCV 11	1	18-Jan-2019 18:49	167_CCV.d	NA
CCB 11	1	18-Jan-2019 18:51	168_CCB.d	NA

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010552

Run ID:ICPMS05_331295
Instrument:ICPMS05
Method:SW6020

CCB 1	Date: 18-Jan-2019 12:55	Seq: 4914405		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		676.2	14	200	
CCB 2	Date: 18-Jan-2019 13:22	Seq: 4914629		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		149.5	14	200	
ICCB 3	Date: 18-Jan-2019 14:11	Seq: 4914661		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		-20.21	14	200	
CCB 4	Date: 18-Jan-2019 15:10	Seq: 4914820		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		321.5	14	200	
ICCB 5	Date: 18-Jan-2019 15:55	Seq: 4915034		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		-70.61	14	200	
CCB 6	Date: 18-Jan-2019 17:00	Seq: 4915238		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		23.34	14	200	
CCB 7	Date: 18-Jan-2019 17:23	Seq: 4915249		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		42.5	14	200	
CCB 8	Date: 18-Jan-2019 17:55	Seq: 4915432		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		-35.92	14	200	
CCB 9	Date: 18-Jan-2019 18:19	Seq: 4915444		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		-53.89	14	200	
CCB 10	Date: 18-Jan-2019 18:43	Seq: 4915456		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		-42.95	14	200	
CCB 11	Date: 18-Jan-2019 18:51	Seq: 4915460		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		-60.77	14	200	
CCB 12	Date: 18-Jan-2019 19:06	Seq: 4915468		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		-25.36	14	200	
CCB 13	Date: 18-Jan-2019 19:22	Seq: 4915476		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		-36.44	14	200	
ICCB 14	Date: 18-Jan-2019 19:50	Seq: 4915490		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		-20.46	14	200	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19010552

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19010552-01	20181220-DGW-MW3-PV10out-ControlD	Groundwater		20-Dec-2018 08:00	12-Jan-2019 09:35	☐
HS19010552-02	20181220-DGW-MW3-PV10out-30D	Groundwater		20-Dec-2018 08:00	12-Jan-2019 09:35	☐
HS19010552-03	20181220-DGW-MW3-PV10out-35D	Groundwater		20-Dec-2018 08:00	12-Jan-2019 09:35	☐
HS19010552-04	20181220-DGW-MW3-PV10out-40D	Groundwater		20-Dec-2018 08:00	12-Jan-2019 09:35	☐
HS19010552-05	20181220-DGW-MW3-PV10inlet-ControlD	Groundwater		20-Dec-2018 08:15	12-Jan-2019 09:35	☐
HS19010552-06	20181220-DGW-MW3-PV10inlet-30-35-40D	Groundwater		20-Dec-2018 08:15	12-Jan-2019 09:35	☐
HS19010552-07	20181221-DGW-MW3-PV10mid-ControlD	Groundwater		21-Dec-2018 08:40	12-Jan-2019 09:35	☐
HS19010552-08	20181221-DGW-MW3-PV10mid-30D	Groundwater		21-Dec-2018 08:40	12-Jan-2019 09:35	☐
HS19010552-09	20181221-DGW-MW3-PV10mid-35D	Groundwater		21-Dec-2018 08:40	12-Jan-2019 09:35	☐
HS19010552-10	20181221-DGW-MW3-PV10mid-40D	Groundwater		21-Dec-2018 08:40	12-Jan-2019 09:35	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181220-DGW-MW3-PV10out-ControlD
Collection Date: 20-Dec-2018 08:00

ANALYTICAL REPORT
WorkOrder:HS19010552
Lab ID:HS19010552-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Jan-2019		Analyst: ALR
Antimony	**0.000427**	J	**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 17:39
Arsenic	**0.00184**	J	**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 17:39
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 17:39
Calcium	**116**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 17:39
Iron	**0.0461**	J	**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 17:39
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 17:39
Magnesium	**20.9**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 17:39
Potassium	**2.17**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 17:39
Selenium	**0.00116**	J	**0.00110**	**0.00200**	**mg/L**	1	17-Jan-2019 17:39
Sodium	**198**		**0.280**	**4.00**	**mg/L**	20	18-Jan-2019 17:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181220-DGW-MW3-PV10out-30D
Collection Date: 20-Dec-2018 08:00

ANALYTICAL REPORT
WorkOrder:HS19010552
Lab ID:HS19010552-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Jan-2019		Analyst: ALR
Antimony	**0.000491**	J	**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 17:53
Arsenic	U		0.000400	0.00200	mg/L	1	17-Jan-2019 17:53
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 17:53
Calcium	**11.9**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 17:53
Iron	U		0.0120	0.200	mg/L	1	17-Jan-2019 17:53
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 17:53
Magnesium	**16.6**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 17:53
Potassium	**2.30**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 17:53
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 17:53
Sodium	**190**		**0.280**	**4.00**	**mg/L**	20	18-Jan-2019 17:43

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181220-DGW-MW3-PV10out-35D
Collection Date: 20-Dec-2018 08:00

ANALYTICAL REPORT
WorkOrder:HS19010552
Lab ID:HS19010552-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Jan-2019		Analyst: ALR
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 17:55
Arsenic	U		0.000400	0.00200	mg/L	1	17-Jan-2019 17:55
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 17:55
Calcium	**12.3**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 17:55
Iron	U		0.0120	0.200	mg/L	1	17-Jan-2019 17:55
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 17:55
Magnesium	**16.1**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 17:55
Potassium	**2.36**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 17:55
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 17:55
Sodium	**196**		**0.280**	**4.00**	**mg/L**	20	18-Jan-2019 17:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181220-DGW-MW3-PV10out-40D
Collection Date: 20-Dec-2018 08:00

ANALYTICAL REPORT
WorkOrder:HS19010552
Lab ID:HS19010552-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Jan-2019		Analyst: ALR
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 17:57
Arsenic	U		0.000400	0.00200	mg/L	1	17-Jan-2019 17:57
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 17:57
Calcium	**10.9**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 17:57
Iron	U		0.0120	0.200	mg/L	1	17-Jan-2019 17:57
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 17:57
Magnesium	**15.5**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 17:57
Potassium	**2.33**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 17:57
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 17:57
Sodium	**190**		**0.280**	**4.00**	**mg/L**	20	18-Jan-2019 17:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181220-DGW-MW3-PV10inlet-ControlD
Collection Date: 20-Dec-2018 08:15

ANALYTICAL REPORT
WorkOrder:HS19010552
Lab ID:HS19010552-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Jan-2019		Analyst: ALR
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 17:59
Arsenic	**0.00659**		**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 17:59
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 17:59
Calcium	**111**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 17:59
Iron	**0.0207**	J	**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 17:59
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 17:59
Magnesium	**20.2**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 17:59
Potassium	**2.16**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 17:59
Selenium	**0.00131**	J	**0.00110**	**0.00200**	**mg/L**	1	17-Jan-2019 17:59
Sodium	**190**		**0.280**	**4.00**	**mg/L**	20	18-Jan-2019 17:49

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181220-DGW-MW3-PV10inlet-30-35-40D
Collection Date: 20-Dec-2018 08:15

ANALYTICAL REPORT
WorkOrder:HS19010552
Lab ID:HS19010552-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Jan-2019		Analyst: ALR
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 18:01
Arsenic	**0.0125**		**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 18:01
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 18:01
Calcium	**126**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 18:01
Iron	**0.0191**	J	**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 18:01
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 18:01
Magnesium	**23.6**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 18:01
Potassium	**2.58**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 18:01
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 18:01
Sodium	**176**		**0.280**	**4.00**	**mg/L**	20	18-Jan-2019 17:51

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181221-DGW-MW3-PV10mid-ControlD
Collection Date: 21-Dec-2018 08:40

ANALYTICAL REPORT
WorkOrder:HS19010552
Lab ID:HS19010552-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Jan-2019		Analyst: ALR
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 18:03
Arsenic	**0.00257**		**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 18:03
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 18:03
Calcium	**115**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 18:03
Iron	**0.0270**	J	**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 18:03
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 18:03
Magnesium	**21.1**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 18:03
Potassium	**2.10**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 18:03
Selenium	**0.00132**	J	**0.00110**	**0.00200**	**mg/L**	1	17-Jan-2019 18:03
Sodium	**184**		**0.280**	**4.00**	**mg/L**	20	18-Jan-2019 17:57

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181221-DGW-MW3-PV10mid-30D
Collection Date: 21-Dec-2018 08:40

ANALYTICAL REPORT
WorkOrder:HS19010552
Lab ID:HS19010552-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Jan-2019		Analyst: ALR
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 18:05
Arsenic	U		0.000400	0.00200	mg/L	1	17-Jan-2019 18:05
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 18:05
Calcium	**17.0**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 18:05
Iron	U		0.0120	0.200	mg/L	1	17-Jan-2019 18:05
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 18:05
Magnesium	**18.3**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 18:05
Potassium	**2.39**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 18:05
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 18:05
Sodium	**173**		**0.280**	**4.00**	**mg/L**	20	18-Jan-2019 17:59

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181221-DGW-MW3-PV10mid-35D
Collection Date: 21-Dec-2018 08:40

ANALYTICAL REPORT
WorkOrder:HS19010552
Lab ID:HS19010552-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Jan-2019		Analyst: ALR
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 18:07
Arsenic	U		0.000400	0.00200	mg/L	1	17-Jan-2019 18:07
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 18:07
Calcium	**16.8**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 18:07
Iron	U		0.0120	0.200	mg/L	1	17-Jan-2019 18:07
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 18:07
Magnesium	**18.0**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 18:07
Potassium	**2.20**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 18:07
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 18:07
Sodium	**195**		**0.280**	**4.00**	**mg/L**	20	18-Jan-2019 18:01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181221-DGW-MW3-PV10mid-40D
Collection Date: 21-Dec-2018 08:40

ANALYTICAL REPORT
WorkOrder:HS19010552
Lab ID:HS19010552-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Jan-2019		Analyst: ALR
Antimony	**0.000626**	J	**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 18:09
Arsenic	U		0.000400	0.00200	mg/L	1	17-Jan-2019 18:09
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 18:09
Calcium	**16.4**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 18:09
Iron	U		0.0120	0.200	mg/L	1	17-Jan-2019 18:09
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 18:09
Magnesium	**18.4**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 18:09
Potassium	**2.74**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 18:09
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 18:09
Sodium	**198**		**0.280**	**4.00**	**mg/L**	20	18-Jan-2019 18:03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010552

Batch ID: 136657 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19010552-01	1	10	10 (mL)	1
HS19010552-02	1	10	10 (mL)	1
HS19010552-03	1	10	10 (mL)	1
HS19010552-04	1	10	10 (mL)	1
HS19010552-05	1	10	10 (mL)	1
HS19010552-06	1	10	10 (mL)	1
HS19010552-07	1	10	10 (mL)	1
HS19010552-08	1	10	10 (mL)	1
HS19010552-09	1	10	10 (mL)	1
HS19010552-10	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010552

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 136657	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS19010552-01	20181220-DGW-MW3-PV10out-ControlD	20 Dec 2018 08:00		15 Jan 2019 09:00	18 Jan 2019 17:37	20
HS19010552-01	20181220-DGW-MW3-PV10out-ControlD	20 Dec 2018 08:00		15 Jan 2019 09:00	17 Jan 2019 17:39	1
HS19010552-02	20181220-DGW-MW3-PV10out-30D	20 Dec 2018 08:00		15 Jan 2019 09:00	18 Jan 2019 17:43	20
HS19010552-02	20181220-DGW-MW3-PV10out-30D	20 Dec 2018 08:00		15 Jan 2019 09:00	17 Jan 2019 17:53	1
HS19010552-03	20181220-DGW-MW3-PV10out-35D	20 Dec 2018 08:00		15 Jan 2019 09:00	18 Jan 2019 17:45	20
HS19010552-03	20181220-DGW-MW3-PV10out-35D	20 Dec 2018 08:00		15 Jan 2019 09:00	17 Jan 2019 17:55	1
HS19010552-04	20181220-DGW-MW3-PV10out-40D	20 Dec 2018 08:00		15 Jan 2019 09:00	18 Jan 2019 17:47	20
HS19010552-04	20181220-DGW-MW3-PV10out-40D	20 Dec 2018 08:00		15 Jan 2019 09:00	17 Jan 2019 17:57	1
HS19010552-05	20181220-DGW-MW3-PV10inlet-ControlD	20 Dec 2018 08:15		15 Jan 2019 09:00	18 Jan 2019 17:49	20
HS19010552-05	20181220-DGW-MW3-PV10inlet-ControlD	20 Dec 2018 08:15		15 Jan 2019 09:00	17 Jan 2019 17:59	1
HS19010552-06	20181220-DGW-MW3-PV10inlet-30-35-40D	20 Dec 2018 08:15		15 Jan 2019 09:00	18 Jan 2019 17:51	20
HS19010552-06	20181220-DGW-MW3-PV10inlet-30-35-40D	20 Dec 2018 08:15		15 Jan 2019 09:00	17 Jan 2019 18:01	1
HS19010552-07	20181221-DGW-MW3-PV10mid-ControlD	21 Dec 2018 08:40		15 Jan 2019 09:00	18 Jan 2019 17:57	20
HS19010552-07	20181221-DGW-MW3-PV10mid-ControlD	21 Dec 2018 08:40		15 Jan 2019 09:00	17 Jan 2019 18:03	1
HS19010552-08	20181221-DGW-MW3-PV10mid-30D	21 Dec 2018 08:40		15 Jan 2019 09:00	18 Jan 2019 17:59	20
HS19010552-08	20181221-DGW-MW3-PV10mid-30D	21 Dec 2018 08:40		15 Jan 2019 09:00	17 Jan 2019 18:05	1
HS19010552-09	20181221-DGW-MW3-PV10mid-35D	21 Dec 2018 08:40		15 Jan 2019 09:00	18 Jan 2019 18:01	20
HS19010552-09	20181221-DGW-MW3-PV10mid-35D	21 Dec 2018 08:40		15 Jan 2019 09:00	17 Jan 2019 18:07	1
HS19010552-10	20181221-DGW-MW3-PV10mid-40D	21 Dec 2018 08:40		15 Jan 2019 09:00	18 Jan 2019 18:03	20
HS19010552-10	20181221-DGW-MW3-PV10mid-40D	21 Dec 2018 08:40		15 Jan 2019 09:00	17 Jan 2019 18:09	1

WorkOrder: HS19010552
InstrumentID: ICPMS05
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000555	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000460	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000554	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0537	0.0340	0.500
A	Iron	7439-89-6	0.0500	0.0549	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.00100	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0680	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0542	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00280	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0459	0.0140	0.200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010552

QC BATCH REPORT

Batch ID: 136657 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLK-136657** Units: **mg/L** Analysis Date: **17-Jan-2019 17:35**
Client ID: Run ID: **ICPMS05_331226** SeqNo: **4913313** PrepDate: **15-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01132	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	U	0.200								

LCS Sample ID: **LCS-136657** Units: **mg/L** Analysis Date: **17-Jan-2019 17:37**
Client ID: Run ID: **ICPMS05_331226** SeqNo: **4913314** PrepDate: **15-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04913	0.00200	0.05	0	98.3	80 - 120				
Arsenic	0.05082	0.00200	0.05	0	102	80 - 120				
Cadmium	0.05158	0.00200	0.05	0	103	80 - 120				
Calcium	5.185	0.500	5	0	104	80 - 120				
Iron	5.046	0.200	5	0	101	80 - 120				
Lead	0.05395	0.00200	0.05	0	108	80 - 120				
Magnesium	5.065	0.200	5	0	101	80 - 120				
Potassium	5.182	0.200	5	0	104	80 - 120				
Selenium	0.05149	0.00200	0.05	0	103	80 - 120				
Sodium	5.071	0.200	5	0	101	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010552

QC BATCH REPORT

Batch ID: 136657 **Instrument:** ICPMS05 **Method:** SW6020 (dissolved) (DISSOLVED)

MS Sample ID: **HS19010552-01MS** Units: **mg/L** Analysis Date: **17-Jan-2019 17:43**
Client ID: **20181220-DGW-MW3-PV10out-ControlD** Run ID: **ICPMS05_331226** SeqNo: **4913317** PrepDate: **15-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05027	0.00200	0.05	0.000427	99.7	75 - 125				
Arsenic	0.05332	0.00200	0.05	0.00184	103	75 - 125				
Cadmium	0.05118	0.00200	0.05	0.000107	102	75 - 125				
Calcium	117.2	0.500	5	115.5	34.3	75 - 125				SO
Iron	4.994	0.200	5	0.04615	99.0	75 - 125				
Lead	0.04947	0.00200	0.05	0.000117	98.7	75 - 125				
Magnesium	25.02	0.200	5	20.92	82.1	75 - 125				O
Potassium	6.939	0.200	5	2.167	95.4	75 - 125				
Selenium	0.05286	0.00200	0.05	0.001156	103	75 - 125				
Sodium	192.1	0.200	5	191.4	13.8	75 - 125				SEO

MSD Sample ID: **HS19010552-01MSD** Units: **mg/L** Analysis Date: **17-Jan-2019 17:45**
Client ID: **20181220-DGW-MW3-PV10out-ControlD** Run ID: **ICPMS05_331226** SeqNo: **4913318** PrepDate: **15-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.0515	0.00200	0.05	0.000427	102	75 - 125	0.05027	2.42	20	
Arsenic	0.05473	0.00200	0.05	0.00184	106	75 - 125	0.05332	2.61	20	
Cadmium	0.05307	0.00200	0.05	0.000107	106	75 - 125	0.05118	3.62	20	
Calcium	123.5	0.500	5	115.5	159	75 - 125	117.2	5.19	20	SO
Iron	5.222	0.200	5	0.04615	104	75 - 125	4.994	4.46	20	
Lead	0.05204	0.00200	0.05	0.000117	104	75 - 125	0.04947	5.06	20	
Magnesium	26.44	0.200	5	20.92	110	75 - 125	25.02	5.51	20	O
Potassium	7.264	0.200	5	2.167	102	75 - 125	6.939	4.59	20	
Selenium	0.05366	0.00200	0.05	0.001156	105	75 - 125	0.05286	1.5	20	
Sodium	199.2	0.200	5	191.4	157	75 - 125	192.1	3.66	20	SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010552

QC BATCH REPORT

Batch ID: 136657 **Instrument:** ICPMS05 **Method:** SW6020 (dissolved) (DISSOLVED)

PDS Sample ID: **HS19010552-01PDS** Units: **mg/L** Analysis Date: **17-Jan-2019 17:47**
Client ID: **20181220-DGW-MW3-PV10out-ControlD** Run ID: **ICPMS05_331226** SeqNo: **4913319** PrepDate: **15-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09724	0.00200	0.1	0.000427	96.8	75 - 125				
Arsenic	0.11	0.00200	0.1	0.00184	108	75 - 125				
Cadmium	0.1076	0.00200	0.1	0.000107	107	75 - 125				
Calcium	122	0.500	10	115.5	64.4	75 - 125				SO
Iron	10.32	0.200	10	0.04615	103	75 - 125				
Lead	0.104	0.00200	0.1	0.000117	104	75 - 125				
Magnesium	30.28	0.200	10	20.92	93.6	75 - 125				
Potassium	12.3	0.200	10	2.167	101	75 - 125				
Selenium	0.1093	0.00200	0.1	0.001156	108	75 - 125				

PDS Sample ID: **HS19010552-01PDS** Units: **mg/L** Analysis Date: **18-Jan-2019 17:41**
Client ID: **20181220-DGW-MW3-PV10out-ControlD** Run ID: **ICPMS05_331295** SeqNo: **4915425** PrepDate: **15-Jan-2019** DF: **20**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	396.8	4.00	200	197.9	99.5	75 - 125				

SD Sample ID: **HS19010552-01SD** Units: **mg/L** Analysis Date: **17-Jan-2019 17:41**
Client ID: **20181220-DGW-MW3-PV10out-ControlD** Run ID: **ICPMS05_331226** SeqNo: **4913316** PrepDate: **15-Jan-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000427	0	10	
Arsenic	U	0.0100					0.00184	0	10	
Cadmium	U	0.0100					0.000107	0	10	
Calcium	113.9	2.50					115.5	1.4	10	
Iron	U	1.00					0.04615	0	10	
Lead	U	0.0100					0.000117	0	10	
Magnesium	21.14	1.00					20.92	1.07	10	
Potassium	2.166	1.00					2.167	0.0621	10	
Selenium	U	0.0100					0.001156	0	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010552

QC BATCH REPORT

Batch ID: 136657 **Instrument:** ICPMS05 **Method:** SW6020 (dissolved) (DISSOLVED)

SD Sample ID: **HS19010552-01SD** Units: **mg/L** Analysis Date: **18-Jan-2019 17:39**
Client ID: **20181220-DGW-MW3-PV10out-ControlID** Run ID: **ICPMS05_331295** SeqNo: **4915424** PrepDate: **15-Jan-2019** DF: **100**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Sodium	194.9	20.0					197.9	1.5	10	

The following samples were analyzed in this batch:

HS19010552-01	HS19010552-02	HS19010552-03	HS19010552-04
HS19010552-05	HS19010552-06	HS19010552-07	HS19010552-08
HS19010552-09	HS19010552-10		

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19010552**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19010552

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19010552-01	20181220-DGW-MW3-PV10out-ControlD	Login	1/14/2019 11:48:56 AM	JRM	MET042
HS19010552-02	20181220-DGW-MW3-PV10out-30D	Login	1/14/2019 11:48:56 AM	JRM	MET042
HS19010552-03	20181220-DGW-MW3-PV10out-35D	Login	1/14/2019 11:48:56 AM	JRM	MET042
HS19010552-04	20181220-DGW-MW3-PV10out-40D	Login	1/14/2019 11:48:56 AM	JRM	MET042
HS19010552-05	20181220-DGW-MW3-PV10inlet-ControlD	Login	1/14/2019 11:48:56 AM	JRM	MET042
HS19010552-06	20181220-DGW-MW3-PV10inlet-30-35-40D	Login	1/14/2019 11:48:56 AM	JRM	MET042
HS19010552-07	20181221-DGW-MW3-PV10mid-ControlD	Login	1/14/2019 11:48:56 AM	JRM	MET042
HS19010552-08	20181221-DGW-MW3-PV10mid-30D	Login	1/14/2019 11:48:56 AM	JRM	MET042
HS19010552-09	20181221-DGW-MW3-PV10mid-35D	Login	1/14/2019 11:48:56 AM	JRM	MET042
HS19010552-10	20181221-DGW-MW3-PV10mid-40D	Login	1/14/2019 11:48:56 AM	JRM	MET042

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19010552

Date/Time Received: **12-Jan-2019 09:35**
Received by: **JRM**

Checklist completed by: *Jared R. Makan* eSignature 14-Jan-2019 Date

Reviewed by: *Dane J. Wacasey* eSignature 17-Jan-2019 Date

Matrices: **Water**

Carrier name: **FedEx International Priority**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	13.6c/13.9c UC/C	IR25	
Cooler(s)/Kit(s):	43811		
Date/Time sample(s) sent to storage:	01/12/2019 15:00		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070

Chain of Custody Form

Page ____ of ____

COC ID: 194447

HS19010552

Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information	
Purchase Order	130-2086-06	Project Name	Exide Column Studies
Work Order		Project Number	130-2086
Company Name	Golder Associates	Bill To Company	Golder Associates
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021
Phone	(314) 984-8800	Phone	(314) 984-8800
Fax		Fax	
e-Mail Address	Emily_White@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com

A	300_W (300 Cl, SO4, [*NO3* *48hr HT*])
B	TDS_W 2540C (2540C TDS)
C	ALK_W 2320B (2320B Alkalinity)
D	HARD (2340B Hardness (calc))
E	ICP_TW (6020A Total Metals (6)+Cations)
F	ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
G	
H	
I	
J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20181220-DGW-MW3-PV10out-control D	2018/12/20	8:00	GW	2	1						X					
2	20181220-DGW-MW3-PV10out-30D	"	"	"	2	1						X					
3	20181220-DGW-MW3-PV10out-35D	"	"	"	2	1						X					
4	20181220-DGW-MW3-PV10out-40D	"	"	"	2	1						X					
5	20181220-DGW-MW3-PV10 inlet-control D	2018/12/20	8:15	"	2	1						X					
6	20181220-DGW-MW3-PV10 inlet-30-35-40D	"	"	"	2	1						X					
7	20181221-DGW-MW3-PV10 mid-control D	2018/12/21	8:40	"	2	1						X					
8	20181221-DGW-MW3-PV10 mid-30D	"	"	"	2	1						X					
9	20181221-DGW-MW3-PV10 mid-35D	"	"	"	2	1						X					
10	20181221-DGW-MW3-PV10 mid-40D	"	"	"	2	1						X					

Sampler(s) Please Print & Sign: Bethina Smith / Giovanni Llanos

Shipment Method:

Required Turnaround Time: (Check Box) ☐ Other ____ ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour

Results Due Date:

Relinquished by: Giovanni Llanos	Date: 2019/01/11	Time: 3:00pm	Received by:	
Relinquished by:	Date: 01/12/19	Time: 07:30	Received by (Laboratory): J. Imanian	
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	

Notes: Exide Column Studies

Cooler ID	Cooler Temp.
	UC
43811	13.6
	10.25
	6.03

QC Package: (Check One Box Below)
☐ Level II Std QC
☐ Level III Std QC/Raw Data
☐ Level IV SW846/CLP
☐ Other
☒ TRRP Checklist
☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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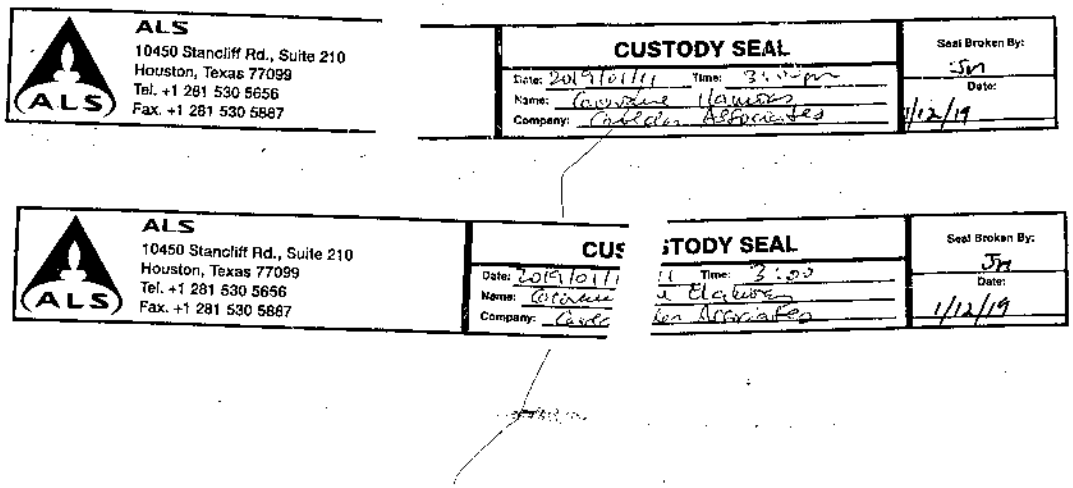
ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CUSTODY SEAL
Date: 2019/01/11
Time: 3:15pm
Name: Courtney Hanson
Company: Cardno Associates
Seal Broken By:
Date:
1/12/19
ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CUS
Date: 2019/01/11
Name: Courtney
Company: Cardno
STODY SEAL
Time: 3:00
Seal Broken By:
Date:
1/12/19

ORIGIN ID:YUXA (514) 383-0990
AUDREY ETHEVES
GOLDER ASSOCIATES LTD
7250 RUE DU MILE END
3E ETAGE
MONTREAL, PQ H2R3A4
CANADA CA

SHIP DATE: 11JAN19
ACTWGT: 22.60 LB
CAD: 108680724/INET4042

BILL RECIPIENT

TO DANE WACASEY
ALS HOUSTON LABORATORY
10450 STANCLIFF RD
STE 210
HOUSTON TX 77099 (US)
(281) 530-5656 REF:
INV:
PO: DEPT:

552J2/D74C/DCA5

FedEx Express

E

TRK# 0430 7741 7166 8422

SATURDAY 12:00P
INTL PRIORITY

X0 SGRA

77099
TX-US IAH

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ORIGIN ID:YUXA (514) 383-0990
Audrey Etheves
Golder Associates Ltd
7250 rue du Mile End
3e etage
MONTREAL, PQ H2R3A4
CANADA, CA

Ship Date: 11JAN19
ActWgt: 22.60 LB
CAD: 108680724/INET4042

BILL RECIPIENT
EIN/VAT:

TO Dane Wacasey
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

(281) 530-5656

FedEx Express

(US)

J18211808152Our

AWB

X0 SGRA

PKG:YOUR PKG

TRK# 7741 7166 8422

Form 0430

SATURDAY 12:00P
INTL PRIORITY

REF:
DESC1:Bouteille d'eau
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: Audrey Etheves
T/C: R 967554812
D/T: R 967554812

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10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

January 21, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19010553**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 10 sample(s) on Jan 12, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19010553**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS19010553**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 01/21/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19010553				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 136658,R331360				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?			X		
		Were analytical duplicates analyzed at the appropriate frequency?			X		
		Were RPDs or relative standard deviations within the laboratory QC limits?			X		
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 01/21/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19010553				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 136658,R331360				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			2
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports	
Laboratory Name: ALS Laboratory Group	LRC Date: 01/21/2019
Project Name: Exide Column Studies	Laboratory Job Number: HS19010553
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 136658,R331360

ER#[5]	Description
1	Batch 136658, Metals Method SW6020, sample HS19010551-01, MS and MSD were performed on unrelated sample.
2	See Run Log and CCB Exceptions Report.

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010553
Start Date: 17-Jan-2019 End Date: 17-Jan-2019

Run ID:ICPMS04_331185
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	17-Jan-2019 11:56	018_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	17-Jan-2019 11:58	019SMPL.d	AS CA CD FE K MG NA PB SB SE
LLICV5	1	17-Jan-2019 12:00	020LICV.d	AS CA CD FE K MG NA PB SB SE
ICB	1	17-Jan-2019 12:02	021_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	17-Jan-2019 12:13	023ICSA.d	AS CA CD FE K MG NA PB SB SE
ICSAB	1	17-Jan-2019 12:15	024ICSB.d	AS CA CD FE K MG NA PB SB SE
CCV 1	1	17-Jan-2019 12:45	036_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	17-Jan-2019 12:47	037_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	17-Jan-2019 13:16	048_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	17-Jan-2019 13:18	049_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	17-Jan-2019 13:49	060_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	17-Jan-2019 13:51	061_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	17-Jan-2019 14:20	072_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	17-Jan-2019 14:22	073_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	17-Jan-2019 14:57	084_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	17-Jan-2019 14:59	085_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	17-Jan-2019 15:22	094_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	17-Jan-2019 15:25	095_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-136658	1	17-Jan-2019 15:50	097SMPL.d	AS CA CD FE K MG NA PB SB SE
LCS-136658	1	17-Jan-2019 15:52	098SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZSD	5	17-Jan-2019 15:57	100SMPL.d	AS CA CD FE K MG PB SB SE
ZZZZZZMS	1	17-Jan-2019 15:59	101SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZMSD	1	17-Jan-2019 16:01	102SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZPDS	1	17-Jan-2019 16:04	103SMPL.d	AS CA FE K MG SB
CCV 7	1	17-Jan-2019 16:10	106_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	17-Jan-2019 16:13	107_CCB.d	AS CA CD FE K MG NA PB SB SE
20190103-DGW-MW3-PV15out-ControlT	1	17-Jan-2019 16:38	116SMPL.d	AS CA CD FE K MG PB SB SE
CCV 8	1	17-Jan-2019 16:43	118_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	17-Jan-2019 16:45	119_CCB.d	AS CA CD FE K MG NA PB SB SE
20190103-DGW-MW3-PV15out-30T	1	17-Jan-2019 16:52	120SMPL.d	AS CA CD FE K MG PB SB SE
20190103-DGW-MW3-PV15out-35T	1	17-Jan-2019 16:55	121SMPL.d	AS CA CD FE K MG PB SB SE
20190103-DGW-MW3-PV15out-40T	1	17-Jan-2019 16:57	122SMPL.d	AS CA CD FE K MG PB SB SE
20190104-DGW-MW3-PV15inlet-ControlT	1	17-Jan-2019 16:59	123SMPL.d	AS CA CD FE K MG PB SB SE
20190104-DGW-MW3-PV15inlet-30-35-40T	1	17-Jan-2019 17:01	124SMPL.d	AS CA CD FE K MG PB SB SE
20190104-DGW-MW3-PV15mid-ControlT	1	17-Jan-2019 17:04	125SMPL.d	AS CA CD FE K MG PB SB SE
20190104-DGW-MW3-PV15mid-30T	1	17-Jan-2019 17:06	126SMPL.d	AS CA CD FE K MG PB SB SE
20190104-DGW-MW3-PV15mid-35T	1	17-Jan-2019 17:08	127SMPL.d	AS CA CD FE K MG NA PB SB SE
20190104-DGW-MW3-PV15mid-40T	1	17-Jan-2019 17:10	128SMPL.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	17-Jan-2019 17:17	131_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	17-Jan-2019 17:22	133_CCV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	17-Jan-2019 18:08	153SMPL.d	AS CA CD FE K MG NA PB SB SE
LLCCV5	1	17-Jan-2019 18:11	154LICV.d	AS CA CD FE K MG NA PB SB SE
ICCB 10	1	17-Jan-2019 18:13	155_ICB.d	AS CA CD FE K MG NA PB SB SE
ICCV 10	1	17-Jan-2019 18:25	157_ICV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	17-Jan-2019 18:54	170_CCB.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010553

Run ID:ICPMS04_331185
Instrument:ICPMS04
Method:SW6020

CCB 1	Date: 17-Jan-2019 12:47	Seq: 4912113	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.784	0.4	2	
Potassium	-35.93	18	200	
Sodium	32.19	14	200	

CCB 2	Date: 17-Jan-2019 13:18	Seq: 4912198	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.868	0.4	2	
Potassium	-20.9	18	200	
Sodium	24.25	14	200	

CCB 3	Date: 17-Jan-2019 13:51	Seq: 4912594	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.943	0.4	2	
Potassium	-18.16	18	200	
Sodium	19.18	14	200	

CCB 4	Date: 17-Jan-2019 14:22	Seq: 4912606	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.774	0.4	2	

CCB 5	Date: 17-Jan-2019 14:59	Seq: 4912833	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.598	0.4	2	
Sodium	19.86	14	200	

CCB 6	Date: 17-Jan-2019 15:25	Seq: 4912843	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.489	0.4	2	

CCB 7	Date: 17-Jan-2019 16:13	Seq: 4912990	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.653	0.4	2	
Iron	21.34	12	200	
Sodium	62.56	14	200	

CCB 8	Date: 17-Jan-2019 16:45	Seq: 4913072	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.44	0.4	2	
Iron	16.88	12	200	
Selenium	1.239	1.1	2	
Sodium	80.23	14	200	

CCB 9	Date: 17-Jan-2019 17:17	Seq: 4913239	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.353	0.4	2	
Calcium	38.36	34	500	
Iron	16.83	12	200	
Magnesium	15.12	10	200	
Potassium	19.39	18	200	
Sodium	101.6	14	200	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010553
Start Date: 18-Jan-2019 End Date: 18-Jan-2019

Run ID:ICPMS04_331292
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	18-Jan-2019 11:51	018_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	18-Jan-2019 11:53	019SMPL.d	NA
LLICV5	1	18-Jan-2019 11:55	020LICV.d	NA
ICB	1	18-Jan-2019 11:58	021_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	18-Jan-2019 12:07	023ICSA.d	NA
ICSAB	1	18-Jan-2019 12:09	024ICSB.d	NA
CCV 1	1	18-Jan-2019 12:39	036_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	18-Jan-2019 12:42	037_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	18-Jan-2019 13:10	048_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	18-Jan-2019 13:13	049_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	18-Jan-2019 13:19	051_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	18-Jan-2019 13:44	061_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	18-Jan-2019 13:47	062_CCB.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZSD	50	18-Jan-2019 14:13	072SMPL.d	NA
CCV 5	1	18-Jan-2019 14:15	073_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	18-Jan-2019 14:17	074_CCB.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZPDS	10	18-Jan-2019 14:36	076SMPL.d	NA
CCV 6	1	18-Jan-2019 14:56	085_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	18-Jan-2019 14:58	086_CCB.d	AS CA CD FE K MG NA PB SB SE
20190103-DGW-MW3-PV15out-ControlT	10	18-Jan-2019 15:07	089SMPL.d	NA
20190103-DGW-MW3-PV15out-30T	10	18-Jan-2019 15:09	090SMPL.d	NA
20190103-DGW-MW3-PV15out-35T	10	18-Jan-2019 15:11	091SMPL.d	NA
20190103-DGW-MW3-PV15out-40T	10	18-Jan-2019 15:14	092SMPL.d	NA
20190104-DGW-MW3-PV15inlet-ControlT	10	18-Jan-2019 15:16	093SMPL.d	NA
20190104-DGW-MW3-PV15inlet-30-35-40T	10	18-Jan-2019 15:18	094SMPL.d	NA
20190104-DGW-MW3-PV15mid-ControlT	10	18-Jan-2019 15:20	095SMPL.d	NA
20190104-DGW-MW3-PV15mid-30T	10	18-Jan-2019 15:23	096SMPL.d	NA
CCV 7	1	18-Jan-2019 15:25	097_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	18-Jan-2019 15:27	098_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	18-Jan-2019 15:56	110_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 8	1	18-Jan-2019 16:17	112_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	18-Jan-2019 16:41	122_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	18-Jan-2019 16:43	123_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 10	1	18-Jan-2019 17:47	143_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	18-Jan-2019 17:49	144SMPL.d	NA
LLCCV5	1	18-Jan-2019 17:52	145LICV.d	NA
ICCB 9	1	18-Jan-2019 17:54	146_ICB.d	AS CA CD FE K MG NA PB SB SE
CCV 11	1	18-Jan-2019 18:28	158_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	18-Jan-2019 18:30	159_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 12	1	18-Jan-2019 18:59	170_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	18-Jan-2019 19:01	171_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 13	1	18-Jan-2019 19:25	180_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 12	1	18-Jan-2019 19:28	181_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 14	1	18-Jan-2019 19:52	192_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 13	1	18-Jan-2019 19:55	193_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 15	1	18-Jan-2019 20:19	204_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 14	1	18-Jan-2019 20:22	205_CCB.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010553

Run ID:ICPMS04_331292
Instrument:ICPMS04
Method:SW6020

CCB 1	Date: 18-Jan-2019 12:42	Seq: 4914346		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		53.46	14	200	
CCB 2	Date: 18-Jan-2019 13:13	Seq: 4914467		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		49.32	14	200	
CCB 3	Date: 18-Jan-2019 13:47	Seq: 4914527		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		101.6	14	200	
CCB 4	Date: 18-Jan-2019 14:17	Seq: 4914695		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		104.8	14	200	
CCB 5	Date: 18-Jan-2019 14:58	Seq: 4914980		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		90.97	14	200	
CCB 6	Date: 18-Jan-2019 15:27	Seq: 4914992		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		84.66	14	200	
CCB 7	Date: 18-Jan-2019 15:56	Seq: 4915022		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		75.83	14	200	
CCB 8	Date: 18-Jan-2019 16:43	Seq: 4915172		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		84.46	14	200	
CCB 10	Date: 18-Jan-2019 18:30	Seq: 4915298		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		-19.19	14	200	
CCB 13	Date: 18-Jan-2019 19:55	Seq: 4916037		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		121.4	14	200	
CCB 14	Date: 18-Jan-2019 20:22	Seq: 4916049		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		80.48	14	200	
CCB 15	Date: 18-Jan-2019 20:44	Seq: 4916134		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		40.3	14	200	
CCB 16	Date: 18-Jan-2019 21:00	Seq: 4916141		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		27.99	14	200	
CCB 20	Date: 18-Jan-2019 22:47	Seq: 4916184		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		18.15	14	200	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19010553

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19010553-01	20190103-DGW-MW3-PV15out-ControlT	Groundwater		03-Jan-2019 09:00	12-Jan-2019 09:35	☐
HS19010553-02	20190103-DGW-MW3-PV15out-30T	Groundwater		03-Jan-2019 09:00	12-Jan-2019 09:35	☐
HS19010553-03	20190103-DGW-MW3-PV15out-35T	Groundwater		03-Jan-2019 09:00	12-Jan-2019 09:35	☐
HS19010553-04	20190103-DGW-MW3-PV15out-40T	Groundwater		03-Jan-2019 09:00	12-Jan-2019 09:35	☐
HS19010553-05	20190104-DGW-MW3-PV15inlet-ControlT	Groundwater		04-Jan-2019 09:00	12-Jan-2019 09:35	☐
HS19010553-06	20190104-DGW-MW3-PV15inlet-30-35-40T	Groundwater		04-Jan-2019 09:00	12-Jan-2019 09:35	☐
HS19010553-07	20190104-DGW-MW3-PV15mid-ControlT	Groundwater		04-Jan-2019 09:00	12-Jan-2019 09:35	☐
HS19010553-08	20190104-DGW-MW3-PV15mid-30T	Groundwater		04-Jan-2019 09:00	12-Jan-2019 09:35	☐
HS19010553-09	20190104-DGW-MW3-PV15mid-35T	Groundwater		04-Jan-2019 09:00	12-Jan-2019 09:35	☐
HS19010553-10	20190104-DGW-MW3-PV15mid-40T	Groundwater		04-Jan-2019 09:00	12-Jan-2019 09:35	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190103-DGW-MW3-PV15out-ControlT
Collection Date: 03-Jan-2019 09:00

ANALYTICAL REPORT
WorkOrder:HS19010553
Lab ID:HS19010553-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**348**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Jan-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 16:38
Arsenic	**0.00177**	J	**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 16:38
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 16:38
Calcium	**107**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 16:38
Iron	**0.146**	J	**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 16:38
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 16:38
Magnesium	**20.2**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 16:38
Potassium	**2.01**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 16:38
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 16:38
Sodium	**205**		**0.140**	**2.00**	**mg/L**	10	18-Jan-2019 15:07

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190103-DGW-MW3-PV15out-30T
Collection Date: 03-Jan-2019 09:00

ANALYTICAL REPORT
WorkOrder:HS19010553
Lab ID:HS19010553-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**76.5**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Jan-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 16:52
Arsenic	U		0.000400	0.00200	mg/L	1	17-Jan-2019 16:52
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 16:52
Calcium	**7.05**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 16:52
Iron	**0.108**	J	**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 16:52
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 16:52
Magnesium	**14.3**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 16:52
Potassium	**1.88**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 16:52
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 16:52
Sodium	**204**		**0.140**	**2.00**	**mg/L**	10	18-Jan-2019 15:09

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190103-DGW-MW3-PV15out-35T
Collection Date: 03-Jan-2019 09:00

ANALYTICAL REPORT
WorkOrder:HS19010553
Lab ID:HS19010553-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**61.5**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Jan-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 16:55
Arsenic	U		0.000400	0.00200	mg/L	1	17-Jan-2019 16:55
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 16:55
Calcium	**5.99**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 16:55
Iron	**0.0503**	J	**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 16:55
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 16:55
Magnesium	**11.3**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 16:55
Potassium	**1.84**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 16:55
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 16:55
Sodium	**200**		**0.140**	**2.00**	**mg/L**	10	18-Jan-2019 15:11

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190103-DGW-MW3-PV15out-40T
Collection Date: 03-Jan-2019 09:00

ANALYTICAL REPORT
WorkOrder:HS19010553
Lab ID:HS19010553-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**69.9**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Jan-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 16:57
Arsenic	U		0.000400	0.00200	mg/L	1	17-Jan-2019 16:57
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 16:57
Calcium	**6.89**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 16:57
Iron	**0.0214**	J	**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 16:57
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 16:57
Magnesium	**12.8**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 16:57
Potassium	**1.89**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 16:57
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 16:57
Sodium	**205**		**0.140**	**2.00**	**mg/L**	10	18-Jan-2019 15:14

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190104-DGW-MW3-PV15inlet-ControlT
Collection Date: 04-Jan-2019 09:00

ANALYTICAL REPORT
WorkOrder:HS19010553
Lab ID:HS19010553-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**352**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Jan-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 16:59
Arsenic	**0.0134**		**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 16:59
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 16:59
Calcium	**108**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 16:59
Iron	**0.550**		**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 16:59
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 16:59
Magnesium	**20.1**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 16:59
Potassium	**2.86**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 16:59
Selenium	**0.00149**	J	**0.00110**	**0.00200**	**mg/L**	1	17-Jan-2019 16:59
Sodium	**198**		**0.140**	**2.00**	**mg/L**	10	18-Jan-2019 15:16

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190104-DGW-MW3-PV15inlet-30-35-40T
Collection Date: 04-Jan-2019 09:00

ANALYTICAL REPORT
WorkOrder:HS19010553
Lab ID:HS19010553-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**343**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Jan-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 17:01
Arsenic	**0.0182**		**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 17:01
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 17:01
Calcium	**105**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 17:01
Iron	**0.597**		**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 17:01
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 17:01
Magnesium	**19.6**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 17:01
Potassium	**2.13**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 17:01
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 17:01
Sodium	**202**		**0.140**	**2.00**	**mg/L**	10	18-Jan-2019 15:18

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190104-DGW-MW3-PV15mid-ControlT
Collection Date: 04-Jan-2019 09:00

ANALYTICAL REPORT
WorkOrder:HS19010553
Lab ID:HS19010553-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**350**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Jan-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 17:04
Arsenic	**0.00471**		**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 17:04
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 17:04
Calcium	**106**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 17:04
Iron	**0.182**	J	**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 17:04
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 17:04
Magnesium	**20.7**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 17:04
Potassium	**1.97**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 17:04
Selenium	**0.00132**	J	**0.00110**	**0.00200**	**mg/L**	1	17-Jan-2019 17:04
Sodium	**207**		**0.140**	**2.00**	**mg/L**	10	18-Jan-2019 15:20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190104-DGW-MW3-PV15mid-30T
Collection Date: 04-Jan-2019 09:00

ANALYTICAL REPORT
WorkOrder:HS19010553
Lab ID:HS19010553-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**92.0**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Jan-2019		Analyst: JCJ
Antimony	**0.00114**	J	**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 17:06
Arsenic	U		0.000400	0.00200	mg/L	1	17-Jan-2019 17:06
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 17:06
Calcium	**10.3**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 17:06
Iron	**0.0909**	J	**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 17:06
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 17:06
Magnesium	**16.1**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 17:06
Potassium	**1.90**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 17:06
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 17:06
Sodium	**203**		**0.140**	**2.00**	**mg/L**	10	18-Jan-2019 15:23

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190104-DGW-MW3-PV15mid-35T
Collection Date: 04-Jan-2019 09:00

ANALYTICAL REPORT
WorkOrder:HS19010553
Lab ID:HS19010553-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**85.8**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Jan-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 17:08
Arsenic	U		0.000400	0.00200	mg/L	1	17-Jan-2019 17:08
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 17:08
Calcium	**9.46**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 17:08
Iron	**0.449**		**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 17:08
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 17:08
Magnesium	**15.1**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 17:08
Potassium	**1.87**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 17:08
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 17:08
Sodium	**177**		**0.0140**	**0.200**	**mg/L**	1	17-Jan-2019 17:08

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190104-DGW-MW3-PV15mid-40T
Collection Date: 04-Jan-2019 09:00

ANALYTICAL REPORT
WorkOrder:HS19010553
Lab ID:HS19010553-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**84.2**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Jan-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 17:10
Arsenic	U		0.000400	0.00200	mg/L	1	17-Jan-2019 17:10
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 17:10
Calcium	**9.00**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 17:10
Iron	**0.748**		**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 17:10
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 17:10
Magnesium	**15.0**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 17:10
Potassium	**1.84**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 17:10
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 17:10
Sodium	**179**		**0.0140**	**0.200**	**mg/L**	1	17-Jan-2019 17:10

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010553

Batch ID: 136658 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19010553-01	1	10	10 (mL)	1
HS19010553-02	1	10	10 (mL)	1
HS19010553-03	1	10	10 (mL)	1
HS19010553-04	1	10	10 (mL)	1
HS19010553-05	1	10	10 (mL)	1
HS19010553-06	1	10	10 (mL)	1
HS19010553-07	1	10	10 (mL)	1
HS19010553-08	1	10	10 (mL)	1
HS19010553-09	1	10	10 (mL)	1
HS19010553-10	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010553

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 136658	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19010553-01	20190103-DGW-MW3-PV15out-ControlT	03 Jan 2019 09:00		15 Jan 2019 09:00	18 Jan 2019 15:07	10
HS19010553-01	20190103-DGW-MW3-PV15out-ControlT	03 Jan 2019 09:00		15 Jan 2019 09:00	17 Jan 2019 16:38	1
HS19010553-02	20190103-DGW-MW3-PV15out-30T	03 Jan 2019 09:00		15 Jan 2019 09:00	18 Jan 2019 15:09	10
HS19010553-02	20190103-DGW-MW3-PV15out-30T	03 Jan 2019 09:00		15 Jan 2019 09:00	17 Jan 2019 16:52	1
HS19010553-03	20190103-DGW-MW3-PV15out-35T	03 Jan 2019 09:00		15 Jan 2019 09:00	18 Jan 2019 15:11	10
HS19010553-03	20190103-DGW-MW3-PV15out-35T	03 Jan 2019 09:00		15 Jan 2019 09:00	17 Jan 2019 16:55	1
HS19010553-04	20190103-DGW-MW3-PV15out-40T	03 Jan 2019 09:00		15 Jan 2019 09:00	18 Jan 2019 15:14	10
HS19010553-04	20190103-DGW-MW3-PV15out-40T	03 Jan 2019 09:00		15 Jan 2019 09:00	17 Jan 2019 16:57	1
HS19010553-05	20190104-DGW-MW3-PV15inlet-ControlT	04 Jan 2019 09:00		15 Jan 2019 09:00	18 Jan 2019 15:16	10
HS19010553-05	20190104-DGW-MW3-PV15inlet-ControlT	04 Jan 2019 09:00		15 Jan 2019 09:00	17 Jan 2019 16:59	1
HS19010553-06	20190104-DGW-MW3-PV15inlet-30-35-40T	04 Jan 2019 09:00		15 Jan 2019 09:00	18 Jan 2019 15:18	10
HS19010553-06	20190104-DGW-MW3-PV15inlet-30-35-40T	04 Jan 2019 09:00		15 Jan 2019 09:00	17 Jan 2019 17:01	1
HS19010553-07	20190104-DGW-MW3-PV15mid-ControlT	04 Jan 2019 09:00		15 Jan 2019 09:00	18 Jan 2019 15:20	10
HS19010553-07	20190104-DGW-MW3-PV15mid-ControlT	04 Jan 2019 09:00		15 Jan 2019 09:00	17 Jan 2019 17:04	1
HS19010553-08	20190104-DGW-MW3-PV15mid-30T	04 Jan 2019 09:00		15 Jan 2019 09:00	18 Jan 2019 15:23	10
HS19010553-08	20190104-DGW-MW3-PV15mid-30T	04 Jan 2019 09:00		15 Jan 2019 09:00	17 Jan 2019 17:06	1
HS19010553-09	20190104-DGW-MW3-PV15mid-35T	04 Jan 2019 09:00		15 Jan 2019 09:00	17 Jan 2019 17:08	1
HS19010553-10	20190104-DGW-MW3-PV15mid-40T	04 Jan 2019 09:00		15 Jan 2019 09:00	17 Jan 2019 17:10	1
Batch ID R331360	**Test Name :** HARDNESS, TOTAL AS CACO3 BY SM2340B			**Matrix:** Groundwater		
HS19010553-01	20190103-DGW-MW3-PV15out-ControlT	03 Jan 2019 09:00			19 Jan 2019 15:58	1
HS19010553-02	20190103-DGW-MW3-PV15out-30T	03 Jan 2019 09:00			19 Jan 2019 15:58	1
HS19010553-03	20190103-DGW-MW3-PV15out-35T	03 Jan 2019 09:00			19 Jan 2019 15:58	1
HS19010553-04	20190103-DGW-MW3-PV15out-40T	03 Jan 2019 09:00			19 Jan 2019 15:58	1
HS19010553-05	20190104-DGW-MW3-PV15inlet-ControlT	04 Jan 2019 09:00			19 Jan 2019 15:58	1
HS19010553-06	20190104-DGW-MW3-PV15inlet-30-35-40T	04 Jan 2019 09:00			19 Jan 2019 15:58	1
HS19010553-07	20190104-DGW-MW3-PV15mid-ControlT	04 Jan 2019 09:00			19 Jan 2019 15:58	1
HS19010553-08	20190104-DGW-MW3-PV15mid-30T	04 Jan 2019 09:00			19 Jan 2019 15:58	1
HS19010553-09	20190104-DGW-MW3-PV15mid-35T	04 Jan 2019 09:00			19 Jan 2019 15:58	1
HS19010553-10	20190104-DGW-MW3-PV15mid-40T	04 Jan 2019 09:00			19 Jan 2019 15:58	1

WorkOrder: HS19010553
InstrumentID: ICPMS04
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000521	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000340	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000553	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0523	0.0340	0.500
A	Iron	7439-89-6	0.0250	0.0205	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000916	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0700	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0418	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00274	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0556	0.0140	0.200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010553

QC BATCH REPORT

Batch ID: 136658 **Instrument: ICPMS04** **Method: SW6020**

MBLK Sample ID: **MBLK-136658** Units: **mg/L** Analysis Date: **17-Jan-2019 15:50**
Client ID: Run ID: **ICPMS04_331185** SeqNo: **4912979** PrepDate: **15-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01146	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	U	0.200								

LCS Sample ID: **LCS-136658** Units: **mg/L** Analysis Date: **17-Jan-2019 15:52**
Client ID: Run ID: **ICPMS04_331185** SeqNo: **4912980** PrepDate: **15-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05503	0.00200	0.05	0	110	80 - 120				
Arsenic	0.05102	0.00200	0.05	0	102	80 - 120				
Cadmium	0.0504	0.00200	0.05	0	101	80 - 120				
Calcium	5.108	0.500	5	0	102	80 - 120				
Iron	5.205	0.200	5	0	104	80 - 120				
Lead	0.05017	0.00200	0.05	0	100	80 - 120				
Magnesium	5.627	0.200	5	0	113	80 - 120				
Potassium	5.184	0.200	5	0	104	80 - 120				
Selenium	0.05326	0.00200	0.05	0	107	80 - 120				
Sodium	5.293	0.200	5	0	106	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010553

QC BATCH REPORT

Batch ID: 136658 **Instrument: ICPMS04** **Method: SW6020**

MS Sample ID: **HS19010551-01MS** Units: **mg/L** Analysis Date: **17-Jan-2019 15:59**
Client ID: Run ID: **ICPMS04_331185** SeqNo: **4912983** PrepDate: **15-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05143	0.00200	0.05	0.00055	102	80 - 120				
Arsenic	0.05043	0.00200	0.05	0.002097	96.7	80 - 120				
Cadmium	0.04834	0.00200	0.05	0.000113	96.4	80 - 120				
Calcium	112.8	0.500	5	107.1	115	80 - 120				O
Iron	4.852	0.200	5	0.1145	94.7	80 - 120				
Lead	0.048	0.00200	0.05	0.00017	95.6	80 - 120				
Magnesium	24.82	0.200	5	21.18	72.8	80 - 120				SO
Potassium	6.833	0.200	5	2.113	94.4	80 - 120				
Selenium	0.05086	0.00200	0.05	0.000579	101	80 - 120				
Sodium	189.2	0.200	5	193.1	-77.0	80 - 120				SEO

MSD Sample ID: **HS19010551-01MSD** Units: **mg/L** Analysis Date: **17-Jan-2019 16:01**
Client ID: Run ID: **ICPMS04_331185** SeqNo: **4912984** PrepDate: **15-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05268	0.00200	0.05	0.00055	104	80 - 120	0.05143	2.41	20	
Arsenic	0.04917	0.00200	0.05	0.002097	94.2	80 - 120	0.05043	2.52	20	
Cadmium	0.04967	0.00200	0.05	0.000113	99.1	80 - 120	0.04834	2.73	20	
Calcium	110.1	0.500	5	107.1	59.6	80 - 120	112.8	2.51	20	SO
Iron	5.148	0.200	5	0.1145	101	80 - 120	4.852	5.93	20	
Lead	0.04836	0.00200	0.05	0.00017	96.4	80 - 120	0.048	0.747	20	
Magnesium	25.27	0.200	5	21.18	81.8	80 - 120	24.82	1.79	20	O
Potassium	6.741	0.200	5	2.113	92.6	80 - 120	6.833	1.35	20	
Selenium	0.0478	0.00200	0.05	0.000579	94.4	80 - 120	0.05086	6.2	20	
Sodium	199	0.200	5	193.1	118	80 - 120	189.2	5.02	20	EO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010553

QC BATCH REPORT

Batch ID: 136658 **Instrument: ICPMS04** **Method: SW6020**

PDS Sample ID: **HS19010551-01PDS** Units: **mg/L** Analysis Date: **17-Jan-2019 16:04**
Client ID: Run ID: **ICPMS04_331185** SeqNo: **4912985** PrepDate: **15-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1224	0.00200	0.1	0.00055	122	75 - 125				
Arsenic	0.125	0.00200	0.1	0.002097	123	75 - 125				
Calcium	118	0.500	10	107.1	109	75 - 125				O
Iron	12.59	0.200	10	0.1145	125	75 - 125				
Magnesium	32.97	0.200	10	21.18	118	75 - 125				
Potassium	13.97	0.200	10	2.113	119	75 - 125				

PDS Sample ID: **HS19010551-01PDS** Units: **mg/L** Analysis Date: **18-Jan-2019 14:36**
Client ID: Run ID: **ICPMS04_331292** SeqNo: **4914970** PrepDate: **15-Jan-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	316.6	2.00	100	207.4	109	75 - 125				

SD Sample ID: **HS19010551-01SD** Units: **mg/L** Analysis Date: **17-Jan-2019 15:57**
Client ID: Run ID: **ICPMS04_331185** SeqNo: **4912982** PrepDate: **15-Jan-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.00055	0	10	
Arsenic	U	0.0100					0.002097	0	10	
Cadmium	U	0.0100					0.000113	0	10	
Calcium	110	2.50					107.1	2.72	10	
Iron	0.3196	1.00					0.1145	0	10	J
Lead	U	0.0100					0.00017	0	10	
Magnesium	22.56	1.00					21.18	6.55	10	
Potassium	2.213	1.00					2.113	4.71	10	
Selenium	U	0.0100					0.000579	0	10	

SD Sample ID: **HS19010551-01SD** Units: **mg/L** Analysis Date: **18-Jan-2019 14:13**
Client ID: Run ID: **ICPMS04_331292** SeqNo: **4914693** PrepDate: **15-Jan-2019** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Sodium	211.6	10.0					207.4	2.03	10	

The following samples were analyzed in this batch:

HS19010553-01	HS19010553-02	HS19010553-03	HS19010553-04
HS19010553-05	HS19010553-06	HS19010553-07	HS19010553-08
HS19010553-09	HS19010553-10		

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19010553**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19010553

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19010553-01	20190103-DGW-MW3-PV15out-ControlT	Login	1/14/2019 12:00:00 PM	JRM	MET042
HS19010553-02	20190103-DGW-MW3-PV15out-30T	Login	1/14/2019 12:00:00 PM	JRM	MET042
HS19010553-03	20190103-DGW-MW3-PV15out-35T	Login	1/14/2019 12:00:00 PM	JRM	MET042
HS19010553-04	20190103-DGW-MW3-PV15out-40T	Login	1/14/2019 12:00:00 PM	JRM	MET042
HS19010553-05	20190104-DGW-MW3-PV15inlet-ControlT	Login	1/14/2019 12:00:00 PM	JRM	MET042
HS19010553-06	20190104-DGW-MW3-PV15inlet-30-35-40T	Login	1/14/2019 12:00:00 PM	JRM	MET042
HS19010553-07	20190104-DGW-MW3-PV15mid-ControlT	Login	1/14/2019 12:00:00 PM	JRM	MET042
HS19010553-08	20190104-DGW-MW3-PV15mid-30T	Login	1/14/2019 12:00:00 PM	JRM	MET042
HS19010553-09	20190104-DGW-MW3-PV15mid-35T	Login	1/14/2019 12:00:00 PM	JRM	MET042
HS19010553-10	20190104-DGW-MW3-PV15mid-40T	Login	1/14/2019 12:00:00 PM	JRM	MET042

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19010553

Date/Time Received: **12-Jan-2019 09:35**
Received by: **JRM**

Checklist completed by: *Jared R. Makan* eSignature 14-Jan-2019 Date

Reviewed by: *Dane J. Wacasey* eSignature 17-Jan-2019 Date

Matrices: **Water**

Carrier name: **FedEx International Priority**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	13.6c/13.9c UC/C	IR25	
Cooler(s)/Kit(s):	43811		
Date/Time sample(s) sent to storage:	01/12/2019 15:00		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070

Chain of Custody Form

Page ____ of ____

COC ID: 194445

HS19010553

Golder Associates
Exide Column Studies

Customer Information		Project Information		ALS Project Manager:
Purchase Order	130-2086-06	Project Name	Exide Column Studies	
Work Order		Project Number	130-2086	
Company Name	Golder Associates	Bill To Company	Golder Associates	
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P	
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive. Suit	
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021	
Phone	(314) 984-8800	Phone	(314) 984-8800	
Fax		Fax		
e-Mail Address	Emily_White@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com	

A: 300_W (300 Cl, SO4, [*NO3* *48hr HT*])
B: TDS_W 2540C (2540C TDS)
C: ALK_W 2320B (2320B Alkalinity)
D: HARD (2340B Hardness (calc))
E: ICP_TW (6020A Total Metals (6)+Cations)
F: ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
G:
H:
I:
J:

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190103-DGW-MW3-PVISout-control T	2019/01/03	9:00	GW	2	1				X	X						
2	20190103-DGW-MW3-PVISout-30T	"	"	"	2	1				X	X						
3	20190103-DGW-MW3-PVISout-35T	"	"	"	2	1				X	X						
4	20190103-DGW-MW3-PVISout-40T	"	"	"	2	1				X	X						
5	20190104-DGW-MW3-PVISinlet-control T	2019/01/04	9:00	"	2	1				X	X						
6	20190104-DGW-MW3-PVISinlet-30-35-40T	"	"	"	2	1				X	X						
7	20190104-DGW-MW3-PVISmid-control T	2019/01/04	9:00	"	2	1				X	X						
8	20190104-DGW-MW3-PVISmid-30T	"	"	"	2	1				X	X						
9	20190104-DGW-MW3-PVISmid-35T	"	"	"	2	1				X	X						
10	20190104-DGW-MW3-PVISmid-40T	"	"	"	2	1				X	X						

Sampler(s) Please Print & Sign: Bethna Eude

Shipment Method:

Required Turnaround Time: (Check Box) ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other ____

Results Due Date:

Relinquished by: [signature] Date: 2019/01/11 Time: 3:00 pm Received by:

Relinquished by: Date: 01/12/19 Time: 09:35 Received by (Laboratory): [signature]

Logged by (Laboratory): Date: Time: Checked by (Laboratory):

Notes: Exide Column Studies

Cooler ID	Cooler Temp.
43811	13.6
	11.25
	60.3

QC Package: (Check One Box Below)
☐ Level II Std QC
☐ Level III Std QC/Raw Data
☐ Level IV SW846/CLP
☐ Other
☒ TRRP Checklist
☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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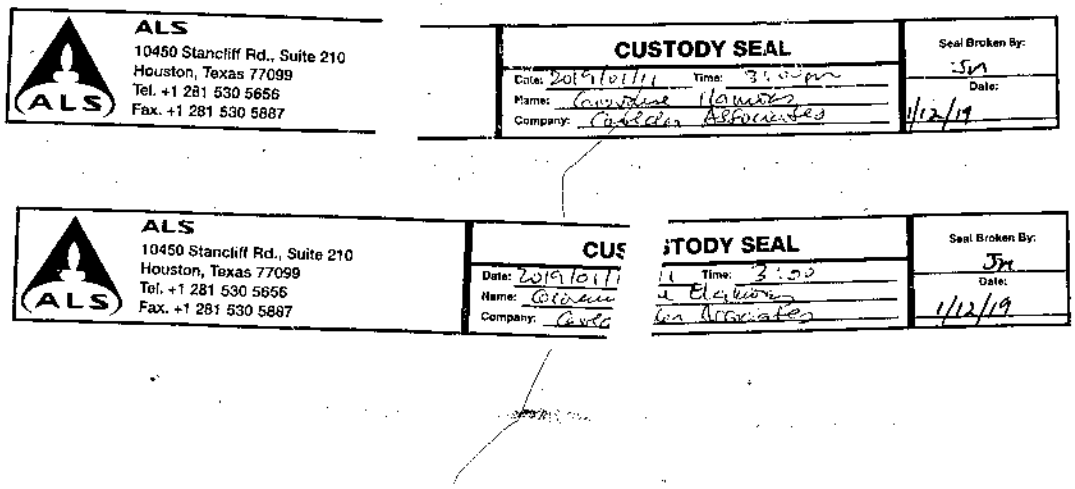
ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CUSTODY SEAL
Date: 2019/01/11
Time: 3:00pm
Name: Caroline Hamon
Company: Caddell Associates
Seal Broken By:
JM
Date:
1/12/19
ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CUS
Date: 2019/01/11
Name: Caroline
Company: Cadd
STODY SEAL
Time: 3:00
Elevation
Associates
Seal Broken By:
JM
Date:
1/12/19

ORIGIN ID:YUXA (514) 383-0990
AUDREY ETHEVES
GOLDER ASSOCIATES LTD
7250 RUE DU MILE END
3E ETAGE
MONTREAL, PQ H2R3A4
CANADA CA

SHIP DATE: 11JAN19
ACTWGT: 22.60 LB
CAD: 108680724/INET4042

BILL RECIPIENT

TO **DANE WACASEY**
ALS HOUSTON LABORATORY
10450 STANCLIFF RD
STE 210
HOUSTON TX 77099 **(US)**
(281) 530-5656 REF:
INV:
PO: DEPT:

552J2/D74C/DCA5

FedEx Express

E

TRK# 0430 **7741 7166 8422**

SATURDAY 12:00P
INTL PRIORITY

X0 SGRA

77099
TX-US IAH

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1. Pliez la page imprimée le long de la ligne horizontale.
2. Placez l'étiquette dans la pochette d'expédition et fixez-la à votre paquet.

ORIGIN ID:YUXA (514) 383-0990
Audrey Etheves
Golder Associates Ltd
7250 rue du Mile End
3e etage
MONTREAL, PQ H2R3A4
CANADA, CA

Ship Date: 11JAN19
ActWgt: 22.60 LB
CAD: 108680724/INET4042

BILL RECIPIENT
EIN/VAT:

TO Dane Wacasey
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

(281) 530-5656

FedEx Express

(US)

J18211803152Duv

AWB

X0 SGRA

PKG:YOUR PKG

TRK# 7741 7166 8422

Form 0430

SATURDAY 12:00P
INTL PRIORITY

REF:
DESC1:Bouteille d'eau
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: Audrey Etheves
T/C: R 967554812
D/T: R 967554812

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MONTREAL, PQ H2R3A4
CANADA CA

SHIP DATE: 11JAN19
ACTWGT: 22.60 LB
CAD: 108680724/INET4042

BILL RECIPIENT

TO **DANE WACASEY**
ALS HOUSTON LABORATORY
10450 STANCLIFF RD
STE 210
HOUSTON TX 77099 **(US)**
(281) 530-5656 REF:
INV:
PO: DEPT:

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TRK# 0430 **7741 7166 8422**

SATURDAY 12:00P
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2. Placez l'étiquette dans la pochette d'expédition et fixez-la à votre paquet.

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

January 21, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19010554**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 10 sample(s) on Jan 12, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19010554**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS19010554**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 01/21/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19010554				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 136657				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?			X		
		Were analytical duplicates analyzed at the appropriate frequency?			X		
		Were RPDs or relative standard deviations within the laboratory QC limits?			X		
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 01/21/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19010554				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 136657				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			2
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		X			3
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports		
Laboratory Name: ALS Laboratory Group		LRC Date: 01/21/2019
Project Name: Exide Column Studies		Laboratory Job Number: HS19010554
Reviewer Name: Dane Wacasey		Prep Batch Number(s): 136657
ER#[5]	**Description**	
1	Batch 136657, Metals Method SW6020, sample HS19010552-01, MS and MSD were performed on unrelated sample.	
2	See Run Log and CCB Exceptions Report.	
3	Batch 136657, Metals Method SW6020, sample HS19010552-01,, PDS was performed on unrelated sample.	

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010554
Start Date: 17-Jan-2019 End Date: 18-Jan-2019

Run ID:ICPMS05_331226
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	17-Jan-2019 14:36	016_ICV.d	AS CA CD FE K MG PB SB SE
LLICV2	1	17-Jan-2019 14:38	017SMPL.d	AS CA CD FE K MG PB SB SE
LLICV5	1	17-Jan-2019 14:40	018LICV.d	AS CA CD FE K MG PB SB SE
ICB	1	17-Jan-2019 14:42	019_ICB.d	AS CA CD FE K MG PB SB SE
LLICV2	1	17-Jan-2019 14:50	021SMPL.d	AS CA CD FE K MG PB SB SE
ICSA	1	17-Jan-2019 14:55	023ICSA.d	AS CA CD FE K MG PB SB SE
ICSAB	1	17-Jan-2019 14:57	024ICSB.d	AS CA CD FE K MG PB SB SE
CCV 1	1	17-Jan-2019 15:17	033_CCV.d	AS CA CD FE K MG PB SB SE
CCB 1	1	17-Jan-2019 15:19	034_CCB.d	AS CA CD FE K MG PB SB SE
CCV 2	1	17-Jan-2019 15:43	045_CCV.d	AS CA CD FE K MG PB SB SE
CCB 2	1	17-Jan-2019 15:45	046_CCB.d	AS CA CD FE K MG PB SB SE
CCV 3	1	17-Jan-2019 16:07	057_CCV.d	AS CA CD FE K MG PB SB SE
CCB 3	1	17-Jan-2019 16:09	058_CCB.d	AS CA CD FE K MG PB SB SE
CCV 4	1	17-Jan-2019 16:30	069_CCV.d	AS CA CD FE K MG PB SB SE
CCB 4	1	17-Jan-2019 16:32	070_CCB.d	AS CA CD FE K MG PB SB SE
ICCV 5	1	17-Jan-2019 17:25	086_ICV.d	AS CA CD FE K MG PB SB SE
LLCCV5	1	17-Jan-2019 17:27	087LICV.d	AS CA CD FE K MG PB SB SE
LLCCV2	1	17-Jan-2019 17:29	088SMPL.d	AS CA CD FE K MG PB SB SE
ICCB 5	1	17-Jan-2019 17:31	089_ICB.d	AS CA CD FE K MG PB SB SE
MBLK-136657	1	17-Jan-2019 17:35	091SMPL.d	AS CA CD FE K MG NA PB SB SE
LCS-136657	1	17-Jan-2019 17:37	092SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZSD	5	17-Jan-2019 17:41	094SMPL.d	AS CA CD FE K MG PB SB SE
ZZZZZZMS	1	17-Jan-2019 17:43	095SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZMSD	1	17-Jan-2019 17:45	096SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZPDS	1	17-Jan-2019 17:47	097SMPL.d	AS CA CD FE K MG PB SB SE
CCV 6	1	17-Jan-2019 17:49	098_CCV.d	AS CA CD FE K MG PB SB SE
CCB 6	1	17-Jan-2019 17:51	099_CCB.d	AS CA CD FE K MG PB SB SE
20190103-DGW-MW3-PV15out-ControlD	1	17-Jan-2019 18:11	109SMPL.d	AS CA CD FE K MG PB SB SE
CCV 7	1	17-Jan-2019 18:13	110_CCV.d	AS CA CD FE K MG PB SB SE
CCB 7	1	17-Jan-2019 18:15	111_CCB.d	AS CA CD FE K MG PB SB SE
20190103-DGW-MW3-PV15out-30D	1	17-Jan-2019 18:17	112SMPL.d	AS CA CD FE K MG PB SB SE
20190103-DGW-MW3-PV15out-35D	1	17-Jan-2019 18:19	113SMPL.d	AS CA CD FE K MG PB SB SE
20190103-DGW-MW3-PV15out-40D	1	17-Jan-2019 18:30	115SMPL.d	AS CA CD FE K MG PB SB SE
20190104-DGW-MW3-PV15inlet-ControlD	1	17-Jan-2019 18:32	116SMPL.d	AS CA CD FE K MG PB SB SE
20190104-DGW-MW3-PV15inlet-30-35-40D	1	17-Jan-2019 18:34	117SMPL.d	AS CA CD FE K MG PB SB SE
20190104-DGW-MW3-PV15mid-ControlD	1	17-Jan-2019 18:36	118SMPL.d	AS CA CD FE K MG PB SB SE
20190104-DGW-MW3-PV15mid-30D	1	17-Jan-2019 18:38	119SMPL.d	AS CA CD FE K MG PB SB SE
20190104-DGW-MW3-PV15mid-35D	1	17-Jan-2019 18:40	120SMPL.d	AS CA CD FE K MG PB SB SE
20190104-DGW-MW3-PV15mid-40D	1	17-Jan-2019 18:42	121SMPL.d	AS CA CD FE K MG PB SB SE
CCV 8	1	17-Jan-2019 18:44	122_CCV.d	AS CA CD FE K MG PB SB SE
CCB 8	1	17-Jan-2019 18:46	123_CCB.d	AS CA CD FE K MG PB SB SE
CCV 9	1	17-Jan-2019 19:35	127_CCV.d	AS CA CD FE K MG PB SB SE
CCB 9	1	17-Jan-2019 19:37	128_CCB.d	AS CA CD FE K MG PB SB SE
CCV 10	1	17-Jan-2019 19:49	134_CCV.d	AS CA CD FE K MG PB SB SE
CCB 10	1	17-Jan-2019 19:51	135_CCB.d	AS CA CD FE K MG PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010554

Run ID:ICPMS05_331226
Instrument:ICPMS05
Method:SW6020

CCB 1	Date: 17-Jan-2019 15:19	Seq: 4913166		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	23.9	14	200	
CCB 2	Date: 17-Jan-2019 15:45	Seq: 4913178		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Potassium	18.11	18	200	
CCB 4	Date: 17-Jan-2019 16:32	Seq: 4913202		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	21.06	14	200	
CCB 6	Date: 17-Jan-2019 17:51	Seq: 4913321		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.562	0.4	2	
	Sodium	62.85	14	200	
CCB 7	Date: 17-Jan-2019 18:15	Seq: 4913333		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.28	0.4	2	
	Sodium	139.2	14	200	
CCB 8	Date: 17-Jan-2019 18:46	Seq: 4913379		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.165	0.4	2	
	Sodium	161.7	14	200	
CCB 9	Date: 17-Jan-2019 19:37	Seq: 4913469		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.09	0.4	2	
	Sodium	43.07	14	200	
CCB 10	Date: 17-Jan-2019 19:51	Seq: 4913476		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.185	0.4	2	
	Sodium	30.5	14	200	
CCB 11	Date: 17-Jan-2019 20:11	Seq: 4913501		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.05	0.4	2	
	Sodium	73.53	14	200	
CCB 12	Date: 17-Jan-2019 20:27	Seq: 4913509		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.213	0.4	2	
	Sodium	71.63	14	200	
ICCB 13	Date: 17-Jan-2019 20:55	Seq: 4913525		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	-17.5	14	200	
CCB 14	Date: 17-Jan-2019 21:09	Seq: 4913544		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.406	0.4	2	
	Potassium	32.06	18	200	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010554
Start Date: 18-Jan-2019 End Date: 19-Jan-2019

Run ID:ICPMS05_331295
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
LLICV5	1	18-Jan-2019 12:07	018LICV.d	NA
ICB	1	18-Jan-2019 12:09	019_ICB.d	NA
ICV	1	18-Jan-2019 12:11	020_ICV.d	NA
ICSA	1	18-Jan-2019 12:14	021ICSA.d	NA
ICSAB	1	18-Jan-2019 12:16	022ICSB.d	NA
LLICV2	1	18-Jan-2019 12:27	024SMPL.d	NA
CCB 1	1	18-Jan-2019 12:55	037_CCB.d	NA
CCV 1	1	18-Jan-2019 13:04	039_CCV.d	NA
CCV 2	1	18-Jan-2019 13:20	046_CCV.d	NA
CCB 2	1	18-Jan-2019 13:22	047_CCB.d	NA
ICCV 3	1	18-Jan-2019 14:05	065_ICV.d	NA
LLCCV2	1	18-Jan-2019 14:09	067SMPL.d	NA
ICCB 3	1	18-Jan-2019 14:11	068_ICB.d	NA
LLCCV5	1	18-Jan-2019 14:25	070LICV.d	NA
CCV 4	1	18-Jan-2019 15:08	084_CCV.d	NA
CCB 4	1	18-Jan-2019 15:10	085_CCB.d	NA
ICCV 5	1	18-Jan-2019 15:50	102_ICV.d	NA
LLCCV5	1	18-Jan-2019 15:52	103LICV.d	NA
LLCCV2	1	18-Jan-2019 15:54	104SMPL.d	NA
ICCB 5	1	18-Jan-2019 15:55	105_ICB.d	NA
CCV 6	1	18-Jan-2019 16:58	115_CCV.d	NA
CCB 6	1	18-Jan-2019 17:00	116_CCB.d	NA
CCB 7	1	18-Jan-2019 17:23	127_CCB.d	NA
CCV 7	1	18-Jan-2019 17:31	129_CCV.d	NA
ZZZZZZSD	100	18-Jan-2019 17:39	132SMPL.d	NA
ZZZZZZPDS	20	18-Jan-2019 17:41	133SMPL.d	NA
CCV 8	1	18-Jan-2019 17:53	139_CCV.d	NA
CCB 8	1	18-Jan-2019 17:55	140_CCB.d	NA
20190103-DGW-MW3-PV15out-ControlD	20	18-Jan-2019 18:05	145SMPL.d	NA
20190103-DGW-MW3-PV15out-30D	20	18-Jan-2019 18:07	146SMPL.d	NA
20190103-DGW-MW3-PV15out-35D	20	18-Jan-2019 18:09	147SMPL.d	NA
20190103-DGW-MW3-PV15out-40D	20	18-Jan-2019 18:11	148SMPL.d	NA
20190104-DGW-MW3-PV15inlet-ControlD	20	18-Jan-2019 18:13	149SMPL.d	NA
20190104-DGW-MW3-PV15inlet-30-35-40D	20	18-Jan-2019 18:15	150SMPL.d	NA
CCV 9	1	18-Jan-2019 18:17	151_CCV.d	NA
CCB 9	1	18-Jan-2019 18:19	152_CCB.d	NA
20190104-DGW-MW3-PV15mid-ControlD	20	18-Jan-2019 18:21	153SMPL.d	NA
20190104-DGW-MW3-PV15mid-30D	20	18-Jan-2019 18:23	154SMPL.d	NA
20190104-DGW-MW3-PV15mid-35D	20	18-Jan-2019 18:25	155SMPL.d	NA
20190104-DGW-MW3-PV15mid-40D	20	18-Jan-2019 18:27	156SMPL.d	NA
CCV 10	1	18-Jan-2019 18:41	163_CCV.d	NA
CCB 10	1	18-Jan-2019 18:43	164_CCB.d	NA
CCV 11	1	18-Jan-2019 18:49	167_CCV.d	NA
CCB 11	1	18-Jan-2019 18:51	168_CCB.d	NA
CCV 12	1	18-Jan-2019 19:04	175_CCV.d	NA

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010554

Run ID:ICPMS05_331295
Instrument:ICPMS05
Method:SW6020

CCB 1	Date: 18-Jan-2019 12:55	Seq: 4914405		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		676.2	14	200	
CCB 2	Date: 18-Jan-2019 13:22	Seq: 4914629		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		149.5	14	200	
ICCB 3	Date: 18-Jan-2019 14:11	Seq: 4914661		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		-20.21	14	200	
CCB 4	Date: 18-Jan-2019 15:10	Seq: 4914820		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		321.5	14	200	
ICCB 5	Date: 18-Jan-2019 15:55	Seq: 4915034		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		-70.61	14	200	
CCB 6	Date: 18-Jan-2019 17:00	Seq: 4915238		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		23.34	14	200	
CCB 7	Date: 18-Jan-2019 17:23	Seq: 4915249		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		42.5	14	200	
CCB 8	Date: 18-Jan-2019 17:55	Seq: 4915432		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		-35.92	14	200	
CCB 9	Date: 18-Jan-2019 18:19	Seq: 4915444		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		-53.89	14	200	
CCB 10	Date: 18-Jan-2019 18:43	Seq: 4915456		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		-42.95	14	200	
CCB 11	Date: 18-Jan-2019 18:51	Seq: 4915460		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		-60.77	14	200	
CCB 12	Date: 18-Jan-2019 19:06	Seq: 4915468		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		-25.36	14	200	
CCB 13	Date: 18-Jan-2019 19:22	Seq: 4915476		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		-36.44	14	200	
ICCB 14	Date: 18-Jan-2019 19:50	Seq: 4915490		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		-20.46	14	200	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19010554

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19010554-01	20190103-DGW-MW3-PV15out-ControlD	Groundwater		03-Jan-2019 09:00	12-Jan-2019 09:35	☐
HS19010554-02	20190103-DGW-MW3-PV15out-30D	Groundwater		03-Jan-2019 09:00	12-Jan-2019 09:35	☐
HS19010554-03	20190103-DGW-MW3-PV15out-35D	Groundwater		03-Jan-2019 09:00	12-Jan-2019 09:35	☐
HS19010554-04	20190103-DGW-MW3-PV15out-40D	Groundwater		03-Jan-2019 09:00	12-Jan-2019 09:35	☐
HS19010554-05	20190104-DGW-MW3-PV15inlet-ControlD	Groundwater		04-Jan-2019 09:00	12-Jan-2019 09:35	☐
HS19010554-06	20190104-DGW-MW3-PV15inlet-30-35-40D	Groundwater		04-Jan-2019 09:00	12-Jan-2019 09:35	☐
HS19010554-07	20190104-DGW-MW3-PV15mid-ControlD	Groundwater		04-Jan-2019 09:00	12-Jan-2019 09:35	☐
HS19010554-08	20190104-DGW-MW3-PV15mid-30D	Groundwater		04-Jan-2019 09:00	12-Jan-2019 09:35	☐
HS19010554-09	20190104-DGW-MW3-PV15mid-35D	Groundwater		04-Jan-2019 09:00	12-Jan-2019 09:35	☐
HS19010554-10	20190104-DGW-MW3-PV15mid-40D	Groundwater		04-Jan-2019 09:00	12-Jan-2019 09:35	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190103-DGW-MW3-PV15out-ControlD
Collection Date: 03-Jan-2019 09:00

ANALYTICAL REPORT
WorkOrder:HS19010554
Lab ID:HS19010554-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Jan-2019		Analyst: ALR
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 18:11
Arsenic	**0.00123**	J	**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 18:11
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 18:11
Calcium	**117**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 18:11
Iron	U		0.0120	0.200	mg/L	1	17-Jan-2019 18:11
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 18:11
Magnesium	**21.6**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 18:11
Potassium	**2.10**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 18:11
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 18:11
Sodium	**193**		**0.280**	**4.00**	**mg/L**	20	18-Jan-2019 18:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190103-DGW-MW3-PV15out-30D
Collection Date: 03-Jan-2019 09:00

ANALYTICAL REPORT
WorkOrder:HS19010554
Lab ID:HS19010554-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Jan-2019		Analyst: ALR
Antimony	**0.000418**	J	**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 18:17
Arsenic	U		0.000400	0.00200	mg/L	1	17-Jan-2019 18:17
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 18:17
Calcium	**8.38**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 18:17
Iron	U		0.0120	0.200	mg/L	1	17-Jan-2019 18:17
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 18:17
Magnesium	**14.6**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 18:17
Potassium	**1.99**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 18:17
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 18:17
Sodium	**173**		**0.280**	**4.00**	**mg/L**	20	18-Jan-2019 18:07

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190103-DGW-MW3-PV15out-35D
Collection Date: 03-Jan-2019 09:00

ANALYTICAL REPORT
WorkOrder:HS19010554
Lab ID:HS19010554-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Jan-2019		Analyst: ALR
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 18:19
Arsenic	U		0.000400	0.00200	mg/L	1	17-Jan-2019 18:19
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 18:19
Calcium	**7.05**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 18:19
Iron	U		0.0120	0.200	mg/L	1	17-Jan-2019 18:19
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 18:19
Magnesium	**11.6**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 18:19
Potassium	**1.92**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 18:19
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 18:19
Sodium	**189**		**0.280**	**4.00**	**mg/L**	20	18-Jan-2019 18:09

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190103-DGW-MW3-PV15out-40D
Collection Date: 03-Jan-2019 09:00

ANALYTICAL REPORT
WorkOrder:HS19010554
Lab ID:HS19010554-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Jan-2019		Analyst: ALR
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 18:30
Arsenic	U		0.000400	0.00200	mg/L	1	17-Jan-2019 18:30
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 18:30
Calcium	**7.87**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 18:30
Iron	U		0.0120	0.200	mg/L	1	17-Jan-2019 18:30
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 18:30
Magnesium	**12.4**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 18:30
Potassium	**1.95**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 18:30
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 18:30
Sodium	**180**		**0.280**	**4.00**	**mg/L**	20	18-Jan-2019 18:11

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190104-DGW-MW3-PV15inlet-ControlD
Collection Date: 04-Jan-2019 09:00

ANALYTICAL REPORT
WorkOrder:HS19010554
Lab ID:HS19010554-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Jan-2019		Analyst: ALR
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 18:32
Arsenic	**0.00873**		**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 18:32
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 18:32
Calcium	**111**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 18:32
Iron	**0.0228**	J	**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 18:32
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 18:32
Magnesium	**20.5**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 18:32
Potassium	**2.78**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 18:32
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 18:32
Sodium	**188**		**0.280**	**4.00**	**mg/L**	20	18-Jan-2019 18:13

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190104-DGW-MW3-PV15inlet-30-35-40D
Collection Date: 04-Jan-2019 09:00

ANALYTICAL REPORT
WorkOrder:HS19010554
Lab ID:HS19010554-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Jan-2019		Analyst: ALR
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 18:34
Arsenic	**0.0142**		**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 18:34
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 18:34
Calcium	**108**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 18:34
Iron	**0.0209**	J	**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 18:34
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 18:34
Magnesium	**19.6**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 18:34
Potassium	**2.22**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 18:34
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 18:34
Sodium	**193**		**0.280**	**4.00**	**mg/L**	20	18-Jan-2019 18:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190104-DGW-MW3-PV15mid-ControlD
Collection Date: 04-Jan-2019 09:00

ANALYTICAL REPORT
WorkOrder:HS19010554
Lab ID:HS19010554-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Jan-2019		Analyst: ALR
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 18:36
Arsenic	**0.00372**		**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 18:36
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 18:36
Calcium	**117**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 18:36
Iron	**0.0141**	J	**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 18:36
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 18:36
Magnesium	**21.8**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 18:36
Potassium	**2.16**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 18:36
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 18:36
Sodium	**205**		**0.280**	**4.00**	**mg/L**	20	18-Jan-2019 18:21

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190104-DGW-MW3-PV15mid-30D
Collection Date: 04-Jan-2019 09:00

ANALYTICAL REPORT
WorkOrder:HS19010554
Lab ID:HS19010554-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Jan-2019		Analyst: ALR
Antimony	**0.00106**	J	**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 18:38
Arsenic	U		0.000400	0.00200	mg/L	1	17-Jan-2019 18:38
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 18:38
Calcium	**13.5**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 18:38
Iron	U		0.0120	0.200	mg/L	1	17-Jan-2019 18:38
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 18:38
Magnesium	**18.1**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 18:38
Potassium	**2.24**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 18:38
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 18:38
Sodium	**209**		**0.280**	**4.00**	**mg/L**	20	18-Jan-2019 18:23

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190104-DGW-MW3-PV15mid-35D
Collection Date: 04-Jan-2019 09:00

ANALYTICAL REPORT
WorkOrder:HS19010554
Lab ID:HS19010554-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Jan-2019		Analyst: ALR
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 18:40
Arsenic	U		0.000400	0.00200	mg/L	1	17-Jan-2019 18:40
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 18:40
Calcium	**11.8**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 18:40
Iron	U		0.0120	0.200	mg/L	1	17-Jan-2019 18:40
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 18:40
Magnesium	**15.9**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 18:40
Potassium	**2.01**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 18:40
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 18:40
Sodium	**175**		**0.280**	**4.00**	**mg/L**	20	18-Jan-2019 18:25

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190104-DGW-MW3-PV15mid-40D
Collection Date: 04-Jan-2019 09:00

ANALYTICAL REPORT
WorkOrder:HS19010554
Lab ID:HS19010554-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Jan-2019		Analyst: ALR
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 18:42
Arsenic	U		0.000400	0.00200	mg/L	1	17-Jan-2019 18:42
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 18:42
Calcium	**11.2**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 18:42
Iron	U		0.0120	0.200	mg/L	1	17-Jan-2019 18:42
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 18:42
Magnesium	**15.8**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 18:42
Potassium	**2.01**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 18:42
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 18:42
Sodium	**198**		**0.280**	**4.00**	**mg/L**	20	18-Jan-2019 18:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010554

Batch ID: 136657 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19010554-01	1	10	10 (mL)	1
HS19010554-02	1	10	10 (mL)	1
HS19010554-03	1	10	10 (mL)	1
HS19010554-04	1	10	10 (mL)	1
HS19010554-05	1	10	10 (mL)	1
HS19010554-06	1	10	10 (mL)	1
HS19010554-07	1	10	10 (mL)	1
HS19010554-08	1	10	10 (mL)	1
HS19010554-09	1	10	10 (mL)	1
HS19010554-10	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010554

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 136657	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS19010554-01	20190103-DGW-MW3-PV15out-ControlD	03 Jan 2019 09:00		15 Jan 2019 09:00	18 Jan 2019 18:05	20
HS19010554-01	20190103-DGW-MW3-PV15out-ControlD	03 Jan 2019 09:00		15 Jan 2019 09:00	17 Jan 2019 18:11	1
HS19010554-02	20190103-DGW-MW3-PV15out-30D	03 Jan 2019 09:00		15 Jan 2019 09:00	18 Jan 2019 18:07	20
HS19010554-02	20190103-DGW-MW3-PV15out-30D	03 Jan 2019 09:00		15 Jan 2019 09:00	17 Jan 2019 18:17	1
HS19010554-03	20190103-DGW-MW3-PV15out-35D	03 Jan 2019 09:00		15 Jan 2019 09:00	18 Jan 2019 18:09	20
HS19010554-03	20190103-DGW-MW3-PV15out-35D	03 Jan 2019 09:00		15 Jan 2019 09:00	17 Jan 2019 18:19	1
HS19010554-04	20190103-DGW-MW3-PV15out-40D	03 Jan 2019 09:00		15 Jan 2019 09:00	18 Jan 2019 18:11	20
HS19010554-04	20190103-DGW-MW3-PV15out-40D	03 Jan 2019 09:00		15 Jan 2019 09:00	17 Jan 2019 18:30	1
HS19010554-05	20190104-DGW-MW3-PV15inlet-ControlD	04 Jan 2019 09:00		15 Jan 2019 09:00	18 Jan 2019 18:13	20
HS19010554-05	20190104-DGW-MW3-PV15inlet-ControlD	04 Jan 2019 09:00		15 Jan 2019 09:00	17 Jan 2019 18:32	1
HS19010554-06	20190104-DGW-MW3-PV15inlet-30-35-40D	04 Jan 2019 09:00		15 Jan 2019 09:00	18 Jan 2019 18:15	20
HS19010554-06	20190104-DGW-MW3-PV15inlet-30-35-40D	04 Jan 2019 09:00		15 Jan 2019 09:00	17 Jan 2019 18:34	1
HS19010554-07	20190104-DGW-MW3-PV15mid-ControlD	04 Jan 2019 09:00		15 Jan 2019 09:00	18 Jan 2019 18:21	20
HS19010554-07	20190104-DGW-MW3-PV15mid-ControlD	04 Jan 2019 09:00		15 Jan 2019 09:00	17 Jan 2019 18:36	1
HS19010554-08	20190104-DGW-MW3-PV15mid-30D	04 Jan 2019 09:00		15 Jan 2019 09:00	18 Jan 2019 18:23	20
HS19010554-08	20190104-DGW-MW3-PV15mid-30D	04 Jan 2019 09:00		15 Jan 2019 09:00	17 Jan 2019 18:38	1
HS19010554-09	20190104-DGW-MW3-PV15mid-35D	04 Jan 2019 09:00		15 Jan 2019 09:00	18 Jan 2019 18:25	20
HS19010554-09	20190104-DGW-MW3-PV15mid-35D	04 Jan 2019 09:00		15 Jan 2019 09:00	17 Jan 2019 18:40	1
HS19010554-10	20190104-DGW-MW3-PV15mid-40D	04 Jan 2019 09:00		15 Jan 2019 09:00	18 Jan 2019 18:27	20
HS19010554-10	20190104-DGW-MW3-PV15mid-40D	04 Jan 2019 09:00		15 Jan 2019 09:00	17 Jan 2019 18:42	1

WorkOrder: HS19010554
InstrumentID: ICPMS05
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000555	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000460	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000554	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0537	0.0340	0.500
A	Iron	7439-89-6	0.0500	0.0549	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.00100	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0680	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0542	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00280	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0459	0.0140	0.200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010554

QC BATCH REPORT

Batch ID: 136657 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLK-136657** Units: **mg/L** Analysis Date: **17-Jan-2019 17:35**
Client ID: Run ID: **ICPMS05_331226** SeqNo: **4913313** PrepDate: **15-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01132	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	U	0.200								

LCS Sample ID: **LCS-136657** Units: **mg/L** Analysis Date: **17-Jan-2019 17:37**
Client ID: Run ID: **ICPMS05_331226** SeqNo: **4913314** PrepDate: **15-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04913	0.00200	0.05	0	98.3	80 - 120				
Arsenic	0.05082	0.00200	0.05	0	102	80 - 120				
Cadmium	0.05158	0.00200	0.05	0	103	80 - 120				
Calcium	5.185	0.500	5	0	104	80 - 120				
Iron	5.046	0.200	5	0	101	80 - 120				
Lead	0.05395	0.00200	0.05	0	108	80 - 120				
Magnesium	5.065	0.200	5	0	101	80 - 120				
Potassium	5.182	0.200	5	0	104	80 - 120				
Selenium	0.05149	0.00200	0.05	0	103	80 - 120				
Sodium	5.071	0.200	5	0	101	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010554

QC BATCH REPORT

Batch ID: 136657 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MS Sample ID: **HS19010552-01MS** Units: **mg/L** Analysis Date: **17-Jan-2019 17:43**
Client ID: Run ID: **ICPMS05_331226** SeqNo: **4913317** PrepDate: **15-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05027	0.00200	0.05	0.000427	99.7	75 - 125				
Arsenic	0.05332	0.00200	0.05	0.00184	103	75 - 125				
Cadmium	0.05118	0.00200	0.05	0.000107	102	75 - 125				
Calcium	117.2	0.500	5	115.5	34.3	75 - 125				SO
Iron	4.994	0.200	5	0.04615	99.0	75 - 125				
Lead	0.04947	0.00200	0.05	0.000117	98.7	75 - 125				
Magnesium	25.02	0.200	5	20.92	82.1	75 - 125				O
Potassium	6.939	0.200	5	2.167	95.4	75 - 125				
Selenium	0.05286	0.00200	0.05	0.001156	103	75 - 125				
Sodium	192.1	0.200	5	191.4	13.8	75 - 125				SEO

MSD Sample ID: **HS19010552-01MSD** Units: **mg/L** Analysis Date: **17-Jan-2019 17:45**
Client ID: Run ID: **ICPMS05_331226** SeqNo: **4913318** PrepDate: **15-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.0515	0.00200	0.05	0.000427	102	75 - 125	0.05027	2.42	20	
Arsenic	0.05473	0.00200	0.05	0.00184	106	75 - 125	0.05332	2.61	20	
Cadmium	0.05307	0.00200	0.05	0.000107	106	75 - 125	0.05118	3.62	20	
Calcium	123.5	0.500	5	115.5	159	75 - 125	117.2	5.19	20	SO
Iron	5.222	0.200	5	0.04615	104	75 - 125	4.994	4.46	20	
Lead	0.05204	0.00200	0.05	0.000117	104	75 - 125	0.04947	5.06	20	
Magnesium	26.44	0.200	5	20.92	110	75 - 125	25.02	5.51	20	O
Potassium	7.264	0.200	5	2.167	102	75 - 125	6.939	4.59	20	
Selenium	0.05366	0.00200	0.05	0.001156	105	75 - 125	0.05286	1.5	20	
Sodium	199.2	0.200	5	191.4	157	75 - 125	192.1	3.66	20	SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010554

QC BATCH REPORT

Batch ID: 136657 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

PDS Sample ID: **HS19010552-01PDS** Units: **mg/L** Analysis Date: **17-Jan-2019 17:47**
Client ID: Run ID: **ICPMS05_331226** SeqNo: **4913319** PrepDate: **15-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09724	0.00200	0.1	0.000427	96.8	75 - 125				
Arsenic	0.11	0.00200	0.1	0.00184	108	75 - 125				
Cadmium	0.1076	0.00200	0.1	0.000107	107	75 - 125				
Calcium	122	0.500	10	115.5	64.4	75 - 125				SO
Iron	10.32	0.200	10	0.04615	103	75 - 125				
Lead	0.104	0.00200	0.1	0.000117	104	75 - 125				
Magnesium	30.28	0.200	10	20.92	93.6	75 - 125				
Potassium	12.3	0.200	10	2.167	101	75 - 125				
Selenium	0.1093	0.00200	0.1	0.001156	108	75 - 125				

PDS Sample ID: **HS19010552-01PDS** Units: **mg/L** Analysis Date: **18-Jan-2019 17:41**
Client ID: Run ID: **ICPMS05_331295** SeqNo: **4915425** PrepDate: **15-Jan-2019** DF: **20**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	396.8	4.00	200	197.9	99.5	75 - 125				

SD Sample ID: **HS19010552-01SD** Units: **mg/L** Analysis Date: **17-Jan-2019 17:41**
Client ID: Run ID: **ICPMS05_331226** SeqNo: **4913316** PrepDate: **15-Jan-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000427	0	10	
Arsenic	U	0.0100					0.00184	0	10	
Cadmium	U	0.0100					0.000107	0	10	
Calcium	113.9	2.50					115.5	1.4	10	
Iron	U	1.00					0.04615	0	10	
Lead	U	0.0100					0.000117	0	10	
Magnesium	21.14	1.00					20.92	1.07	10	
Potassium	2.166	1.00					2.167	0.0621	10	
Selenium	U	0.0100					0.001156	0	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010554

QC BATCH REPORT

Batch ID: 136657 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

SD Sample ID: **HS19010552-01SD** Units: **mg/L** Analysis Date: **18-Jan-2019 17:39**
Client ID: Run ID: **ICPMS05_331295** SeqNo: **4915424** PrepDate: **15-Jan-2019** DF: **100**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Sodium	194.9	20.0					197.9	1.5	10	

The following samples were analyzed in this batch:

HS19010554-01	HS19010554-02	HS19010554-03	HS19010554-04
HS19010554-05	HS19010554-06	HS19010554-07	HS19010554-08
HS19010554-09	HS19010554-10		

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19010554**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19010554

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19010554-01	20190103-DGW-MW3-PV15out-ControlD	Login	1/14/2019 12:00:35 PM	JRM	MET042
HS19010554-02	20190103-DGW-MW3-PV15out-30D	Login	1/14/2019 12:00:35 PM	JRM	MET042
HS19010554-03	20190103-DGW-MW3-PV15out-35D	Login	1/14/2019 12:00:35 PM	JRM	MET042
HS19010554-04	20190103-DGW-MW3-PV15out-40D	Login	1/14/2019 12:00:35 PM	JRM	MET042
HS19010554-05	20190104-DGW-MW3-PV15inlet-ControlD	Login	1/14/2019 12:00:35 PM	JRM	MET042
HS19010554-06	20190104-DGW-MW3-PV15inlet-30-35-40D	Login	1/14/2019 12:00:35 PM	JRM	MET042
HS19010554-07	20190104-DGW-MW3-PV15mid-ControlD	Login	1/14/2019 12:00:35 PM	JRM	MET042
HS19010554-08	20190104-DGW-MW3-PV15mid-30D	Login	1/14/2019 12:00:35 PM	JRM	MET042
HS19010554-09	20190104-DGW-MW3-PV15mid-35D	Login	1/14/2019 12:00:35 PM	JRM	MET042
HS19010554-10	20190104-DGW-MW3-PV15mid-40D	Login	1/14/2019 12:00:35 PM	JRM	MET042

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19010554
Date/Time Received: **12-Jan-2019 09:35**
Received by: **JRM**

Checklist completed by: *Jared R. Makan* eSignature 14-Jan-2019 Date
Reviewed by: *Dane J. Wacasey* eSignature 17-Jan-2019 Date

Matrices: **Water**
Carrier name: **FedEx International Priority**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☐	No ☑	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	13.6c/13.9c UC/C	IR25	
Cooler(s)/Kit(s):	43811		
Date/Time sample(s) sent to storage:	01/12/2019 15:00		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070

Chain of Custody Form

Page ____ of ____

COC ID: 194456

HS19010554

Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information	
Purchase Order	130-2086-06	Project Name	Exide Column Studies
Work Order		Project Number	130-2086
Company Name	Golder Associates	Bill To Company	Golder Associates
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021
Phone	(314) 984-8800	Phone	(314) 984-8800
Fax		Fax	
e-Mail Address	Emily_White@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com

A	300_W (300 Cl, SO4, [*NO3* *48hr HT*])
B	TDS_W 2540C (2540C TDS)
C	ALK_W 2320B (2320B Alkalinity)
D	HARD (2340B Hardness (calc))
E	ICP_TW (6020A Total Metals (6)+Cations)
F	ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
G	
H	
I	
J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190103-DGW-MW3-PV1Sout-control D	2019/01/03	9:00	GW	2	1						X					
2	20190103-DGW-MW3-PV1Sout-30D	"	"	"	2	1						X					
3	20190103-DGW-MW3-PV1Sout-35D	"	"	"	2	1						X					
4	20190103-DGW-MW3-PV1Sout-40D	"	"	"	2	1						X					
5	20190104-DGW-MW3-PV1Sinlet-control D	2019/01/04	9:00	"	2	1						X					
6	20190104-DGW-MW3-PV1Sinlet-30 35 40D	"	"	"	2	1						X					
7	20190104-DGW-MW3-PV1Smid-control D	2019/01/04	9:00	"	2	1						X					
8	20190104-DGW-MW3-PV1Smid-30D	"	"	"	2	1						X					
9	20190104-DGW-MW3-PV1Smid-35D	"	"	"	2	1						X					
10	20190104-DGW-MW3-PV1Smid-40D	"	"	"	2	1						X					

Sampler(s) Please Print & Sign

Shipment Method

Required Turnaround Time: (Check Box) ☐ Other ____ ☐ STD 10 WK Days ☒ 5 WK Days ☐ 2 WK Days ☐ 24 Hour

Results Due Date:

Relinquished by: Date: Time: Received by:

Relinquished by: Date: 01/12/19 Time: 09:35 Received by (Laboratory): J. Mumma

Logged by (Laboratory): Date: Time: Checked by (Laboratory):

Notes: Exide Column Studies

Cooler ID	Cooler Temp.
	4.6
4.3E II	13.6
	14.23
	CF03

QC Package: (Check One Box Below)

☐ Level II Std QC
☐ Level III Std QC/Raw Data
☐ Level IV SW846/CLP
☐ Other
☒ TRRP CheckList
☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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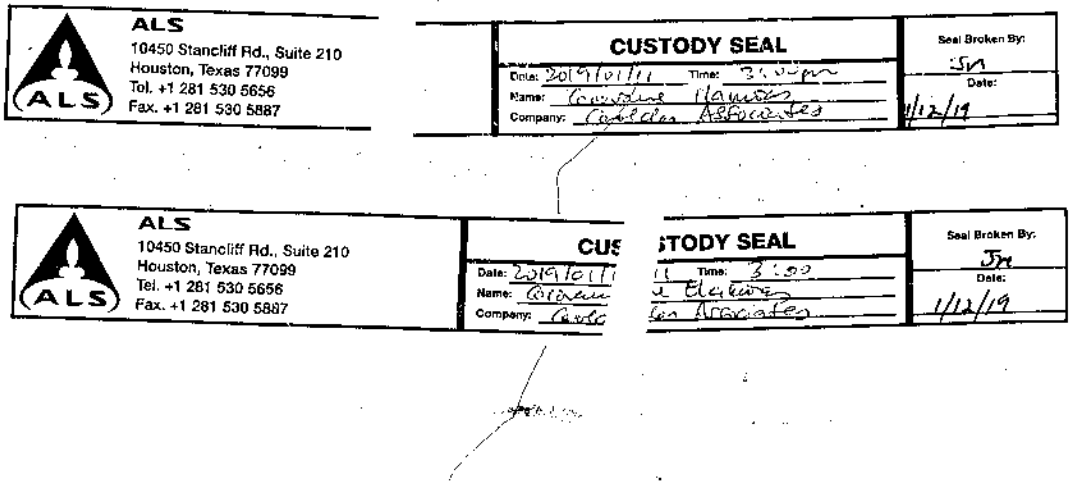
ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CUSTODY SEAL
Date: 2019/01/11
Time: 3:30pm
Name: Tawnalee Hanson
Company: Golder Associates
Seal Broken By:
SM
Date:
1/12/19
ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CUS
STODY SEAL
Date: 2019/01/11
Time: 3:00
Name: Brian
Company: Golder
Associates
Seal Broken By:
JM
Date:
1/12/19

ORIGIN ID:YUXA (514) 383-0990
AUDREY ETHEVES
GOLDER ASSOCIATES LTD
7250 RUE DU MILE END
3E ETAGE
MONTREAL, PQ H2R3A4
CANADA CA

SHIP DATE: 11JAN19
ACTWGT: 22.60 LB
CAD: 108680724/INET4042

BILL RECIPIENT

TO **DANE WACASEY**
ALS HOUSTON LABORATORY
10450 STANCLIFF RD
STE 210
HOUSTON TX 77099 **(US)**
(281) 530-5656 REF:
INV:
PO: DEPT:

552J2/D74C/DCA5

FedEx Express

E

TRK# 0430 **7741 7166 8422**

SATURDAY 12:00P
INTL PRIORITY

X0 SGRA

77099
TX-US IAH

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ORIGIN ID:YUXA (514) 383-0990
Audrey Etheves
Golder Associates Ltd
7250 rue du Mile End
3e etage
MONTREAL, PQ H2R3A4
CANADA, CA

Ship Date: 11JAN19
ActWgt: 22.60 LB
CAD: 108680724/INET4042

BILL RECIPIENT
EIN/VAT:

TO Dane Wacasey
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

(281) 530-5656

FedEx Express

(US)

J1821180815/2dv

AWB

TRK# 7741 7166 8422

Form 0430

X0 SGRA

PKG:YOUR PKG

SATURDAY 12:00P
INTL PRIORITY

REF:
DESC1:Bouteille d'eau
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: Audrey Etheves
T/C: R 967554812
D/T: R 967554812

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10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

January 21, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19010555**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 4 sample(s) on Jan 12, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19010555**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS19010555**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 01/21/2019				
Project Name: Exide Column Studies			5 Laboratory Job Number: HS19010555				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 136687,R331428				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?			X		
		Were analytical duplicates analyzed at the appropriate frequency?			X		
		Were RPDs or relative standard deviations within the laboratory QC limits?			X		
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 01/21/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19010555				
Reviewer Name: Dane Wacasey			Prep Batch Number(s) 136687,R331428				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			2
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports		
Laboratory Name: ALS Laboratory Group		LRC Date: 01/21/2019
Project Name: Exide Column Studies		5Laboratory Job Number: HS19010555
Reviewer Name: Dane Wacasey		Prep Batch Number(s): 136687,R331428
ER#[5]	**Description**	
1	Batch136687, R331428, Metals Method SW6020, sample 20190102-DGW-MW3-PV15out-40TDup, MS and MSD recovered outside the control limits for Sodium, however, the result in the parent sample is greater than 4x the spike amount.	
2	See Run Log and CCB Exceptions Report.	

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010555
Start Date: 18-Jan-2019 End Date: 19-Jan-2019

Run ID:ICPMS05_331295
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
CCB 19	1	18-Jan-2019 21:39	251_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 20	1	18-Jan-2019 21:51	253_CCV.d	AS CA CD FE K MG NA PB SB SE
ICCV 21	1	18-Jan-2019 22:31	266_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV5	1	18-Jan-2019 22:33	267LICV.d	AS CA CD FE K MG SB SE
LLCCV2	1	18-Jan-2019 22:35	268SMPL.d	AS CA CD FE K MG SB SE
LLCCV5	1	18-Jan-2019 22:37	269LICV.d	AS CA CD FE K MG SB SE
ICCB 20	1	18-Jan-2019 22:39	270_ICB.d	AS CA CD FE K MG NA PB SB SE
CCV 22	1	18-Jan-2019 22:56	279_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 21	1	18-Jan-2019 22:58	280_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 23	1	18-Jan-2019 23:08	285_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 22	1	18-Jan-2019 23:10	286_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-136687	1	18-Jan-2019 23:12	287SMPL.d	AS CA CD FE K MG NA SB SE
LCS-136687	1	18-Jan-2019 23:14	288SMPL.d	AS CA CD FE K MG NA SB SE
20190102-DGW-MW3-PV15out-40T-Dup	1	18-Jan-2019 23:16	289SMPL.d	AS CA CD FE K MG SB SE
20190102-DGW-MW3-PV15out-40T-DupSD	5	18-Jan-2019 23:18	290SMPL.d	AS CA CD FE K MG SB SE
20190102-DGW-MW3-PV15out-40T-DupMS	1	18-Jan-2019 23:20	291SMPL.d	AS CA CD FE K MG NA SB SE
20190102-DGW-MW3-PV15out-40T-DupMSD	1	18-Jan-2019 23:22	292SMPL.d	AS CA CD FE K MG NA SB SE
20190102-DGW-MW3-PV15out-40T-DupPDS	1	18-Jan-2019 23:24	293SMPL.d	AS CA CD FE K MG SB SE
CCV 24	1	18-Jan-2019 23:26	294_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 23	1	18-Jan-2019 23:28	295_CCB.d	AS CA CD FE K MG NA PB SB SE
20190102-DGW-MW3-PV15out-35T-Dup	1	18-Jan-2019 23:30	296SMPL.d	AS CA CD FE K MG SB SE
20190102-DGW-MW3-PV15out-30T-Dup	1	18-Jan-2019 23:32	297SMPL.d	AS CA CD FE K MG SB SE
20190102-DGW-MW3-PV15out-ControlT-Dup	1	18-Jan-2019 23:34	298SMPL.d	AS CA CD FE K MG SB SE
CCV 25	1	18-Jan-2019 23:50	306_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 24	1	18-Jan-2019 23:52	307_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 26	1	19-Jan-2019 00:14	318_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 25	1	19-Jan-2019 00:16	319_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 27	1	19-Jan-2019 00:18	320_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 26	1	19-Jan-2019 00:20	321_CCB.d	AS CA CD FE K MG NA PB SB SE
LLCCV5	1	19-Jan-2019 00:21	322LICV.d	AS CA CD FE K MG SB SE
LLCCV2	1	19-Jan-2019 00:23	323SMPL.d	AS CA CD FE K MG SB SE
ICSA	1	19-Jan-2019 00:25	324ICSA.d	AS CA CD FE K MG SB SE
ICSAB	1	19-Jan-2019 00:27	325ICSB.d	AS CA CD FE K MG SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010555

Run ID:ICPMS05_331295
Instrument:ICPMS05
Method:SW6020

ICCB 14	Date: 18-Jan-2019 19:50	Seq: 4915490		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	-20.46	14	200	
CCB 15	Date: 18-Jan-2019 20:08	Seq: 4915513		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	-25.09	14	200	
CCB 17	Date: 18-Jan-2019 20:57	Seq: 4915556		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.523	0.4	2	
	Potassium	-19.53	18	200	
	Sodium	22.43	14	200	
CCB 18	Date: 18-Jan-2019 21:21	Seq: 4915568		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Potassium	-20.01	18	200	
	Sodium	55.86	14	200	
CCB 19	Date: 18-Jan-2019 21:39	Seq: 4915577		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.404	0.4	2	
	Sodium	250.1	14	200	
ICCB 20	Date: 18-Jan-2019 22:39	Seq: 4916067		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	-73.33	14	200	
CCB 21	Date: 18-Jan-2019 22:58	Seq: 4916077		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Calcium	49.96	34	500	
	Potassium	26.37	18	200	
	Sodium	171.9	14	200	
CCB 22	Date: 18-Jan-2019 23:10	Seq: 4916083		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	-15.12	14	200	
CCB 23	Date: 18-Jan-2019 23:28	Seq: 4916092		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.445	0.4	2	
	Potassium	18.7	18	200	
	Sodium	20.76	14	200	
CCB 24	Date: 18-Jan-2019 23:52	Seq: 4916104		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Potassium	19.27	18	200	
	Sodium	87.81	14	200	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19010555

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19010555-01	20190102-DGW-MW3-PV15out-40T-Dup	Groundwater		02-Jan-2019 07:45	12-Jan-2019 09:35	☐
HS19010555-02	20190102-DGW-MW3-PV15out-35T-Dup	Groundwater		02-Jan-2019 07:45	12-Jan-2019 09:35	☐
HS19010555-03	20190102-DGW-MW3-PV15out-30T-Dup	Groundwater		02-Jan-2019 07:45	12-Jan-2019 09:35	☐
HS19010555-04	20190102-DGW-MW3-PV15out-ControlT-Dup	Groundwater		02-Jan-2019 07:45	12-Jan-2019 09:35	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190102-DGW-MW3-PV15out-40T-Dup
Collection Date: 02-Jan-2019 07:45

ANALYTICAL REPORT
WorkOrder:HS19010555
Lab ID:HS19010555-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**74.1**		**2.00**	**2.00**	**mg/L**	1	21-Jan-2019 17:48
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 16-Jan-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	18-Jan-2019 23:16
Arsenic	U		0.000400	0.00200	mg/L	1	18-Jan-2019 23:16
Cadmium	U		0.000200	0.00200	mg/L	1	18-Jan-2019 23:16
Calcium	**8.25**		**0.0340**	**0.500**	**mg/L**	1	18-Jan-2019 23:16
Iron	U		0.0120	0.200	mg/L	1	18-Jan-2019 23:16
Lead	U		0.000600	0.00200	mg/L	1	21-Jan-2019 12:40
Magnesium	**13.0**		**0.0100**	**0.200**	**mg/L**	1	18-Jan-2019 23:16
Potassium	**2.02**		**0.0180**	**0.200**	**mg/L**	1	18-Jan-2019 23:16
Selenium	U		0.00110	0.00200	mg/L	1	18-Jan-2019 23:16
Sodium	**192**		**0.280**	**4.00**	**mg/L**	20	21-Jan-2019 12:43

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190102-DGW-MW3-PV15out-35T-Dup
Collection Date: 02-Jan-2019 07:45

ANALYTICAL REPORT
WorkOrder:HS19010555
Lab ID:HS19010555-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**70.1**		**2.00**	**2.00**	**mg/L**	1	21-Jan-2019 17:48
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 16-Jan-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	18-Jan-2019 23:30
Arsenic	U		0.000400	0.00200	mg/L	1	18-Jan-2019 23:30
Cadmium	U		0.000200	0.00200	mg/L	1	18-Jan-2019 23:30
Calcium	**7.80**		**0.0340**	**0.500**	**mg/L**	1	18-Jan-2019 23:30
Iron	**0.0222**	J	**0.0120**	**0.200**	**mg/L**	1	18-Jan-2019 23:30
Lead	U		0.000600	0.00200	mg/L	1	21-Jan-2019 13:06
Magnesium	**12.3**		**0.0100**	**0.200**	**mg/L**	1	18-Jan-2019 23:30
Potassium	**2.07**		**0.0180**	**0.200**	**mg/L**	1	18-Jan-2019 23:30
Selenium	U		0.00110	0.00200	mg/L	1	18-Jan-2019 23:30
Sodium	**176**		**0.280**	**4.00**	**mg/L**	20	21-Jan-2019 12:49

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190102-DGW-MW3-PV15out-30T-Dup
Collection Date: 02-Jan-2019 07:45

ANALYTICAL REPORT
WorkOrder:HS19010555
Lab ID:HS19010555-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**85.7**		**2.00**	**2.00**	**mg/L**	1	21-Jan-2019 17:48
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 16-Jan-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	18-Jan-2019 23:32
Arsenic	U		0.000400	0.00200	mg/L	1	18-Jan-2019 23:32
Cadmium	U		0.000200	0.00200	mg/L	1	18-Jan-2019 23:32
Calcium	**9.08**		**0.0340**	**0.500**	**mg/L**	1	18-Jan-2019 23:32
Iron	**0.0470**	J	**0.0120**	**0.200**	**mg/L**	1	18-Jan-2019 23:32
Lead	U		0.000600	0.00200	mg/L	1	21-Jan-2019 13:08
Magnesium	**15.3**		**0.0100**	**0.200**	**mg/L**	1	18-Jan-2019 23:32
Potassium	**2.13**		**0.0180**	**0.200**	**mg/L**	1	18-Jan-2019 23:32
Selenium	U		0.00110	0.00200	mg/L	1	18-Jan-2019 23:32
Sodium	**168**		**0.280**	**4.00**	**mg/L**	20	21-Jan-2019 12:51

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190102-DGW-MW3-PV15out-ControlT-Dup
Collection Date: 02-Jan-2019 07:45

ANALYTICAL REPORT
WorkOrder:HS19010555
Lab ID:HS19010555-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**372**		**2.00**	**2.00**	**mg/L**	1	21-Jan-2019 17:48
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 16-Jan-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	18-Jan-2019 23:34
Arsenic	**0.00170**	J	**0.000400**	**0.00200**	**mg/L**	1	18-Jan-2019 23:34
Cadmium	U		0.000200	0.00200	mg/L	1	18-Jan-2019 23:34
Calcium	**114**		**0.0340**	**0.500**	**mg/L**	1	18-Jan-2019 23:34
Iron	**0.0977**	J	**0.0120**	**0.200**	**mg/L**	1	18-Jan-2019 23:34
Lead	U		0.000600	0.00200	mg/L	1	21-Jan-2019 13:10
Magnesium	**21.3**		**0.0100**	**0.200**	**mg/L**	1	18-Jan-2019 23:34
Potassium	**2.11**		**0.0180**	**0.200**	**mg/L**	1	18-Jan-2019 23:34
Selenium	U		0.00110	0.00200	mg/L	1	18-Jan-2019 23:34
Sodium	**194**		**0.280**	**4.00**	**mg/L**	20	21-Jan-2019 12:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010555

Batch ID: 136687 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19010555-01	1	10	10 (mL)	1
HS19010555-02	1	10	10 (mL)	1
HS19010555-03	1	10	10 (mL)	1
HS19010555-04	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010555

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 136687	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19010555-01	20190102-DGW-MW3-PV15out-40T-Dup	02 Jan 2019 07:45		16 Jan 2019 13:30	21 Jan 2019 12:43	20
HS19010555-01	20190102-DGW-MW3-PV15out-40T-Dup	02 Jan 2019 07:45		16 Jan 2019 13:30	21 Jan 2019 12:40	1
HS19010555-01	20190102-DGW-MW3-PV15out-40T-Dup	02 Jan 2019 07:45		16 Jan 2019 13:30	18 Jan 2019 23:16	1
HS19010555-02	20190102-DGW-MW3-PV15out-35T-Dup	02 Jan 2019 07:45		16 Jan 2019 13:30	21 Jan 2019 13:06	1
HS19010555-02	20190102-DGW-MW3-PV15out-35T-Dup	02 Jan 2019 07:45		16 Jan 2019 13:30	21 Jan 2019 12:49	20
HS19010555-02	20190102-DGW-MW3-PV15out-35T-Dup	02 Jan 2019 07:45		16 Jan 2019 13:30	18 Jan 2019 23:30	1
HS19010555-03	20190102-DGW-MW3-PV15out-30T-Dup	02 Jan 2019 07:45		16 Jan 2019 13:30	21 Jan 2019 13:08	1
HS19010555-03	20190102-DGW-MW3-PV15out-30T-Dup	02 Jan 2019 07:45		16 Jan 2019 13:30	21 Jan 2019 12:51	20
HS19010555-03	20190102-DGW-MW3-PV15out-30T-Dup	02 Jan 2019 07:45		16 Jan 2019 13:30	18 Jan 2019 23:32	1
HS19010555-04	20190102-DGW-MW3-PV15out-ControlT-Dup	02 Jan 2019 07:45		16 Jan 2019 13:30	21 Jan 2019 13:10	1
HS19010555-04	20190102-DGW-MW3-PV15out-ControlT-Dup	02 Jan 2019 07:45		16 Jan 2019 13:30	21 Jan 2019 12:53	20
HS19010555-04	20190102-DGW-MW3-PV15out-ControlT-Dup	02 Jan 2019 07:45		16 Jan 2019 13:30	18 Jan 2019 23:34	1
Batch ID R331428	**Test Name :** HARDNESS, TOTAL AS CACO3 BY SM2340B			**Matrix:** Groundwater		
HS19010555-01	20190102-DGW-MW3-PV15out-40T-Dup	02 Jan 2019 07:45			21 Jan 2019 17:48	1
HS19010555-02	20190102-DGW-MW3-PV15out-35T-Dup	02 Jan 2019 07:45			21 Jan 2019 17:48	1
HS19010555-03	20190102-DGW-MW3-PV15out-30T-Dup	02 Jan 2019 07:45			21 Jan 2019 17:48	1
HS19010555-04	20190102-DGW-MW3-PV15out-ControlT-Dup	02 Jan 2019 07:45			21 Jan 2019 17:48	1

WorkOrder: HS19010555
InstrumentID: ICPMS05
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000555	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000460	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000554	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0537	0.0340	0.500
A	Iron	7439-89-6	0.0500	0.0549	0.0120	0.200
A	Magnesium	7439-95-4	0.0500	0.0680	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0542	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00280	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0459	0.0140	0.200

WorkOrder: HS19010555
InstrumentID: ICPMS04
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Lead	7439-92-1	0.00100	0.000916	0.000600	0.00200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010555

QC BATCH REPORT

Batch ID: 136687 **Instrument: ICPMS05** **Method: SW6020**

MBLK Sample ID: **MBLK-136687** Units: **mg/L** Analysis Date: **18-Jan-2019 23:12**
Client ID: Run ID: **ICPMS05_331295** SeqNo: **4916084** PrepDate: **16-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Magnesium	U	0.200								
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	U	0.200								

MBLK Sample ID: **MBLK-136687** Units: **mg/L** Analysis Date: **21-Jan-2019 12:35**
Client ID: Run ID: **ICPMS04_331384** SeqNo: **4916877** PrepDate: **16-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	U	0.00200								

LCS Sample ID: **LCS-136687** Units: **mg/L** Analysis Date: **18-Jan-2019 23:14**
Client ID: Run ID: **ICPMS05_331295** SeqNo: **4916085** PrepDate: **16-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04636	0.00200	0.05	0	92.7	80 - 120				
Arsenic	0.05083	0.00200	0.05	0	102	80 - 120				
Cadmium	0.05028	0.00200	0.05	0	101	80 - 120				
Calcium	5.118	0.500	5	0	102	80 - 120				
Iron	4.952	0.200	5	0	99.0	80 - 120				
Magnesium	5.027	0.200	5	0	101	80 - 120				
Potassium	4.969	0.200	5	0	99.4	80 - 120				
Selenium	0.05198	0.00200	0.05	0	104	80 - 120				
Sodium	5.018	0.200	5	0	100	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010555

QC BATCH REPORT

Batch ID: 136687 **Instrument: ICPMS05** **Method: SW6020**

LCS Sample ID: **LCS-136687** Units: **mg/L** Analysis Date: **21-Jan-2019 12:37**
Client ID: Run ID: **ICPMS04_331384** SeqNo: **4916878** PrepDate: **16-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.04843	0.00200	0.05	0	96.9	80 - 120				

MS Sample ID: **HS19010555-01MS** Units: **mg/L** Analysis Date: **18-Jan-2019 23:20**
Client ID: **20190102-DGW-MW3-PV15out-40T-Dup** Run ID: **ICPMS05_331295** SeqNo: **4916088** PrepDate: **16-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04642	0.00200	0.05	0.000109	92.6	80 - 120				
Arsenic	0.05243	0.00200	0.05	0.000065	105	80 - 120				
Cadmium	0.05221	0.00200	0.05	0.000058	104	80 - 120				
Calcium	13.41	0.500	5	8.253	103	80 - 120				
Iron	4.983	0.200	5	0.001192	99.6	80 - 120				
Magnesium	17.58	0.200	5	12.95	92.6	80 - 120				
Potassium	7.095	0.200	5	2.021	101	80 - 120				
Selenium	0.05416	0.00200	0.05	0.000094	108	80 - 120				
Sodium	194.8	0.200	5	196.2	-27.6	80 - 120				SEO

MS Sample ID: **HS19010555-01MS** Units: **mg/L** Analysis Date: **21-Jan-2019 12:44**
Client ID: **20190102-DGW-MW3-PV15out-40T-Dup** Run ID: **ICPMS04_331384** SeqNo: **4916881** PrepDate: **16-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.04854	0.00200	0.05	0.000012	97.1	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010555

QC BATCH REPORT

Batch ID: 136687 **Instrument: ICPMS05** **Method: SW6020**

MSD Sample ID: **HS19010555-01MSD** Units: **mg/L** Analysis Date: **18-Jan-2019 23:22**
Client ID: **20190102-DGW-MW3-PV15out-40T-Dup** Run ID: **ICPMS05_331295** SeqNo: **4916089** PrepDate: **16-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04545	0.00200	0.05	0.000109	90.7	80 - 120	0.04642	2.11	20	
Arsenic	0.05203	0.00200	0.05	0.000065	104	80 - 120	0.05243	0.77	20	
Cadmium	0.05238	0.00200	0.05	0.000058	105	80 - 120	0.05221	0.323	20	
Calcium	13.24	0.500	5	8.253	99.8	80 - 120	13.41	1.27	20	
Iron	4.905	0.200	5	0.001192	98.1	80 - 120	4.983	1.58	20	
Magnesium	17.71	0.200	5	12.95	95.1	80 - 120	17.58	0.708	20	
Potassium	7.171	0.200	5	2.021	103	80 - 120	7.095	1.05	20	
Selenium	0.05266	0.00200	0.05	0.000094	105	80 - 120	0.05416	2.81	20	
Sodium	197	0.200	5	196.2	15.4	80 - 120	194.8	1.1	20	SEO

MSD Sample ID: **HS19010555-01MSD** Units: **mg/L** Analysis Date: **21-Jan-2019 12:46**
Client ID: **20190102-DGW-MW3-PV15out-40T-Dup** Run ID: **ICPMS04_331384** SeqNo: **4916882** PrepDate: **16-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.04827	0.00200	0.05	0.000012	96.5	80 - 120	0.04854	0.564	20	

PDS Sample ID: **HS19010555-01PDS** Units: **mg/L** Analysis Date: **18-Jan-2019 23:24**
Client ID: **20190102-DGW-MW3-PV15out-40T-Dup** Run ID: **ICPMS05_331295** SeqNo: **4916090** PrepDate: **16-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.08923	0.00200	0.1	0.000109	89.1	75 - 125				
Arsenic	0.1068	0.00200	0.1	0.000065	107	75 - 125				
Cadmium	0.1014	0.00200	0.1	0.000058	101	75 - 125				
Calcium	17.71	0.500	10	8.253	94.5	75 - 125				
Iron	9.949	0.200	10	0.001192	99.5	75 - 125				
Magnesium	22.78	0.200	10	12.95	98.3	75 - 125				
Potassium	12.21	0.200	10	2.021	102	75 - 125				
Selenium	0.1099	0.00200	0.1	0.000094	110	75 - 125				

PDS Sample ID: **HS19010555-01PDS** Units: **mg/L** Analysis Date: **21-Jan-2019 12:49**
Client ID: **20190102-DGW-MW3-PV15out-40T-Dup** Run ID: **ICPMS04_331384** SeqNo: **4916883** PrepDate: **16-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.09723	0.00200	0.1	0.000012	97.2	75 - 125				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010555

QC BATCH REPORT

Batch ID: 136687 **Instrument: ICPMS05** **Method: SW6020**

PDS Sample ID: **HS19010555-01PDS** Units: **mg/L** Analysis Date: **21-Jan-2019 12:47**
Client ID: **20190102-DGW-MW3-PV15out-40T-Dup** Run ID: **ICPMS05_331390** SeqNo: **4917209** PrepDate: **16-Jan-2019** DF: **20**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	385.6	4.00	200	192.1	96.8	75 - 125				

SD Sample ID: **HS19010555-01SD** Units: **mg/L** Analysis Date: **18-Jan-2019 23:18**
Client ID: **20190102-DGW-MW3-PV15out-40T-Dup** Run ID: **ICPMS05_331295** SeqNo: **4916087** PrepDate: **16-Jan-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000109	0	10	
Arsenic	U	0.0100					0.000065	0	10	
Cadmium	U	0.0100					0.000058	0	10	
Calcium	8.063	2.50					8.253	2.3	10	
Iron	U	1.00					0.001192	0	10	
Magnesium	12.8	1.00					12.95	1.17	10	
Potassium	2.15	1.00					2.021	6.41	10	
Selenium	U	0.0100					0.000094	0	10	

SD Sample ID: **HS19010555-01SD** Units: **mg/L** Analysis Date: **21-Jan-2019 12:42**
Client ID: **20190102-DGW-MW3-PV15out-40T-Dup** Run ID: **ICPMS04_331384** SeqNo: **4916880** PrepDate: **16-Jan-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Lead	U	0.0100					0.000012	0	10	

SD Sample ID: **HS19010555-01SD** Units: **mg/L** Analysis Date: **21-Jan-2019 12:45**
Client ID: **20190102-DGW-MW3-PV15out-40T-Dup** Run ID: **ICPMS05_331390** SeqNo: **4917208** PrepDate: **16-Jan-2019** DF: **100**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Sodium	201	20.0					192.1	4.61	10	

The following samples were analyzed in this batch: HS19010555-01 HS19010555-02 HS19010555-03 HS19010555-04

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19010555**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19010555

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19010555-01	20190102-DGW-MW3-PV15out-40T-Dup	Login	1/14/2019 12:28:49 PM	JRM	MET042
HS19010555-02	20190102-DGW-MW3-PV15out-35T-Dup	Login	1/14/2019 12:28:49 PM	JRM	MET042
HS19010555-03	20190102-DGW-MW3-PV15out-30T-Dup	Login	1/14/2019 12:28:49 PM	JRM	MET042
HS19010555-04	20190102-DGW-MW3-PV15out-ControlT-Dup	Login	1/14/2019 12:28:49 PM	JRM	MET042

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19010555
Date/Time Received: **12-Jan-2019 09:35**
Received by: **JRM**

Checklist completed by: *Jared R. Makan* eSignature 14-Jan-2019 Date
Reviewed by: *Dane J. Wacasey* eSignature 17-Jan-2019 Date

Matrices: **Water**
Carrier name: **FedEx International Priority**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	13.6c/13.9c UC/C	IR25	
Cooler(s)/Kit(s):	43811		
Date/Time sample(s) sent to storage:	01/12/2019 15:00		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070

Chain of Custody Form

Page ____ of ____

COC ID: 194446

HS19010555

Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information	
Purchase Order	130-2086-06	Project Name	Exide Column Studies
Work Order		Project Number	130-2086
Company Name	Golder Associates	Bill To Company	Golder Associates
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021
Phone	(314) 984-8800	Phone	(314) 984-8800
Fax		Fax	
e-Mail Address	Emily_White@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com

A	300_W (300 Cl, SO4, [*NO3* *48hr HT*])
B	TDS_W 2540C (2540C TDS)
C	ALK_W 2320B (2320B Alkalinity)
D	HARD (2340B Hardness (calc))
E	ICP_TW (6020A Total Metals (6)+Cations)
F	ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
G	
H	
I	
J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190102-DGW-MW3-PVISout-40T-DUP	2019/01/02	9:45	GW	2	1				X	X						
2	20190102-DGW-MW3-PVISout-35T DUP	"	"	"	2	1				X	X						
3	20190102-DGW-MW3-PVISout-30T DUP	"	"	"	2	1				X	X						
4	20190102-DGW-MW3-PVISout-control DUP	"	"	"	2	1				X	X						
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Bethany Ewile

Shipment Method:

Required Turnaround Time: (Check Box) ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other ____

Results Due Date:

Relinquished by: [signature] Date: 2019/01/11 Time: 3:00pm

Received by:

Relinquished by: Date: 01/12/19 Time: 09:35

Received by (Laboratory): [signature]

Logged by (Laboratory): Date: Time:

Checked by (Laboratory):

Notes: Exide Column Studies

Cooler ID	Cooler Temp.
43911	13.6
	11.25
	CF03

QC Package: (Check One Box Below)

☐ Level II Std QC
☐ Level III Std QC/Raw Data
☐ Level IV SW846/CLP
☐ Other
☒ TRRP Checklist
☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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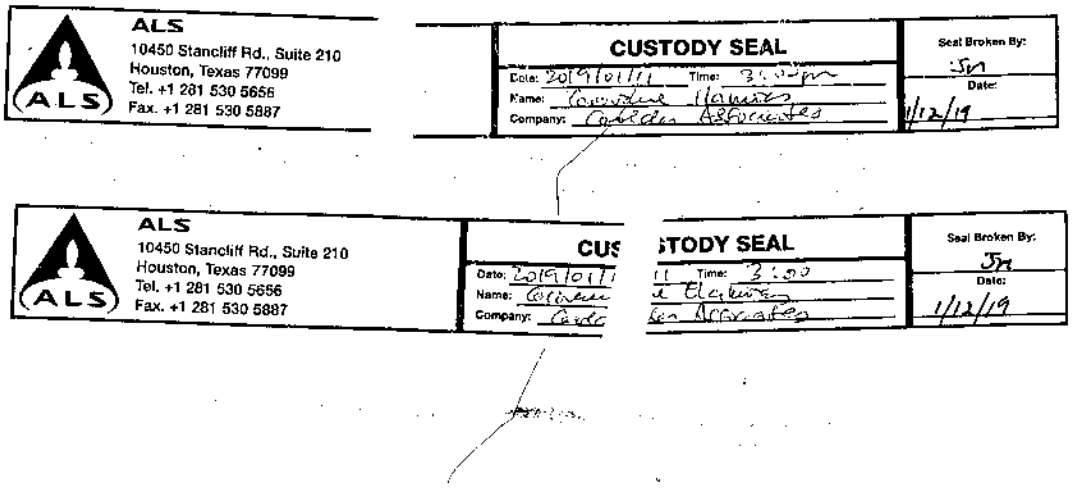
ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CUSTODY SEAL
Date: 20191011
Time: 3:00 pm
Name: Tourdine Hawkins
Company: Golder Associates
Seal Broken By:
Date:
1/12/19
ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
Date: 20191011
Time: 3:00
Seal Broken By:
Date:
1/12/19

ORIGIN ID:YUXA (514) 383-0990
AUDREY ETHEVES
GOLDER ASSOCIATES LTD
7250 RUE DU MILE END
3E ETAGE
MONTREAL, PQ H2R3A4
CANADA CA

SHIP DATE: 11JAN19
ACTWGT: 22.60 LB
CAD: 108660724/INET4042

BILL RECIPIENT

TO **DANE WACASEY**
ALS HOUSTON LABORATORY
10450 STANCLIFF RD
STE 210
HOUSTON TX 77099 **(US)**
(281) 530-5656 REF:
INV:
PO: DEPT:

552J2/D74C/DCA5

FedEx Express

E

J18211803150201

TRK# 0430 **7741 7166 8422**

SATURDAY 12:00P
INTL PRIORITY

X0 SGRA

77099
TX-US IAH

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ORIGIN ID:YUXA (514) 383-0990
Audrey Etheves
Golder Associates Ltd
7250 rue du Mile End
3e etage
MONTREAL, PQ H2R3A4
CANADA, CA

Ship Date: 11JAN19
ActWgt: 22.60 LB
CAD: 108680724/INET4042

BILL RECIPIENT
EIN/VAT:

TO Dane Wacasey
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

(281) 530-5656

FedEx Express

(US)

E

AWB

J18211808152uv

X0 SGRA

PKG:YOUR PKG

TRK# 7741 7166 8422

Form 0430

SATURDAY 12:00P
INTL PRIORITY

REF:
DESC1:Bouteille d'eau
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: Audrey Etheves
T/C: R 967554812
D/T: R 967554812

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10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

January 21, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19010556**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 10 sample(s) on Jan 12, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19010556**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS19010556**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 01/21/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19010556				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 136690,R331360				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?			X		
		Were analytical duplicates analyzed at the appropriate frequency?			X		
		Were RPDs or relative standard deviations within the laboratory QC limits?			X		
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 01/21/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19010556				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 136690,R331360				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			2
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports		
Laboratory Name: ALS Laboratory Group		LRC Date: 01/21/2019
Project Name: Exide Column Studies		Laboratory Job Number: HS19010556
Reviewer Name: Dane Wacasey		Prep Batch Number(s): 136690,R331360
ER#[5]	**Description**	
1	Batch 136690, Metals Method SW6020, sample 20190103-DGW-MW11-PV5out-ControlT, MS and or MSD recovered outside the control limit for Sodium due to suspect matrix effect. For Calcium, Magnesium and Potassium the result in the parent sample is greater than 4x the spike amount.	
2	See Run Log and CCB Exceptions Report.	

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010556
Start Date: 17-Jan-2019 End Date: 17-Jan-2019

Run ID:ICPMS04_331185
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	17-Jan-2019 11:56	018_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	17-Jan-2019 11:58	019SMPL.d	AS CD FE K PB SB SE
LLICV5	1	17-Jan-2019 12:00	020LICV.d	AS CD FE K PB SB SE
ICB	1	17-Jan-2019 12:02	021_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	17-Jan-2019 12:13	023ICSA.d	AS CD FE K PB SB SE
ICSAB	1	17-Jan-2019 12:15	024ICSB.d	AS CD FE K PB SB SE
CCV 1	1	17-Jan-2019 12:45	036_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	17-Jan-2019 12:47	037_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	17-Jan-2019 13:16	048_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	17-Jan-2019 13:18	049_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	17-Jan-2019 13:49	060_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	17-Jan-2019 13:51	061_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	17-Jan-2019 14:20	072_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	17-Jan-2019 14:22	073_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	17-Jan-2019 14:57	084_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	17-Jan-2019 14:59	085_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	17-Jan-2019 15:22	094_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	17-Jan-2019 15:25	095_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	17-Jan-2019 16:10	106_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	17-Jan-2019 16:13	107_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 8	1	17-Jan-2019 16:43	118_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	17-Jan-2019 16:45	119_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	17-Jan-2019 17:17	131_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	17-Jan-2019 17:22	133_CCV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	17-Jan-2019 18:08	153SMPL.d	AS CD FE K PB SB SE
LLCCV5	1	17-Jan-2019 18:11	154LICV.d	AS CD FE K PB SB SE
ICCB 10	1	17-Jan-2019 18:13	155_ICB.d	AS CA CD FE K MG NA PB SB SE
ICCV 10	1	17-Jan-2019 18:25	157_ICV.d	AS CA CD FE K MG NA PB SB SE
MBLK-136690	1	17-Jan-2019 18:34	161SMPL.d	AS CA CD FE K MG PB SB SE
LCS-136690	1	17-Jan-2019 18:37	162SMPL.d	AS CA CD FE K MG PB SB SE
20190103-DGW-MW11-PV5out-ControlT	1	17-Jan-2019 18:39	163SMPL.d	AS CD FE K PB SB SE
20190103-DGW-MW11-PV5out-ControlTSD	5	17-Jan-2019 18:41	164SMPL.d	AS CD FE K PB SB SE
20190103-DGW-MW11-PV5out-ControlTMS	1	17-Jan-2019 18:43	165SMPL.d	AS CA CD FE K MG NA PB SB SE
20190103-DGW-MW11-PV5out-ControlTMSD	1	17-Jan-2019 18:46	166SMPL.d	AS CA CD FE K MG NA PB SB SE
20190103-DGW-MW11-PV5out-ControlTPDS	1	17-Jan-2019 18:48	167SMPL.d	AS CD FE K PB SB SE
CCB 11	1	17-Jan-2019 18:54	170_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 11	1	17-Jan-2019 19:07	172_CCV.d	AS CA CD FE K MG NA PB SB SE
20190103-DGW-MW11-PV5out-30T	1	17-Jan-2019 19:10	173SMPL.d	AS CD FE K PB SB SE
20190103-DGW-MW11-PV5out-35T	1	17-Jan-2019 19:12	174SMPL.d	AS CD FE K PB SB SE
20190103-DGW-MW11-PV5out-40T	1	17-Jan-2019 19:14	175SMPL.d	AS CD FE K PB SB SE
20190104-DGW-MW11-PV5inlet-ControlT	1	17-Jan-2019 19:17	176SMPL.d	AS CD FE K PB SB SE
20190104-DGW-MW11-PV5inlet-30-35-40T	1	17-Jan-2019 19:19	177SMPL.d	AS CD FE K PB SB SE
20190104-DGW-MW11-PV5mid-ControlT	1	17-Jan-2019 19:21	178SMPL.d	AS CD FE K PB SB SE
20190104-DGW-MW11-PV5mid-30T	1	17-Jan-2019 19:23	179SMPL.d	AS CD FE K PB SB SE

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010556
Start Date: 17-Jan-2019 End Date: 17-Jan-2019

Run ID:ICPMS04_331185
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
20190104-DGW-MW11-PV5mid-35T	1	17-Jan-2019 19:26	180SMPL.d	AS CD FE K PB SB SE
CCB 12	1	17-Jan-2019 19:32	183_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 12	1	17-Jan-2019 19:52	185_CCV.d	AS CA CD FE K MG NA PB SB SE
20190104-DGW-MW11-PV5mid-40T	1	17-Jan-2019 19:59	186SMPL.d	AS CD FE K PB SB SE
CCV 13	1	17-Jan-2019 20:19	195_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 13	1	17-Jan-2019 20:21	196_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 14	1	17-Jan-2019 20:34	201_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 14	1	17-Jan-2019 20:36	202_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 15	1	17-Jan-2019 20:54	210_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 15	1	17-Jan-2019 20:57	211_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 16	1	17-Jan-2019 22:04	232_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	17-Jan-2019 22:06	233SMPL.d	AS CD FE K PB SB SE
LLCCV5	1	17-Jan-2019 22:08	234LICV.d	AS CD FE K PB SB SE
ICCB 16	1	17-Jan-2019 22:11	235_ICB.d	AS CA CD FE K MG NA PB SB SE
CCV 17	1	17-Jan-2019 22:28	243_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 17	1	17-Jan-2019 22:31	244_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 18	1	17-Jan-2019 22:53	254_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 18	1	17-Jan-2019 22:55	255_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 19	1	17-Jan-2019 23:20	266_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 19	1	17-Jan-2019 23:22	267_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 20	1	17-Jan-2019 23:33	272_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 20	1	17-Jan-2019 23:36	273_CCB.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	17-Jan-2019 23:38	274SMPL.d	AS CD FE K PB SB SE
LLICV5	1	17-Jan-2019 23:40	275LICV.d	AS CD FE K PB SB SE
ICSA	1	17-Jan-2019 23:42	276ICSA.d	AS CD FE K PB SB SE
ICSAB	1	17-Jan-2019 23:45	277ICSB.d	AS CD FE K PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010556

Run ID:ICPMS04_331185
Instrument:ICPMS04
Method:SW6020

ICCB 10	Date: 17-Jan-2019 18:13	Seq: 4913293	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	-14.52	12	200	

CCB 11	Date: 17-Jan-2019 18:54	Seq: 4913367	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.321	0.4	2	
Iron	16.26	12	200	
Magnesium	21.92	10	200	
Sodium	661.1	14	200	

CCB 12	Date: 17-Jan-2019 19:32	Seq: 4913608	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.9	0.4	2	
Magnesium	31.21	10	200	
Potassium	-42.81	18	200	
Sodium	1048	14	200	

CCB 13	Date: 17-Jan-2019 20:21	Seq: 4913621	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.965	0.4	2	
Calcium	55.85	34	500	
Potassium	-34.52	18	200	
Selenium	1.313	1.1	2	
Sodium	578.6	14	200	

CCB 14	Date: 17-Jan-2019 20:36	Seq: 4913627	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.889	0.4	2	
Magnesium	10.31	10	200	
Potassium	-28.37	18	200	
Sodium	371	14	200	

CCB 15	Date: 17-Jan-2019 20:57	Seq: 4913732	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.226	0.4	2	
Calcium	125.8	34	500	
Iron	17.06	12	200	
Magnesium	91.44	10	200	
Potassium	-25.35	18	200	
Sodium	1254	14	200	

ICCB 16	Date: 17-Jan-2019 22:11	Seq: 4913650	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	-13.55	12	200	
Sodium	-49.36	14	200	

CCB 17	Date: 17-Jan-2019 22:31	Seq: 4913689	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.128	0.4	2	
Iron	23.71	12	200	
Potassium	-30.41	18	200	
Sodium	-80.12	14	200	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010556
Start Date: 18-Jan-2019 End Date: 18-Jan-2019

Run ID:ICPMS04_331292
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	18-Jan-2019 11:51	018_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	18-Jan-2019 11:53	019SMPL.d	CA MG NA
LLICV5	1	18-Jan-2019 11:55	020LICV.d	CA MG NA
ICB	1	18-Jan-2019 11:58	021_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	18-Jan-2019 12:07	023ICSA.d	CA MG NA
ICSAB	1	18-Jan-2019 12:09	024ICSB.d	CA MG NA
CCV 1	1	18-Jan-2019 12:39	036_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	18-Jan-2019 12:42	037_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	18-Jan-2019 13:10	048_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	18-Jan-2019 13:13	049_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	18-Jan-2019 13:19	051_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	18-Jan-2019 13:44	061_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	18-Jan-2019 13:47	062_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	18-Jan-2019 14:15	073_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	18-Jan-2019 14:17	074_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	18-Jan-2019 14:56	085_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	18-Jan-2019 14:58	086_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	18-Jan-2019 15:25	097_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	18-Jan-2019 15:27	098_CCB.d	AS CA CD FE K MG NA PB SB SE
20190103-DGW-MW11-PV5out-ControlT	100	18-Jan-2019 15:43	104SMPL.d	CA MG NA
20190103-DGW-MW11-PV5out-ControlTSD	500	18-Jan-2019 15:45	105SMPL.d	CA MG NA
20190103-DGW-MW11-PV5out-ControlTPDS	100	18-Jan-2019 15:47	106SMPL.d	CA MG NA
20190103-DGW-MW11-PV5out-30T	100	18-Jan-2019 15:49	107SMPL.d	CA MG NA
CCB 7	1	18-Jan-2019 15:56	110_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 8	1	18-Jan-2019 16:17	112_CCV.d	AS CA CD FE K MG NA PB SB SE
20190103-DGW-MW11-PV5out-35T	50	18-Jan-2019 16:20	113SMPL.d	CA MG
20190103-DGW-MW11-PV5out-40T	50	18-Jan-2019 16:23	114SMPL.d	CA MG
20190104-DGW-MW11-PV5inlet-ControlT	50	18-Jan-2019 16:25	115SMPL.d	CA MG
20190104-DGW-MW11-PV5inlet-30-35-40T	50	18-Jan-2019 16:27	116SMPL.d	CA MG
20190104-DGW-MW11-PV5mid-ControlT	50	18-Jan-2019 16:29	117SMPL.d	CA MG
20190104-DGW-MW11-PV5mid-30T	50	18-Jan-2019 16:32	118SMPL.d	CA MG
20190104-DGW-MW11-PV5mid-35T	50	18-Jan-2019 16:34	119SMPL.d	CA MG
20190104-DGW-MW11-PV5mid-40T	50	18-Jan-2019 16:36	120SMPL.d	CA MG
CCV 9	1	18-Jan-2019 16:41	122_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	18-Jan-2019 16:43	123_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 10	1	18-Jan-2019 17:47	143_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	18-Jan-2019 17:49	144SMPL.d	CA MG NA
LLCCV5	1	18-Jan-2019 17:52	145LICV.d	CA MG NA
ICCB 9	1	18-Jan-2019 17:54	146_ICB.d	AS CA CD FE K MG NA PB SB SE
20190103-DGW-MW11-PV5out-35T	50	18-Jan-2019 18:06	148SMPL.d	NA
20190103-DGW-MW11-PV5out-40T	50	18-Jan-2019 18:08	149SMPL.d	NA
20190104-DGW-MW11-PV5inlet-ControlT	50	18-Jan-2019 18:10	150SMPL.d	NA

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010556
Start Date: 18-Jan-2019 End Date: 18-Jan-2019

Run ID:ICPMS04_331292
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
20190104-DGW-MW11-PV5inlet-30-35-40T	50	18-Jan-2019 18:12	151SMPL.d	NA
20190104-DGW-MW11-PV5mid-ControlT	50	18-Jan-2019 18:15	152SMPL.d	NA
20190104-DGW-MW11-PV5mid-30T	50	18-Jan-2019 18:17	153SMPL.d	NA
20190104-DGW-MW11-PV5mid-35T	50	18-Jan-2019 18:19	154SMPL.d	NA
20190104-DGW-MW11-PV5mid-40T	50	18-Jan-2019 18:21	155SMPL.d	NA
CCV 11	1	18-Jan-2019 18:28	158_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	18-Jan-2019 18:30	159_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 12	1	18-Jan-2019 18:59	170_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	18-Jan-2019 19:01	171_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 13	1	18-Jan-2019 19:25	180_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 12	1	18-Jan-2019 19:28	181_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 14	1	18-Jan-2019 19:52	192_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 13	1	18-Jan-2019 19:55	193_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 15	1	18-Jan-2019 20:19	204_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 14	1	18-Jan-2019 20:22	205_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 16	1	18-Jan-2019 20:42	214_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 15	1	18-Jan-2019 20:44	215_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 17	1	18-Jan-2019 20:58	221_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 16	1	18-Jan-2019 21:00	222_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 17	1	18-Jan-2019 21:20	231_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 18	1	18-Jan-2019 21:36	233_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 19	1	18-Jan-2019 21:58	243_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 18	1	18-Jan-2019 22:01	244_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 20	1	18-Jan-2019 22:18	252_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 19	1	18-Jan-2019 22:21	253_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 21	1	18-Jan-2019 22:45	264_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 20	1	18-Jan-2019 22:47	265_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 22	1	18-Jan-2019 23:12	276_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 21	1	18-Jan-2019 23:14	277_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 23	1	18-Jan-2019 23:19	279_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 22	1	18-Jan-2019 23:21	280_CCB.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	18-Jan-2019 23:23	281SMPL.d	CA MG NA
LLICV5	1	18-Jan-2019 23:25	282LICV.d	CA MG NA
ICSA	1	18-Jan-2019 23:28	283ICSA.d	CA MG NA
ICSAB	1	18-Jan-2019 23:30	284ICSB.d	CA MG NA

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010556

Run ID:ICPMS04_331292
Instrument:ICPMS04
Method:SW6020

CCB 1	Date: 18-Jan-2019 12:42	Seq: 4914346	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	53.46	14	200	

CCB 2	Date: 18-Jan-2019 13:13	Seq: 4914467	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	49.32	14	200	

CCB 3	Date: 18-Jan-2019 13:47	Seq: 4914527	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	101.6	14	200	

CCB 4	Date: 18-Jan-2019 14:17	Seq: 4914695	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	104.8	14	200	

CCB 5	Date: 18-Jan-2019 14:58	Seq: 4914980	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	90.97	14	200	

CCB 6	Date: 18-Jan-2019 15:27	Seq: 4914992	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	84.66	14	200	

CCB 7	Date: 18-Jan-2019 15:56	Seq: 4915022	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	75.83	14	200	

CCB 8	Date: 18-Jan-2019 16:43	Seq: 4915172	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	84.46	14	200	

CCB 10	Date: 18-Jan-2019 18:30	Seq: 4915298	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	34.84	34	500	
Sodium	-19.19	14	200	

CCB 11	Date: 18-Jan-2019 19:01	Seq: 4915347	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	39.04	34	500	

CCB 12	Date: 18-Jan-2019 19:28	Seq: 4916025	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	35.14	34	500	

CCB 13	Date: 18-Jan-2019 19:55	Seq: 4916037	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	42.21	34	500	
Sodium	121.4	14	200	

CCB 14	Date: 18-Jan-2019 20:22	Seq: 4916049	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	36.9	34	500	
Sodium	80.48	14	200	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19010556

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19010556-01	20190103-DGW-MW11-PV5out-ControlT	Groundwater		03-Jan-2019 08:00	12-Jan-2019 09:35	☐
HS19010556-02	20190103-DGW-MW11-PV5out-30T	Groundwater		03-Jan-2019 08:00	12-Jan-2019 09:35	☐
HS19010556-03	20190103-DGW-MW11-PV5out-35T	Groundwater		03-Jan-2019 08:00	12-Jan-2019 09:35	☐
HS19010556-04	20190103-DGW-MW11-PV5out-40T	Groundwater		03-Jan-2019 08:00	12-Jan-2019 09:35	☐
HS19010556-05	20190104-DGW-MW11-PV5inlet-ControlT	Groundwater		04-Jan-2019 10:00	12-Jan-2019 09:35	☐
HS19010556-06	20190104-DGW-MW11-PV5inlet-30-35-40T	Groundwater		04-Jan-2019 10:00	12-Jan-2019 09:35	☐
HS19010556-07	20190104-DGW-MW11-PV5mid-ControlT	Groundwater		04-Jan-2019 10:00	12-Jan-2019 09:35	☐
HS19010556-08	20190104-DGW-MW11-PV5mid-30T	Groundwater		04-Jan-2019 10:00	12-Jan-2019 09:35	☐
HS19010556-09	20190104-DGW-MW11-PV5mid-35T	Groundwater		04-Jan-2019 10:00	12-Jan-2019 09:35	☐
HS19010556-10	20190104-DGW-MW11-PV5mid-40T	Groundwater		04-Jan-2019 10:00	12-Jan-2019 09:35	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190103-DGW-MW11-PV5out-ControlT
Collection Date: 03-Jan-2019 08:00

ANALYTICAL REPORT
WorkOrder:HS19010556
Lab ID:HS19010556-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**2,360**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 16-Jan-2019		Analyst: JCJ
Antimony	**0.000661**	J	**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 18:39
Arsenic	U		0.000400	0.00200	mg/L	1	17-Jan-2019 18:39
Cadmium	**0.00902**		**0.000200**	**0.00200**	**mg/L**	1	17-Jan-2019 18:39
Calcium	**423**		**3.40**	**50.0**	**mg/L**	100	18-Jan-2019 15:43
Iron	U		0.0120	0.200	mg/L	1	17-Jan-2019 18:39
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 18:39
Magnesium	**317**		**1.00**	**20.0**	**mg/L**	100	18-Jan-2019 15:43
Potassium	**20.9**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 18:39
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 18:39
Sodium	**1,580**		**1.40**	**20.0**	**mg/L**	100	18-Jan-2019 15:43

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190103-DGW-MW11-PV5out-30T
Collection Date: 03-Jan-2019 08:00

ANALYTICAL REPORT
WorkOrder:HS19010556
Lab ID:HS19010556-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**1,820**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 16-Jan-2019		Analyst: JCJ
Antimony	**0.000943**	J	**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 19:10
Arsenic	U		0.000400	0.00200	mg/L	1	17-Jan-2019 19:10
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 19:10
Calcium	**263**		**3.40**	**50.0**	**mg/L**	100	18-Jan-2019 15:49
Iron	**1.82**		**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 19:10
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 19:10
Magnesium	**283**		**1.00**	**20.0**	**mg/L**	100	18-Jan-2019 15:49
Potassium	**18.3**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 19:10
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 19:10
Sodium	**1,840**		**1.40**	**20.0**	**mg/L**	100	18-Jan-2019 15:49

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190103-DGW-MW11-PV5out-35T
Collection Date: 03-Jan-2019 08:00

ANALYTICAL REPORT
WorkOrder:HS19010556
Lab ID:HS19010556-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**1,790**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 16-Jan-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 19:12
Arsenic	U		0.000400	0.00200	mg/L	1	17-Jan-2019 19:12
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 19:12
Calcium	**257**		**1.70**	**25.0**	**mg/L**	50	18-Jan-2019 16:20
Iron	**1.29**		**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 19:12
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 19:12
Magnesium	**278**		**0.500**	**10.0**	**mg/L**	50	18-Jan-2019 16:20
Potassium	**17.9**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 19:12
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 19:12
Sodium	**1,700**		**0.700**	**10.0**	**mg/L**	50	18-Jan-2019 18:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190103-DGW-MW11-PV5out-40T
Collection Date: 03-Jan-2019 08:00

ANALYTICAL REPORT
WorkOrder:HS19010556
Lab ID:HS19010556-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**1,970**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 16-Jan-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 19:14
Arsenic	U		0.000400	0.00200	mg/L	1	17-Jan-2019 19:14
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 19:14
Calcium	**291**		**1.70**	**25.0**	**mg/L**	50	18-Jan-2019 16:23
Iron	**0.553**		**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 19:14
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 19:14
Magnesium	**301**		**0.500**	**10.0**	**mg/L**	50	18-Jan-2019 16:23
Potassium	**17.3**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 19:14
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 19:14
Sodium	**1,740**		**0.700**	**10.0**	**mg/L**	50	18-Jan-2019 18:08

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190104-DGW-MW11-PV5inlet-ControlT
Collection Date: 04-Jan-2019 10:00

ANALYTICAL REPORT
WorkOrder:HS19010556
Lab ID:HS19010556-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**2,520**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 16-Jan-2019		Analyst: JCJ
Antimony	**0.000882**	J	**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 19:17
Arsenic	**0.000636**	J	**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 19:17
Cadmium	**0.00989**		**0.000200**	**0.00200**	**mg/L**	1	17-Jan-2019 19:17
Calcium	**466**		**1.70**	**25.0**	**mg/L**	50	18-Jan-2019 16:25
Iron	**28.3**		**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 19:17
Lead	**0.0259**		**0.000600**	**0.00200**	**mg/L**	1	17-Jan-2019 19:17
Magnesium	**329**		**0.500**	**10.0**	**mg/L**	50	18-Jan-2019 16:25
Potassium	**20.4**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 19:17
Selenium	**0.00172**	J	**0.00110**	**0.00200**	**mg/L**	1	17-Jan-2019 19:17
Sodium	**1,530**		**0.700**	**10.0**	**mg/L**	50	18-Jan-2019 18:10

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190104-DGW-MW11-PV5inlet-30-35-40T
Collection Date: 04-Jan-2019 10:00

ANALYTICAL REPORT
WorkOrder:HS19010556
Lab ID:HS19010556-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**2,300**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 16-Jan-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 19:19
Arsenic	**0.00143**	J	**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 19:19
Cadmium	**0.00124**	J	**0.000200**	**0.00200**	**mg/L**	1	17-Jan-2019 19:19
Calcium	**442**		**1.70**	**25.0**	**mg/L**	50	18-Jan-2019 16:27
Iron	**9.77**		**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 19:19
Lead	**0.00472**		**0.000600**	**0.00200**	**mg/L**	1	17-Jan-2019 19:19
Magnesium	**290**		**0.500**	**10.0**	**mg/L**	50	18-Jan-2019 16:27
Potassium	**18.1**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 19:19
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 19:19
Sodium	**1,730**		**0.700**	**10.0**	**mg/L**	50	18-Jan-2019 18:12

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190104-DGW-MW11-PV5mid-ControlT
Collection Date: 04-Jan-2019 10:00

ANALYTICAL REPORT
WorkOrder:HS19010556
Lab ID:HS19010556-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**2,560**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 16-Jan-2019		Analyst: JCJ
Antimony	**0.000436**	J	**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 19:21
Arsenic	U		0.000400	0.00200	mg/L	1	17-Jan-2019 19:21
Cadmium	**0.00956**		**0.000200**	**0.00200**	**mg/L**	1	17-Jan-2019 19:21
Calcium	**474**		**1.70**	**25.0**	**mg/L**	50	18-Jan-2019 16:29
Iron	**0.0535**	J	**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 19:21
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 19:21
Magnesium	**334**		**0.500**	**10.0**	**mg/L**	50	18-Jan-2019 16:29
Potassium	**21.2**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 19:21
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 19:21
Sodium	**1,470**		**0.700**	**10.0**	**mg/L**	50	18-Jan-2019 18:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190104-DGW-MW11-PV5mid-30T
Collection Date: 04-Jan-2019 10:00

ANALYTICAL REPORT
WorkOrder:HS19010556
Lab ID:HS19010556-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**1,900**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 16-Jan-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 19:23
Arsenic	U		0.000400	0.00200	mg/L	1	17-Jan-2019 19:23
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 19:23
Calcium	**291**		**1.70**	**25.0**	**mg/L**	50	18-Jan-2019 16:32
Iron	**17.6**		**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 19:23
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 19:23
Magnesium	**285**		**0.500**	**10.0**	**mg/L**	50	18-Jan-2019 16:32
Potassium	**18.0**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 19:23
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 19:23
Sodium	**1,690**		**0.700**	**10.0**	**mg/L**	50	18-Jan-2019 18:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190104-DGW-MW11-PV5mid-35T
Collection Date: 04-Jan-2019 10:00

ANALYTICAL REPORT
WorkOrder:HS19010556
Lab ID:HS19010556-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**1,880**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 16-Jan-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 19:26
Arsenic	U		0.000400	0.00200	mg/L	1	17-Jan-2019 19:26
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 19:26
Calcium	**269**		**1.70**	**25.0**	**mg/L**	50	18-Jan-2019 16:34
Iron	**13.4**		**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 19:26
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 19:26
Magnesium	**293**		**0.500**	**10.0**	**mg/L**	50	18-Jan-2019 16:34
Potassium	**18.1**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 19:26
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 19:26
Sodium	**1,660**		**0.700**	**10.0**	**mg/L**	50	18-Jan-2019 18:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190104-DGW-MW11-PV5mid-40T
Collection Date: 04-Jan-2019 10:00

ANALYTICAL REPORT
WorkOrder:HS19010556
Lab ID:HS19010556-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**1,810**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 16-Jan-2019		Analyst: JCJ
Antimony	**0.000511**	J	**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 19:59
Arsenic	U		0.000400	0.00200	mg/L	1	17-Jan-2019 19:59
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 19:59
Calcium	**267**		**1.70**	**25.0**	**mg/L**	50	18-Jan-2019 16:36
Iron	**4.76**		**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 19:59
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 19:59
Magnesium	**278**		**0.500**	**10.0**	**mg/L**	50	18-Jan-2019 16:36
Potassium	**17.7**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 19:59
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 19:59
Sodium	**1,680**		**0.700**	**10.0**	**mg/L**	50	18-Jan-2019 18:21

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010556

Batch ID: 136690 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19010556-01	1	10	10 (mL)	1
HS19010556-02	1	10	10 (mL)	1
HS19010556-03	1	10	10 (mL)	1
HS19010556-04	1	10	10 (mL)	1
HS19010556-05	1	10	10 (mL)	1
HS19010556-06	1	10	10 (mL)	1
HS19010556-07	1	10	10 (mL)	1
HS19010556-08	1	10	10 (mL)	1
HS19010556-09	1	10	10 (mL)	1
HS19010556-10	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010556

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 136690	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19010556-01	20190103-DGW-MW11-PV5out-ControlT	03 Jan 2019 08:00		16 Jan 2019 13:30	18 Jan 2019 15:43	100
HS19010556-01	20190103-DGW-MW11-PV5out-ControlT	03 Jan 2019 08:00		16 Jan 2019 13:30	17 Jan 2019 18:39	1
HS19010556-02	20190103-DGW-MW11-PV5out-30T	03 Jan 2019 08:00		16 Jan 2019 13:30	18 Jan 2019 15:49	100
HS19010556-02	20190103-DGW-MW11-PV5out-30T	03 Jan 2019 08:00		16 Jan 2019 13:30	17 Jan 2019 19:10	1
HS19010556-03	20190103-DGW-MW11-PV5out-35T	03 Jan 2019 08:00		16 Jan 2019 13:30	18 Jan 2019 18:06	50
HS19010556-03	20190103-DGW-MW11-PV5out-35T	03 Jan 2019 08:00		16 Jan 2019 13:30	18 Jan 2019 16:20	50
HS19010556-03	20190103-DGW-MW11-PV5out-35T	03 Jan 2019 08:00		16 Jan 2019 13:30	17 Jan 2019 19:12	1
HS19010556-04	20190103-DGW-MW11-PV5out-40T	03 Jan 2019 08:00		16 Jan 2019 13:30	18 Jan 2019 18:08	50
HS19010556-04	20190103-DGW-MW11-PV5out-40T	03 Jan 2019 08:00		16 Jan 2019 13:30	18 Jan 2019 16:23	50
HS19010556-04	20190103-DGW-MW11-PV5out-40T	03 Jan 2019 08:00		16 Jan 2019 13:30	17 Jan 2019 19:14	1
HS19010556-05	20190104-DGW-MW11-PV5inlet-ControlT	04 Jan 2019 10:00		16 Jan 2019 13:30	18 Jan 2019 18:10	50
HS19010556-05	20190104-DGW-MW11-PV5inlet-ControlT	04 Jan 2019 10:00		16 Jan 2019 13:30	18 Jan 2019 16:25	50
HS19010556-05	20190104-DGW-MW11-PV5inlet-ControlT	04 Jan 2019 10:00		16 Jan 2019 13:30	17 Jan 2019 19:17	1
HS19010556-06	20190104-DGW-MW11-PV5inlet-30-35-40T	04 Jan 2019 10:00		16 Jan 2019 13:30	18 Jan 2019 18:12	50
HS19010556-06	20190104-DGW-MW11-PV5inlet-30-35-40T	04 Jan 2019 10:00		16 Jan 2019 13:30	18 Jan 2019 16:27	50
HS19010556-06	20190104-DGW-MW11-PV5inlet-30-35-40T	04 Jan 2019 10:00		16 Jan 2019 13:30	17 Jan 2019 19:19	1
HS19010556-07	20190104-DGW-MW11-PV5mid-ControlT	04 Jan 2019 10:00		16 Jan 2019 13:30	18 Jan 2019 18:15	50
HS19010556-07	20190104-DGW-MW11-PV5mid-ControlT	04 Jan 2019 10:00		16 Jan 2019 13:30	18 Jan 2019 16:29	50
HS19010556-07	20190104-DGW-MW11-PV5mid-ControlT	04 Jan 2019 10:00		16 Jan 2019 13:30	17 Jan 2019 19:21	1
HS19010556-08	20190104-DGW-MW11-PV5mid-30T	04 Jan 2019 10:00		16 Jan 2019 13:30	18 Jan 2019 18:17	50
HS19010556-08	20190104-DGW-MW11-PV5mid-30T	04 Jan 2019 10:00		16 Jan 2019 13:30	18 Jan 2019 16:32	50
HS19010556-08	20190104-DGW-MW11-PV5mid-30T	04 Jan 2019 10:00		16 Jan 2019 13:30	17 Jan 2019 19:23	1
HS19010556-09	20190104-DGW-MW11-PV5mid-35T	04 Jan 2019 10:00		16 Jan 2019 13:30	18 Jan 2019 18:19	50
HS19010556-09	20190104-DGW-MW11-PV5mid-35T	04 Jan 2019 10:00		16 Jan 2019 13:30	18 Jan 2019 16:34	50
HS19010556-09	20190104-DGW-MW11-PV5mid-35T	04 Jan 2019 10:00		16 Jan 2019 13:30	17 Jan 2019 19:26	1
HS19010556-10	20190104-DGW-MW11-PV5mid-40T	04 Jan 2019 10:00		16 Jan 2019 13:30	18 Jan 2019 18:21	50
HS19010556-10	20190104-DGW-MW11-PV5mid-40T	04 Jan 2019 10:00		16 Jan 2019 13:30	18 Jan 2019 16:36	50
HS19010556-10	20190104-DGW-MW11-PV5mid-40T	04 Jan 2019 10:00		16 Jan 2019 13:30	17 Jan 2019 19:59	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010556

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R331360	**Test Name :** HARDNESS, TOTAL AS CACO3 BY SM2340B			**Matrix:** Groundwater		
HS19010556-01	20190103-DGW-MW11-PV5out-ControlT	03 Jan 2019 08:00			19 Jan 2019 15:58	1
HS19010556-02	20190103-DGW-MW11-PV5out-30T	03 Jan 2019 08:00			19 Jan 2019 15:58	1
HS19010556-03	20190103-DGW-MW11-PV5out-35T	03 Jan 2019 08:00			19 Jan 2019 15:58	1
HS19010556-04	20190103-DGW-MW11-PV5out-40T	03 Jan 2019 08:00			19 Jan 2019 15:58	1
HS19010556-05	20190104-DGW-MW11-PV5inlet-ControlT	04 Jan 2019 10:00			19 Jan 2019 15:58	1
HS19010556-06	20190104-DGW-MW11-PV5inlet-30-35-40T	04 Jan 2019 10:00			19 Jan 2019 15:58	1
HS19010556-07	20190104-DGW-MW11-PV5mid-ControlT	04 Jan 2019 10:00			19 Jan 2019 15:58	1
HS19010556-08	20190104-DGW-MW11-PV5mid-30T	04 Jan 2019 10:00			19 Jan 2019 15:58	1
HS19010556-09	20190104-DGW-MW11-PV5mid-35T	04 Jan 2019 10:00			19 Jan 2019 15:58	1
HS19010556-10	20190104-DGW-MW11-PV5mid-40T	04 Jan 2019 10:00			19 Jan 2019 15:58	1

WorkOrder: HS19010556
InstrumentID: ICPMS04
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000521	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000340	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000553	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0523	0.0340	0.500
A	Iron	7439-89-6	0.0250	0.0205	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000916	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0700	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0418	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00274	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0556	0.0140	0.200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010556

QC BATCH REPORT

Batch ID: 136690 **Instrument: ICPMS04** **Method: SW6020**

MBLK Sample ID: **MBLK-136690** Units: **mg/L** Analysis Date: **17-Jan-2019 18:34**
Client ID: Run ID: **ICPMS04_331185** SeqNo: **4913358** PrepDate: **16-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01128	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								

LCS Sample ID: **LCS-136690** Units: **mg/L** Analysis Date: **17-Jan-2019 18:37**
Client ID: Run ID: **ICPMS04_331185** SeqNo: **4913359** PrepDate: **16-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04945	0.00200	0.05	0	98.9	80 - 120				
Arsenic	0.04865	0.00200	0.05	0	97.3	80 - 120				
Cadmium	0.04959	0.00200	0.05	0	99.2	80 - 120				
Calcium	4.93	0.500	5	0	98.6	80 - 120				
Iron	5.024	0.200	5	0	100	80 - 120				
Lead	0.05004	0.00200	0.05	0	100	80 - 120				
Magnesium	5.01	0.200	5	0	100	80 - 120				
Potassium	5.044	0.200	5	0	101	80 - 120				
Selenium	0.04839	0.00200	0.05	0	96.8	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010556

QC BATCH REPORT

Batch ID: 136690 **Instrument: ICPMS04** **Method: SW6020**

MS Sample ID: **HS19010556-01MS** Units: **mg/L** Analysis Date: **17-Jan-2019 18:43**
Client ID: **20190103-DGW-MW11-PV5out-ControlT** Run ID: **ICPMS04_331185** SeqNo: **4913362** PrepDate: **16-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04987	0.00200	0.05	0.000661	98.4	80 - 120				
Arsenic	0.04945	0.00200	0.05	0.000295	98.3	80 - 120				
Cadmium	0.06062	0.00200	0.05	0.009021	103	80 - 120				
Calcium	480.8	0.500	5	460.4	409	80 - 120				SEO
Iron	4.771	0.200	5	0.01046	95.2	80 - 120				
Lead	0.05088	0.00200	0.05	0.000165	101	80 - 120				
Magnesium	297.4	0.200	5	297.7	-6.51	80 - 120				SEO
Potassium	25.43	0.200	5	20.92	90.2	80 - 120				O
Selenium	0.04999	0.00200	0.05	0.000874	98.2	80 - 120				
Sodium	U	0.200	5	0	0	80 - 120				S

MSD Sample ID: **HS19010556-01MSD** Units: **mg/L** Analysis Date: **17-Jan-2019 18:46**
Client ID: **20190103-DGW-MW11-PV5out-ControlT** Run ID: **ICPMS04_331185** SeqNo: **4913363** PrepDate: **16-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05169	0.00200	0.05	0.000661	102	80 - 120	0.04987	3.58	20	
Arsenic	0.04815	0.00200	0.05	0.000295	95.7	80 - 120	0.04945	2.66	20	
Cadmium	0.05919	0.00200	0.05	0.009021	100	80 - 120	0.06062	2.39	20	
Calcium	459.1	0.500	5	460.4	-26.6	80 - 120	480.8	4.63	20	SEO
Iron	4.598	0.200	5	0.01046	91.8	80 - 120	4.771	3.7	20	
Lead	0.05018	0.00200	0.05	0.000165	100	80 - 120	0.05088	1.38	20	
Magnesium	295.3	0.200	5	297.7	-48.7	80 - 120	297.4	0.711	20	SEO
Potassium	24.9	0.200	5	20.92	79.6	80 - 120	25.43	2.09	20	SO
Selenium	0.04754	0.00200	0.05	0.000874	93.3	80 - 120	0.04999	5.04	20	
Sodium	U	0.200	5	0	0	80 - 120	0	0	20	S

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010556

QC BATCH REPORT

Batch ID: 136690 **Instrument: ICPMS04** **Method: SW6020**

PDS Sample ID: **HS19010556-01PDS** Units: **mg/L** Analysis Date: **17-Jan-2019 18:48**
Client ID: **20190103-DGW-MW11-PV5out-ControlT** Run ID: **ICPMS04_331185** SeqNo: **4913364** PrepDate: **16-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1012	0.00200	0.1	0.000661	100	75 - 125				
Arsenic	0.1043	0.00200	0.1	0.000295	104	75 - 125				
Cadmium	0.1189	0.00200	0.1	0.009021	110	75 - 125				
Iron	10.04	0.200	10	0.01046	100	75 - 125				
Lead	0.108	0.00200	0.1	0.000165	108	75 - 125				
Potassium	30.42	0.200	10	20.92	94.9	75 - 125				
Selenium	0.1071	0.00200	0.1	0.000874	106	75 - 125				

PDS Sample ID: **HS19010556-01PDS** Units: **mg/L** Analysis Date: **18-Jan-2019 15:47**
Client ID: **20190103-DGW-MW11-PV5out-ControlT** Run ID: **ICPMS04_331292** SeqNo: **4915018** PrepDate: **16-Jan-2019** DF: **100**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	1394	50.0	1000	423.2	97.1	75 - 125				
Magnesium	1348	20.0	1000	317.4	103	75 - 125				
Sodium	2686	20.0	1000	1584	110	75 - 125				

SD Sample ID: **HS19010556-01SD** Units: **mg/L** Analysis Date: **17-Jan-2019 18:41**
Client ID: **20190103-DGW-MW11-PV5out-ControlT** Run ID: **ICPMS04_331185** SeqNo: **4913361** PrepDate: **16-Jan-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000661	0	10	
Arsenic	U	0.0100					0.000295	0	10	
Cadmium	0.009395	0.0100					0.009021	0	10	J
Iron	0.0776	1.00					0.01046	0	10	J
Lead	U	0.0100					0.000165	0	10	
Potassium	21.56	1.00					20.92	3.06	10	
Selenium	U	0.0100					0.000874	0	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010556

QC BATCH REPORT

Batch ID: **136690** **Instrument:** **ICPMS04** **Method:** **SW6020**

SD Sample ID: **HS19010556-01SD** Units: **mg/L** Analysis Date: **18-Jan-2019 15:45**
Client ID: **20190103-DGW-MW11-PV5out-ControlT** Run ID: **ICPMS04_331292** SeqNo: **4915017** PrepDate: **16-Jan-2019** DF: **500**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	437.4	250					423.2	3.37	10	
Magnesium	319.7	100					317.4	0.724	10	
Sodium	1629	100					1584	2.84	10	

The following samples were analyzed in this batch:

HS19010556-01	HS19010556-02	HS19010556-03	HS19010556-04
HS19010556-05	HS19010556-06	HS19010556-07	HS19010556-08
HS19010556-09	HS19010556-10		

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19010556**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19010556

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19010556-01	20190103-DGW-MW11-PV5out-ControlT	Login	1/14/2019 12:38:18 PM	JRM	MET042
HS19010556-02	20190103-DGW-MW11-PV5out-30T	Login	1/14/2019 12:38:18 PM	JRM	MET042
HS19010556-03	20190103-DGW-MW11-PV5out-35T	Login	1/14/2019 12:38:18 PM	JRM	MET042
HS19010556-04	20190103-DGW-MW11-PV5out-40T	Login	1/14/2019 12:38:18 PM	JRM	MET042
HS19010556-05	20190104-DGW-MW11-PV5inlet-ControlT	Login	1/14/2019 12:38:18 PM	JRM	MET042
HS19010556-06	20190104-DGW-MW11-PV5inlet-30-35-40T	Login	1/14/2019 12:38:18 PM	JRM	MET042
HS19010556-07	20190104-DGW-MW11-PV5mid-ControlT	Login	1/14/2019 12:38:18 PM	JRM	MET042
HS19010556-08	20190104-DGW-MW11-PV5mid-30T	Login	1/14/2019 12:38:18 PM	JRM	MET042
HS19010556-09	20190104-DGW-MW11-PV5mid-35T	Login	1/14/2019 12:38:18 PM	JRM	MET042
HS19010556-10	20190104-DGW-MW11-PV5mid-40T	Login	1/14/2019 12:38:18 PM	JRM	MET042

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19010556
Date/Time Received: **12-Jan-2019 09:35**
Received by: **JRM**

Checklist completed by: *Jared R. Makan* eSignature 14-Jan-2019 Date
Reviewed by: *Dane J. Wacasey* eSignature 17-Jan-2019 Date

Matrices: **Water**
Carrier name: **FedEx International Priority**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	13.6c/13.9c UC/C	IR25	
Cooler(s)/Kit(s):	43811		
Date/Time sample(s) sent to storage:	01/12/2019 15:00		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070

Chain of Custody Form

Page ____ of ____

COC ID: 194450

HS19010556

WV

Golder Associates
Exide Column Studies

Customer Information		Project Information		ALS Project Manager:
Purchase Order	130-2086-06	Project Name	Exide Column Studies	
Work Order		Project Number	130-2086	
Company Name	Golder Associates	Bill To Company	Golder Associates	
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P	
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit	
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021	
Phone	(314) 984-8800	Phone	(314) 984-8800	
Fax		Fax		
e-Mail Address	Emily_White@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com	

A 300_W (300.0, SO4, [*NO3* *48hr HT*])
B TDS_W 2540C (2540C TDS)
C ALK_W 2320B (2320B Alkalinity)
D HARD (2340B Hardness (calc))
E ICP_TW (6020A Total Metals (6)+Cations)
F ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
G
H
I
J

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190103-DGW-MW11-PUSout-control	2019/01/03	8:00	GW	2	1				X	X						
2	20190103-DGW-MW11-PUSout-30T	"	"	"	2	1				X	X						
3	20190103-DGW-MW11-PUSout-35T	"	"	"	2	1				X	X						
4	20190103-DGW-MW11-PUSout-40T	"	"	"	2	1				X	X						
5	20190104-DGW-MW11-PUSinlet-control	2019/01/04	10:00	"	2	1				X	X						
6	20190104-DGW-MW11-PUSinlet-30-35-40T	"	"	"	2	1				X	X						
7	20190104-DGW-MW11-PUSmid-control	2019/01/04	10:00	"	2	1				X	X						
8	20190104-DGW-MW11-PUSmid-30T	"	"	"	2	1				X	X						
9	20190104-DGW-MW11-PUSmid-35T	"	"	"	2	1				X	X						
10	20190104-DGW-MW11-PUSmid-40T	"	"	"	2	1				X	X						

Sampler(s) Please Print & Sign: Bethnie Emily

Shipment Method:

Required Turnaround Time: (Check Box) ☐ Other ____ ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour

Results Due Date:

Relinquished by: [signature] Date: 2019/01/11 Time: 3:00 pm Received by: ____

Relinquished by: ____ Date: 01/12/19 Time: 09:35 Received by (Laboratory): [signature]

Logged by (Laboratory): Date: Time: Checked by (Laboratory):

Notes: Exide Column Studies

Cooler ID	Cooler Temp.
	4C
43011	13.6
	11.23
	0.03

QC Package: (Check One Box Below)
☐ Level II Std QC
☐ Level III Std QC/Raw Data
☐ Level IV SW846/CLP
☐ Other
☒ TRRP Checklist
☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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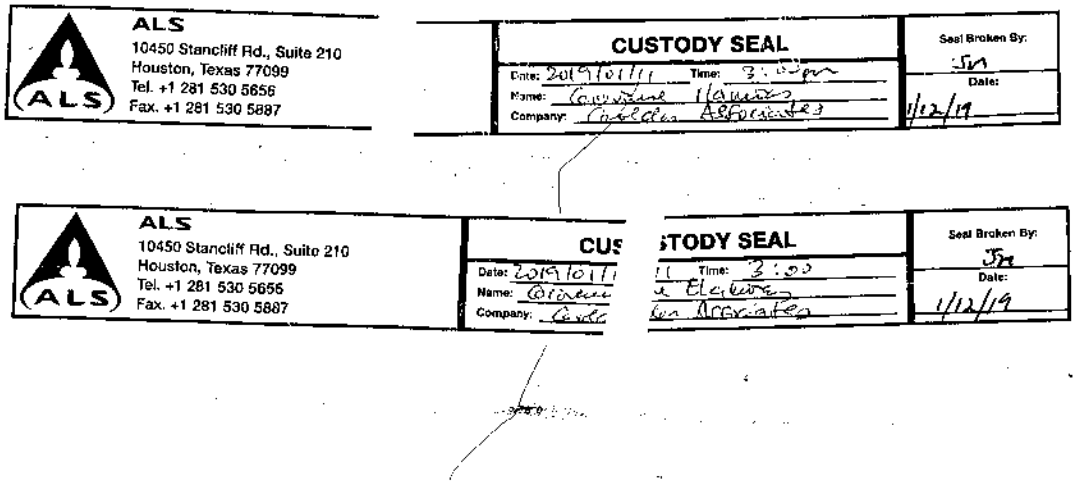

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

CUSTODY SEAL
Date: 2019/01/11 Time: 3:00pm
Name: Caroline Hawkins
Company: Golder Associates

Seal Broken By:
Date: 1/12/19

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

CUS TODY SEAL
Date: 2019/01/11 Time: 3:00
Name: Caroline Hawkins
Company: Golder Associates

Seal Broken By:
Date: 1/12/19

ORIGIN ID:YUXA (514) 383-0990
AUDREY ETHEVES
GOLDER ASSOCIATES LTD
7250 RUE DU MILE END
3E ETAGE
MONTREAL, PQ H2R3A4
CANADA CA

SHIP DATE: 11JAN19
ACTWGT: 22.60 LB
CAD: 108680724/INET4042

BILL RECIPIENT

TO **DANE WACASEY**
ALS HOUSTON LABORATORY
10450 STANCLIFF RD
STE 210
HOUSTON TX 77099 **(US)**
(281) 530-5656 REF:
INV:
PO: DEPT:

552J2/D74C/DCA5

FedEx Express

E

J18211901602uv

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Audrey Etheves
Golder Associates Ltd
7250 rue du Mile End
3e etage
MONTREAL, PQ H2R3A4
CANADA, CA

Ship Date: 11JAN19
ActWgt: 22.60 LB
CAD: 108680724/INET4042

BILL RECIPIENT
EIN/VAT:

TO Dane Wacasey
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

(281) 530-5656

FedEx Express

(US)

J182180915/2dcv

AWB

X0 SGRA

PKG:YOUR PKG

TRK# 7741 7166 8422

Form 0430

SATURDAY 12:00P
INTL PRIORITY

REF:
DESC1:Bouteille d'eau
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: Audrey Etheves
T/C: R 967554812
D/T: R 967554812

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10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

January 22, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19010557**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 10 sample(s) on Jan 12, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DAYNA.FISHER
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19010557**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS19010557**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 01/22/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19010557				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 136692				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?			X		
		Were analytical duplicates analyzed at the appropriate frequency?			X		
		Were RPDs or relative standard deviations within the laboratory QC limits?			X		
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				2
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 01/22/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19010557				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 136692				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			3
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports	
Laboratory Name: ALS Laboratory Group	LRC Date: 01/22/2019
Project Name: Exide Column Studies	Laboratory Job Number: HS19010557
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 136692

ER#[5]	Description
1	Batch 136692, Dissolved Metals by Method SW6020, Sample 20190103-DGW-MW11-PV5out-ControlD: MS/MSD recovered outside control limits for Sodium. For Calcium and Magnesium, the results in the parent sample is greater than 4x the spike amount.
2	Batch 136692, Dissolved Metals by Method SW6020, Samples HS19010557-02 through -10, Sample ran at a 5X dilution due to high concentration of Sodium.
3	See Run Log and CCB Exception Reports

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010557
Start Date: 17-Jan-2019 End Date: 17-Jan-2019

Run ID:ICPMS04_331185
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	17-Jan-2019 11:56	018_ICV.d	AS CD FE K PB SB SE
LLICV2	1	17-Jan-2019 11:58	019SMPL.d	AS CD FE K PB SB SE
LLICV5	1	17-Jan-2019 12:00	020LICV.d	AS CD FE K PB SB SE
ICB	1	17-Jan-2019 12:02	021_ICB.d	AS CD FE K PB SB SE
ICSA	1	17-Jan-2019 12:13	023ICSA.d	AS CD FE K PB SB SE
ICSAB	1	17-Jan-2019 12:15	024ICSB.d	AS CD FE K PB SB SE
CCV 1	1	17-Jan-2019 12:45	036_CCV.d	AS CD FE K PB SB SE
CCB 1	1	17-Jan-2019 12:47	037_CCB.d	AS CD FE K PB SB SE
CCV 2	1	17-Jan-2019 13:16	048_CCV.d	AS CD FE K PB SB SE
CCB 2	1	17-Jan-2019 13:18	049_CCB.d	AS CD FE K PB SB SE
CCV 3	1	17-Jan-2019 13:49	060_CCV.d	AS CD FE K PB SB SE
CCB 3	1	17-Jan-2019 13:51	061_CCB.d	AS CD FE K PB SB SE
CCV 4	1	17-Jan-2019 14:20	072_CCV.d	AS CD FE K PB SB SE
CCB 4	1	17-Jan-2019 14:22	073_CCB.d	AS CD FE K PB SB SE
CCV 5	1	17-Jan-2019 14:57	084_CCV.d	AS CD FE K PB SB SE
CCB 5	1	17-Jan-2019 14:59	085_CCB.d	AS CD FE K PB SB SE
CCV 6	1	17-Jan-2019 15:22	094_CCV.d	AS CD FE K PB SB SE
CCB 6	1	17-Jan-2019 15:25	095_CCB.d	AS CD FE K PB SB SE
CCV 7	1	17-Jan-2019 16:10	106_CCV.d	AS CD FE K PB SB SE
CCB 7	1	17-Jan-2019 16:13	107_CCB.d	AS CD FE K PB SB SE
CCV 8	1	17-Jan-2019 16:43	118_CCV.d	AS CD FE K PB SB SE
CCB 8	1	17-Jan-2019 16:45	119_CCB.d	AS CD FE K PB SB SE
CCB 9	1	17-Jan-2019 17:17	131_CCB.d	AS CD FE K PB SB SE
CCV 9	1	17-Jan-2019 17:22	133_CCV.d	AS CD FE K PB SB SE
LLCCV2	1	17-Jan-2019 18:08	153SMPL.d	AS CD FE K PB SB SE
LLCCV5	1	17-Jan-2019 18:11	154LICV.d	AS CD FE K PB SB SE
ICCB 10	1	17-Jan-2019 18:13	155_ICB.d	AS CD FE K PB SB SE
ICCV 10	1	17-Jan-2019 18:25	157_ICV.d	AS CD FE K PB SB SE
CCB 11	1	17-Jan-2019 18:54	170_CCB.d	AS CD FE K PB SB SE
CCV 11	1	17-Jan-2019 19:07	172_CCV.d	AS CD FE K PB SB SE
CCB 12	1	17-Jan-2019 19:32	183_CCB.d	AS CD FE K PB SB SE
CCV 12	1	17-Jan-2019 19:52	185_CCV.d	AS CD FE K PB SB SE
CCV 13	1	17-Jan-2019 20:19	195_CCV.d	AS CD FE K PB SB SE
CCB 13	1	17-Jan-2019 20:21	196_CCB.d	AS CD FE K PB SB SE
CCV 14	1	17-Jan-2019 20:34	201_CCV.d	AS CD FE K PB SB SE
CCB 14	1	17-Jan-2019 20:36	202_CCB.d	AS CD FE K PB SB SE
MBLK-136692	1	17-Jan-2019 20:39	203SMPL.d	AS CA CD FE K MG PB SB SE
LCS-136692	1	17-Jan-2019 20:41	204SMPL.d	AS CA CD FE K MG PB SB SE
20190103-DGW-MW11-PV5out-ControlD	1	17-Jan-2019 20:43	205SMPL.d	AS CD FE K PB SB SE
20190103-DGW-MW11-PV5out-ControlDSD	5	17-Jan-2019 20:45	206SMPL.d	AS CD FE K PB SB SE
20190103-DGW-MW11-PV5out-ControlDMS	1	17-Jan-2019 20:48	207SMPL.d	AS CA CD FE K MG NA PB SB SE
20190103-DGW-MW11-PV5out-ControlDMSD	1	17-Jan-2019 20:50	208SMPL.d	AS CA CD FE K MG NA PB SB SE
20190103-DGW-MW11-PV5out-ControlDPDS	1	17-Jan-2019 20:52	209SMPL.d	AS CD FE K PB SB SE
CCV 15	1	17-Jan-2019 20:54	210_CCV.d	AS CD FE K PB SB SE
CCB 15	1	17-Jan-2019 20:57	211_CCB.d	AS CD FE K PB SB SE
ICCV 16	1	17-Jan-2019 22:04	232_ICV.d	AS CD FE K PB SB SE
LLCCV2	1	17-Jan-2019 22:06	233SMPL.d	AS CD FE K PB SB SE
LLCCV5	1	17-Jan-2019 22:08	234LICV.d	AS CD FE K PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010557

Run ID:ICPMS04_331185
Instrument:ICPMS04
Method:SW6020

ICCB 10	Date: 17-Jan-2019 18:13	Seq: 4913293	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	-14.52	12	200	

CCB 11	Date: 17-Jan-2019 18:54	Seq: 4913367	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.321	0.4	2	
Iron	16.26	12	200	
Magnesium	21.92	10	200	
Sodium	661.1	14	200	

CCB 12	Date: 17-Jan-2019 19:32	Seq: 4913608	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.9	0.4	2	
Magnesium	31.21	10	200	
Potassium	-42.81	18	200	
Sodium	1048	14	200	

CCB 13	Date: 17-Jan-2019 20:21	Seq: 4913621	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.965	0.4	2	
Calcium	55.85	34	500	
Potassium	-34.52	18	200	
Selenium	1.313	1.1	2	
Sodium	578.6	14	200	

CCB 14	Date: 17-Jan-2019 20:36	Seq: 4913627	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.889	0.4	2	
Magnesium	10.31	10	200	
Potassium	-28.37	18	200	
Sodium	371	14	200	

CCB 15	Date: 17-Jan-2019 20:57	Seq: 4913732	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.226	0.4	2	
Calcium	125.8	34	500	
Iron	17.06	12	200	
Magnesium	91.44	10	200	
Potassium	-25.35	18	200	
Sodium	1254	14	200	

ICCB 16	Date: 17-Jan-2019 22:11	Seq: 4913650	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	-13.55	12	200	
Sodium	-49.36	14	200	

CCB 17	Date: 17-Jan-2019 22:31	Seq: 4913689	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.128	0.4	2	
Iron	23.71	12	200	
Potassium	-30.41	18	200	
Sodium	-80.12	14	200	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010557
Start Date: 18-Jan-2019 End Date: 18-Jan-2019

Run ID:ICPMS04_331292
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	18-Jan-2019 11:51	018_ICV.d	AS CA CD FE K MG NA PB SE
LLICV2	1	18-Jan-2019 11:53	019SMPL.d	AS CA CD FE K MG NA PB SE
LLICV5	1	18-Jan-2019 11:55	020LICV.d	AS CA CD FE K MG NA PB SE
ICB	1	18-Jan-2019 11:58	021_ICB.d	AS CA CD FE K MG NA PB SE
ICSA	1	18-Jan-2019 12:07	023ICSA.d	AS CA CD FE K MG NA PB SE
ICSAB	1	18-Jan-2019 12:09	024ICSB.d	AS CA CD FE K MG NA PB SE
CCV 1	1	18-Jan-2019 12:39	036_CCV.d	AS CA CD FE K MG NA PB SE
CCB 1	1	18-Jan-2019 12:42	037_CCB.d	AS CA CD FE K MG NA PB SE
CCV 2	1	18-Jan-2019 13:10	048_CCV.d	AS CA CD FE K MG NA PB SE
CCB 2	1	18-Jan-2019 13:13	049_CCB.d	AS CA CD FE K MG NA PB SE
CCV 3	1	18-Jan-2019 13:19	051_CCV.d	AS CA CD FE K MG NA PB SE
CCV 4	1	18-Jan-2019 13:44	061_CCV.d	AS CA CD FE K MG NA PB SE
CCB 3	1	18-Jan-2019 13:47	062_CCB.d	AS CA CD FE K MG NA PB SE
CCV 5	1	18-Jan-2019 14:15	073_CCV.d	AS CA CD FE K MG NA PB SE
CCB 4	1	18-Jan-2019 14:17	074_CCB.d	AS CA CD FE K MG NA PB SE
CCV 6	1	18-Jan-2019 14:56	085_CCV.d	AS CA CD FE K MG NA PB SE
CCB 5	1	18-Jan-2019 14:58	086_CCB.d	AS CA CD FE K MG NA PB SE
CCV 7	1	18-Jan-2019 15:25	097_CCV.d	AS CA CD FE K MG NA PB SE
CCB 6	1	18-Jan-2019 15:27	098_CCB.d	AS CA CD FE K MG NA PB SE
CCB 7	1	18-Jan-2019 15:56	110_CCB.d	AS CA CD FE K MG NA PB SE
CCV 8	1	18-Jan-2019 16:17	112_CCV.d	AS CA CD FE K MG NA PB SE
CCV 9	1	18-Jan-2019 16:41	122_CCV.d	AS CA CD FE K MG NA PB SE
CCB 8	1	18-Jan-2019 16:43	123_CCB.d	AS CA CD FE K MG NA PB SE
ICCV 10	1	18-Jan-2019 17:47	143_ICV.d	AS CA CD FE K MG NA PB SE
LLCCV2	1	18-Jan-2019 17:49	144SMPL.d	AS CA CD FE K MG NA PB SE
LLCCV5	1	18-Jan-2019 17:52	145LICV.d	AS CA CD FE K MG NA PB SE
ICCB 9	1	18-Jan-2019 17:54	146_ICB.d	AS CA CD FE K MG NA PB SE
CCV 11	1	18-Jan-2019 18:28	158_CCV.d	AS CA CD FE K MG NA PB SE
CCB 10	1	18-Jan-2019 18:30	159_CCB.d	AS CA CD FE K MG NA PB SE
CCV 12	1	18-Jan-2019 18:59	170_CCV.d	AS CA CD FE K MG NA PB SE
CCB 11	1	18-Jan-2019 19:01	171_CCB.d	AS CA CD FE K MG NA PB SE
MBLK-136692	1	18-Jan-2019 19:10	173SMPL.d	NA
LCS-136692	1	18-Jan-2019 19:12	174SMPL.d	NA
20190103-DGW-MW11-PV5out-ControlD	50	18-Jan-2019 19:14	175SMPL.d	CA MG NA
20190103-DGW-MW11-PV5out-ControlDSD	250	18-Jan-2019 19:16	176SMPL.d	CA MG NA
20190103-DGW-MW11-PV5out-ControlDPDS	50	18-Jan-2019 19:19	177SMPL.d	CA MG NA
20190103-DGW-MW11-PV5out-30D	50	18-Jan-2019 19:21	178SMPL.d	NA
CCV 13	1	18-Jan-2019 19:25	180_CCV.d	AS CA CD FE K MG NA PB SE
CCB 12	1	18-Jan-2019 19:28	181_CCB.d	AS CA CD FE K MG NA PB SE
20190103-DGW-MW11-PV5out-30D	5	18-Jan-2019 19:30	182SMPL.d	AS CA CD FE K MG PB SE
20190103-DGW-MW11-PV5out-35D	5	18-Jan-2019 19:32	183SMPL.d	AS CA CD FE K MG PB SE
20190103-DGW-MW11-PV5out-40D	5	18-Jan-2019 19:34	184SMPL.d	AS CA CD FE K MG PB SE
20190104-DGW-MW11-PV5inlet-ControlD	5	18-Jan-2019 19:37	185SMPL.d	AS CA CD FE K MG PB SE
20190104-DGW-MW11-PV5inlet-30-35-40D	5	18-Jan-2019 19:39	186SMPL.d	AS CA CD FE K MG PB SE
20190104-DGW-MW11-PV5mid-ControlD	5	18-Jan-2019 19:41	187SMPL.d	AS CA CD FE K MG PB SE

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010557
Start Date: 18-Jan-2019 End Date: 18-Jan-2019

Run ID:ICPMS04_331292
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
20190104-DGW-MW11-PV5mid-30D	5	18-Jan-2019 19:43	188SMPL.d	AS CA CD FE K MG PB SE
20190104-DGW-MW11-PV5mid-35D	5	18-Jan-2019 19:46	189SMPL.d	AS CA CD FE K MG PB SE
20190104-DGW-MW11-PV5mid-40D	5	18-Jan-2019 19:48	190SMPL.d	AS CA CD FE K MG PB SE
CCV 14	1	18-Jan-2019 19:52	192_CCV.d	AS CA CD FE K MG NA PB SE
CCB 13	1	18-Jan-2019 19:55	193_CCB.d	AS CA CD FE K MG NA PB SE
CCV 15	1	18-Jan-2019 20:19	204_CCV.d	AS CA CD FE K MG NA PB SE
CCB 14	1	18-Jan-2019 20:22	205_CCB.d	AS CA CD FE K MG NA PB SE
CCV 16	1	18-Jan-2019 20:42	214_CCV.d	AS CA CD FE K MG NA PB SE
CCB 15	1	18-Jan-2019 20:44	215_CCB.d	AS CA CD FE K MG NA PB SE
CCV 17	1	18-Jan-2019 20:58	221_CCV.d	AS CA CD FE K MG NA PB SE
CCB 16	1	18-Jan-2019 21:00	222_CCB.d	AS CA CD FE K MG NA PB SE
CCB 17	1	18-Jan-2019 21:20	231_CCB.d	AS CA CD FE K MG NA PB SE
CCV 18	1	18-Jan-2019 21:36	233_CCV.d	AS CA CD FE K MG NA PB SE
CCV 19	1	18-Jan-2019 21:58	243_CCV.d	AS CA CD FE K MG NA PB SE
CCB 18	1	18-Jan-2019 22:01	244_CCB.d	AS CA CD FE K MG NA PB SE
CCV 20	1	18-Jan-2019 22:18	252_CCV.d	AS CA CD FE K MG NA PB SE
CCB 19	1	18-Jan-2019 22:21	253_CCB.d	AS CA CD FE K MG NA PB SE
CCV 21	1	18-Jan-2019 22:45	264_CCV.d	AS CA CD FE K MG NA PB SE
CCB 20	1	18-Jan-2019 22:47	265_CCB.d	AS CA CD FE K MG NA PB SE
CCV 22	1	18-Jan-2019 23:12	276_CCV.d	AS CA CD FE K MG NA PB SE
CCB 21	1	18-Jan-2019 23:14	277_CCB.d	AS CA CD FE K MG NA PB SE
CCV 23	1	18-Jan-2019 23:19	279_CCV.d	AS CA CD FE K MG NA PB SE
CCB 22	1	18-Jan-2019 23:21	280_CCB.d	AS CA CD FE K MG NA PB SE
LLICV2	1	18-Jan-2019 23:23	281SMPL.d	AS CA CD FE K MG NA PB SE
LLICV5	1	18-Jan-2019 23:25	282LICV.d	AS CA CD FE K MG NA PB SE
ICSA	1	18-Jan-2019 23:28	283ICSA.d	AS CA CD FE K MG NA PB SE
ICSAB	1	18-Jan-2019 23:30	284ICSB.d	AS CA CD FE K MG NA PB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010557

Run ID:ICPMS04_331292
Instrument:ICPMS04
Method:SW6020

ICB	Date: 18-Jan-2019 11:58	Seq: 4914269		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Selenium	-1.349	1.1	2	
CCB 1	Date: 18-Jan-2019 12:42	Seq: 4914346		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Potassium	-18.94	18	200	
	Sodium	53.46	14	200	
CCB 2	Date: 18-Jan-2019 13:13	Seq: 4914467		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Potassium	-33.47	18	200	
	Sodium	49.32	14	200	
CCB 3	Date: 18-Jan-2019 13:47	Seq: 4914527		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	101.6	14	200	
CCB 4	Date: 18-Jan-2019 14:17	Seq: 4914695		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Potassium	18.63	18	200	
	Selenium	-1.297	1.1	2	
	Sodium	104.8	14	200	
CCB 5	Date: 18-Jan-2019 14:58	Seq: 4914980		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Selenium	-1.476	1.1	2	
	Sodium	90.97	14	200	
CCB 6	Date: 18-Jan-2019 15:27	Seq: 4914992		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Potassium	25.21	18	200	
	Sodium	84.66	14	200	
CCB 7	Date: 18-Jan-2019 15:56	Seq: 4915022		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Potassium	30.64	18	200	
	Selenium	-1.186	1.1	2	
	Sodium	75.83	14	200	
CCB 8	Date: 18-Jan-2019 16:43	Seq: 4915172		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Potassium	24.81	18	200	
	Sodium	84.46	14	200	
CCB 10	Date: 18-Jan-2019 18:30	Seq: 4915298		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Calcium	34.84	34	500	
	Potassium	-28.8	18	200	
	Sodium	-19.19	14	200	
CCB 11	Date: 18-Jan-2019 19:01	Seq: 4915347		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Calcium	39.04	34	500	

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010557

Run ID:ICPMS04_331292
Instrument:ICPMS04
Method:SW6020

CCB 12	Date: 18-Jan-2019 19:28	Seq: 4916025	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	35.14	34	500	

CCB 13	Date: 18-Jan-2019 19:55	Seq: 4916037	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	42.21	34	500	
Iron	21.02	12	200	
Potassium	-22.34	18	200	
Sodium	121.4	14	200	

CCB 14	Date: 18-Jan-2019 20:22	Seq: 4916049	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	36.9	34	500	
Sodium	80.48	14	200	

CCB 15	Date: 18-Jan-2019 20:44	Seq: 4916134	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	38.04	34	500	
Potassium	-25.22	18	200	
Sodium	40.3	14	200	

CCB 16	Date: 18-Jan-2019 21:00	Seq: 4916141	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	39.8	34	500	
Magnesium	10.74	10	200	
Potassium	-40.15	18	200	
Sodium	27.99	14	200	

CCB 17	Date: 18-Jan-2019 21:20	Seq: 4916150	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	57.48	34	500	
Magnesium	10.76	10	200	
Potassium	-24.13	18	200	
Selenium	1.248	1.1	2	

CCB 18	Date: 18-Jan-2019 22:01	Seq: 4916163	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	47.53	34	500	
Potassium	-57.48	18	200	

CCB 19	Date: 18-Jan-2019 22:21	Seq: 4916172	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	50.91	34	500	
Iron	19.24	12	200	
Lead	0.678	0.6	2	
Magnesium	13.47	10	200	
Potassium	-62.21	18	200	

CCB 20	Date: 18-Jan-2019 22:47	Seq: 4916184	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Lead	5.941	0.6	2	
Potassium	-79.75	18	200	
Sodium	18.15	14	200	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010557
Start Date: 21-Jan-2019 End Date: 21-Jan-2019

Run ID:ICPMS05_331390
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
LLICV5	1	21-Jan-2019 12:09	018LICV.d	NA SB
ICB	1	21-Jan-2019 12:11	019_ICB.d	NA SB
ICV	1	21-Jan-2019 12:20	021_ICV.d	NA SB
LLICV2	1	21-Jan-2019 12:22	022SMPL.d	NA SB
ICSA	1	21-Jan-2019 12:26	023ICSA.d	NA SB
ICSAB	1	21-Jan-2019 12:28	024ICSB.d	NA SB
CCV 1	1	21-Jan-2019 12:55	036_CCV.d	NA SB
CCB 1	1	21-Jan-2019 12:57	037_CCB.d	NA SB
20190103-DGW-MW11-PV5out-35D	50	21-Jan-2019 13:01	039SMPL.d	NA
20190103-DGW-MW11-PV5out-40D	50	21-Jan-2019 13:03	040SMPL.d	NA
20190104-DGW-MW11-PV5inlet-ControlD	50	21-Jan-2019 13:05	041SMPL.d	NA
20190104-DGW-MW11-PV5inlet-30-35-40D	50	21-Jan-2019 13:07	042SMPL.d	NA
20190104-DGW-MW11-PV5mid-ControlD	50	21-Jan-2019 13:09	043SMPL.d	NA
20190104-DGW-MW11-PV5mid-30D	50	21-Jan-2019 13:11	044SMPL.d	NA
20190104-DGW-MW11-PV5mid-35D	50	21-Jan-2019 13:13	045SMPL.d	NA
20190104-DGW-MW11-PV5mid-40D	50	21-Jan-2019 13:15	046SMPL.d	NA
20190103-DGW-MW11-PV5out-30D	5	21-Jan-2019 13:17	047SMPL.d	SB
CCV 2	1	21-Jan-2019 13:19	048_CCV.d	NA SB
CCB 2	1	21-Jan-2019 13:21	049_CCB.d	NA SB
20190103-DGW-MW11-PV5out-35D	5	21-Jan-2019 13:26	051SMPL.d	SB
20190103-DGW-MW11-PV5out-40D	5	21-Jan-2019 13:28	052SMPL.d	SB
20190104-DGW-MW11-PV5inlet-ControlD	5	21-Jan-2019 13:30	053SMPL.d	SB
20190104-DGW-MW11-PV5inlet-30-35-40D	5	21-Jan-2019 13:32	054SMPL.d	SB
20190104-DGW-MW11-PV5mid-ControlD	5	21-Jan-2019 13:34	055SMPL.d	SB
20190104-DGW-MW11-PV5mid-30D	5	21-Jan-2019 13:36	056SMPL.d	SB
20190104-DGW-MW11-PV5mid-35D	5	21-Jan-2019 13:38	057SMPL.d	SB
20190104-DGW-MW11-PV5mid-40D	5	21-Jan-2019 13:40	058SMPL.d	SB
CCV 3	1	21-Jan-2019 13:44	060_CCV.d	NA SB
CCB 3	1	21-Jan-2019 13:46	061_CCB.d	NA SB
ICCV 4	1	21-Jan-2019 14:40	078_ICV.d	NA SB
LLCCV5	1	21-Jan-2019 14:42	079LICV.d	NA SB
LLCCV2	1	21-Jan-2019 14:44	080SMPL.d	NA SB
ICCB 4	1	21-Jan-2019 14:46	081_ICB.d	NA SB
CCV 5	1	21-Jan-2019 15:24	091_CCV.d	NA SB
CCB 5	1	21-Jan-2019 15:26	092_CCB.d	NA SB
CCV 6	1	21-Jan-2019 15:42	100_CCV.d	NA SB
CCB 6	1	21-Jan-2019 15:44	101_CCB.d	NA SB
CCV 7	1	21-Jan-2019 16:55	124_CCV.d	NA SB
CCB 7	1	21-Jan-2019 16:57	125_CCB.d	NA SB
LLCCV5	1	21-Jan-2019 18:17	137LICV.d	NA SB
LLCCV2	1	21-Jan-2019 18:19	138SMPL.d	NA SB

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010557

Run ID:ICPMS05_331390
Instrument:ICPMS05
Method:SW6020

CCB 2	Date: 21-Jan-2019 13:21	Seq: 4917324		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	73.45	14	200	
CCB 3	Date: 21-Jan-2019 13:46	Seq: 4917336		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	162.8	14	200	
CCB 6	Date: 21-Jan-2019 15:44	Seq: 4917409		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	60.31	14	200	
CCB 7	Date: 21-Jan-2019 16:57	Seq: 4917668		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	130.4	14	200	
ICCB 8	Date: 21-Jan-2019 18:21	Seq: 4917786		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	-37.59	14	200	
CCB 9	Date: 21-Jan-2019 18:41	Seq: 4917836		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	244.1	14	200	
CCB 11	Date: 21-Jan-2019 20:17	Seq: 4917873		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.175	0.4	2	
	Sodium	73.44	14	200	
CCB 12	Date: 21-Jan-2019 20:35	Seq: 4917882		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.366	0.4	2	
	Sodium	22.4	14	200	
CCB 13	Date: 21-Jan-2019 20:58	Seq: 4917894		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.978	0.4	2	
	Sodium	53.02	14	200	
CCB 14	Date: 21-Jan-2019 21:02	Seq: 4917896		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.029	0.4	2	
	Sodium	38.33	14	200	
CCB 15	Date: 21-Jan-2019 21:16	Seq: 4917905		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.045	0.4	2	
	Sodium	76.62	14	200	
CCB 17	Date: 21-Jan-2019 22:39	Seq: 4918281		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.722	0.4	2	
CCB 18	Date: 21-Jan-2019 22:53	Seq: 4918288		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19010557

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19010557-01	20190103-DGW-MW11-PV5out-ControlD	Groundwater		03-Jan-2019 08:00	12-Jan-2019 09:35	☐
HS19010557-02	20190103-DGW-MW11-PV5out-30D	Groundwater		03-Jan-2019 08:00	12-Jan-2019 09:35	☐
HS19010557-03	20190103-DGW-MW11-PV5out-35D	Groundwater		03-Jan-2019 08:00	12-Jan-2019 09:35	☐
HS19010557-04	20190103-DGW-MW11-PV5out-40D	Groundwater		03-Jan-2019 08:00	12-Jan-2019 09:35	☐
HS19010557-05	20190104-DGW-MW11-PV5inlet-ControlD	Groundwater		04-Jan-2019 10:00	12-Jan-2019 09:35	☐
HS19010557-06	20190104-DGW-MW11-PV5inlet-30-35-40D	Groundwater		04-Jan-2019 10:00	12-Jan-2019 09:35	☐
HS19010557-07	20190104-DGW-MW11-PV5mid-ControlD	Groundwater		04-Jan-2019 10:00	12-Jan-2019 09:35	☐
HS19010557-08	20190104-DGW-MW11-PV5mid-30D	Groundwater		04-Jan-2019 10:00	12-Jan-2019 09:35	☐
HS19010557-09	20190104-DGW-MW11-PV5mid-35D	Groundwater		04-Jan-2019 10:00	12-Jan-2019 09:35	☐
HS19010557-10	20190104-DGW-MW11-PV5mid-40D	Groundwater		04-Jan-2019 10:00	12-Jan-2019 09:35	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190103-DGW-MW11-PV5out-ControlD
Collection Date: 03-Jan-2019 08:00

ANALYTICAL REPORT
WorkOrder:HS19010557
Lab ID:HS19010557-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 16-Jan-2019		Analyst: JCJ
Antimony	**0.000719**	J	**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 20:43
Arsenic	U		0.000400	0.00200	mg/L	1	17-Jan-2019 20:43
Cadmium	**0.00974**		**0.000200**	**0.00200**	**mg/L**	1	17-Jan-2019 20:43
Calcium	**497**		**1.70**	**25.0**	**mg/L**	50	18-Jan-2019 19:14
Iron	U		0.0120	0.200	mg/L	1	17-Jan-2019 20:43
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 20:43
Magnesium	**338**		**0.500**	**10.0**	**mg/L**	50	18-Jan-2019 19:14
Potassium	**20.8**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 20:43
Selenium	**0.00173**	J	**0.00110**	**0.00200**	**mg/L**	1	17-Jan-2019 20:43
Sodium	**1,480**		**0.700**	**10.0**	**mg/L**	50	18-Jan-2019 19:14

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190103-DGW-MW11-PV5out-30D
Collection Date: 03-Jan-2019 08:00

ANALYTICAL REPORT
WorkOrder:HS19010557
Lab ID:HS19010557-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 16-Jan-2019		Analyst: ALR
Antimony	U		0.00200	0.0100	mg/L	5	21-Jan-2019 13:17
Arsenic	U		0.00200	0.0100	mg/L	5	18-Jan-2019 19:30
Cadmium	U		0.00100	0.0100	mg/L	5	18-Jan-2019 19:30
Calcium	**285**		**0.170**	**2.50**	**mg/L**	5	18-Jan-2019 19:30
Iron	U		0.0600	1.00	mg/L	5	18-Jan-2019 19:30
Lead	U		0.00300	0.0100	mg/L	5	18-Jan-2019 19:30
Magnesium	**271**		**0.0500**	**1.00**	**mg/L**	5	18-Jan-2019 19:30
Potassium	**19.0**		**0.0900**	**1.00**	**mg/L**	5	18-Jan-2019 19:30
Selenium	U		0.00550	0.0100	mg/L	5	18-Jan-2019 19:30
Sodium	**1,560**		**0.700**	**10.0**	**mg/L**	50	18-Jan-2019 19:21

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190103-DGW-MW11-PV5out-35D
Collection Date: 03-Jan-2019 08:00

ANALYTICAL REPORT
WorkOrder:HS19010557
Lab ID:HS19010557-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 16-Jan-2019		Analyst: ALR
Antimony	U		0.00200	0.0100	mg/L	5	21-Jan-2019 13:26
Arsenic	U		0.00200	0.0100	mg/L	5	18-Jan-2019 19:32
Cadmium	U		0.00100	0.0100	mg/L	5	18-Jan-2019 19:32
Calcium	**286**		**0.170**	**2.50**	**mg/L**	5	18-Jan-2019 19:32
Iron	U		0.0600	1.00	mg/L	5	18-Jan-2019 19:32
Lead	U		0.00300	0.0100	mg/L	5	18-Jan-2019 19:32
Magnesium	**262**		**0.0500**	**1.00**	**mg/L**	5	18-Jan-2019 19:32
Potassium	**20.1**		**0.0900**	**1.00**	**mg/L**	5	18-Jan-2019 19:32
Selenium	U		0.00550	0.0100	mg/L	5	18-Jan-2019 19:32
Sodium	**1,860**		**0.700**	**10.0**	**mg/L**	50	21-Jan-2019 13:01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190103-DGW-MW11-PV5out-40D
Collection Date: 03-Jan-2019 08:00

ANALYTICAL REPORT
WorkOrder:HS19010557
Lab ID:HS19010557-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 16-Jan-2019		Analyst: ALR
Antimony	U		0.00200	0.0100	mg/L	5	21-Jan-2019 13:28
Arsenic	U		0.00200	0.0100	mg/L	5	18-Jan-2019 19:34
Cadmium	U		0.00100	0.0100	mg/L	5	18-Jan-2019 19:34
Calcium	**274**		**0.170**	**2.50**	**mg/L**	5	18-Jan-2019 19:34
Iron	U		0.0600	1.00	mg/L	5	18-Jan-2019 19:34
Lead	U		0.00300	0.0100	mg/L	5	18-Jan-2019 19:34
Magnesium	**272**		**0.0500**	**1.00**	**mg/L**	5	18-Jan-2019 19:34
Potassium	**18.9**		**0.0900**	**1.00**	**mg/L**	5	18-Jan-2019 19:34
Selenium	U		0.00550	0.0100	mg/L	5	18-Jan-2019 19:34
Sodium	**1,880**		**0.700**	**10.0**	**mg/L**	50	21-Jan-2019 13:03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190104-DGW-MW11-PV5inlet-ControlD
Collection Date: 04-Jan-2019 10:00

ANALYTICAL REPORT
WorkOrder:HS19010557
Lab ID:HS19010557-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 16-Jan-2019		Analyst: ALR
Antimony	U		0.00200	0.0100	mg/L	5	21-Jan-2019 13:30
Arsenic	U		0.00200	0.0100	mg/L	5	18-Jan-2019 19:37
Cadmium	**0.00967**	J	**0.00100**	**0.0100**	**mg/L**	5	18-Jan-2019 19:37
Calcium	**468**		**0.170**	**2.50**	**mg/L**	5	18-Jan-2019 19:37
Iron	**19.2**		**0.0600**	**1.00**	**mg/L**	5	18-Jan-2019 19:37
Lead	U		0.00300	0.0100	mg/L	5	18-Jan-2019 19:37
Magnesium	**303**		**0.0500**	**1.00**	**mg/L**	5	18-Jan-2019 19:37
Potassium	**22.5**		**0.0900**	**1.00**	**mg/L**	5	18-Jan-2019 19:37
Selenium	U		0.00550	0.0100	mg/L	5	18-Jan-2019 19:37
Sodium	**1,650**		**0.700**	**10.0**	**mg/L**	50	21-Jan-2019 13:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190104-DGW-MW11-PV5inlet-30-35-40D
Collection Date: 04-Jan-2019 10:00

ANALYTICAL REPORT
WorkOrder:HS19010557
Lab ID:HS19010557-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 16-Jan-2019		Analyst: ALR
Antimony	U		0.00200	0.0100	mg/L	5	21-Jan-2019 13:32
Arsenic	U		0.00200	0.0100	mg/L	5	18-Jan-2019 19:39
Cadmium	**0.00128**	J	**0.00100**	**0.0100**	**mg/L**	5	18-Jan-2019 19:39
Calcium	**512**		**0.170**	**2.50**	**mg/L**	5	18-Jan-2019 19:39
Iron	U		0.0600	1.00	mg/L	5	18-Jan-2019 19:39
Lead	U		0.00300	0.0100	mg/L	5	18-Jan-2019 19:39
Magnesium	**268**		**0.0500**	**1.00**	**mg/L**	5	18-Jan-2019 19:39
Potassium	**19.4**		**0.0900**	**1.00**	**mg/L**	5	18-Jan-2019 19:39
Selenium	U		0.00550	0.0100	mg/L	5	18-Jan-2019 19:39
Sodium	**1,910**		**0.700**	**10.0**	**mg/L**	50	21-Jan-2019 13:07

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190104-DGW-MW11-PV5mid-ControlD
Collection Date: 04-Jan-2019 10:00

ANALYTICAL REPORT
WorkOrder:HS19010557
Lab ID:HS19010557-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 16-Jan-2019		Analyst: ALR
Antimony	U		0.00200	0.0100	mg/L	5	21-Jan-2019 13:34
Arsenic	U		0.00200	0.0100	mg/L	5	18-Jan-2019 19:41
Cadmium	**0.00934**	J	**0.00100**	**0.0100**	**mg/L**	5	18-Jan-2019 19:41
Calcium	**487**		**0.170**	**2.50**	**mg/L**	5	18-Jan-2019 19:41
Iron	U		0.0600	1.00	mg/L	5	18-Jan-2019 19:41
Lead	U		0.00300	0.0100	mg/L	5	18-Jan-2019 19:41
Magnesium	**306**		**0.0500**	**1.00**	**mg/L**	5	18-Jan-2019 19:41
Potassium	**22.3**		**0.0900**	**1.00**	**mg/L**	5	18-Jan-2019 19:41
Selenium	U		0.00550	0.0100	mg/L	5	18-Jan-2019 19:41
Sodium	**1,720**		**0.700**	**10.0**	**mg/L**	50	21-Jan-2019 13:09

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190104-DGW-MW11-PV5mid-30D
Collection Date: 04-Jan-2019 10:00

ANALYTICAL REPORT
WorkOrder:HS19010557
Lab ID:HS19010557-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 16-Jan-2019		Analyst: ALR
Antimony	U		0.00200	0.0100	mg/L	5	21-Jan-2019 13:36
Arsenic	U		0.00200	0.0100	mg/L	5	18-Jan-2019 19:43
Cadmium	U		0.00100	0.0100	mg/L	5	18-Jan-2019 19:43
Calcium	**290**		**0.170**	**2.50**	**mg/L**	5	18-Jan-2019 19:43
Iron	**0.255**	J	**0.0600**	**1.00**	**mg/L**	5	18-Jan-2019 19:43
Lead	U		0.00300	0.0100	mg/L	5	18-Jan-2019 19:43
Magnesium	**272**		**0.0500**	**1.00**	**mg/L**	5	18-Jan-2019 19:43
Potassium	**18.6**		**0.0900**	**1.00**	**mg/L**	5	18-Jan-2019 19:43
Selenium	U		0.00550	0.0100	mg/L	5	18-Jan-2019 19:43
Sodium	**1,890**		**0.700**	**10.0**	**mg/L**	50	21-Jan-2019 13:11

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190104-DGW-MW11-PV5mid-35D
Collection Date: 04-Jan-2019 10:00

ANALYTICAL REPORT
WorkOrder:HS19010557
Lab ID:HS19010557-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 16-Jan-2019		Analyst: ALR
Antimony	U		0.00200	0.0100	mg/L	5	21-Jan-2019 13:38
Arsenic	U		0.00200	0.0100	mg/L	5	18-Jan-2019 19:46
Cadmium	U		0.00100	0.0100	mg/L	5	18-Jan-2019 19:46
Calcium	**278**		**0.170**	**2.50**	**mg/L**	5	18-Jan-2019 19:46
Iron	**0.574**	J	**0.0600**	**1.00**	**mg/L**	5	18-Jan-2019 19:46
Lead	U		0.00300	0.0100	mg/L	5	18-Jan-2019 19:46
Magnesium	**255**		**0.0500**	**1.00**	**mg/L**	5	18-Jan-2019 19:46
Potassium	**18.3**		**0.0900**	**1.00**	**mg/L**	5	18-Jan-2019 19:46
Selenium	U		0.00550	0.0100	mg/L	5	18-Jan-2019 19:46
Sodium	**1,890**		**0.700**	**10.0**	**mg/L**	50	21-Jan-2019 13:13

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190104-DGW-MW11-PV5mid-40D
Collection Date: 04-Jan-2019 10:00

ANALYTICAL REPORT
WorkOrder:HS19010557
Lab ID:HS19010557-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 16-Jan-2019		Analyst: ALR
Antimony	U		0.00200	0.0100	mg/L	5	21-Jan-2019 13:40
Arsenic	U		0.00200	0.0100	mg/L	5	18-Jan-2019 19:48
Cadmium	U		0.00100	0.0100	mg/L	5	18-Jan-2019 19:48
Calcium	**277**		**0.170**	**2.50**	**mg/L**	5	18-Jan-2019 19:48
Iron	**0.138**	J	**0.0600**	**1.00**	**mg/L**	5	18-Jan-2019 19:48
Lead	U		0.00300	0.0100	mg/L	5	18-Jan-2019 19:48
Magnesium	**258**		**0.0500**	**1.00**	**mg/L**	5	18-Jan-2019 19:48
Potassium	**18.3**		**0.0900**	**1.00**	**mg/L**	5	18-Jan-2019 19:48
Selenium	U		0.00550	0.0100	mg/L	5	18-Jan-2019 19:48
Sodium	**1,910**		**0.700**	**10.0**	**mg/L**	50	21-Jan-2019 13:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010557

Batch ID: 136692 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19010557-01	1	10	10 (mL)	1
HS19010557-02	1	10	10 (mL)	1
HS19010557-03	1	10	10 (mL)	1
HS19010557-04	1	10	10 (mL)	1
HS19010557-05	1	10	10 (mL)	1
HS19010557-06	1	10	10 (mL)	1
HS19010557-07	1	10	10 (mL)	1
HS19010557-08	1	10	10 (mL)	1
HS19010557-09	1	10	10 (mL)	1
HS19010557-10	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010557

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 136692	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS19010557-01	20190103-DGW-MW11-PV5out-ControlD	03 Jan 2019 08:00		16 Jan 2019 13:30	18 Jan 2019 19:14	50
HS19010557-01	20190103-DGW-MW11-PV5out-ControlD	03 Jan 2019 08:00		16 Jan 2019 13:30	17 Jan 2019 20:43	1
HS19010557-02	20190103-DGW-MW11-PV5out-30D	03 Jan 2019 08:00		16 Jan 2019 13:30	21 Jan 2019 13:17	5
HS19010557-02	20190103-DGW-MW11-PV5out-30D	03 Jan 2019 08:00		16 Jan 2019 13:30	18 Jan 2019 19:30	5
HS19010557-02	20190103-DGW-MW11-PV5out-30D	03 Jan 2019 08:00		16 Jan 2019 13:30	18 Jan 2019 19:21	50
HS19010557-03	20190103-DGW-MW11-PV5out-35D	03 Jan 2019 08:00		16 Jan 2019 13:30	21 Jan 2019 13:26	5
HS19010557-03	20190103-DGW-MW11-PV5out-35D	03 Jan 2019 08:00		16 Jan 2019 13:30	21 Jan 2019 13:01	50
HS19010557-03	20190103-DGW-MW11-PV5out-35D	03 Jan 2019 08:00		16 Jan 2019 13:30	18 Jan 2019 19:32	5
HS19010557-04	20190103-DGW-MW11-PV5out-40D	03 Jan 2019 08:00		16 Jan 2019 13:30	21 Jan 2019 13:28	5
HS19010557-04	20190103-DGW-MW11-PV5out-40D	03 Jan 2019 08:00		16 Jan 2019 13:30	21 Jan 2019 13:03	50
HS19010557-04	20190103-DGW-MW11-PV5out-40D	03 Jan 2019 08:00		16 Jan 2019 13:30	18 Jan 2019 19:34	5
HS19010557-05	20190104-DGW-MW11-PV5inlet-ControlD	04 Jan 2019 10:00		16 Jan 2019 13:30	21 Jan 2019 13:30	5
HS19010557-05	20190104-DGW-MW11-PV5inlet-ControlD	04 Jan 2019 10:00		16 Jan 2019 13:30	21 Jan 2019 13:05	50
HS19010557-05	20190104-DGW-MW11-PV5inlet-ControlD	04 Jan 2019 10:00		16 Jan 2019 13:30	18 Jan 2019 19:37	5
HS19010557-06	20190104-DGW-MW11-PV5inlet-30-35-40D	04 Jan 2019 10:00		16 Jan 2019 13:30	21 Jan 2019 13:32	5
HS19010557-06	20190104-DGW-MW11-PV5inlet-30-35-40D	04 Jan 2019 10:00		16 Jan 2019 13:30	21 Jan 2019 13:07	50
HS19010557-06	20190104-DGW-MW11-PV5inlet-30-35-40D	04 Jan 2019 10:00		16 Jan 2019 13:30	18 Jan 2019 19:39	5
HS19010557-07	20190104-DGW-MW11-PV5mid-ControlD	04 Jan 2019 10:00		16 Jan 2019 13:30	21 Jan 2019 13:34	5
HS19010557-07	20190104-DGW-MW11-PV5mid-ControlD	04 Jan 2019 10:00		16 Jan 2019 13:30	21 Jan 2019 13:09	50
HS19010557-07	20190104-DGW-MW11-PV5mid-ControlD	04 Jan 2019 10:00		16 Jan 2019 13:30	18 Jan 2019 19:41	5
HS19010557-08	20190104-DGW-MW11-PV5mid-30D	04 Jan 2019 10:00		16 Jan 2019 13:30	21 Jan 2019 13:36	5
HS19010557-08	20190104-DGW-MW11-PV5mid-30D	04 Jan 2019 10:00		16 Jan 2019 13:30	21 Jan 2019 13:11	50
HS19010557-08	20190104-DGW-MW11-PV5mid-30D	04 Jan 2019 10:00		16 Jan 2019 13:30	18 Jan 2019 19:43	5
HS19010557-09	20190104-DGW-MW11-PV5mid-35D	04 Jan 2019 10:00		16 Jan 2019 13:30	21 Jan 2019 13:38	5
HS19010557-09	20190104-DGW-MW11-PV5mid-35D	04 Jan 2019 10:00		16 Jan 2019 13:30	21 Jan 2019 13:13	50
HS19010557-09	20190104-DGW-MW11-PV5mid-35D	04 Jan 2019 10:00		16 Jan 2019 13:30	18 Jan 2019 19:46	5
HS19010557-10	20190104-DGW-MW11-PV5mid-40D	04 Jan 2019 10:00		16 Jan 2019 13:30	21 Jan 2019 13:40	5
HS19010557-10	20190104-DGW-MW11-PV5mid-40D	04 Jan 2019 10:00		16 Jan 2019 13:30	21 Jan 2019 13:15	50
HS19010557-10	20190104-DGW-MW11-PV5mid-40D	04 Jan 2019 10:00		16 Jan 2019 13:30	18 Jan 2019 19:48	5

WorkOrder: HS19010557
InstrumentID: ICPMS04
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000521	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000340	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000553	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0523	0.0340	0.500
A	Iron	7439-89-6	0.0250	0.0205	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000916	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0700	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0418	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00274	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0556	0.0140	0.200

WorkOrder: HS19010557
InstrumentID: ICPMS05
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000555	0.000400	0.00200
A	Sodium	7440-23-5	0.0500	0.0459	0.0140	0.200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010557

QC BATCH REPORT

Batch ID: 136692 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLK-136692** Units: **mg/L** Analysis Date: **17-Jan-2019 20:39**
Client ID: Run ID: **ICPMS04_331185** SeqNo: **4913724** PrepDate: **16-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.0142	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								

MBLK Sample ID: **MBLK-136692** Units: **mg/L** Analysis Date: **18-Jan-2019 19:10**
Client ID: Run ID: **ICPMS04_331292** SeqNo: **4916017** PrepDate: **16-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	U	0.200								

LCS Sample ID: **LCS-136692** Units: **mg/L** Analysis Date: **17-Jan-2019 20:41**
Client ID: Run ID: **ICPMS04_331185** SeqNo: **4913725** PrepDate: **16-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04803	0.00200	0.05	0	96.1	80 - 120				
Arsenic	0.04614	0.00200	0.05	0	92.3	80 - 120				
Cadmium	0.04981	0.00200	0.05	0	99.6	80 - 120				
Calcium	4.554	0.500	5	0	91.1	80 - 120				
Iron	4.78	0.200	5	0	95.6	80 - 120				
Lead	0.05021	0.00200	0.05	0	100	80 - 120				
Magnesium	4.612	0.200	5	0	92.2	80 - 120				
Potassium	4.651	0.200	5	0	93.0	80 - 120				
Selenium	0.0458	0.00200	0.05	0	91.6	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010557

QC BATCH REPORT

Batch ID: 136692 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

LCS Sample ID: **LCS-136692** Units: **mg/L** Analysis Date: **18-Jan-2019 19:12**
Client ID: Run ID: **ICPMS04_331292** SeqNo: **4916018** PrepDate: **16-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	4.688	0.200	5	0	93.8	80 - 120				

MS Sample ID: **HS19010557-01MS** Units: **mg/L** Analysis Date: **17-Jan-2019 20:48**
Client ID: **20190103-DGW-MW11-PV5out-ControlD** Run ID: **ICPMS04_331185** SeqNo: **4913728** PrepDate: **16-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05069	0.00200	0.05	0.000719	99.9	75 - 125				
Arsenic	0.04758	0.00200	0.05	0.000135	94.9	75 - 125				
Cadmium	0.05813	0.00200	0.05	0.009743	96.8	75 - 125				
Calcium	470.6	0.500	5	473.2	-51.9	75 - 125				SEO
Iron	4.593	0.200	5	0.002482	91.8	75 - 125				
Lead	0.0497	0.00200	0.05	0.000142	99.1	75 - 125				
Magnesium	290.4	0.200	5	293.3	-56.9	75 - 125				SEO
Potassium	25.36	0.200	5	20.78	91.5	75 - 125				O
Selenium	0.04552	0.00200	0.05	0.001732	87.6	75 - 125				
Sodium	U	0.200	5	0	0	75 - 125				S

MSD Sample ID: **HS19010557-01MSD** Units: **mg/L** Analysis Date: **17-Jan-2019 20:50**
Client ID: **20190103-DGW-MW11-PV5out-ControlD** Run ID: **ICPMS04_331185** SeqNo: **4913729** PrepDate: **16-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05221	0.00200	0.05	0.000719	103	75 - 125	0.05069	2.96	20	
Arsenic	0.04705	0.00200	0.05	0.000135	93.8	75 - 125	0.04758	1.13	20	
Cadmium	0.06032	0.00200	0.05	0.009743	101	75 - 125	0.05813	3.68	20	
Calcium	467.3	0.500	5	473.2	-117	75 - 125	470.6	0.69	20	SEO
Iron	4.682	0.200	5	0.002482	93.6	75 - 125	4.593	1.92	20	
Lead	0.04983	0.00200	0.05	0.000142	99.4	75 - 125	0.0497	0.265	20	
Magnesium	300.3	0.200	5	293.3	140	75 - 125	290.4	3.33	20	SEO
Potassium	24.79	0.200	5	20.78	80.1	75 - 125	25.36	2.27	20	O
Selenium	0.04855	0.00200	0.05	0.001732	93.6	75 - 125	0.04552	6.44	20	
Sodium	U	0.200	5	0	0	75 - 125	0	0	20	S

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010557

QC BATCH REPORT

Batch ID: 136692 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

PDS Sample ID: **HS19010557-01PDS** Units: **mg/L** Analysis Date: **17-Jan-2019 20:52**
Client ID: **20190103-DGW-MW11-PV5out-ControlD** Run ID: **ICPMS04_331185** SeqNo: **4913730** PrepDate: **16-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09818	0.00200	0.1	0.000719	97.5	75 - 125				
Arsenic	0.09891	0.00200	0.1	0.000135	98.8	75 - 125				
Cadmium	0.1126	0.00200	0.1	0.009743	103	75 - 125				
Iron	9.574	0.200	10	0.002482	95.7	75 - 125				
Lead	0.104	0.00200	0.1	0.000142	104	75 - 125				
Potassium	28.95	0.200	10	20.78	81.7	75 - 125				
Selenium	0.09838	0.00200	0.1	0.001732	96.6	75 - 125				

PDS Sample ID: **HS19010557-01PDS** Units: **mg/L** Analysis Date: **18-Jan-2019 19:19**
Client ID: **20190103-DGW-MW11-PV5out-ControlD** Run ID: **ICPMS04_331292** SeqNo: **4916021** PrepDate: **16-Jan-2019** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	1028	25.0	500	497.2	106	75 - 125				
Magnesium	848.9	10.0	500	338.1	102	75 - 125				
Sodium	2018	10.0	500	1479	108	75 - 125				

SD Sample ID: **HS19010557-01SD** Units: **mg/L** Analysis Date: **17-Jan-2019 20:45**
Client ID: **20190103-DGW-MW11-PV5out-ControlD** Run ID: **ICPMS04_331185** SeqNo: **4913727** PrepDate: **16-Jan-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000719	0	10	
Arsenic	U	0.0100					0.000135	0	10	
Cadmium	0.009319	0.0100					0.009743	0	10	J
Iron	U	1.00					0.002482	0	10	
Lead	U	0.0100					0.000142	0	10	
Potassium	21.16	1.00					20.78	1.81	10	
Selenium	U	0.0100					0.001732	0	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010557

QC BATCH REPORT

Batch ID: 136692 **Instrument:** ICPMS04 **Method:** SW6020 (dissolved) (DISSOLVED)

SD Sample ID: **HS19010557-01SD** Units: **mg/L** Analysis Date: **18-Jan-2019 19:16**
Client ID: **20190103-DGW-MW11-PV5out-ControlID** Run ID: **ICPMS04_331292** SeqNo: **4916020** PrepDate: **16-Jan-2019** DF: **250**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	487.2	125					497.2	2	10	
Magnesium	328.7	50.0					338.1	2.77	10	
Sodium	1503	50.0					1479	1.67	10	

The following samples were analyzed in this batch:

HS19010557-01	HS19010557-02	HS19010557-03	HS19010557-04
HS19010557-05	HS19010557-06	HS19010557-07	HS19010557-08
HS19010557-09	HS19010557-10		

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19010557**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19010557

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19010557-01	20190103-DGW-MW11-PV5out-ControlD	Login	1/14/2019 12:42:41 PM	JRM	MET072
HS19010557-02	20190103-DGW-MW11-PV5out-30D	Login	1/14/2019 12:42:41 PM	JRM	MET072
HS19010557-03	20190103-DGW-MW11-PV5out-35D	Login	1/14/2019 12:42:41 PM	JRM	MET072
HS19010557-04	20190103-DGW-MW11-PV5out-40D	Login	1/14/2019 12:42:41 PM	JRM	MET072
HS19010557-05	20190104-DGW-MW11-PV5inlet-ControlD	Login	1/14/2019 12:42:41 PM	JRM	MET072
HS19010557-06	20190104-DGW-MW11-PV5inlet-30-35-40D	Login	1/14/2019 12:42:41 PM	JRM	MET072
HS19010557-07	20190104-DGW-MW11-PV5mid-ControlD	Login	1/14/2019 12:42:41 PM	JRM	MET072
HS19010557-08	20190104-DGW-MW11-PV5mid-30D	Login	1/14/2019 12:42:41 PM	JRM	MET072
HS19010557-09	20190104-DGW-MW11-PV5mid-35D	Login	1/14/2019 12:42:41 PM	JRM	MET072
HS19010557-10	20190104-DGW-MW11-PV5mid-40D	Login	1/14/2019 12:42:41 PM	JRM	MET072

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19010557
Date/Time Received: **12-Jan-2019 09:35**
Received by: **JRM**

Checklist completed by: *Jared R. Makan* eSignature 14-Jan-2019 Date
Reviewed by: *Dane J. Wacasey* eSignature 17-Jan-2019 Date

Matrices: **Water**
Carrier name: **FedEx International Priority**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	13.6c/13.9c UC/C	IR25	
Cooler(s)/Kit(s):	43811		
Date/Time sample(s) sent to storage:	01/12/2019 15:00		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070

Chain of Custody Form

Page ____ of ____

COC ID: 194449

HS19010557

Golder Associates
Exide Column Studies

Customer Information		Project Information		ALS Project Manager:
Purchase Order	130-2086-06	Project Name	Exide Column Studies	
Work Order		Project Number	130-2086	
Company Name	Golder Associates	Bill To Company	Golder Associates	
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P	
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit	
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021	
Phone	(314) 984-8800	Phone	(314) 984-8800	
Fax		Fax		
e-Mail Address	Emily_White@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com	

A: 300_W (300 Cl, SO4, [*NO3* *48hr HT*])
B: TDS_W 2540C (2540C TDS)
C: ALK_W 2320B (2320B Alkalinity)
D: HARD (2340B Hardness (calc))
E: ICP_TW (6020A Total Metals (6)+Cations)
F: ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
G:
H:
I:
J:

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190103-DGW-MW11-PUSout-controlD	2019/01/03	8:00	GW	2	1						X					
2	20190103-DGW-MW11-PUSout-30D	"	"	"	2	1						X					
3	20190103-DGW-MW11-PUSout-35D	"	"	"	2	1						X					
4	20190103-DGW-MW11-PUSout-40D	"	"	"	2	1						X					
5	20190104-DGW-MW11-PUSinlet-controlD	2019/01/04	10:00	"	2	1						X					
6	20190104-DGW-MW11-PUSinlet-30-35-40D	2019/01/04	"	"	2	1						X					
7	20190104-DGW-MW11-PUSmid-controlD	2019/01/04	10:00	"	2	1						X					
8	20190104-DGW-MW11-PUSmid-30D	"	"	"	2	1						X					
9	20190104-DGW-MW11-PUSmid-35D	"	"	"	2	1						X					
10	20190104-DGW-MW11-PUSmid-40D	"	"	"	2	1						X					

Sampler(s) Please Print & Sign: Bethne Ercole

Shipment Method:

Required Turnaround Time: (Check Box) ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other ____

Results Due Date:

Relinquished by: Bethne Ercole — Date: 2019/01/11 — Time: 3:00pm

Received by:

Relinquished by: — Date: 01/12/19 — Time: 09:35

Received by (Laboratory): J. Immunen

Logged by (Laboratory): — Date: — Time:

Checked by (Laboratory):

Notes: Exide Column Studies

Cooler ID	Cooler Temp.
	UC
43811	13.6
	UC2S
	60.3

QC Package: (Check One Box Below)
☐ Level II Std QC
☐ Level III Std QC/Raw Data
☐ Level IV SW846/CLP
☐ Other
☒ TRRP Checklist
☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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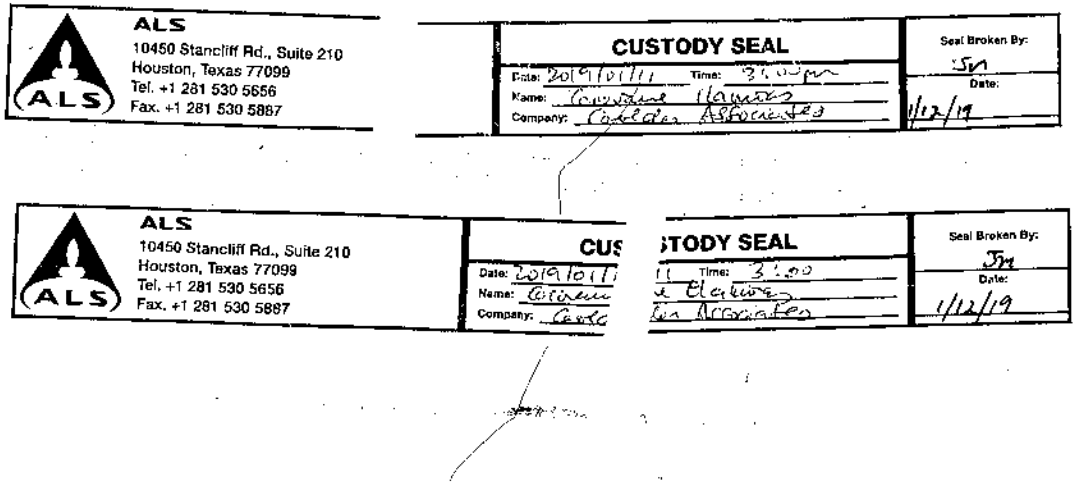
ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CUSTODY SEAL
Date: 2019/01/11
Time: 3:00 pm
Name: Christine Hawkins
Company: Cardno Associates
Seal Broken By:
Date: 1/12/19
ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CUS
Date: 2019/01/11
Name: Christine
Company: Cardno
TODY SEAL
Time: 3:00
e Hawkins
es Associates
Seal Broken By:
Date: 1/12/19

ORIGIN ID:YUXA
AUDREY ETHIER
GOLDEX & ASSOCIATES LTD
7250 RUE DU MILE END
3E ETAGE
MONTREAL, PQ H2R3A4
CANADA CA

(514) 383-0990

SHIP DATE: 11JAN19
ACTWGT: 22.00 LB
CAD: 106389724/INET4042

BILL RECIPIENT

TO DANE WACASEY
ALS HOUSTON LABORATORY
10450 STANCLIFF RD
STE 210
HOUSTON TX 77099

(US)

REF:

DEPT:

FedEx Express

TRK# 0430 7741 7166 8422

XO SGRA

SATURDAY 12:00P
INTL PRIORITY

77099
TX-US IAH

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DÉFINITIONS. Dans la présente lettre de transport aérien, « nous », « notre », et « FedEx » se rapportent à Federal Express Corporation, ses filiales, succursales et leurs employés, mandataires et prestataires externes. « Vous », « votre » et « vos » se rapportent à l'expéditeur, ses employés, dirigeants et mandataires. Si le voyage prévoit plus des États-Unis, votre contrat d'expédition est conclu avec la filiale, la succursale ou les prestataires externes de FedEx ayant à l'origine accepté du produit à l'expédition. « Colis » renferme de tous contenus du colis tous enveloppes d'emballage, documents et tous autres articles qui transportés par vous sous par le biais de nos systèmes automatisés, comprenant, marchandises ou autres de transport. « Envoi » renferme de tous colis sous cette lettre du transport aérien sur une même lettre du transport aérien. REMARQUE RELATIVE AU TRANSPORT AÉRIEN La Convention de Varsovie amendée est applicable à tout envoi soumis à cette convention lorsque la destination finale ou l'escale prévue se situe dans un pays autre que le pays de départ. La Convention de Varsovie amendée régit et limite dans la plupart des cas la responsabilité de FedEx en cas de perte, retard ou dommage affectant votre envoi. La Convention de Varsovie amendée limite la responsabilité de FedEx. Par exemple, aux États-Unis, la responsabilité est limitée à 9,07 $ par livre (20 $ par kilogramme). Sauf si vous déclarez une valeur d'expédition supérieure ne soit déclarée comme décrit ci-dessous, tout frais supplémentaire d'une valeur à votre charge. L'interprétation et la mise en application des dispositions relatives aux limites de responsabilité de la Convention de Varsovie peuvent varier d'un pays à l'autre. FedEx se réserve le droit d'organiser l'itinéraire emprunté et les escales à sa convenance. REMARQUE RELATIVE AU TRANSPORT ROUTIER. Les envois transportés uniquement par voie terrestre vers ou depuis un pays ayant ratifié la Convention de Varsovie outre Convention, relative au contrat de transport international de marchandises par route (la CMR) et sont soumis aux termes et conditions de la CMR, sans préjudice de toute autre disposition contraire de la présente lettre de transport aérien. Concernant les envois transportés exclusivement par voie terrestre, les clauses de la CMR prévalent en cas de conflit entre les dispositions de la CMR et celles de la présente lettre de transport aérien. LIMITATION DE RESPONSABILITÉ. La responsabilité maximale de FedEx en cas de dommage, perte, retard, manque, erreur de livraison, défaut de livraison, d'informations incorrectes ou défaut d'information n'excédera pas 100 $ US, sauf si vous déclarez une valeur supérieure et payez les frais supplémentaires, dans la limite autorisée par la présente. Certains articles ne sont pas admis à l'expédition, et certaines restrictions du contrat d'expédition, et celles régies par la Convention de Varsovie, la CMR ou autres valeurs intermédiaires, liés. Spécifiées réglementations, décrets ou déclarés. Veuillez vous référer à notre site d'expédition (accessible depuis le Guide des Services FedEx) ou à notre document d'explication de déclarées les limites applicables. FedEx ne propose pas de responsabilité marchandises et assurance tout risque, mais il vous est possible de payer des frais supplémentaires par tranche de 100 $US supplémentaires (ou équivalent en monnaie locale du pays d'origine) de valeur d'expédition déclarée. Si la valeur d'expédition déclarée est supérieure aux dommages supplémentaires sont acquittés, la responsabilité de FedEx équivaut alors à la valeur la plus faible entre la valeur déclarée et les dommages réels. EXCLUSION DE RESPONSABILITÉ. 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ORIGIN ID:YUXA (514) 383-0990
Audrey Etheves
Golder Associates Ltd
7250 rue du Mile End
3e etage
MONTREAL, PQ H2R3A4
CANADA, CA

Ship Date: 11JAN19
ActWgt: 22.60 LB
CAD: 106680724/INET4042

BILL RECIPIENT
EIN/VAT:

TO Dane Wacasey
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

(281) 530-5656

FedEx Express

(US)

E

AWB

J18211803152Ov

TRK# 7741 7166 8422

Form 0430

X0 SGRA

PKG:YOUR PKG

SATURDAY 12:00P
INTL PRIORITY

REF:
DESC1:Bouteille d'eau
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: Audrey Etheves
T/C: R 957554812
D/T. R 957554812

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10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

January 21, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19010558**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 10 sample(s) on Jan 12, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19010558**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS19010558**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data								
Laboratory Name: ALS Laboratory Group			LRC Date: 01/21/2019					
Project Name: Exide Column Studies			Laboratory Job Number: HS19010558					
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 136690,R331360					
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]	
R1	OI	**Chain-of-custody (C-O-C)**						
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X					
		Were all departures from standard conditions described in an exception report?	X					
R2	OI	**Sample and quality control (QC) identification**						
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X					
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X					
R3	OI	**Test reports**						
		Were all samples prepared and analyzed within holding times?	X					
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X					
		Were calculations checked by a peer or supervisor?	X					
		Were all analyte identifications checked by a peer or supervisor?	X					
		Were sample detection limits reported for all analytes not detected?	X					
		Were all results for soil and sediment samples reported on a dry weight basis?			X			
		Were % moisture (or solids) reported for all soil and sediment samples?			X			
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X			
		If required for the project, TICs reported?			X			
R4	O	**Surrogate recovery data**						
		Were surrogates added prior to extraction?			X			
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X			
R5	OI	**Test reports/summary forms for blank samples**						
		Were appropriate type(s) of blanks analyzed?	X					
		Were blanks analyzed at the appropriate frequency?	X					
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X					
		Were blank concentrations < MQL?	X					
R6	OI	**Laboratory control samples (LCS):**						
		Were all COCs included in the LCS?	X					
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X					
		Were LCSs analyzed at the required frequency?	X					
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X					
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X					
		Was the LCSD RPD within QC limits?	X					
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**						
		Were the project/method specified analytes included in the MS and MSD?	X					
		Were MS/MSD analyzed at the appropriate frequency?	X					
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1	
		Were MS/MSD RPDs within laboratory QC limits?	X					
R8	OI	**Analytical duplicate data**						
		Were appropriate analytical duplicates analyzed for each matrix?			X			
		Were analytical duplicates analyzed at the appropriate frequency?			X			
		Were RPDs or relative standard deviations within the laboratory QC limits?			X			
R9	OI	**Method quantitation limits (MQLs):**						
		Are the MQLs for each method analyte included in the laboratory data package?	X					
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X					
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X					
R10	OI	**Other problems/anomalies**						
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X					
		Were all necessary corrective actions performed for the reported data?	X					
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X					
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X					

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 01/21/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19010558				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 136690,R331360				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			2
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports	
Laboratory Name: ALS Laboratory Group	LRC Date: 01/21/2019
Project Name: Exide Column Studies	Laboratory Job Number: HS19010558
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 136690,R331360

ER#[5]	Description
1	Batch 136690, Metals Method SW6020, sample HS19010556-01, MS and MSD were performed on unrelated sample.
2	See Run Log and CCB Exceptions Report.

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010558
Start Date: 17-Jan-2019 End Date: 17-Jan-2019

Run ID:ICPMS04_331185
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	17-Jan-2019 11:56	018_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	17-Jan-2019 11:58	019SMPL.d	AS CA CD FE K MG PB SB SE
LLICV5	1	17-Jan-2019 12:00	020LICV.d	AS CA CD FE K MG PB SB SE
ICB	1	17-Jan-2019 12:02	021_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	17-Jan-2019 12:13	023ICSA.d	AS CA CD FE K MG PB SB SE
ICSAB	1	17-Jan-2019 12:15	024ICSB.d	AS CA CD FE K MG PB SB SE
CCV 1	1	17-Jan-2019 12:45	036_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	17-Jan-2019 12:47	037_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	17-Jan-2019 13:16	048_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	17-Jan-2019 13:18	049_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	17-Jan-2019 13:49	060_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	17-Jan-2019 13:51	061_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	17-Jan-2019 14:20	072_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	17-Jan-2019 14:22	073_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	17-Jan-2019 14:57	084_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	17-Jan-2019 14:59	085_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	17-Jan-2019 15:22	094_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	17-Jan-2019 15:25	095_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	17-Jan-2019 16:10	106_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	17-Jan-2019 16:13	107_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 8	1	17-Jan-2019 16:43	118_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	17-Jan-2019 16:45	119_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	17-Jan-2019 17:17	131_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	17-Jan-2019 17:22	133_CCV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	17-Jan-2019 18:08	153SMPL.d	AS CA CD FE K MG PB SB SE
LLCCV5	1	17-Jan-2019 18:11	154LICV.d	AS CA CD FE K MG PB SB SE
ICCB 10	1	17-Jan-2019 18:13	155_ICB.d	AS CA CD FE K MG NA PB SB SE
ICCV 10	1	17-Jan-2019 18:25	157_ICV.d	AS CA CD FE K MG NA PB SB SE
MBLK-136690	1	17-Jan-2019 18:34	161SMPL.d	AS CA CD FE K MG PB SB SE
LCS-136690	1	17-Jan-2019 18:37	162SMPL.d	AS CA CD FE K MG PB SB SE
ZZZZZZSD	5	17-Jan-2019 18:41	164SMPL.d	AS CD FE K PB SB SE
ZZZZZZMS	1	17-Jan-2019 18:43	165SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZMSD	1	17-Jan-2019 18:46	166SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZPDS	1	17-Jan-2019 18:48	167SMPL.d	AS CD FE K PB SB SE
CCB 11	1	17-Jan-2019 18:54	170_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 11	1	17-Jan-2019 19:07	172_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 12	1	17-Jan-2019 19:32	183_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 12	1	17-Jan-2019 19:52	185_CCV.d	AS CA CD FE K MG NA PB SB SE
20181227-FD-PV5out-ControlT	1	17-Jan-2019 20:01	187SMPL.d	AS CD FE K MG PB SB SE
20181227-FD-PV5out-30T	1	17-Jan-2019 20:03	188SMPL.d	AS CD FE K MG PB SB SE
20181227-FD-PV5out-35T	1	17-Jan-2019 20:06	189SMPL.d	AS CD FE K MG PB SB SE
20181227-FD-PV5out-40T	1	17-Jan-2019 20:08	190SMPL.d	AS CA CD FE K MG PB SB SE
20181228-FD-PV5inlet-ControlT	1	17-Jan-2019 20:10	191SMPL.d	AS CD FE K MG PB SB SE
20181228-FD-PV5inlet-30-35-40T	1	17-Jan-2019 20:12	192SMPL.d	AS CD FE K MG PB SB SE
20181228-FD-PV5mid-ControlT	1	17-Jan-2019 20:15	193SMPL.d	AS CD FE K MG PB SB SE
20181228-FD-PV5mid-30T	1	17-Jan-2019 20:17	194SMPL.d	AS CA CD FE K MG PB SB SE
CCV 13	1	17-Jan-2019 20:19	195_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 13	1	17-Jan-2019 20:21	196_CCB.d	AS CA CD FE K MG NA PB SB SE
20181228-FD-PV5mid-35T	1	17-Jan-2019 20:27	198SMPL.d	AS CD FE K MG PB SB SE
20181228-FD-PV5mid-40T	1	17-Jan-2019 20:30	199SMPL.d	AS CA CD FE K MG PB SB SE
CCV 14	1	17-Jan-2019 20:34	201_CCV.d	AS CA CD FE K MG NA PB SB SE

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010558
Start Date: 17-Jan-2019 End Date: 17-Jan-2019

Run ID:ICPMS04_331185
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
CCB 14	1	17-Jan-2019 20:36	202_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 15	1	17-Jan-2019 20:54	210_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 15	1	17-Jan-2019 20:57	211_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 16	1	17-Jan-2019 22:04	232_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	17-Jan-2019 22:06	233SMPL.d	AS CA CD FE K MG PB SB SE
LLCCV5	1	17-Jan-2019 22:08	234LICV.d	AS CA CD FE K MG PB SB SE
ICCB 16	1	17-Jan-2019 22:11	235_ICB.d	AS CA CD FE K MG NA PB SB SE
CCV 17	1	17-Jan-2019 22:28	243_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 17	1	17-Jan-2019 22:31	244_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 18	1	17-Jan-2019 22:53	254_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 18	1	17-Jan-2019 22:55	255_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 19	1	17-Jan-2019 23:20	266_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 19	1	17-Jan-2019 23:22	267_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 20	1	17-Jan-2019 23:33	272_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 20	1	17-Jan-2019 23:36	273_CCB.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	17-Jan-2019 23:38	274SMPL.d	AS CA CD FE K MG PB SB SE
LLICV5	1	17-Jan-2019 23:40	275LICV.d	AS CA CD FE K MG PB SB SE
ICSA	1	17-Jan-2019 23:42	276ICSA.d	AS CA CD FE K MG PB SB SE
ICSAB	1	17-Jan-2019 23:45	277ICSB.d	AS CA CD FE K MG PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010558

Run ID:ICPMS04_331185
Instrument:ICPMS04
Method:SW6020

ICCB 10	Date: 17-Jan-2019 18:13	Seq: 4913293	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	-14.52	12	200	

CCB 11	Date: 17-Jan-2019 18:54	Seq: 4913367	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.321	0.4	2	
Iron	16.26	12	200	
Magnesium	21.92	10	200	
Sodium	661.1	14	200	

CCB 12	Date: 17-Jan-2019 19:32	Seq: 4913608	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.9	0.4	2	
Magnesium	31.21	10	200	
Potassium	-42.81	18	200	
Sodium	1048	14	200	

CCB 13	Date: 17-Jan-2019 20:21	Seq: 4913621	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.965	0.4	2	
Calcium	55.85	34	500	
Potassium	-34.52	18	200	
Selenium	1.313	1.1	2	
Sodium	578.6	14	200	

CCB 14	Date: 17-Jan-2019 20:36	Seq: 4913627	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.889	0.4	2	
Magnesium	10.31	10	200	
Potassium	-28.37	18	200	
Sodium	371	14	200	

CCB 15	Date: 17-Jan-2019 20:57	Seq: 4913732	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.226	0.4	2	
Calcium	125.8	34	500	
Iron	17.06	12	200	
Magnesium	91.44	10	200	
Potassium	-25.35	18	200	
Sodium	1254	14	200	

ICCB 16	Date: 17-Jan-2019 22:11	Seq: 4913650	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	-13.55	12	200	
Sodium	-49.36	14	200	

CCB 17	Date: 17-Jan-2019 22:31	Seq: 4913689	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.128	0.4	2	
Iron	23.71	12	200	
Potassium	-30.41	18	200	
Sodium	-80.12	14	200	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010558
Start Date: 18-Jan-2019 End Date: 18-Jan-2019

Run ID:ICPMS04_331292
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	18-Jan-2019 11:51	018_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	18-Jan-2019 11:53	019SMPL.d	CA NA
LLICV5	1	18-Jan-2019 11:55	020LICV.d	CA NA
ICB	1	18-Jan-2019 11:58	021_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	18-Jan-2019 12:07	023ICSA.d	CA NA
ICSAB	1	18-Jan-2019 12:09	024ICSB.d	CA NA
CCV 1	1	18-Jan-2019 12:39	036_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	18-Jan-2019 12:42	037_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	18-Jan-2019 13:10	048_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	18-Jan-2019 13:13	049_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	18-Jan-2019 13:19	051_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	18-Jan-2019 13:44	061_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	18-Jan-2019 13:47	062_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	18-Jan-2019 14:15	073_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	18-Jan-2019 14:17	074_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	18-Jan-2019 14:56	085_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	18-Jan-2019 14:58	086_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	18-Jan-2019 15:25	097_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	18-Jan-2019 15:27	098_CCB.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZSD	500	18-Jan-2019 15:45	105SMPL.d	CA MG NA
ZZZZZZPDS	100	18-Jan-2019 15:47	106SMPL.d	CA MG NA
CCB 7	1	18-Jan-2019 15:56	110_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 8	1	18-Jan-2019 16:17	112_CCV.d	AS CA CD FE K MG NA PB SB SE
20181227-FD-PV5out-ControlT	20	18-Jan-2019 16:38	121SMPL.d	CA
CCV 9	1	18-Jan-2019 16:41	122_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	18-Jan-2019 16:43	123_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 10	1	18-Jan-2019 17:47	143_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	18-Jan-2019 17:49	144SMPL.d	CA NA
LLCCV5	1	18-Jan-2019 17:52	145LICV.d	CA NA
ICCB 9	1	18-Jan-2019 17:54	146_ICB.d	AS CA CD FE K MG NA PB SB SE
20181227-FD-PV5out-ControlT	20	18-Jan-2019 18:24	156SMPL.d	NA
CCV 11	1	18-Jan-2019 18:28	158_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	18-Jan-2019 18:30	159_CCB.d	AS CA CD FE K MG NA PB SB SE
20181227-FD-PV5out-30T	20	18-Jan-2019 18:36	160SMPL.d	CA NA
20181227-FD-PV5out-35T	20	18-Jan-2019 18:39	161SMPL.d	CA NA
20181227-FD-PV5out-40T	20	18-Jan-2019 18:41	162SMPL.d	NA
20181228-FD-PV5inlet-ControlT	20	18-Jan-2019 18:43	163SMPL.d	CA NA
20181228-FD-PV5inlet-30-35-40T	20	18-Jan-2019 18:45	164SMPL.d	CA NA
20181228-FD-PV5mid-ControlT	20	18-Jan-2019 18:48	165SMPL.d	CA NA
20181228-FD-PV5mid-30T	20	18-Jan-2019 18:50	166SMPL.d	NA
20181228-FD-PV5mid-35T	20	18-Jan-2019 18:52	167SMPL.d	CA NA
20181228-FD-PV5mid-40T	20	18-Jan-2019 18:54	168SMPL.d	NA
CCV 12	1	18-Jan-2019 18:59	170_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	18-Jan-2019 19:01	171_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 13	1	18-Jan-2019 19:25	180_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 12	1	18-Jan-2019 19:28	181_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 14	1	18-Jan-2019 19:52	192_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 13	1	18-Jan-2019 19:55	193_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 15	1	18-Jan-2019 20:19	204_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 14	1	18-Jan-2019 20:22	205_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 16	1	18-Jan-2019 20:42	214_CCV.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010558

Run ID:ICPMS04_331292
Instrument:ICPMS04
Method:SW6020

CCB 1	Date: 18-Jan-2019 12:42	Seq: 4914346		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	53.46	14	200	
CCB 2	Date: 18-Jan-2019 13:13	Seq: 4914467		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	49.32	14	200	
CCB 3	Date: 18-Jan-2019 13:47	Seq: 4914527		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	101.6	14	200	
CCB 4	Date: 18-Jan-2019 14:17	Seq: 4914695		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	104.8	14	200	
CCB 5	Date: 18-Jan-2019 14:58	Seq: 4914980		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	90.97	14	200	
CCB 6	Date: 18-Jan-2019 15:27	Seq: 4914992		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	84.66	14	200	
CCB 7	Date: 18-Jan-2019 15:56	Seq: 4915022		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	75.83	14	200	
CCB 8	Date: 18-Jan-2019 16:43	Seq: 4915172		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	84.46	14	200	
CCB 10	Date: 18-Jan-2019 18:30	Seq: 4915298		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Calcium	34.84	34	500	
	Sodium	-19.19	14	200	
CCB 11	Date: 18-Jan-2019 19:01	Seq: 4915347		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Calcium	39.04	34	500	
CCB 12	Date: 18-Jan-2019 19:28	Seq: 4916025		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Calcium	35.14	34	500	
CCB 13	Date: 18-Jan-2019 19:55	Seq: 4916037		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Calcium	42.21	34	500	
	Sodium	121.4	14	200	
CCB 14	Date: 18-Jan-2019 20:22	Seq: 4916049		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Calcium	36.9	34	500	
	Sodium	80.48	14	200	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19010558

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19010558-01	20181227-FD-PV5out-ControlT	Groundwater		27-Dec-2018 09:00	12-Jan-2019 09:35	☐
HS19010558-02	20181227-FD-PV5out-30T	Groundwater		27-Dec-2018 09:00	12-Jan-2019 09:35	☐
HS19010558-03	20181227-FD-PV5out-35T	Groundwater		27-Dec-2018 09:00	12-Jan-2019 09:35	☐
HS19010558-04	20181227-FD-PV5out-40T	Groundwater		27-Dec-2018 09:00	12-Jan-2019 09:35	☐
HS19010558-05	20181228-FD-PV5inlet-ControlT	Groundwater		28-Dec-2018 09:00	12-Jan-2019 09:35	☐
HS19010558-06	20181228-FD-PV5inlet-30-35-40T	Groundwater		28-Dec-2018 09:00	12-Jan-2019 09:35	☐
HS19010558-07	20181228-FD-PV5mid-ControlT	Groundwater		28-Dec-2018 09:00	12-Jan-2019 09:35	☐
HS19010558-08	20181228-FD-PV5mid-30T	Groundwater		28-Dec-2018 09:00	12-Jan-2019 09:35	☐
HS19010558-09	20181228-FD-PV5mid-35T	Groundwater		28-Dec-2018 09:00	12-Jan-2019 09:35	☐
HS19010558-10	20181228-FD-PV5mid-40T	Groundwater		28-Dec-2018 09:00	12-Jan-2019 09:35	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181227-FD-PV5out-ControlT
Collection Date: 27-Dec-2018 09:00

ANALYTICAL REPORT
WorkOrder:HS19010558
Lab ID:HS19010558-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**470**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 16-Jan-2019		Analyst: JCJ
Antimony	**0.0310**		**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 20:01
Arsenic	**0.000831**	J	**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 20:01
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 20:01
Calcium	**186**		**0.680**	**10.0**	**mg/L**	20	18-Jan-2019 16:38
Iron	**0.0214**	J	**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 20:01
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 20:01
Magnesium	**1.27**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 20:01
Potassium	**11.3**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 20:01
Selenium	**0.00593**		**0.00110**	**0.00200**	**mg/L**	1	17-Jan-2019 20:01
Sodium	**241**		**0.280**	**4.00**	**mg/L**	20	18-Jan-2019 18:24

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181227-FD-PV5out-30T
Collection Date: 27-Dec-2018 09:00

ANALYTICAL REPORT
WorkOrder:HS19010558
Lab ID:HS19010558-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**486**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 16-Jan-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 20:03
Arsenic	U		0.000400	0.00200	mg/L	1	17-Jan-2019 20:03
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 20:03
Calcium	**193**		**0.680**	**10.0**	**mg/L**	20	18-Jan-2019 18:36
Iron	**0.0775**	J	**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 20:03
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 20:03
Magnesium	**0.990**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 20:03
Potassium	**11.2**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 20:03
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 20:03
Sodium	**235**		**0.280**	**4.00**	**mg/L**	20	18-Jan-2019 18:36

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181227-FD-PV5out-35T
Collection Date: 27-Dec-2018 09:00

ANALYTICAL REPORT
WorkOrder:HS19010558
Lab ID:HS19010558-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**491**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 16-Jan-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 20:06
Arsenic	U		0.000400	0.00200	mg/L	1	17-Jan-2019 20:06
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 20:06
Calcium	**195**		**0.680**	**10.0**	**mg/L**	20	18-Jan-2019 18:39
Iron	**0.165**	J	**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 20:06
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 20:06
Magnesium	**1.07**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 20:06
Potassium	**11.5**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 20:06
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 20:06
Sodium	**239**		**0.280**	**4.00**	**mg/L**	20	18-Jan-2019 18:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181227-FD-PV5out-40T
Collection Date: 27-Dec-2018 09:00

ANALYTICAL REPORT
WorkOrder:HS19010558
Lab ID:HS19010558-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**431**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 16-Jan-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 20:08
Arsenic	U		0.000400	0.00200	mg/L	1	17-Jan-2019 20:08
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 20:08
Calcium	**171**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 20:08
Iron	**0.0259**	J	**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 20:08
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 20:08
Magnesium	**0.984**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 20:08
Potassium	**10.9**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 20:08
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 20:08
Sodium	**240**		**0.280**	**4.00**	**mg/L**	20	18-Jan-2019 18:41

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181228-FD-PV5inlet-ControlT
Collection Date: 28-Dec-2018 09:00

ANALYTICAL REPORT
WorkOrder:HS19010558
Lab ID:HS19010558-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**481**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 16-Jan-2019		Analyst: JCJ
Antimony	**0.0339**		**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 20:10
Arsenic	**0.00125**	J	**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 20:10
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 20:10
Calcium	**191**		**0.680**	**10.0**	**mg/L**	20	18-Jan-2019 18:43
Iron	U		0.0120	0.200	mg/L	1	17-Jan-2019 20:10
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 20:10
Magnesium	**1.09**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 20:10
Potassium	**11.3**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 20:10
Selenium	**0.00738**		**0.00110**	**0.00200**	**mg/L**	1	17-Jan-2019 20:10
Sodium	**241**		**0.280**	**4.00**	**mg/L**	20	18-Jan-2019 18:43

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181228-FD-PV5inlet-30-35-40T
Collection Date: 28-Dec-2018 09:00

ANALYTICAL REPORT
WorkOrder:HS19010558
Lab ID:HS19010558-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**471**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 16-Jan-2019		Analyst: JCJ
Antimony	**0.0333**		**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 20:12
Arsenic	**0.000951**	J	**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 20:12
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 20:12
Calcium	**187**		**0.680**	**10.0**	**mg/L**	20	18-Jan-2019 18:45
Iron	U		0.0120	0.200	mg/L	1	17-Jan-2019 20:12
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 20:12
Magnesium	**1.04**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 20:12
Potassium	**11.8**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 20:12
Selenium	**0.00653**		**0.00110**	**0.00200**	**mg/L**	1	17-Jan-2019 20:12
Sodium	**231**		**0.280**	**4.00**	**mg/L**	20	18-Jan-2019 18:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181228-FD-PV5mid-ControlT
Collection Date: 28-Dec-2018 09:00

ANALYTICAL REPORT
WorkOrder:HS19010558
Lab ID:HS19010558-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**517**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 16-Jan-2019		Analyst: JCJ
Antimony	**0.0332**		**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 20:15
Arsenic	**0.00144**	J	**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 20:15
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 20:15
Calcium	**205**		**0.680**	**10.0**	**mg/L**	20	18-Jan-2019 18:48
Iron	**0.0254**	J	**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 20:15
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 20:15
Magnesium	**1.25**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 20:15
Potassium	**11.2**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 20:15
Selenium	**0.00646**		**0.00110**	**0.00200**	**mg/L**	1	17-Jan-2019 20:15
Sodium	**248**		**0.280**	**4.00**	**mg/L**	20	18-Jan-2019 18:48

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181228-FD-PV5mid-30T
Collection Date: 28-Dec-2018 09:00

ANALYTICAL REPORT
WorkOrder:HS19010558
Lab ID:HS19010558-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**441**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 16-Jan-2019		Analyst: JCJ
Antimony	**0.000428**	J	**0.000400**	**0.00200**	**mg/L**	1	17-Jan-2019 20:17
Arsenic	U		0.000400	0.00200	mg/L	1	17-Jan-2019 20:17
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 20:17
Calcium	**175**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 20:17
Iron	**1.05**		**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 20:17
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 20:17
Magnesium	**0.959**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 20:17
Potassium	**10.8**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 20:17
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 20:17
Sodium	**241**		**0.280**	**4.00**	**mg/L**	20	18-Jan-2019 18:50

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181228-FD-PV5mid-35T
Collection Date: 28-Dec-2018 09:00

ANALYTICAL REPORT
WorkOrder:HS19010558
Lab ID:HS19010558-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**491**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 16-Jan-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 20:27
Arsenic	U		0.000400	0.00200	mg/L	1	17-Jan-2019 20:27
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 20:27
Calcium	**195**		**0.680**	**10.0**	**mg/L**	20	18-Jan-2019 18:52
Iron	**1.28**		**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 20:27
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 20:27
Magnesium	**1.03**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 20:27
Potassium	**11.4**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 20:27
Selenium	**0.00119**	J	**0.00110**	**0.00200**	**mg/L**	1	17-Jan-2019 20:27
Sodium	**238**		**0.280**	**4.00**	**mg/L**	20	18-Jan-2019 18:52

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181228-FD-PV5mid-40T
Collection Date: 28-Dec-2018 09:00

ANALYTICAL REPORT
WorkOrder:HS19010558
Lab ID:HS19010558-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**436**		**2.00**	**2.00**	**mg/L**	1	19-Jan-2019 15:58
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 16-Jan-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	17-Jan-2019 20:30
Arsenic	U		0.000400	0.00200	mg/L	1	17-Jan-2019 20:30
Cadmium	U		0.000200	0.00200	mg/L	1	17-Jan-2019 20:30
Calcium	**173**		**0.0340**	**0.500**	**mg/L**	1	17-Jan-2019 20:30
Iron	**1.24**		**0.0120**	**0.200**	**mg/L**	1	17-Jan-2019 20:30
Lead	U		0.000600	0.00200	mg/L	1	17-Jan-2019 20:30
Magnesium	**0.983**		**0.0100**	**0.200**	**mg/L**	1	17-Jan-2019 20:30
Potassium	**10.7**		**0.0180**	**0.200**	**mg/L**	1	17-Jan-2019 20:30
Selenium	U		0.00110	0.00200	mg/L	1	17-Jan-2019 20:30
Sodium	**231**		**0.280**	**4.00**	**mg/L**	20	18-Jan-2019 18:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010558

Batch ID: 136690 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19010558-01	1	10	10 (mL)	1
HS19010558-02	1	10	10 (mL)	1
HS19010558-03	1	10	10 (mL)	1
HS19010558-04	1	10	10 (mL)	1
HS19010558-05	1	10	10 (mL)	1
HS19010558-06	1	10	10 (mL)	1
HS19010558-07	1	10	10 (mL)	1
HS19010558-08	1	10	10 (mL)	1
HS19010558-09	1	10	10 (mL)	1
HS19010558-10	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010558

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 136690	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19010558-01	20181227-FD-PV5out-ControlT	27 Dec 2018 09:00		16 Jan 2019 13:30	18 Jan 2019 18:24	20
HS19010558-01	20181227-FD-PV5out-ControlT	27 Dec 2018 09:00		16 Jan 2019 13:30	18 Jan 2019 16:38	20
HS19010558-01	20181227-FD-PV5out-ControlT	27 Dec 2018 09:00		16 Jan 2019 13:30	17 Jan 2019 20:01	1
HS19010558-02	20181227-FD-PV5out-30T	27 Dec 2018 09:00		16 Jan 2019 13:30	18 Jan 2019 18:36	20
HS19010558-02	20181227-FD-PV5out-30T	27 Dec 2018 09:00		16 Jan 2019 13:30	17 Jan 2019 20:03	1
HS19010558-03	20181227-FD-PV5out-35T	27 Dec 2018 09:00		16 Jan 2019 13:30	18 Jan 2019 18:39	20
HS19010558-03	20181227-FD-PV5out-35T	27 Dec 2018 09:00		16 Jan 2019 13:30	17 Jan 2019 20:06	1
HS19010558-04	20181227-FD-PV5out-40T	27 Dec 2018 09:00		16 Jan 2019 13:30	18 Jan 2019 18:41	20
HS19010558-04	20181227-FD-PV5out-40T	27 Dec 2018 09:00		16 Jan 2019 13:30	17 Jan 2019 20:08	1
HS19010558-05	20181228-FD-PV5inlet-ControlT	28 Dec 2018 09:00		16 Jan 2019 13:30	18 Jan 2019 18:43	20
HS19010558-05	20181228-FD-PV5inlet-ControlT	28 Dec 2018 09:00		16 Jan 2019 13:30	17 Jan 2019 20:10	1
HS19010558-06	20181228-FD-PV5inlet-30-35-40T	28 Dec 2018 09:00		16 Jan 2019 13:30	18 Jan 2019 18:45	20
HS19010558-06	20181228-FD-PV5inlet-30-35-40T	28 Dec 2018 09:00		16 Jan 2019 13:30	17 Jan 2019 20:12	1
HS19010558-07	20181228-FD-PV5mid-ControlT	28 Dec 2018 09:00		16 Jan 2019 13:30	18 Jan 2019 18:48	20
HS19010558-07	20181228-FD-PV5mid-ControlT	28 Dec 2018 09:00		16 Jan 2019 13:30	17 Jan 2019 20:15	1
HS19010558-08	20181228-FD-PV5mid-30T	28 Dec 2018 09:00		16 Jan 2019 13:30	18 Jan 2019 18:50	20
HS19010558-08	20181228-FD-PV5mid-30T	28 Dec 2018 09:00		16 Jan 2019 13:30	17 Jan 2019 20:17	1
HS19010558-09	20181228-FD-PV5mid-35T	28 Dec 2018 09:00		16 Jan 2019 13:30	18 Jan 2019 18:52	20
HS19010558-09	20181228-FD-PV5mid-35T	28 Dec 2018 09:00		16 Jan 2019 13:30	17 Jan 2019 20:27	1
HS19010558-10	20181228-FD-PV5mid-40T	28 Dec 2018 09:00		16 Jan 2019 13:30	18 Jan 2019 18:54	20
HS19010558-10	20181228-FD-PV5mid-40T	28 Dec 2018 09:00		16 Jan 2019 13:30	17 Jan 2019 20:30	1
Batch ID R331360	**Test Name :** HARDNESS, TOTAL AS CACO3 BY SM2340B			**Matrix:** Groundwater		
HS19010558-01	20181227-FD-PV5out-ControlT	27 Dec 2018 09:00			19 Jan 2019 15:58	1
HS19010558-02	20181227-FD-PV5out-30T	27 Dec 2018 09:00			19 Jan 2019 15:58	1
HS19010558-03	20181227-FD-PV5out-35T	27 Dec 2018 09:00			19 Jan 2019 15:58	1
HS19010558-04	20181227-FD-PV5out-40T	27 Dec 2018 09:00			19 Jan 2019 15:58	1
HS19010558-05	20181228-FD-PV5inlet-ControlT	28 Dec 2018 09:00			19 Jan 2019 15:58	1
HS19010558-06	20181228-FD-PV5inlet-30-35-40T	28 Dec 2018 09:00			19 Jan 2019 15:58	1
HS19010558-07	20181228-FD-PV5mid-ControlT	28 Dec 2018 09:00			19 Jan 2019 15:58	1
HS19010558-08	20181228-FD-PV5mid-30T	28 Dec 2018 09:00			19 Jan 2019 15:58	1
HS19010558-09	20181228-FD-PV5mid-35T	28 Dec 2018 09:00			19 Jan 2019 15:58	1
HS19010558-10	20181228-FD-PV5mid-40T	28 Dec 2018 09:00			19 Jan 2019 15:58	1

WorkOrder: HS19010558
InstrumentID: ICPMS04
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000521	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000340	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000553	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0523	0.0340	0.500
A	Iron	7439-89-6	0.0250	0.0205	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000916	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0700	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0418	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00274	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0556	0.0140	0.200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010558

QC BATCH REPORT

Batch ID: 136690 **Instrument: ICPMS04** **Method: SW6020**

MBLK Sample ID: **MBLK-136690** Units: **mg/L** Analysis Date: **17-Jan-2019 18:34**
Client ID: Run ID: **ICPMS04_331185** SeqNo: **4913358** PrepDate: **16-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01128	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								

LCS Sample ID: **LCS-136690** Units: **mg/L** Analysis Date: **17-Jan-2019 18:37**
Client ID: Run ID: **ICPMS04_331185** SeqNo: **4913359** PrepDate: **16-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04945	0.00200	0.05	0	98.9	80 - 120				
Arsenic	0.04865	0.00200	0.05	0	97.3	80 - 120				
Cadmium	0.04959	0.00200	0.05	0	99.2	80 - 120				
Calcium	4.93	0.500	5	0	98.6	80 - 120				
Iron	5.024	0.200	5	0	100	80 - 120				
Lead	0.05004	0.00200	0.05	0	100	80 - 120				
Magnesium	5.01	0.200	5	0	100	80 - 120				
Potassium	5.044	0.200	5	0	101	80 - 120				
Selenium	0.04839	0.00200	0.05	0	96.8	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010558

QC BATCH REPORT

Batch ID: 136690 **Instrument: ICPMS04** **Method: SW6020**

MS Sample ID: **HS19010556-01MS** Units: **mg/L** Analysis Date: **17-Jan-2019 18:43**
Client ID: Run ID: **ICPMS04_331185** SeqNo: **4913362** PrepDate: **16-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04987	0.00200	0.05	0.000661	98.4	80 - 120				
Arsenic	0.04945	0.00200	0.05	0.000295	98.3	80 - 120				
Cadmium	0.06062	0.00200	0.05	0.009021	103	80 - 120				
Calcium	480.8	0.500	5	460.4	409	80 - 120				SEO
Iron	4.771	0.200	5	0.01046	95.2	80 - 120				
Lead	0.05088	0.00200	0.05	0.000165	101	80 - 120				
Magnesium	297.4	0.200	5	297.7	-6.51	80 - 120				SEO
Potassium	25.43	0.200	5	20.92	90.2	80 - 120				O
Selenium	0.04999	0.00200	0.05	0.000874	98.2	80 - 120				
Sodium	U	0.200	5	0	0	80 - 120				S

MSD Sample ID: **HS19010556-01MSD** Units: **mg/L** Analysis Date: **17-Jan-2019 18:46**
Client ID: Run ID: **ICPMS04_331185** SeqNo: **4913363** PrepDate: **16-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05169	0.00200	0.05	0.000661	102	80 - 120	0.04987	3.58	20	
Arsenic	0.04815	0.00200	0.05	0.000295	95.7	80 - 120	0.04945	2.66	20	
Cadmium	0.05919	0.00200	0.05	0.009021	100	80 - 120	0.06062	2.39	20	
Calcium	459.1	0.500	5	460.4	-26.6	80 - 120	480.8	4.63	20	SEO
Iron	4.598	0.200	5	0.01046	91.8	80 - 120	4.771	3.7	20	
Lead	0.05018	0.00200	0.05	0.000165	100	80 - 120	0.05088	1.38	20	
Magnesium	295.3	0.200	5	297.7	-48.7	80 - 120	297.4	0.711	20	SEO
Potassium	24.9	0.200	5	20.92	79.6	80 - 120	25.43	2.09	20	SO
Selenium	0.04754	0.00200	0.05	0.000874	93.3	80 - 120	0.04999	5.04	20	
Sodium	U	0.200	5	0	0	80 - 120	0	0	20	S

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010558

QC BATCH REPORT

Batch ID: 136690 **Instrument: ICPMS04** **Method: SW6020**

PDS Sample ID: **HS19010556-01PDS** Units: **mg/L** Analysis Date: **17-Jan-2019 18:48**
Client ID: Run ID: **ICPMS04_331185** SeqNo: **4913364** PrepDate: **16-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1012	0.00200	0.1	0.000661	100	75 - 125				
Arsenic	0.1043	0.00200	0.1	0.000295	104	75 - 125				
Cadmium	0.1189	0.00200	0.1	0.009021	110	75 - 125				
Iron	10.04	0.200	10	0.01046	100	75 - 125				
Lead	0.108	0.00200	0.1	0.000165	108	75 - 125				
Potassium	30.42	0.200	10	20.92	94.9	75 - 125				
Selenium	0.1071	0.00200	0.1	0.000874	106	75 - 125				

PDS Sample ID: **HS19010556-01PDS** Units: **mg/L** Analysis Date: **18-Jan-2019 15:47**
Client ID: Run ID: **ICPMS04_331292** SeqNo: **4915018** PrepDate: **16-Jan-2019** DF: **100**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	1394	50.0	1000	423.2	97.1	75 - 125				
Magnesium	1348	20.0	1000	317.4	103	75 - 125				
Sodium	2686	20.0	1000	1584	110	75 - 125				

SD Sample ID: **HS19010556-01SD** Units: **mg/L** Analysis Date: **17-Jan-2019 18:41**
Client ID: Run ID: **ICPMS04_331185** SeqNo: **4913361** PrepDate: **16-Jan-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000661	0	10	
Arsenic	U	0.0100					0.000295	0	10	
Cadmium	0.009395	0.0100					0.009021	0	10	J
Iron	0.0776	1.00					0.01046	0	10	J
Lead	U	0.0100					0.000165	0	10	
Potassium	21.56	1.00					20.92	3.06	10	
Selenium	U	0.0100					0.000874	0	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010558

QC BATCH REPORT

Batch ID: 136690 **Instrument: ICPMS04** **Method: SW6020**

SD Sample ID: **HS19010556-01SD** Units: **mg/L** Analysis Date: **18-Jan-2019 15:45**
Client ID: Run ID: **ICPMS04_331292** SeqNo: **4915017** PrepDate: **16-Jan-2019** DF: **500**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	437.4	250					423.2	3.37	10	
Magnesium	319.7	100					317.4	0.724	10	
Sodium	1629	100					1584	2.84	10	

The following samples were analyzed in this batch:

HS19010558-01	HS19010558-02	HS19010558-03	HS19010558-04
HS19010558-05	HS19010558-06	HS19010558-07	HS19010558-08
HS19010558-09	HS19010558-10		

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19010558**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19010558

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19010558-01	20181227-FD-PV5out-ControlT	Login	1/14/2019 12:59:08 PM	JRM	MET072
HS19010558-02	20181227-FD-PV5out-30T	Login	1/14/2019 12:59:08 PM	JRM	MET072
HS19010558-03	20181227-FD-PV5out-35T	Login	1/14/2019 12:59:08 PM	JRM	MET072
HS19010558-04	20181227-FD-PV5out-40T	Login	1/14/2019 12:59:08 PM	JRM	MET072
HS19010558-05	20181228-FD-PV5inlet-ControlT	Login	1/14/2019 12:59:08 PM	JRM	MET072
HS19010558-06	20181228-FD-PV5inlet-30-35-40T	Login	1/14/2019 12:59:08 PM	JRM	MET072
HS19010558-07	20181228-FD-PV5mid-ControlT	Login	1/14/2019 12:59:08 PM	JRM	MET072
HS19010558-08	20181228-FD-PV5mid-30T	Login	1/14/2019 12:59:08 PM	JRM	MET072
HS19010558-09	20181228-FD-PV5mid-35T	Login	1/14/2019 12:59:08 PM	JRM	MET072
HS19010558-10	20181228-FD-PV5mid-40T	Login	1/14/2019 12:59:08 PM	JRM	MET072

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19010558
Date/Time Received: **12-Jan-2019 09:35**
Received by: **JRM**

Checklist completed by: *Jared R. Makan* eSignature 14-Jan-2019 Date
Reviewed by: *Dane J. Wacasey* eSignature 17-Jan-2019 Date

Matrices: **Water**
Carrier name: **FedEx International Priority**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	13.6c/13.9c UC/C	IR25	
Cooler(s)/Kit(s):	43811		
Date/Time sample(s) sent to storage:	01/12/2019 15:00		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070

Chain of Custody Form

Page _____ of _____

COC ID: 194452

HS19010558

Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information			
Purchase Order	130-2086-06	Project Name	Exide Column Studies	A	300_W (300 Cl, SO4, ["NO3" "48hr HT"])
Work Order		Project Number	130-2086	B	TDS_W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK_W 2320B (2320B Alkalinity)
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P	D	HARD (2340B Hardness (calc))
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit	E	ICP_TW (6020A Total Metals (6)+Cations)
				F	ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021	G	
Phone	(314) 984-8800	Phone	(314) 984-8800	H	
Fax		Fax		I	
e-Mail Address	Emily_White@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20181227-FD-PVSout-control T	2018/12/27	9:00	GW	2	1				X	X						
2	20181227-FD-PVSout-30T	"	"	"	2	1				X	X						
3	20181227-FD-PVSout-35T	"	"	"	2	1				X	X						
4	20181227-FD-PVSout-40T	"	"	"	2	1				X	X						
5	20181228-FD-PVSinlet-control T	2018/12/28	"	"	2	1				X	X						
6	20181228-FD-PVSinlet-30-35-40T	"	"	"	2	1				X	X						
7	20181228-FD-PVSmid-control T	2018/12/28	9:00	"	2	1				X	X						
8	20181228-FD-PVSmid-30T	"	"	"	2	1				X	X						
9	20181228-FD-PVSmid-35T	"	"	"	2	1				X	X						
10	20181228-FD-PVSmid-40T	"	"	"	2	1				X	X						

Sampler(s) Please Print & Sign: Fatima Emile

Shipment Method:

Required Turnaround Time: (Check Box) ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by: Giovanna Ciancas — Date: 2019/01/11 — Time: 3:00 — Received by: _____

Relinquished by: _____ — Date: 01/12/19 — Time: 09:35 — Received by (Laboratory): S. [illegible]

Logged by (Laboratory): _____ — Date: _____ — Time: _____ — Checked by (Laboratory): _____

Notes: Exide Column Studies

Cooler ID	Cooler Temp.
	ice
43811	13.6
	11.25
	CF 0.5

QC Package: (Check One Box Below)

☐ Level II Std QC
☐ Level III Std QC/Raw Data
☐ Level IV SW846/CLP
☐ Other
☒ TRRP Checklist
☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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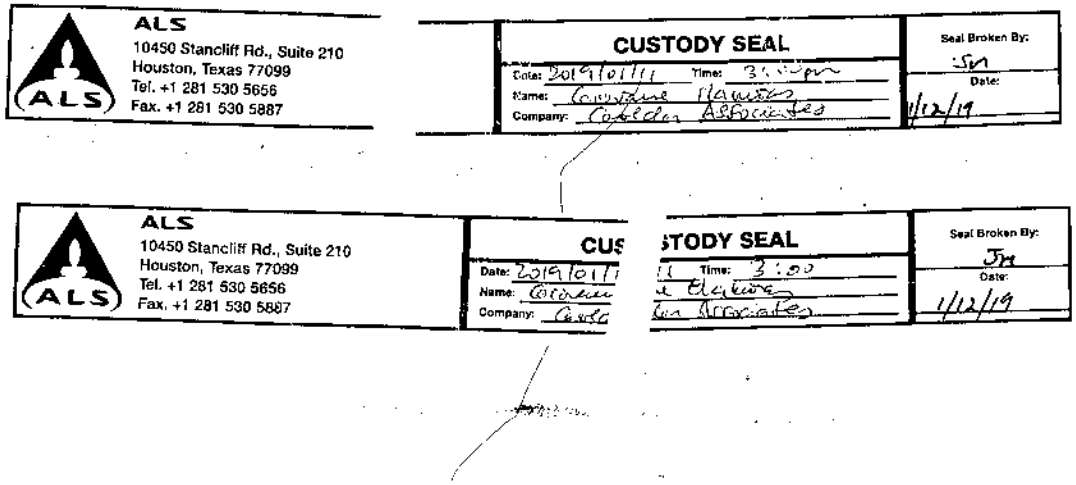
ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CUSTODY SEAL
Date: 20190111
Time: 3:00pm
Name: Courtney Hawkins
Company: Cobb Associates
Seal Broken By:
SM
Date:
1/12/19
ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CUS
Date: 2019011
Name:
Company:
STODY SEAL
Time: 3:00
Seal Broken By:
JM
Date:
1/12/19

ORIGIN ID:YUXA (514) 383-0990
Audrey Elheves
Golder Associates Ltd
7250 rue du Mile End
3e etage
MONTREAL, PQ H2R3A4
CANADA, CA

Ship Date: 11JAN19
ActWgt: 22.60 LB
CAD: 108680724/INET4042

BILL RECIPIENT
EIN/VAT:

TO Dane Wacasey
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

(281) 530-5656

FedEx Express

(US)

J18251808152Ov

AWB

X0 SGRA

PKG:YOUR PKG

TRK# 7741 7166 8422

Form 0430

SATURDAY 12:00P
INTL PRIORITY

REF:
DESC1:Bouteille d'eau
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: Audrey Elheves
T/C: R 967554812
D/T: R 967554812

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2. Placez l'étiquette dans la pochette d'expédition et fixez-la à votre paquet.

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

January 21, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19010559**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 10 sample(s) on Jan 12, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19010559**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS19010559**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 01/21/2019				
Project Name: Exide Column Studies			5 Laboratory Job Number: HS19010559				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 136692				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?			X		
		Were analytical duplicates analyzed at the appropriate frequency?			X		
		Were RPDs or relative standard deviations within the laboratory QC limits?			X		
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 01/21/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19010559				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 136692				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			2
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports	
Laboratory Name: ALS Laboratory Group	LRC Date: 01/21/2019
Project Name: Exide Column Studies	5Laboratory Job Number: HS19010559
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 136692

ER#[5]	Description
1	Batch 136692, Metals Method SW6020, sample HS19010557-01, MS and MSD were performed on unrelated sample.
2	See Run Log and CCB Exceptions Report.

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010559
Start Date: 18-Jan-2019 End Date: 18-Jan-2019

Run ID:ICPMS04_331292
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	18-Jan-2019 11:51	018_ICV.d	CA NA
LLICV2	1	18-Jan-2019 11:53	019SMPL.d	CA NA
LLICV5	1	18-Jan-2019 11:55	020LICV.d	CA NA
ICB	1	18-Jan-2019 11:58	021_ICB.d	CA NA
ICSA	1	18-Jan-2019 12:07	023ICSA.d	CA NA
ICSAB	1	18-Jan-2019 12:09	024ICSB.d	CA NA
CCV 1	1	18-Jan-2019 12:39	036_CCV.d	CA NA
CCB 1	1	18-Jan-2019 12:42	037_CCB.d	CA NA
CCV 2	1	18-Jan-2019 13:10	048_CCV.d	CA NA
CCB 2	1	18-Jan-2019 13:13	049_CCB.d	CA NA
CCV 3	1	18-Jan-2019 13:19	051_CCV.d	CA NA
CCV 4	1	18-Jan-2019 13:44	061_CCV.d	CA NA
CCB 3	1	18-Jan-2019 13:47	062_CCB.d	CA NA
CCV 5	1	18-Jan-2019 14:15	073_CCV.d	CA NA
CCB 4	1	18-Jan-2019 14:17	074_CCB.d	CA NA
CCV 6	1	18-Jan-2019 14:56	085_CCV.d	CA NA
CCB 5	1	18-Jan-2019 14:58	086_CCB.d	CA NA
CCV 7	1	18-Jan-2019 15:25	097_CCV.d	CA NA
CCB 6	1	18-Jan-2019 15:27	098_CCB.d	CA NA
CCB 7	1	18-Jan-2019 15:56	110_CCB.d	CA NA
CCV 8	1	18-Jan-2019 16:17	112_CCV.d	CA NA
CCV 9	1	18-Jan-2019 16:41	122_CCV.d	CA NA
CCB 8	1	18-Jan-2019 16:43	123_CCB.d	CA NA
ICCV 10	1	18-Jan-2019 17:47	143_ICV.d	CA NA
LLCCV2	1	18-Jan-2019 17:49	144SMPL.d	CA NA
LLCCV5	1	18-Jan-2019 17:52	145LICV.d	CA NA
ICCB 9	1	18-Jan-2019 17:54	146_ICB.d	CA NA
CCV 11	1	18-Jan-2019 18:28	158_CCV.d	CA NA
CCB 10	1	18-Jan-2019 18:30	159_CCB.d	CA NA
CCV 12	1	18-Jan-2019 18:59	170_CCV.d	CA NA
CCB 11	1	18-Jan-2019 19:01	171_CCB.d	CA NA
MBLK-136692	1	18-Jan-2019 19:10	173SMPL.d	NA
LCS-136692	1	18-Jan-2019 19:12	174SMPL.d	NA
ZZZZZZSD	250	18-Jan-2019 19:16	176SMPL.d	CA MG NA
ZZZZZZPDS	50	18-Jan-2019 19:19	177SMPL.d	CA MG NA
CCV 13	1	18-Jan-2019 19:25	180_CCV.d	CA NA
CCB 12	1	18-Jan-2019 19:28	181_CCB.d	CA NA
CCV 14	1	18-Jan-2019 19:52	192_CCV.d	CA NA
CCB 13	1	18-Jan-2019 19:55	193_CCB.d	CA NA
20181227-FD-PV5out-ControlD	5	18-Jan-2019 19:57	194SMPL.d	CA NA
20181227-FD-PV5out-30D	5	18-Jan-2019 19:59	195SMPL.d	CA NA
20181227-FD-PV5out-35D	5	18-Jan-2019 20:01	196SMPL.d	CA NA
20181227-FD-PV5out-40D	5	18-Jan-2019 20:04	197SMPL.d	CA NA
20181228-FD-PV5inlet-ControlD	5	18-Jan-2019 20:06	198SMPL.d	CA NA
20181228-FD-PV5inlet-30-35-40D	5	18-Jan-2019 20:08	199SMPL.d	CA NA
20181228-FD-PV5mid-ControlD	5	18-Jan-2019 20:10	200SMPL.d	CA NA
20181228-FD-PV5mid-30D	5	18-Jan-2019 20:13	201SMPL.d	CA NA
20181228-FD-PV5mid-35D	5	18-Jan-2019 20:15	202SMPL.d	CA NA
20181228-FD-PV5mid-40D	5	18-Jan-2019 20:17	203SMPL.d	CA NA
CCV 15	1	18-Jan-2019 20:19	204_CCV.d	CA NA
CCB 14	1	18-Jan-2019 20:22	205_CCB.d	CA NA

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010559

Run ID:ICPMS04_331292
Instrument:ICPMS04
Method:SW6020

CCB 1	Date: 18-Jan-2019 12:42	Seq: 4914346		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	53.46	14	200	
CCB 2	Date: 18-Jan-2019 13:13	Seq: 4914467		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	49.32	14	200	
CCB 3	Date: 18-Jan-2019 13:47	Seq: 4914527		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	101.6	14	200	
CCB 4	Date: 18-Jan-2019 14:17	Seq: 4914695		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	104.8	14	200	
CCB 5	Date: 18-Jan-2019 14:58	Seq: 4914980		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	90.97	14	200	
CCB 6	Date: 18-Jan-2019 15:27	Seq: 4914992		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	84.66	14	200	
CCB 7	Date: 18-Jan-2019 15:56	Seq: 4915022		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	75.83	14	200	
CCB 8	Date: 18-Jan-2019 16:43	Seq: 4915172		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	84.46	14	200	
CCB 10	Date: 18-Jan-2019 18:30	Seq: 4915298		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Calcium	34.84	34	500	
	Sodium	-19.19	14	200	
CCB 11	Date: 18-Jan-2019 19:01	Seq: 4915347		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Calcium	39.04	34	500	
CCB 12	Date: 18-Jan-2019 19:28	Seq: 4916025		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Calcium	35.14	34	500	
CCB 13	Date: 18-Jan-2019 19:55	Seq: 4916037		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Calcium	42.21	34	500	
	Sodium	121.4	14	200	
CCB 14	Date: 18-Jan-2019 20:22	Seq: 4916049		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Calcium	36.9	34	500	
	Sodium	80.48	14	200	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010559
Start Date: 21-Jan-2019 End Date: 21-Jan-2019

Run ID:ICPMS04_331384
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
LLICV2	1	21-Jan-2019 11:33	019SMPL.d	AS CD FE K MG PB SB SE
LLICV5	1	21-Jan-2019 11:35	020LICV.d	AS CD FE K MG PB SB SE
ICB	1	21-Jan-2019 11:38	021_ICB.d	AS CD FE K MG PB SB SE
ICV	1	21-Jan-2019 11:40	022_ICV.d	AS CD FE K MG PB SB SE
ICSA	1	21-Jan-2019 11:50	024ICSA.d	AS CD FE K MG PB SB SE
ICSAB	1	21-Jan-2019 11:53	025ICSB.d	AS CD FE K MG PB SB SE
20181227-FD-PV5out-ControlD	1	21-Jan-2019 11:59	027SMPL.d	AS CD FE K MG PB SB SE
20181227-FD-PV5out-30D	1	21-Jan-2019 12:02	028SMPL.d	AS CD FE K MG PB SB SE
20181227-FD-PV5out-35D	1	21-Jan-2019 12:04	029SMPL.d	AS CD FE K MG PB SB SE
20181227-FD-PV5out-40D	1	21-Jan-2019 12:06	030SMPL.d	AS CD FE K MG PB SB SE
20181228-FD-PV5inlet-ControlD	1	21-Jan-2019 12:08	031SMPL.d	AS CD FE K MG PB SB SE
20181228-FD-PV5inlet-30-35-40D	1	21-Jan-2019 12:11	032SMPL.d	AS CD FE K MG PB SB SE
20181228-FD-PV5mid-ControlD	1	21-Jan-2019 12:13	033SMPL.d	AS CD FE K MG PB SB SE
20181228-FD-PV5mid-30D	1	21-Jan-2019 12:15	034SMPL.d	AS CD FE K MG PB SB SE
20181228-FD-PV5mid-35D	1	21-Jan-2019 12:17	035SMPL.d	AS CD FE K MG PB SB SE
CCV 1	1	21-Jan-2019 12:22	037_CCV.d	AS CD FE K MG PB SB SE
CCB 1	1	21-Jan-2019 12:24	038_CCB.d	AS CD FE K MG PB SB SE
20181228-FD-PV5mid-40D	1	21-Jan-2019 12:31	039SMPL.d	AS CD FE K MG PB SB SE
CCV 2	1	21-Jan-2019 12:53	049_CCV.d	AS CD FE K MG PB SB SE
CCB 2	1	21-Jan-2019 12:55	050_CCB.d	AS CD FE K MG PB SB SE
CCB 3	1	21-Jan-2019 13:28	062_CCB.d	AS CD FE K MG PB SB SE
CCV 3	1	21-Jan-2019 13:34	064_CCV.d	AS CD FE K MG PB SB SE
CCV 4	1	21-Jan-2019 13:57	074_CCV.d	AS CD FE K MG PB SB SE
CCB 4	1	21-Jan-2019 13:59	075_CCB.d	AS CD FE K MG PB SB SE
CCV 5	1	21-Jan-2019 14:29	086_CCV.d	AS CD FE K MG PB SB SE
CCB 5	1	21-Jan-2019 14:31	087_CCB.d	AS CD FE K MG PB SB SE
CCV 6	1	21-Jan-2019 14:59	098_CCV.d	AS CD FE K MG PB SB SE
CCB 6	1	21-Jan-2019 15:01	099_CCB.d	AS CD FE K MG PB SB SE
CCV 7	1	21-Jan-2019 15:24	108_CCV.d	AS CD FE K MG PB SB SE
CCB 7	1	21-Jan-2019 15:26	109_CCB.d	AS CD FE K MG PB SB SE
CCV 8	1	21-Jan-2019 16:00	120_CCV.d	AS CD FE K MG PB SB SE
CCB 8	1	21-Jan-2019 16:02	121_CCB.d	AS CD FE K MG PB SB SE
CCV 9	1	21-Jan-2019 16:37	132_CCV.d	AS CD FE K MG PB SB SE
CCB 9	1	21-Jan-2019 16:39	133_CCB.d	AS CD FE K MG PB SB SE
CCB 10	1	21-Jan-2019 17:15	145_CCB.d	AS CD FE K MG PB SB SE
CCV 10	1	21-Jan-2019 17:24	147_CCV.d	AS CD FE K MG PB SB SE
CCV 11	1	21-Jan-2019 17:53	157_CCV.d	AS CD FE K MG PB SB SE
CCB 11	1	21-Jan-2019 17:55	158_CCB.d	AS CD FE K MG PB SB SE
LLCCV2	1	21-Jan-2019 18:47	175SMPL.d	AS CD FE K MG PB SB SE
LLCCV5	1	21-Jan-2019 18:49	176LICV.d	AS CD FE K MG PB SB SE
ICCB 12	1	21-Jan-2019 18:51	177_ICB.d	AS CD FE K MG PB SB SE
ICCV 12	1	21-Jan-2019 18:54	178_ICV.d	AS CD FE K MG PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010559

Run ID:ICPMS04_331384
Instrument:ICPMS04
Method:SW6020

CCB 1	Date: 21-Jan-2019 12:24	Seq: 4916853	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.493	0.4	2	
Iron	18.04	12	200	
Selenium	1.37	1.1	2	

CCB 2	Date: 21-Jan-2019 12:55	Seq: 4916886	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.434	0.4	2	

CCB 3	Date: 21-Jan-2019 13:28	Seq: 4917046	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.777	0.4	2	

CCB 5	Date: 21-Jan-2019 14:31	Seq: 4917109	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.43	0.4	2	
Potassium	-37.65	18	200	

CCB 6	Date: 21-Jan-2019 15:01	Seq: 4917313	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.46	0.4	2	
Potassium	-32.44	18	200	

CCB 7	Date: 21-Jan-2019 15:26	Seq: 4917357	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.474	0.4	2	
Potassium	-30.78	18	200	

CCB 8	Date: 21-Jan-2019 16:02	Seq: 4917444	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.635	0.4	2	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19010559

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19010559-01	20181227-FD-PV5out-ControlD	Groundwater		27-Dec-2018 09:00	12-Jan-2019 09:35	☐
HS19010559-02	20181227-FD-PV5out-30D	Groundwater		27-Dec-2018 09:00	12-Jan-2019 09:35	☐
HS19010559-03	20181227-FD-PV5out-35D	Groundwater		27-Dec-2018 09:00	12-Jan-2019 09:35	☐
HS19010559-04	20181227-FD-PV5out-40D	Groundwater		27-Dec-2018 09:00	12-Jan-2019 09:35	☐
HS19010559-05	20181228-FD-PV5inlet-ControlD	Groundwater		28-Dec-2018 09:00	12-Jan-2019 09:35	☐
HS19010559-06	20181228-FD-PV5inlet-30-35-40D	Groundwater		28-Dec-2018 09:00	12-Jan-2019 09:35	☐
HS19010559-07	20181228-FD-PV5mid-ControlD	Groundwater		28-Dec-2018 09:00	12-Jan-2019 09:35	☐
HS19010559-08	20181228-FD-PV5mid-30D	Groundwater		28-Dec-2018 09:00	12-Jan-2019 09:35	☐
HS19010559-09	20181228-FD-PV5mid-35D	Groundwater		28-Dec-2018 09:00	12-Jan-2019 09:35	☐
HS19010559-10	20181228-FD-PV5mid-40D	Groundwater		28-Dec-2018 09:00	12-Jan-2019 09:35	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181227-FD-PV5out-ControlD
Collection Date: 27-Dec-2018 09:00

ANALYTICAL REPORT
WorkOrder:HS19010559
Lab ID:HS19010559-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 16-Jan-2019		Analyst: JCJ
Antimony	**0.0319**		**0.000400**	**0.00200**	**mg/L**	1	21-Jan-2019 11:59
Arsenic	**0.00108**	J	**0.000400**	**0.00200**	**mg/L**	1	21-Jan-2019 11:59
Cadmium	U		0.000200	0.00200	mg/L	1	21-Jan-2019 11:59
Calcium	**196**		**0.170**	**2.50**	**mg/L**	5	18-Jan-2019 19:57
Iron	**0.0226**	J	**0.0120**	**0.200**	**mg/L**	1	21-Jan-2019 11:59
Lead	U		0.000600	0.00200	mg/L	1	21-Jan-2019 11:59
Magnesium	**1.41**		**0.0100**	**0.200**	**mg/L**	1	21-Jan-2019 11:59
Potassium	**11.5**		**0.0180**	**0.200**	**mg/L**	1	21-Jan-2019 11:59
Selenium	**0.00615**		**0.00110**	**0.00200**	**mg/L**	1	21-Jan-2019 11:59
Sodium	**257**		**0.0700**	**1.00**	**mg/L**	5	18-Jan-2019 19:57

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181227-FD-PV5out-30D
Collection Date: 27-Dec-2018 09:00

ANALYTICAL REPORT
WorkOrder:HS19010559
Lab ID:HS19010559-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 16-Jan-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	21-Jan-2019 12:02
Arsenic	U		0.000400	0.00200	mg/L	1	21-Jan-2019 12:02
Cadmium	U		0.000200	0.00200	mg/L	1	21-Jan-2019 12:02
Calcium	**188**		**0.170**	**2.50**	**mg/L**	5	18-Jan-2019 19:59
Iron	**0.0762**	J	**0.0120**	**0.200**	**mg/L**	1	21-Jan-2019 12:02
Lead	U		0.000600	0.00200	mg/L	1	21-Jan-2019 12:02
Magnesium	**1.08**		**0.0100**	**0.200**	**mg/L**	1	21-Jan-2019 12:02
Potassium	**12.3**		**0.0180**	**0.200**	**mg/L**	1	21-Jan-2019 12:02
Selenium	U		0.00110	0.00200	mg/L	1	21-Jan-2019 12:02
Sodium	**248**		**0.0700**	**1.00**	**mg/L**	5	18-Jan-2019 19:59

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181227-FD-PV5out-35D
Collection Date: 27-Dec-2018 09:00

ANALYTICAL REPORT
WorkOrder:HS19010559
Lab ID:HS19010559-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 16-Jan-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	21-Jan-2019 12:04
Arsenic	U		0.000400	0.00200	mg/L	1	21-Jan-2019 12:04
Cadmium	U		0.000200	0.00200	mg/L	1	21-Jan-2019 12:04
Calcium	**195**		**0.170**	**2.50**	**mg/L**	5	18-Jan-2019 20:01
Iron	**0.255**		**0.0120**	**0.200**	**mg/L**	1	21-Jan-2019 12:04
Lead	U		0.000600	0.00200	mg/L	1	21-Jan-2019 12:04
Magnesium	**1.14**		**0.0100**	**0.200**	**mg/L**	1	21-Jan-2019 12:04
Potassium	**11.9**		**0.0180**	**0.200**	**mg/L**	1	21-Jan-2019 12:04
Selenium	U		0.00110	0.00200	mg/L	1	21-Jan-2019 12:04
Sodium	**251**		**0.0700**	**1.00**	**mg/L**	5	18-Jan-2019 20:01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181227-FD-PV5out-40D
Collection Date: 27-Dec-2018 09:00

ANALYTICAL REPORT
WorkOrder:HS19010559
Lab ID:HS19010559-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 16-Jan-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	21-Jan-2019 12:06
Arsenic	U		0.000400	0.00200	mg/L	1	21-Jan-2019 12:06
Cadmium	U		0.000200	0.00200	mg/L	1	21-Jan-2019 12:06
Calcium	**184**		**0.170**	**2.50**	**mg/L**	5	18-Jan-2019 20:04
Iron	**0.0883**	J	**0.0120**	**0.200**	**mg/L**	1	21-Jan-2019 12:06
Lead	U		0.000600	0.00200	mg/L	1	21-Jan-2019 12:06
Magnesium	**1.07**		**0.0100**	**0.200**	**mg/L**	1	21-Jan-2019 12:06
Potassium	**11.9**		**0.0180**	**0.200**	**mg/L**	1	21-Jan-2019 12:06
Selenium	U		0.00110	0.00200	mg/L	1	21-Jan-2019 12:06
Sodium	**253**		**0.0700**	**1.00**	**mg/L**	5	18-Jan-2019 20:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181228-FD-PV5inlet-ControlD
Collection Date: 28-Dec-2018 09:00

ANALYTICAL REPORT
WorkOrder:HS19010559
Lab ID:HS19010559-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 16-Jan-2019		Analyst: JCJ
Antimony	**0.0328**		**0.000400**	**0.00200**	**mg/L**	1	21-Jan-2019 12:08
Arsenic	**0.00128**	J	**0.000400**	**0.00200**	**mg/L**	1	21-Jan-2019 12:08
Cadmium	U		0.000200	0.00200	mg/L	1	21-Jan-2019 12:08
Calcium	**192**		**0.170**	**2.50**	**mg/L**	5	18-Jan-2019 20:06
Iron	**0.0752**	J	**0.0120**	**0.200**	**mg/L**	1	21-Jan-2019 12:08
Lead	U		0.000600	0.00200	mg/L	1	21-Jan-2019 12:08
Magnesium	**1.21**		**0.0100**	**0.200**	**mg/L**	1	21-Jan-2019 12:08
Potassium	**11.7**		**0.0180**	**0.200**	**mg/L**	1	21-Jan-2019 12:08
Selenium	**0.00633**		**0.00110**	**0.00200**	**mg/L**	1	21-Jan-2019 12:08
Sodium	**232**		**0.0700**	**1.00**	**mg/L**	5	18-Jan-2019 20:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181228-FD-PV5inlet-30-35-40D
Collection Date: 28-Dec-2018 09:00

ANALYTICAL REPORT
WorkOrder:HS19010559
Lab ID:HS19010559-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 16-Jan-2019		Analyst: JCJ
Antimony	**0.0335**		**0.000400**	**0.00200**	**mg/L**	1	21-Jan-2019 12:11
Arsenic	**0.000970**	J	**0.000400**	**0.00200**	**mg/L**	1	21-Jan-2019 12:11
Cadmium	U		0.000200	0.00200	mg/L	1	21-Jan-2019 12:11
Calcium	**189**		**0.170**	**2.50**	**mg/L**	5	18-Jan-2019 20:08
Iron	**0.0588**	J	**0.0120**	**0.200**	**mg/L**	1	21-Jan-2019 12:11
Lead	U		0.000600	0.00200	mg/L	1	21-Jan-2019 12:11
Magnesium	**1.12**		**0.0100**	**0.200**	**mg/L**	1	21-Jan-2019 12:11
Potassium	**12.4**		**0.0180**	**0.200**	**mg/L**	1	21-Jan-2019 12:11
Selenium	**0.00609**		**0.00110**	**0.00200**	**mg/L**	1	21-Jan-2019 12:11
Sodium	**234**		**0.0700**	**1.00**	**mg/L**	5	18-Jan-2019 20:08

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181228-FD-PV5mid-ControlD
Collection Date: 28-Dec-2018 09:00

ANALYTICAL REPORT
WorkOrder:HS19010559
Lab ID:HS19010559-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 16-Jan-2019		Analyst: JCJ
Antimony	**0.0338**		**0.000400**	**0.00200**	**mg/L**	1	21-Jan-2019 12:13
Arsenic	**0.00148**	J	**0.000400**	**0.00200**	**mg/L**	1	21-Jan-2019 12:13
Cadmium	U		0.000200	0.00200	mg/L	1	21-Jan-2019 12:13
Calcium	**200**		**0.170**	**2.50**	**mg/L**	5	18-Jan-2019 20:10
Iron	**0.0522**	J	**0.0120**	**0.200**	**mg/L**	1	21-Jan-2019 12:13
Lead	U		0.000600	0.00200	mg/L	1	21-Jan-2019 12:13
Magnesium	**1.36**		**0.0100**	**0.200**	**mg/L**	1	21-Jan-2019 12:13
Potassium	**11.6**		**0.0180**	**0.200**	**mg/L**	1	21-Jan-2019 12:13
Selenium	**0.00600**		**0.00110**	**0.00200**	**mg/L**	1	21-Jan-2019 12:13
Sodium	**251**		**0.0700**	**1.00**	**mg/L**	5	18-Jan-2019 20:10

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181228-FD-PV5mid-30D
Collection Date: 28-Dec-2018 09:00

ANALYTICAL REPORT
WorkOrder:HS19010559
Lab ID:HS19010559-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 16-Jan-2019		Analyst: JCJ
Antimony	**0.000432**	J	**0.000400**	**0.00200**	**mg/L**	1	21-Jan-2019 12:15
Arsenic	U		0.000400	0.00200	mg/L	1	21-Jan-2019 12:15
Cadmium	U		0.000200	0.00200	mg/L	1	21-Jan-2019 12:15
Calcium	**182**		**0.170**	**2.50**	**mg/L**	5	18-Jan-2019 20:13
Iron	**0.0498**	J	**0.0120**	**0.200**	**mg/L**	1	21-Jan-2019 12:15
Lead	U		0.000600	0.00200	mg/L	1	21-Jan-2019 12:15
Magnesium	**1.03**		**0.0100**	**0.200**	**mg/L**	1	21-Jan-2019 12:15
Potassium	**11.3**		**0.0180**	**0.200**	**mg/L**	1	21-Jan-2019 12:15
Selenium	U		0.00110	0.00200	mg/L	1	21-Jan-2019 12:15
Sodium	**242**		**0.0700**	**1.00**	**mg/L**	5	18-Jan-2019 20:13

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181228-FD-PV5mid-35D
Collection Date: 28-Dec-2018 09:00

ANALYTICAL REPORT
WorkOrder:HS19010559
Lab ID:HS19010559-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 16-Jan-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	21-Jan-2019 12:17
Arsenic	U		0.000400	0.00200	mg/L	1	21-Jan-2019 12:17
Cadmium	U		0.000200	0.00200	mg/L	1	21-Jan-2019 12:17
Calcium	**191**		**0.170**	**2.50**	**mg/L**	5	18-Jan-2019 20:15
Iron	**0.0339**	J	**0.0120**	**0.200**	**mg/L**	1	21-Jan-2019 12:17
Lead	U		0.000600	0.00200	mg/L	1	21-Jan-2019 12:17
Magnesium	**1.07**		**0.0100**	**0.200**	**mg/L**	1	21-Jan-2019 12:17
Potassium	**11.5**		**0.0180**	**0.200**	**mg/L**	1	21-Jan-2019 12:17
Selenium	U		0.00110	0.00200	mg/L	1	21-Jan-2019 12:17
Sodium	**226**		**0.0700**	**1.00**	**mg/L**	5	18-Jan-2019 20:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20181228-FD-PV5mid-40D
Collection Date: 28-Dec-2018 09:00

ANALYTICAL REPORT
WorkOrder:HS19010559
Lab ID:HS19010559-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 16-Jan-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	21-Jan-2019 12:31
Arsenic	U		0.000400	0.00200	mg/L	1	21-Jan-2019 12:31
Cadmium	U		0.000200	0.00200	mg/L	1	21-Jan-2019 12:31
Calcium	**183**		**0.170**	**2.50**	**mg/L**	5	18-Jan-2019 20:17
Iron	**0.0163**	J	**0.0120**	**0.200**	**mg/L**	1	21-Jan-2019 12:31
Lead	U		0.000600	0.00200	mg/L	1	21-Jan-2019 12:31
Magnesium	**1.14**		**0.0100**	**0.200**	**mg/L**	1	21-Jan-2019 12:31
Potassium	**11.4**		**0.0180**	**0.200**	**mg/L**	1	21-Jan-2019 12:31
Selenium	U		0.00110	0.00200	mg/L	1	21-Jan-2019 12:31
Sodium	**248**		**0.0700**	**1.00**	**mg/L**	5	18-Jan-2019 20:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010559

Batch ID: 136692 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19010559-01	1	10	10 (mL)	1
HS19010559-02	1	10	10 (mL)	1
HS19010559-03	1	10	10 (mL)	1
HS19010559-04	1	10	10 (mL)	1
HS19010559-05	1	10	10 (mL)	1
HS19010559-06	1	10	10 (mL)	1
HS19010559-07	1	10	10 (mL)	1
HS19010559-08	1	10	10 (mL)	1
HS19010559-09	1	10	10 (mL)	1
HS19010559-10	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010559

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 136692	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS19010559-01	20181227-FD-PV5out-ControlD	27 Dec 2018 09:00		16 Jan 2019 13:30	21 Jan 2019 11:59	1
HS19010559-01	20181227-FD-PV5out-ControlD	27 Dec 2018 09:00		16 Jan 2019 13:30	18 Jan 2019 19:57	5
HS19010559-02	20181227-FD-PV5out-30D	27 Dec 2018 09:00		16 Jan 2019 13:30	21 Jan 2019 12:02	1
HS19010559-02	20181227-FD-PV5out-30D	27 Dec 2018 09:00		16 Jan 2019 13:30	18 Jan 2019 19:59	5
HS19010559-03	20181227-FD-PV5out-35D	27 Dec 2018 09:00		16 Jan 2019 13:30	21 Jan 2019 12:04	1
HS19010559-03	20181227-FD-PV5out-35D	27 Dec 2018 09:00		16 Jan 2019 13:30	18 Jan 2019 20:01	5
HS19010559-04	20181227-FD-PV5out-40D	27 Dec 2018 09:00		16 Jan 2019 13:30	21 Jan 2019 12:06	1
HS19010559-04	20181227-FD-PV5out-40D	27 Dec 2018 09:00		16 Jan 2019 13:30	18 Jan 2019 20:04	5
HS19010559-05	20181228-FD-PV5inlet-ControlD	28 Dec 2018 09:00		16 Jan 2019 13:30	21 Jan 2019 12:08	1
HS19010559-05	20181228-FD-PV5inlet-ControlD	28 Dec 2018 09:00		16 Jan 2019 13:30	18 Jan 2019 20:06	5
HS19010559-06	20181228-FD-PV5inlet-30-35-40D	28 Dec 2018 09:00		16 Jan 2019 13:30	21 Jan 2019 12:11	1
HS19010559-06	20181228-FD-PV5inlet-30-35-40D	28 Dec 2018 09:00		16 Jan 2019 13:30	18 Jan 2019 20:08	5
HS19010559-07	20181228-FD-PV5mid-ControlD	28 Dec 2018 09:00		16 Jan 2019 13:30	21 Jan 2019 12:13	1
HS19010559-07	20181228-FD-PV5mid-ControlD	28 Dec 2018 09:00		16 Jan 2019 13:30	18 Jan 2019 20:10	5
HS19010559-08	20181228-FD-PV5mid-30D	28 Dec 2018 09:00		16 Jan 2019 13:30	21 Jan 2019 12:15	1
HS19010559-08	20181228-FD-PV5mid-30D	28 Dec 2018 09:00		16 Jan 2019 13:30	18 Jan 2019 20:13	5
HS19010559-09	20181228-FD-PV5mid-35D	28 Dec 2018 09:00		16 Jan 2019 13:30	21 Jan 2019 12:17	1
HS19010559-09	20181228-FD-PV5mid-35D	28 Dec 2018 09:00		16 Jan 2019 13:30	18 Jan 2019 20:15	5
HS19010559-10	20181228-FD-PV5mid-40D	28 Dec 2018 09:00		16 Jan 2019 13:30	21 Jan 2019 12:31	1
HS19010559-10	20181228-FD-PV5mid-40D	28 Dec 2018 09:00		16 Jan 2019 13:30	18 Jan 2019 20:17	5

WorkOrder: HS19010559
InstrumentID: ICPMS04
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000521	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000340	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000553	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0523	0.0340	0.500
A	Iron	7439-89-6	0.0250	0.0205	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000916	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0700	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0418	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00274	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0556	0.0140	0.200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010559

QC BATCH REPORT

Batch ID: 136692 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLK-136692** Units: **mg/L** Analysis Date: **17-Jan-2019 20:39**
Client ID: Run ID: **ICPMS04_331185** SeqNo: **4913724** PrepDate: **16-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.0142	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								

MBLK Sample ID: **MBLK-136692** Units: **mg/L** Analysis Date: **18-Jan-2019 19:10**
Client ID: Run ID: **ICPMS04_331292** SeqNo: **4916017** PrepDate: **16-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	U	0.200								

LCS Sample ID: **LCS-136692** Units: **mg/L** Analysis Date: **17-Jan-2019 20:41**
Client ID: Run ID: **ICPMS04_331185** SeqNo: **4913725** PrepDate: **16-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04803	0.00200	0.05	0	96.1	80 - 120				
Arsenic	0.04614	0.00200	0.05	0	92.3	80 - 120				
Cadmium	0.04981	0.00200	0.05	0	99.6	80 - 120				
Calcium	4.554	0.500	5	0	91.1	80 - 120				
Iron	4.78	0.200	5	0	95.6	80 - 120				
Lead	0.05021	0.00200	0.05	0	100	80 - 120				
Magnesium	4.612	0.200	5	0	92.2	80 - 120				
Potassium	4.651	0.200	5	0	93.0	80 - 120				
Selenium	0.0458	0.00200	0.05	0	91.6	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010559

QC BATCH REPORT

Batch ID: 136692 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

LCS Sample ID: **LCS-136692** Units: **mg/L** Analysis Date: **18-Jan-2019 19:12**
Client ID: Run ID: **ICPMS04_331292** SeqNo: **4916018** PrepDate: **16-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	4.688	0.200	5	0	93.8	80 - 120				

MS Sample ID: **HS19010557-01MS** Units: **mg/L** Analysis Date: **17-Jan-2019 20:48**
Client ID: Run ID: **ICPMS04_331185** SeqNo: **4913728** PrepDate: **16-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05069	0.00200	0.05	0.000719	99.9	75 - 125				
Arsenic	0.04758	0.00200	0.05	0.000135	94.9	75 - 125				
Cadmium	0.05813	0.00200	0.05	0.009743	96.8	75 - 125				
Calcium	470.6	0.500	5	473.2	-51.9	75 - 125				SEO
Iron	4.593	0.200	5	0.002482	91.8	75 - 125				
Lead	0.0497	0.00200	0.05	0.000142	99.1	75 - 125				
Magnesium	290.4	0.200	5	293.3	-56.9	75 - 125				SEO
Potassium	25.36	0.200	5	20.78	91.5	75 - 125				O
Selenium	0.04552	0.00200	0.05	0.001732	87.6	75 - 125				
Sodium	U	0.200	5	0	0	75 - 125				S

MSD Sample ID: **HS19010557-01MSD** Units: **mg/L** Analysis Date: **17-Jan-2019 20:50**
Client ID: Run ID: **ICPMS04_331185** SeqNo: **4913729** PrepDate: **16-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05221	0.00200	0.05	0.000719	103	75 - 125	0.05069	2.96	20	
Arsenic	0.04705	0.00200	0.05	0.000135	93.8	75 - 125	0.04758	1.13	20	
Cadmium	0.06032	0.00200	0.05	0.009743	101	75 - 125	0.05813	3.68	20	
Calcium	467.3	0.500	5	473.2	-117	75 - 125	470.6	0.69	20	SEO
Iron	4.682	0.200	5	0.002482	93.6	75 - 125	4.593	1.92	20	
Lead	0.04983	0.00200	0.05	0.000142	99.4	75 - 125	0.0497	0.265	20	
Magnesium	300.3	0.200	5	293.3	140	75 - 125	290.4	3.33	20	SEO
Potassium	24.79	0.200	5	20.78	80.1	75 - 125	25.36	2.27	20	O
Selenium	0.04855	0.00200	0.05	0.001732	93.6	75 - 125	0.04552	6.44	20	
Sodium	U	0.200	5	0	0	75 - 125	0	0	20	S

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010559

QC BATCH REPORT

Batch ID: 136692 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

PDS Sample ID: **HS19010557-01PDS** Units: **mg/L** Analysis Date: **17-Jan-2019 20:52**
Client ID: Run ID: **ICPMS04_331185** SeqNo: **4913730** PrepDate: **16-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09818	0.00200	0.1	0.000719	97.5	75 - 125				
Arsenic	0.09891	0.00200	0.1	0.000135	98.8	75 - 125				
Cadmium	0.1126	0.00200	0.1	0.009743	103	75 - 125				
Iron	9.574	0.200	10	0.002482	95.7	75 - 125				
Lead	0.104	0.00200	0.1	0.000142	104	75 - 125				
Potassium	28.95	0.200	10	20.78	81.7	75 - 125				
Selenium	0.09838	0.00200	0.1	0.001732	96.6	75 - 125				

PDS Sample ID: **HS19010557-01PDS** Units: **mg/L** Analysis Date: **18-Jan-2019 19:19**
Client ID: Run ID: **ICPMS04_331292** SeqNo: **4916021** PrepDate: **16-Jan-2019** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	1028	25.0	500	497.2	106	75 - 125				
Magnesium	848.9	10.0	500	338.1	102	75 - 125				
Sodium	2018	10.0	500	1479	108	75 - 125				

SD Sample ID: **HS19010557-01SD** Units: **mg/L** Analysis Date: **17-Jan-2019 20:45**
Client ID: Run ID: **ICPMS04_331185** SeqNo: **4913727** PrepDate: **16-Jan-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000719	0	10	
Arsenic	U	0.0100					0.000135	0	10	
Cadmium	0.009319	0.0100					0.009743	0	10	J
Iron	U	1.00					0.002482	0	10	
Lead	U	0.0100					0.000142	0	10	
Potassium	21.16	1.00					20.78	1.81	10	
Selenium	U	0.0100					0.001732	0	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010559

QC BATCH REPORT

Batch ID: 136692 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

SD Sample ID: **HS19010557-01SD** Units: **mg/L** Analysis Date: **18-Jan-2019 19:16**
Client ID: Run ID: **ICPMS04_331292** SeqNo: **4916020** PrepDate: **16-Jan-2019** DF: **250**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	487.2	125					497.2	2	10	
Magnesium	328.7	50.0					338.1	2.77	10	
Sodium	1503	50.0					1479	1.67	10	

The following samples were analyzed in this batch:

HS19010559-01	HS19010559-02	HS19010559-03	HS19010559-04
HS19010559-05	HS19010559-06	HS19010559-07	HS19010559-08
HS19010559-09	HS19010559-10		

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19010559**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19010559

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19010559-01	20181227-FD-PV5out-ControlD	Login	1/14/2019 1:04:27 PM	JRM	MET072
HS19010559-02	20181227-FD-PV5out-30D	Login	1/14/2019 1:04:27 PM	JRM	MET072
HS19010559-03	20181227-FD-PV5out-35D	Login	1/14/2019 1:04:27 PM	JRM	MET072
HS19010559-04	20181227-FD-PV5out-40D	Login	1/14/2019 1:04:27 PM	JRM	MET072
HS19010559-05	20181228-FD-PV5inlet-ControlD	Login	1/14/2019 1:04:27 PM	JRM	MET072
HS19010559-06	20181228-FD-PV5inlet-30-35-40D	Login	1/14/2019 1:04:27 PM	JRM	MET072
HS19010559-07	20181228-FD-PV5mid-ControlD	Login	1/14/2019 1:04:27 PM	JRM	MET072
HS19010559-08	20181228-FD-PV5mid-30D	Login	1/14/2019 1:04:27 PM	JRM	MET072
HS19010559-09	20181228-FD-PV5mid-35D	Login	1/14/2019 1:04:27 PM	JRM	MET072
HS19010559-10	20181228-FD-PV5mid-40D	Login	1/14/2019 1:04:27 PM	JRM	MET072

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19010559

Date/Time Received: **12-Jan-2019 09:35**
Received by: **JRM**

Checklist completed by: *Jared R. Makan* eSignature 14-Jan-2019 Date

Reviewed by: *Dane J. Wacasey* eSignature 17-Jan-2019 Date

Matrices: **Water**

Carrier name: **FedEx International Priority**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	13.6c/13.9c UC/C	IR25	
Cooler(s)/Kit(s):	43811		
Date/Time sample(s) sent to storage:	01/12/2019 15:00		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070

Chain of Custody Form

Page ____ of ____

COC ID: 194451

HS19010559 WV

Golder Associates
Exide Column Studies

Customer Information		Project Information		ALS Project Manager:
Purchase Order	130-2086-06	Project Name	Exide Column Studies	
Work Order		Project Number	130-2086	
Company Name	Golder Associates	Bill To Company	Golder Associates	
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P	
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit	
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021	
Phone	(314) 984-8800	Phone	(314) 984-8800	
Fax		Fax		
e-Mail Address	Emily_White@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com	

A	300_W (300 Cl, SO4, [*NO3* *48hr HT*])
B	TDS_W 2540C (2540C TDS)
C	ALK_W 2320B (2320B Alkalinity)
D	HARD (2340B Hardness (calc))
E	ICP_TW (6020A Total Metals (6)+Cations)
F	ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
G	
H	
I	
J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20181227-FD-PVSout-control D	2018/12/27	9:00	GW	2	1						X					
2	20181227-FD-PVSout-30D	"	"	"	2	1						X					
3	20181227-FD-PVSout-35D	"	"	"	2	1						X					
4	20181227-FD-PVSout-40D	"	"	"	2	1						X					
5	20181228-FD-PVSinlet-control D	2018/12/28	9:00	"	2	1						X					
6	20181228-FD-PVSinlet-30-35-40D	"	"	"	2	1						X					
7	20181228-FD-PVSmid-control D	2018/12/28	9:00	"	2	1						X					
8	20181228-FD-PVSmid-30D	"	"	"	2	1						X					
9	20181228-FD-PVSmid-35D	"	"	"	2	1						X					
10	20181228-FD-PVSmid-40D	"	"	"	2	1						X					

Sampler(s) Please Print & Sign: Bethan Eccle

Shipment Method:

Required Turnaround Time: (Check Box) ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other ____

Results Due Date:

Relinquished by: Shannon Hannan Date: 2019/01/11 Time: 3:00pm

Received by:

Relinquished by: Date: 01/12/19 Time: 09:25

Received by (Laboratory): J. Hannan

Logged by (Laboratory): Date: Time:

Checked by (Laboratory):

Notes: Exide Column Studies

Cooler ID	Cooler Temp.
	°C
43211	1.3.6
	1225
	CF 0.7

QC Package: (Check One Box Below)
☐ Level II Std QC
☐ Level III Std QC/Raw Data
☐ Level IV SW846/CLP
☐ Other
☒ TRRP Checklist
☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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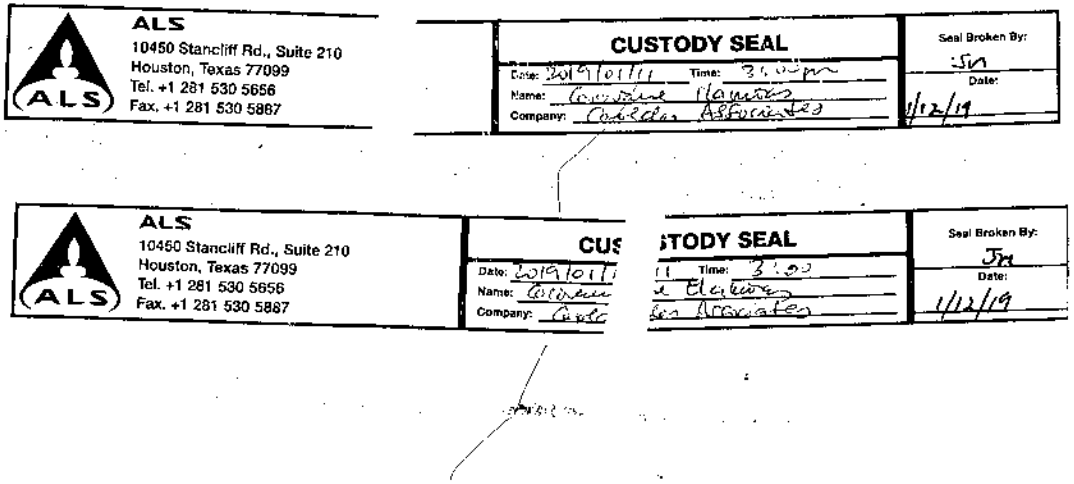
ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5867
CUSTODY SEAL
Date: 2019/01/11
Time: 3:00pm
Name: Caroline Flamm
Company: Cardno Associates
Seal Broken By:
JM
Date:
1/12/19
ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5867
CUS
Date: 2019/01/1
Name: Caroline
Company: Cardno
STODY SEAL
11 Time: 3:00
e Flamm
tes Associates
Seal Broken By:
JM
Date:
1/12/19

ORIGIN ID:YUXA (514) 383-0990
AUDREY ETHEVES
GOLDER ASSOCIATES LTD
7250 RUE DU MILE END
3E ETAGE
MONTREAL, PQ H2R3A4
CANADA CA

SHIP DATE: 11JAN19
ACTWGT: 22.60 LB
CAD: 108680724/INET4042

BILL RECIPIENT

TO **DANE WACASEY**
ALS HOUSTON LABORATORY
10450 STANCLIFF RD
STE 210
HOUSTON TX 77099 **(US)**
(281) 530-5656 REF:
INV:
PO: DEPT:

552J2/D74C/DCA5

FedEx Express

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TRK# 0430 **7741 7166 8422**

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Audrey Etheves
Golder Associates Ltd
7250 rue du Mile End
3e etage
MONTREAL, PQ H2R3A4
CANADA, CA

Ship Date: 11JAN19
ActWgt: 22.60 LB
CAD: 106680724/INET4042

BILL RECIPIENT
EIN/VAT:

TO Dane Wacasey
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

(281) 530-5656

FedEx Express

(US)

J1821480815200w

AWB

X0 SGRA

PKG:YOUR PKG

TRK# 7741 7166 8422

Form
0430

SATURDAY 12:00P
INTL PRIORITY

REF:
DESC1:Bouteille d'eau
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: Audrey Etheves
T/C: R 967554812
DIT: R 967554812

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10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

January 22, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19010624**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 4 sample(s) on Jan 15, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DAYNA.FISHER
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19010624**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

ALS Houston, US Date: 22-Jan-19

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19010624**	

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 01/22/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19010624				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): R331143, R331147, R331434				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?	X				
		Were analytical duplicates analyzed at the appropriate frequency?	X				
		Were RPDs or relative standard deviations within the laboratory QC limits?	X				
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 01/22/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19010624				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): R331143, R331147, R331434				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			2
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?			X		
		Were ion abundance data within the method-required QC limits?			X		
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?			X		
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?			X		
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports	
Laboratory Name: ALS Laboratory Group	LRC Date: 01/22/2019
Project Name: Exide Column Studies	Laboratory Job Number: HS19010624
Reviewer Name: Dane Wacasey	Prep Batch Number(s): R331143, R331147, R331434

ER#[5]	Description
1	Batch R331143, Anions by Method E300, Sample HS19010531-02, MS and MSD were performed on an unrelated sample
2	See Run Log and CCB Exception Reports

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010624
Start Date: 15-Jan-2019 End Date: 16-Jan-2019

Run ID:ICS2100_331143
Instrument:ICS2100
Method:E300

Sample No.	D/F	Time	FileID	Analytes
CCV 1	1	15-Jan-2019 10:21		CL NO3N SO4
CCB 1	1	15-Jan-2019 10:35		CL NO3N SO4
WBLKW1-011519	1	15-Jan-2019 10:50		CL NO3N SO4
WLCSW1-011519	1	15-Jan-2019 11:08		CL NO3N SO4
WLCSDW1-011519	1	15-Jan-2019 11:22		CL NO3N SO4
ZZZZZZMS	1	15-Jan-2019 12:35		CL NO3N SO4
ZZZZZZMSD	1	15-Jan-2019 12:50		CL NO3N SO4
CCB 2	1	15-Jan-2019 13:53		CL NO3N SO4
ZZZZZZMS	50	15-Jan-2019 14:57		CL NO3N SO4
ZZZZZZMSD	50	15-Jan-2019 15:12		CL NO3N SO4
ZZZZZZMS	50	15-Jan-2019 15:41		CL NO3N SO4
ZZZZZZMSD	50	15-Jan-2019 15:55		CL NO3N SO4
CCV 2	1	15-Jan-2019 17:14		CL NO3N SO4
CCB 3	1	15-Jan-2019 17:28		CL NO3N SO4
2019-0114-DGW-MW3-PV20out-Control	1	15-Jan-2019 17:53		CL NO3N
2019-0114-DGW-MW3-PV20out-30	1	15-Jan-2019 18:08		CL NO3N
2019-0114-DGW-MW3-PV20out-35	1	15-Jan-2019 18:22		CL NO3N
2019-0114-DGW-MW3-PV20out-40	1	15-Jan-2019 18:37		CL NO3N
2019-0114-DGW-MW3-PV20out-Control	5	15-Jan-2019 19:46		SO4
2019-0114-DGW-MW3-PV20out-30	5	15-Jan-2019 20:01		SO4
2019-0114-DGW-MW3-PV20out-35	5	15-Jan-2019 20:15		SO4
CCB 4	1	15-Jan-2019 20:44		CL NO3N SO4
CCV 3	1	15-Jan-2019 23:24		CL NO3N SO4
CCB 5	1	15-Jan-2019 23:39		CL NO3N SO4
2019-0114-DGW-MW3-PV20out-40	5	16-Jan-2019 00:37		SO4
CCB 6	1	16-Jan-2019 02:33		CL NO3N SO4

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010624

Run ID:ICS2100_331143
Instrument:ICS2100
Method:E300

CCB 1	Date: 15-Jan-2019 10:35	Seq: 4910730	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	216	200	500	
Sulfate	345	200	500	

CCB 2	Date: 15-Jan-2019 13:53	Seq: 4910739	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	223	200	500	
Sulfate	438	200	500	

CCB 6	Date: 16-Jan-2019 02:33	Seq: 4910779	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sulfate	279	200	500	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19010624

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19010624-01	20190114-DGW-MW3-PV20out-Control	Groundwater		14-Jan-2019 10:10	15-Jan-2019 08:50	☐
HS19010624-02	20190114-DGW-MW3-PV20out-30	Groundwater		14-Jan-2019 10:10	15-Jan-2019 08:50	☐
HS19010624-03	20190114-DGW-MW3-PV20out-35	Groundwater		14-Jan-2019 10:10	15-Jan-2019 08:50	☐
HS19010624-04	20190114-DGW-MW3-PV20out-40	Groundwater		14-Jan-2019 10:10	15-Jan-2019 08:50	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190114-DGW-MW3-PV20out-Control
Collection Date: 14-Jan-2019 10:10

ANALYTICAL REPORT
WorkOrder:HS19010624
Lab ID:HS19010624-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**49.3**		**0.200**	**0.500**	**mg/L**	1	15-Jan-2019 17:53
Nitrogen, Nitrate (As N)	U		0.0300	0.100	mg/L	1	15-Jan-2019 17:53
Sulfate	**217**		**1.00**	**2.50**	**mg/L**	5	15-Jan-2019 19:46
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	**798**		**5.00**	**10.0**	**mg/L**	1	21-Jan-2019 17:20
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**453**		**5.00**	**5.00**	**mg/L**	1	16-Jan-2019 15:05
Alkalinity, Carbonate (As CaCO3)	**10.3**		**5.00**	**5.00**	**mg/L**	1	16-Jan-2019 15:05
Alkalinity, Total (As CaCO3)	**463**		**5.00**	**5.00**	**mg/L**	1	16-Jan-2019 15:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190114-DGW-MW3-PV20out-30
Collection Date: 14-Jan-2019 10:10

ANALYTICAL REPORT
WorkOrder:HS19010624
Lab ID:HS19010624-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**47.5**		**0.200**	**0.500**	**mg/L**	1	15-Jan-2019 18:08
Nitrogen, Nitrate (As N)	U		0.0300	0.100	mg/L	1	15-Jan-2019 18:08
Sulfate	**175**		**1.00**	**2.50**	**mg/L**	5	15-Jan-2019 20:01
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	**552**		**5.00**	**10.0**	**mg/L**	1	21-Jan-2019 17:20
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**227**		**5.00**	**5.00**	**mg/L**	1	16-Jan-2019 15:12
Alkalinity, Carbonate (As CaCO3)	**44.3**		**5.00**	**5.00**	**mg/L**	1	16-Jan-2019 15:12
Alkalinity, Total (As CaCO3)	**271**		**5.00**	**5.00**	**mg/L**	1	16-Jan-2019 15:12

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190114-DGW-MW3-PV20out-35
Collection Date: 14-Jan-2019 10:10

ANALYTICAL REPORT
WorkOrder:HS19010624
Lab ID:HS19010624-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**48.5**		**0.200**	**0.500**	**mg/L**	1	15-Jan-2019 18:22
Nitrogen, Nitrate (As N)	U		0.0300	0.100	mg/L	1	15-Jan-2019 18:22
Sulfate	**181**		**1.00**	**2.50**	**mg/L**	5	15-Jan-2019 20:15
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	**546**		**5.00**	**10.0**	**mg/L**	1	21-Jan-2019 17:20
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**213**		**5.00**	**5.00**	**mg/L**	1	16-Jan-2019 15:19
Alkalinity, Carbonate (As CaCO3)	**41.8**		**5.00**	**5.00**	**mg/L**	1	16-Jan-2019 15:19
Alkalinity, Total (As CaCO3)	**255**		**5.00**	**5.00**	**mg/L**	1	16-Jan-2019 15:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190114-DGW-MW3-PV20out-40
Collection Date: 14-Jan-2019 10:10

ANALYTICAL REPORT
WorkOrder:HS19010624
Lab ID:HS19010624-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**47.5**		**0.200**	**0.500**	**mg/L**	1	15-Jan-2019 18:37
Nitrogen, Nitrate (As N)	U		0.0300	0.100	mg/L	1	15-Jan-2019 18:37
Sulfate	**186**		**1.00**	**2.50**	**mg/L**	5	16-Jan-2019 00:37
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	**556**		**5.00**	**10.0**	**mg/L**	1	21-Jan-2019 17:20
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**212**		**5.00**	**5.00**	**mg/L**	1	16-Jan-2019 15:28
Alkalinity, Carbonate (As CaCO3)	**37.1**		**5.00**	**5.00**	**mg/L**	1	16-Jan-2019 15:28
Alkalinity, Total (As CaCO3)	**249**		**5.00**	**5.00**	**mg/L**	1	16-Jan-2019 15:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010624

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R331143	**Test Name :** ANIONS BY E300.0			**Matrix:** Groundwater		
HS19010624-01	20190114-DGW-MW3-PV20out-Control	14 Jan 2019 10:10			15 Jan 2019 19:46	5
HS19010624-01	20190114-DGW-MW3-PV20out-Control	14 Jan 2019 10:10			15 Jan 2019 17:53	1
HS19010624-02	20190114-DGW-MW3-PV20out-30	14 Jan 2019 10:10			15 Jan 2019 20:01	5
HS19010624-02	20190114-DGW-MW3-PV20out-30	14 Jan 2019 10:10			15 Jan 2019 18:08	1
HS19010624-03	20190114-DGW-MW3-PV20out-35	14 Jan 2019 10:10			15 Jan 2019 20:15	5
HS19010624-03	20190114-DGW-MW3-PV20out-35	14 Jan 2019 10:10			15 Jan 2019 18:22	1
HS19010624-04	20190114-DGW-MW3-PV20out-40	14 Jan 2019 10:10			16 Jan 2019 00:37	5
HS19010624-04	20190114-DGW-MW3-PV20out-40	14 Jan 2019 10:10			15 Jan 2019 18:37	1
Batch ID R331147	**Test Name :** ALKALINITY BY SM2320B			**Matrix:** Groundwater		
HS19010624-01	20190114-DGW-MW3-PV20out-Control	14 Jan 2019 10:10			16 Jan 2019 15:05	1
HS19010624-02	20190114-DGW-MW3-PV20out-30	14 Jan 2019 10:10			16 Jan 2019 15:12	1
HS19010624-03	20190114-DGW-MW3-PV20out-35	14 Jan 2019 10:10			16 Jan 2019 15:19	1
HS19010624-04	20190114-DGW-MW3-PV20out-40	14 Jan 2019 10:10			16 Jan 2019 15:28	1
Batch ID R331434	**Test Name :** TOTAL DISSOLVED SOLIDS BY SM2540C			**Matrix:** Groundwater		
HS19010624-01	20190114-DGW-MW3-PV20out-Control	14 Jan 2019 10:10			21 Jan 2019 17:20	1
HS19010624-02	20190114-DGW-MW3-PV20out-30	14 Jan 2019 10:10			21 Jan 2019 17:20	1
HS19010624-03	20190114-DGW-MW3-PV20out-35	14 Jan 2019 10:10			21 Jan 2019 17:20	1
HS19010624-04	20190114-DGW-MW3-PV20out-40	14 Jan 2019 10:10			21 Jan 2019 17:20	1

WorkOrder: HS19010624
InstrumentID: ICS2100
Test Code: 300_W
Test Number: E300
Test Name: Anions by E300.0

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Chloride	16887-00-6	0.500	0.581	0.200	0.500
A	Nitrogen, Nitrate (As N)	14797-55-8	0.100	0.107	0.0300	0.100
A	Sulfate	14808-79-8	0.500	0.626	0.200	0.500

WorkOrder: HS19010624
InstrumentID: ManTech01
Test Code: ALK_W 2320B
Test Number: SM2320B
Test Name: Alkalinity by SM2320B

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Alkalinity, Bicarbonate (As CaCO3)	ALK-Bicarb	5.00	5.06	5.00	5.00
A	Alkalinity, Carbonate (As CaCO3)	ALK-Carb	5.00	5.06	5.00	5.00
A	Alkalinity, Total (As CaCO3)	ALK	5.00	5.06	5.00	5.00

WorkOrder: HS19010624
InstrumentID: Balance1
Test Code: TDS_W 2540C
Test Number: M2540C
Test Name: Total Dissolved Solids by

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Total Dissolved Solids (Residue, Filterable)	TDS	5.00	6.00	5.00	10.0

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010624

QC BATCH REPORT

Batch ID: R331143 **Instrument: ICS2100** **Method: E300**

MBLK Sample ID: **WBLKW1-011519** Units: **mg/L** Analysis Date: **15-Jan-2019 10:50**
Client ID: Run ID: **ICS2100_331143** SeqNo: **4910731** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	0.500								
Nitrogen, Nitrate (As N)	U	0.100								
Sulfate	U	0.500								

LCS Sample ID: **WLCSW1-011519** Units: **mg/L** Analysis Date: **15-Jan-2019 11:08**
Client ID: Run ID: **ICS2100_331143** SeqNo: **4910732** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.1	0.500	20	0	100	90 - 110				
Nitrogen, Nitrate (As N)	3.927	0.100	4	0	98.2	90 - 110				
Sulfate	19.89	0.500	20	0	99.4	90 - 110				

LCSD Sample ID: **WLCSDW1-011519** Units: **mg/L** Analysis Date: **15-Jan-2019 11:22**
Client ID: Run ID: **ICS2100_331143** SeqNo: **4910733** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.78	0.500	20	0	104	90 - 110	20.1	3.35	20	
Nitrogen, Nitrate (As N)	4.063	0.100	4	0	102	90 - 110	3.927	3.4	20	
Sulfate	20.52	0.500	20	0	103	90 - 110	19.89	3.13	20	

MS Sample ID: **HS19010531-02MS** Units: **mg/L** Analysis Date: **15-Jan-2019 12:35**
Client ID: Run ID: **ICS2100_331143** SeqNo: **4910735** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	27.68	0.500	10	16.25	114	80 - 120				
Nitrogen, Nitrate (As N)	2.602	0.100	2	0.414	109	80 - 120				
Sulfate	1378	0.500	10	1386	-84.7	80 - 120				SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010624

QC BATCH REPORT

Batch ID: R331143 **Instrument: ICS2100** **Method: E300**

MS Sample ID: **HS19010531-02MS** Units: **mg/L** Analysis Date: **15-Jan-2019 15:41**
Client ID: Run ID: **ICS2100_331143** SeqNo: **4910744** PrepDate: DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	507.8	25.0	500	18.78	97.8	80 - 120				
Nitrogen, Nitrate (As N)	95.71	5.00	100	0	95.7	80 - 120				
Sulfate	1694	25.0	500	1192	100	80 - 120				

MS Sample ID: **HS19010531-01MS** Units: **mg/L** Analysis Date: **15-Jan-2019 14:57**
Client ID: Run ID: **ICS2100_331143** SeqNo: **4910741** PrepDate: DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	508.2	25.0	500	18.88	97.9	80 - 120				
Nitrogen, Nitrate (As N)	95.85	5.00	100	0	95.8	80 - 120				
Sulfate	1691	25.0	500	1219	94.5	80 - 120				

MSD Sample ID: **HS19010531-02MSD** Units: **mg/L** Analysis Date: **15-Jan-2019 12:50**
Client ID: Run ID: **ICS2100_331143** SeqNo: **4910736** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	27.87	0.500	10	16.25	116	80 - 120	27.68	0.688	20	
Nitrogen, Nitrate (As N)	2.668	0.100	2	0.414	113	80 - 120	2.602	2.5	20	
Sulfate	1373	0.500	10	1386	-130	80 - 120	1378	0.33	20	SEO

MSD Sample ID: **HS19010531-02MSD** Units: **mg/L** Analysis Date: **15-Jan-2019 15:55**
Client ID: Run ID: **ICS2100_331143** SeqNo: **4910745** PrepDate: DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	525.3	25.0	500	18.78	101	80 - 120	507.8	3.38	20	
Nitrogen, Nitrate (As N)	99.16	5.00	100	0	99.2	80 - 120	95.71	3.54	20	
Sulfate	1744	25.0	500	1192	110	80 - 120	1694	2.87	20	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010624

QC BATCH REPORT

Batch ID: R331143 **Instrument: ICS2100** **Method: E300**

MSD Sample ID: **HS19010531-01MSD** Units: **mg/L** Analysis Date: **15-Jan-2019 15:12**
Client ID: Run ID: **ICS2100_331143** SeqNo: **4910742** PrepDate: DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	506.6	25.0	500	18.88	97.6	80 - 120	508.2	0.304	20	
Nitrogen, Nitrate (As N)	95.62	5.00	100	0	95.6	80 - 120	95.85	0.24	20	
Sulfate	1689	25.0	500	1219	94.0	80 - 120	1691	0.164	20	

The following samples were analyzed in this batch: HS19010624-01 HS19010624-02 HS19010624-03 HS19010624-04

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010624

QC BATCH REPORT

Batch ID: R331147 **Instrument: ManTech01** **Method: SM2320B**

MBLK Sample ID: **WBLKW1-190116** Units: **mg/L** Analysis Date: **16-Jan-2019 12:58**
Client ID: Run ID: **ManTech01_331147** SeqNo: **4910950** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	U	5.00								
Alkalinity, Carbonate (As CaCO3)	U	5.00								
Alkalinity, Total (As CaCO3)	U	5.00								

LCS Sample ID: **WLCS1-190116** Units: **mg/L** Analysis Date: **16-Jan-2019 13:07**
Client ID: Run ID: **ManTech01_331147** SeqNo: **4910951** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1059	5.00	1000	0	106	85 - 115				
Alkalinity, Total (As CaCO3)	1069	5.00	1000	0	107	85 - 115				

LCSD Sample ID: **WLCSD1-190116** Units: **mg/L** Analysis Date: **16-Jan-2019 13:16**
Client ID: Run ID: **ManTech01_331147** SeqNo: **4910952** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1070	5.00	1000	0	107	85 - 115	1059	1.05	20	
Alkalinity, Total (As CaCO3)	1078	5.00	1000	0	108	85 - 115	1069	0.818	20	

DUP Sample ID: **HS19010343-01DUP** Units: **mg/L** Analysis Date: **16-Jan-2019 13:39**
Client ID: Run ID: **ManTech01_331147** SeqNo: **4910956** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	456.7	5.00					457.4	0.14	20	
Alkalinity, Carbonate (As CaCO3)	U	5.00					0	0	20	
Alkalinity, Total (As CaCO3)	456.7	5.00					457.4	0.14	20	

The following samples were analyzed in this batch: HS19010624-01 HS19010624-02 HS19010624-03 HS19010624-04

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010624

QC BATCH REPORT

Batch ID: R331434 **Instrument: Balance1** **Method: M2540C**

MBLK Sample ID: **WBLK-012119** Units: **mg/L** Analysis Date: **21-Jan-2019 17:20**
Client ID: Run ID: **Balance1_331434** SeqNo: **4918186** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	U	10.0								

LCS Sample ID: **WLCS-012119** Units: **mg/L** Analysis Date: **21-Jan-2019 17:20**
Client ID: Run ID: **Balance1_331434** SeqNo: **4918187** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	1004	10.0	1000	0	100	85 - 115				

DUP Sample ID: **HS19010627-02DUP** Units: **mg/L** Analysis Date: **21-Jan-2019 17:20**
Client ID: Run ID: **Balance1_331434** SeqNo: **4918174** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	1654	10.0					1656	0.121	5	

DUP Sample ID: **HS19010627-01DUP** Units: **mg/L** Analysis Date: **21-Jan-2019 17:20**
Client ID: Run ID: **Balance1_331434** SeqNo: **4918172** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	1664	10.0					1630	2.06	5	

The following samples were analyzed in this batch: HS19010624-01 HS19010624-02 HS19010624-03 HS19010624-04

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19010624**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

ALS Houston, US Date: 22-Jan-19

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19010624
Date/Time Received: **15-Jan-2019 08:50**
Received by: **JRM**

Checklist completed by: *Pablo Marinez* eSignature 15-Jan-2019 Date
Reviewed by: *Dane J. Wacasey* eSignature 21-Jan-2019 Date

Matrices: **WATER**
Carrier name: **FedEx International Priority**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	4.0C/4.4C UC/C	IR # 11	
Cooler(s)/Kit(s):	43317		
Date/Time sample(s) sent to storage:	1/15/19 13:45		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070

Chain of Custody Form

Page ____ of ____

COC ID: 194455

HS19010624

Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information	
Purchase Order	130-2086-05	Project Name	Exide Column Studies
Work Order		Project Number	130-2086
Company Name	Golder Associates	Bill To Company	Golder Associates
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021
Phone	(314) 984-8800	Phone	(314) 984-8800
Fax		Fax	
e-Mail Address	Emily_White@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com

A	300_W (300 Cl, SO4, [*NO3* *48hr HT*])
B	TDS_W 2540C (2540C TDS)
C	ALK_W 2320B (2320B Alkalinity)
D	HARD (2340B Hardness (calc))
E	ICP_TW (6020A Total Metals (6)+Cations)
F	ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
G	
H	
I	
J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190114-DGW-MW3-PV2000t-control	2019/01/14	10:10	GW	N	1	X	X	X								
2	20190114-DGW-MW3-PV2000t-30	2019/01/14	10:10	GW	N	1	X	X	X								
3	20190114-DGW-MW3-PV2000t-35	2019/01/14	10:10	GW	N	1	X	X	X								
4	20190114-DGW-MW3-PV2000t-40	2019/01/14	10:10	GW	N	1	X	X	X								
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Jaime Hanson

Shipment Method:

Required Turnaround Time: (Check Box) ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other ____

Results Due Date:

Relinquished by: Jaime Hanson Date: 2019/01/14 Time: 15:30

Relinquished by: Date: Time:

Received by:

Received by (Laboratory): JM 01/15/19 08:50

Logged by (Laboratory): Date: Time:

Checked by (Laboratory):

Notes: Exide Column Studies

Cooler ID	Cooler Temp.
43317	4.0

QC Package: (Check One Box Below)
☐ Level II Std QC
☐ Level III Std QC/Raw Data
☐ Level IV SW846/CLP
☐ Other
☒ TRRP Checklist
☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

JR # 1
CF = 0.4

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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ORIGIN ID:YUXA (514) 383-0990
AUDREY ETHEVES
GOLDER ASSOCIATES LTD
7250 RUE DU MILE END
3E ETAGE
MONTREAL, PQ H2R3A4
CANADA CA

SHIP DATE: 14JAN19
ACTWGT: 21.50 LB
CAD: 108680724/INET4042

BILL RECIPIENT

TO **DANE WACASEY**
ALS HOUSTON LABORATORY
10450 STANCLIFF RD
STE 210
HOUSTON TX 77099 **(US)**
(281) 530-5656 REF.
INV:
PO: DEPT:

552J2/D74C/DCA5

FedEx Express

E

J152118081502uv

10:30A
INTL PRIORITY

TRK# 0430 **7741 8624 2354**

NH SGRA

77099
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ORIGIN ID:YUXA (514) 383-0990
Audrey Etheves
Golder Associates Ltd
7250 rue du Mile End
3e etage
MONTREAL, PQ H2R3A4
CANADA, CA

Ship Date: 14JAN19
ActWgt: 21.50 LB
CAD: 108680724/INET4042

BILL RECIPIENT
EIN/VAT:

TO Dane Wacasey
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

(281) 530-5656

FedEx Express

(US)

E

AWB

J18211608152Ouv

NH SGRA

PKG:YOUR PKG

TRK# 7741 8624 2354 Form 0430

10:30A
INTL PRIORITY

REF:
DESC1:Bouteille d'eau
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: Audrey Etheves
T/C: R 967554812
D/T: R 967554812

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43317

CUSTODY SEAL
Date:
Name:
Company:
Time:

Seal Broken By: SM
Date: 01/15/19

JAN 15 2019

43317

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CUSTODY SEAL
Date:
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Company:
Time:

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10450 Stancliff Rd. Suite 210
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January 22, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19010655**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 10 sample(s) on Jan 15, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DAYNA.FISHER
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19010655**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19010655**	

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 01/22/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19010655				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 136804				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?			X		
		Were analytical duplicates analyzed at the appropriate frequency?			X		
		Were RPDs or relative standard deviations within the laboratory QC limits?			X		
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 01/22/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19010655				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 136804				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			2
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports	
Laboratory Name: ALS Laboratory Group	LRC Date: 01/22/2019
Project Name: Exide Column Studies	Laboratory Job Number: HS19010655
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 136804

ER#[5]	Description
1	Batch 136804, Dissolved Metals by Method SW6020, Sample 20190108-FD-PV10out-controlD, MS/MSD recovered outside control limits for Calcium and Sodium; however, the results in the parent sample is greater than 4x the spike amount
2	See Run Log and CCB Exception Reports

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010655
Start Date: 21-Jan-2019 End Date: 21-Jan-2019

Run ID:ICPMS05_331390
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
LLICV5	1	21-Jan-2019 12:09	018LICV.d	AS CD FE K MG PB SB SE
ICB	1	21-Jan-2019 12:11	019_ICB.d	AS CD FE K MG PB SB SE
ICV	1	21-Jan-2019 12:20	021_ICV.d	AS CD FE K MG PB SB SE
LLICV2	1	21-Jan-2019 12:22	022SMPL.d	AS CD FE K MG PB SB SE
ICSA	1	21-Jan-2019 12:26	023ICSA.d	AS CD FE K MG PB SB SE
ICSAB	1	21-Jan-2019 12:28	024ICSB.d	AS CD FE K MG PB SB SE
CCV 1	1	21-Jan-2019 12:55	036_CCV.d	AS CD FE K MG PB SB SE
CCB 1	1	21-Jan-2019 12:57	037_CCB.d	AS CD FE K MG PB SB SE
CCV 2	1	21-Jan-2019 13:19	048_CCV.d	AS CD FE K MG PB SB SE
CCB 2	1	21-Jan-2019 13:21	049_CCB.d	AS CD FE K MG PB SB SE
CCV 3	1	21-Jan-2019 13:44	060_CCV.d	AS CD FE K MG PB SB SE
CCB 3	1	21-Jan-2019 13:46	061_CCB.d	AS CD FE K MG PB SB SE
ICCV 4	1	21-Jan-2019 14:40	078_ICV.d	AS CD FE K MG PB SB SE
LLCCV5	1	21-Jan-2019 14:42	079LICV.d	AS CD FE K MG PB SB SE
LLCCV2	1	21-Jan-2019 14:44	080SMPL.d	AS CD FE K MG PB SB SE
ICCB 4	1	21-Jan-2019 14:46	081_ICB.d	AS CD FE K MG PB SB SE
CCV 5	1	21-Jan-2019 15:24	091_CCV.d	AS CD FE K MG PB SB SE
CCB 5	1	21-Jan-2019 15:26	092_CCB.d	AS CD FE K MG PB SB SE
CCV 6	1	21-Jan-2019 15:42	100_CCV.d	AS CD FE K MG PB SB SE
CCB 6	1	21-Jan-2019 15:44	101_CCB.d	AS CD FE K MG PB SB SE
CCV 7	1	21-Jan-2019 16:55	124_CCV.d	AS CD FE K MG PB SB SE
CCB 7	1	21-Jan-2019 16:57	125_CCB.d	AS CD FE K MG PB SB SE
LLCCV5	1	21-Jan-2019 18:17	137LICV.d	AS CD FE K MG PB SB SE
LLCCV2	1	21-Jan-2019 18:19	138SMPL.d	AS CD FE K MG PB SB SE
ICCB 8	1	21-Jan-2019 18:21	139_ICB.d	AS CD FE K MG PB SB SE
ICCV 8	1	21-Jan-2019 18:24	140_ICV.d	AS CD FE K MG PB SB SE
CCV 9	1	21-Jan-2019 18:39	148_CCV.d	AS CD FE K MG PB SB SE
CCB 9	1	21-Jan-2019 18:41	149_CCB.d	AS CD FE K MG PB SB SE
ICCV 10	1	21-Jan-2019 19:55	167_ICV.d	AS CD FE K MG PB SB SE
LLCCV5	1	21-Jan-2019 19:57	168LICV.d	AS CD FE K MG PB SB SE
LLCCV2	1	21-Jan-2019 19:59	169SMPL.d	AS CD FE K MG PB SB SE
ICCB 10	1	21-Jan-2019 20:01	170_ICB.d	AS CD FE K MG PB SB SE
CCV 11	1	21-Jan-2019 20:15	177_CCV.d	AS CD FE K MG PB SB SE
CCB 11	1	21-Jan-2019 20:17	178_CCB.d	AS CD FE K MG PB SB SE
CCV 12	1	21-Jan-2019 20:33	186_CCV.d	AS CD FE K MG PB SB SE
CCB 12	1	21-Jan-2019 20:35	187_CCB.d	AS CD FE K MG PB SB SE
CCV 13	1	21-Jan-2019 20:57	198_CCV.d	AS CD FE K MG PB SB SE
CCB 13	1	21-Jan-2019 20:58	199_CCB.d	AS CD FE K MG PB SB SE
CCV 14	1	21-Jan-2019 21:00	200_CCV.d	AS CD FE K MG PB SB SE
CCB 14	1	21-Jan-2019 21:02	201_CCB.d	AS CD FE K MG PB SB SE
CCV 15	1	21-Jan-2019 21:14	207_CCV.d	AS CD FE K MG PB SB SE
CCB 15	1	21-Jan-2019 21:16	208_CCB.d	AS CD FE K MG PB SB SE
ICCV 16	1	21-Jan-2019 22:23	233_ICV.d	AS CD FE K MG PB SB SE
LLCCV5	1	21-Jan-2019 22:25	234LICV.d	AS CD FE K MG PB SB SE
LLCCV2	1	21-Jan-2019 22:27	235SMPL.d	AS CD FE K MG PB SB SE
ICCB 16	1	21-Jan-2019 22:29	236_ICB.d	AS CD FE K MG PB SB SE
MBLKF1-136804	1	21-Jan-2019 22:31	237SMPL.d	AS CA CD FE K MG NA PB SB SE
MBLK-136804	1	21-Jan-2019 22:33	238SMPL.d	AS CA CD FE K MG NA PB SB SE
LCS-136804	1	21-Jan-2019 22:35	239SMPL.d	AS CA CD FE K MG NA PB SB SE
CCV 17	1	21-Jan-2019 22:37	240_CCV.d	AS CD FE K MG PB SB SE
CCB 17	1	21-Jan-2019 22:39	241_CCB.d	AS CD FE K MG PB SB SE

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010655
Start Date: 21-Jan-2019 End Date: 21-Jan-2019

Run ID:ICPMS05_331390
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
20190108-FD-PV10out-controlD	1	21-Jan-2019 22:41	242SMPL.d	AS CD FE K MG PB SB SE
20190108-FD-PV10out-controlDSD	5	21-Jan-2019 22:43	243SMPL.d	AS CD FE K MG PB SB SE
20190108-FD-PV10out-controlDMS	1	21-Jan-2019 22:45	244SMPL.d	AS CA CD FE K MG NA SB SE
20190108-FD-PV10out-controlDMSD	1	21-Jan-2019 22:47	245SMPL.d	AS CA CD FE K MG NA SB SE
20190108-FD-PV10out-controlDPDS	1	21-Jan-2019 22:49	246SMPL.d	AS CD FE K MG PB SB SE
CCV 18	1	21-Jan-2019 22:51	247_CCV.d	AS CD FE K MG PB SB SE
CCB 18	1	21-Jan-2019 22:53	248_CCB.d	AS CD FE K MG PB SB SE
20190108-FD-PV10out-30D	1	21-Jan-2019 22:55	249SMPL.d	CD FE K MG SB SE
20190108-FD-PV10out-35D	1	21-Jan-2019 22:57	250SMPL.d	CD FE K MG SB SE
20190108-FD-PV10out-40D	1	21-Jan-2019 22:59	251SMPL.d	CD FE K MG SB SE
20190109-FD-PV10inlet-controlD	1	21-Jan-2019 23:01	252SMPL.d	CD FE K MG SB SE
20190109-FD-PV10inlet-30-35-40D	1	21-Jan-2019 23:03	253SMPL.d	CD FE K MG SB SE
20190110-FD-PV10mid-controlD	1	21-Jan-2019 23:05	254SMPL.d	CD FE K MG SB SE
20190110-FD-PV10mid-30D	1	21-Jan-2019 23:07	255SMPL.d	CD FE K MG SB SE
20190110-FD-PV10mid-35D	1	21-Jan-2019 23:09	256SMPL.d	CD FE K MG SB SE
20190110-FD-PV10mid-40D	1	21-Jan-2019 23:11	257SMPL.d	CD FE K MG SB SE
CCV 19	1	21-Jan-2019 23:15	259_CCV.d	AS CD FE K MG PB SB SE
CCB 19	1	21-Jan-2019 23:17	260_CCB.d	AS CD FE K MG PB SB SE
CCV 20	1	21-Jan-2019 23:39	271_CCV.d	AS CD FE K MG PB SB SE
CCB 20	1	21-Jan-2019 23:41	272_CCB.d	AS CD FE K MG PB SB SE
LLCCV5	1	21-Jan-2019 23:47	275LICV.d	AS CD FE K MG PB SB SE
LLCCV2	1	21-Jan-2019 23:49	276SMPL.d	AS CD FE K MG PB SB SE
ICSA	1	21-Jan-2019 23:51	277ICSA.d	AS CD FE K MG PB SB SE
ICSAB	1	21-Jan-2019 23:53	278ICSB.d	AS CD FE K MG PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010655

Run ID:ICPMS05_331390
Instrument:ICPMS05
Method:SW6020

CCB 15	Date: 21-Jan-2019 21:16	Seq: 4917905	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.045	0.4	2	
Potassium	33.11	18	200	
Sodium	76.62	14	200	

ICCB 16	Date: 21-Jan-2019 22:29	Seq: 4918276	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Arsenic	-0.878	0.4	2	
Calcium	40.02	34	500	

CCB 17	Date: 21-Jan-2019 22:39	Seq: 4918281	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.722	0.4	2	
Arsenic	-1.478	0.4	2	

CCB 18	Date: 21-Jan-2019 22:53	Seq: 4918288	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.086	0.4	2	
Arsenic	0.903	0.4	2	
Sodium	122.2	14	200	

CCB 19	Date: 21-Jan-2019 23:17	Seq: 4918309	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.737	0.4	2	
Arsenic	4.846	0.4	2	
Iron	18.31	12	200	
Potassium	64.62	18	200	
Sodium	239.2	14	200	

CCB 20	Date: 21-Jan-2019 23:41	Seq: 4918321	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.66	0.4	2	
Arsenic	9.191	0.4	2	
Calcium	48.06	34	500	
Potassium	54.39	18	200	
Sodium	112.8	14	200	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010655
Start Date: 22-Jan-2019 End Date: 22-Jan-2019

Run ID:ICPMS05_331472
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	22-Jan-2019 12:12	016_ICV.d	CA NA
LLICV2	1	22-Jan-2019 12:14	017SMPL.d	CA NA
LLICV5	1	22-Jan-2019 12:16	018LICV.d	CA NA
ICB	1	22-Jan-2019 12:18	019_ICB.d	CA NA
ICSA	1	22-Jan-2019 12:29	021ICSA.d	CA NA
ICSAB	1	22-Jan-2019 12:31	022ICSB.d	CA NA
20190108-FD-PV10out-controlD	20	22-Jan-2019 12:39	024SMPL.d	CA NA
20190108-FD-PV10out-controlDPDS	20	22-Jan-2019 12:43	026SMPL.d	CA NA
20190108-FD-PV10out-30D	20	22-Jan-2019 12:45	027SMPL.d	CA NA
20190108-FD-PV10out-35D	20	22-Jan-2019 12:47	028SMPL.d	CA NA
CCV 1	1	22-Jan-2019 12:49	029_CCV.d	CA NA
CCB 1	1	22-Jan-2019 12:51	030_CCB.d	CA NA
20190108-FD-PV10out-40D	20	22-Jan-2019 12:53	031SMPL.d	CA NA
20190109-FD-PV10inlet-controlD	20	22-Jan-2019 12:55	032SMPL.d	CA NA
20190109-FD-PV10inlet-30-35-40D	20	22-Jan-2019 12:57	033SMPL.d	CA NA
20190110-FD-PV10mid-controlD	20	22-Jan-2019 12:59	034SMPL.d	CA NA
20190110-FD-PV10mid-30D	20	22-Jan-2019 13:01	035SMPL.d	CA NA
20190110-FD-PV10mid-35D	20	22-Jan-2019 13:03	036SMPL.d	CA NA
20190110-FD-PV10mid-40D	20	22-Jan-2019 13:05	037SMPL.d	CA NA
CCV 2	1	22-Jan-2019 13:09	039_CCV.d	CA NA
CCB 2	1	22-Jan-2019 13:11	040_CCB.d	CA NA
CCB 3	1	22-Jan-2019 13:46	051_CCB.d	CA NA
CCV 3	1	22-Jan-2019 13:50	052_CCV.d	CA NA
CCV 4	1	22-Jan-2019 14:12	063_CCV.d	CA NA
CCB 4	1	22-Jan-2019 14:22	066_CCB.d	CA NA
20190108-FD-PV10out-controlDSD	100	22-Jan-2019 14:40	075SMPL.d	CA NA
CCV 5	1	22-Jan-2019 14:44	077_CCV.d	CA NA
CCB 5	1	22-Jan-2019 14:46	078_CCB.d	CA NA
CCV 6	1	22-Jan-2019 15:23	089_CCV.d	CA NA
CCB 6	1	22-Jan-2019 15:25	090_CCB.d	CA NA
CCV 7	1	22-Jan-2019 15:46	099_CCV.d	CA NA
CCB 7	1	22-Jan-2019 15:48	100_CCB.d	CA NA
ICCV 8	1	22-Jan-2019 16:19	115_ICV.d	CA NA
LLCCV5	1	22-Jan-2019 16:21	116LICV.d	CA NA
LLCCV2	1	22-Jan-2019 16:23	117SMPL.d	CA NA
ICCB 8	1	22-Jan-2019 16:25	118_ICB.d	CA NA

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010655

Run ID:ICPMS05_331472
Instrument:ICPMS05
Method:SW6020

CCB 1	Date: 22-Jan-2019 12:51	Seq: 4919350	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	22.43	14	200	

CCB 2	Date: 22-Jan-2019 13:11	Seq: 4919360	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	21.68	14	200	

CCB 3	Date: 22-Jan-2019 13:46	Seq: 4919495	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	44.97	34	500	
Sodium	59.02	14	200	

CCB 4	Date: 22-Jan-2019 14:22	Seq: 4919580	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	120.6	14	200	

CCB 5	Date: 22-Jan-2019 14:46	Seq: 4919749	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	34.48	34	500	
Sodium	64.24	14	200	

CCB 6	Date: 22-Jan-2019 15:25	Seq: 4919913	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	40.21	14	200	

CCB 7	Date: 22-Jan-2019 15:48	Seq: 4919923	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	33.92	14	200	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19010655

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19010655-01	20190108-FD-PV10out-controlD	GW		08-Jan-2019 10:10	15-Jan-2019 08:50	☐
HS19010655-02	20190108-FD-PV10out-30D	GW		08-Jan-2019 10:10	15-Jan-2019 08:50	☐
HS19010655-03	20190108-FD-PV10out-35D	GW		08-Jan-2019 10:10	15-Jan-2019 08:50	☐
HS19010655-04	20190108-FD-PV10out-40D	GW		08-Jan-2019 10:10	15-Jan-2019 08:50	☐
HS19010655-05	20190109-FD-PV10inlet-controlD	GW		09-Jan-2019 13:15	15-Jan-2019 08:50	☐
HS19010655-06	20190109-FD-PV10inlet-30-35-40D	GW		09-Jan-2019 13:15	15-Jan-2019 08:50	☐
HS19010655-07	20190110-FD-PV10mid-controlD	GW		10-Jan-2019 16:45	15-Jan-2019 08:50	☐
HS19010655-08	20190110-FD-PV10mid-30D	GW		10-Jan-2019 16:45	15-Jan-2019 08:50	☐
HS19010655-09	20190110-FD-PV10mid-35D	GW		10-Jan-2019 16:45	15-Jan-2019 08:50	☐
HS19010655-10	20190110-FD-PV10mid-40D	GW		10-Jan-2019 16:45	15-Jan-2019 08:50	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190108-FD-PV10out-controlD
Collection Date: 08-Jan-2019 10:10

ANALYTICAL REPORT
WorkOrder:HS19010655
Lab ID:HS19010655-01
Matrix:GW

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 18-Jan-2019		Analyst: ALR
Antimony	**0.0350**		**0.000400**	**0.00200**	**mg/L**	1	21-Jan-2019 22:41
Arsenic	**0.00565**		**0.000400**	**0.00200**	**mg/L**	1	21-Jan-2019 22:41
Cadmium	U		0.000200	0.00200	mg/L	1	21-Jan-2019 22:41
Calcium	**206**		**0.680**	**10.0**	**mg/L**	20	22-Jan-2019 12:39
Iron	**0.0698**	J	**0.0120**	**0.200**	**mg/L**	1	21-Jan-2019 22:41
Lead	U		0.000600	0.00200	mg/L	1	21-Jan-2019 22:41
Magnesium	**1.32**		**0.0100**	**0.200**	**mg/L**	1	21-Jan-2019 22:41
Potassium	**13.2**		**0.0180**	**0.200**	**mg/L**	1	21-Jan-2019 22:41
Selenium	**0.00889**		**0.00110**	**0.00200**	**mg/L**	1	21-Jan-2019 22:41
Sodium	**274**		**0.280**	**4.00**	**mg/L**	20	22-Jan-2019 12:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190108-FD-PV10out-30D
Collection Date: 08-Jan-2019 10:10

ANALYTICAL REPORT
WorkOrder:HS19010655
Lab ID:HS19010655-02
Matrix:GW

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 18-Jan-2019		Analyst: ALR
Antimony	U		0.000400	0.00200	mg/L	1	21-Jan-2019 22:55
Arsenic	U		0.000400	0.00200	mg/L	1	22-Jan-2019 13:56
Cadmium	U		0.000200	0.00200	mg/L	1	21-Jan-2019 22:55
Calcium	**198**		**0.680**	**10.0**	**mg/L**	20	22-Jan-2019 12:45
Iron	**0.108**	J	**0.0120**	**0.200**	**mg/L**	1	21-Jan-2019 22:55
Lead	U		0.000600	0.00200	mg/L	1	22-Jan-2019 13:56
Magnesium	**0.990**		**0.0100**	**0.200**	**mg/L**	1	21-Jan-2019 22:55
Potassium	**13.4**		**0.0180**	**0.200**	**mg/L**	1	21-Jan-2019 22:55
Selenium	**0.00331**		**0.00110**	**0.00200**	**mg/L**	1	21-Jan-2019 22:55
Sodium	**270**		**0.280**	**4.00**	**mg/L**	20	22-Jan-2019 12:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190108-FD-PV10out-35D
Collection Date: 08-Jan-2019 10:10

ANALYTICAL REPORT
WorkOrder:HS19010655
Lab ID:HS19010655-03
Matrix:GW

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 18-Jan-2019		Analyst: ALR
Antimony	U		0.000400	0.00200	mg/L	1	21-Jan-2019 22:57
Arsenic	U		0.000400	0.00200	mg/L	1	22-Jan-2019 13:58
Cadmium	U		0.000200	0.00200	mg/L	1	21-Jan-2019 22:57
Calcium	**211**		**0.680**	**10.0**	**mg/L**	20	22-Jan-2019 12:47
Iron	**0.108**	J	**0.0120**	**0.200**	**mg/L**	1	21-Jan-2019 22:57
Lead	U		0.000600	0.00200	mg/L	1	22-Jan-2019 13:58
Magnesium	**1.11**		**0.0100**	**0.200**	**mg/L**	1	21-Jan-2019 22:57
Potassium	**13.0**		**0.0180**	**0.200**	**mg/L**	1	21-Jan-2019 22:57
Selenium	**0.00274**		**0.00110**	**0.00200**	**mg/L**	1	21-Jan-2019 22:57
Sodium	**279**		**0.280**	**4.00**	**mg/L**	20	22-Jan-2019 12:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190108-FD-PV10out-40D
Collection Date: 08-Jan-2019 10:10

ANALYTICAL REPORT
WorkOrder:HS19010655
Lab ID:HS19010655-04
Matrix:GW

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 18-Jan-2019		Analyst: ALR
Antimony	U		0.000400	0.00200	mg/L	1	21-Jan-2019 22:59
Arsenic	U		0.000400	0.00200	mg/L	1	22-Jan-2019 14:00
Cadmium	U		0.000200	0.00200	mg/L	1	21-Jan-2019 22:59
Calcium	**195**		**0.680**	**10.0**	**mg/L**	20	22-Jan-2019 12:53
Iron	**0.129**	J	**0.0120**	**0.200**	**mg/L**	1	21-Jan-2019 22:59
Lead	U		0.000600	0.00200	mg/L	1	22-Jan-2019 14:00
Magnesium	**1.10**		**0.0100**	**0.200**	**mg/L**	1	21-Jan-2019 22:59
Potassium	**13.0**		**0.0180**	**0.200**	**mg/L**	1	21-Jan-2019 22:59
Selenium	**0.00329**		**0.00110**	**0.00200**	**mg/L**	1	21-Jan-2019 22:59
Sodium	**262**		**0.280**	**4.00**	**mg/L**	20	22-Jan-2019 12:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190109-FD-PV10inlet-controlD
Collection Date: 09-Jan-2019 13:15

ANALYTICAL REPORT
WorkOrder:HS19010655
Lab ID:HS19010655-05
Matrix:GW

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 18-Jan-2019		Analyst: ALR
Antimony	**0.0320**		**0.000400**	**0.00200**	**mg/L**	1	21-Jan-2019 23:01
Arsenic	**0.000879**	J	**0.000400**	**0.00200**	**mg/L**	1	22-Jan-2019 14:03
Cadmium	U		0.000200	0.00200	mg/L	1	21-Jan-2019 23:01
Calcium	**206**		**0.680**	**10.0**	**mg/L**	20	22-Jan-2019 12:55
Iron	**0.0967**	J	**0.0120**	**0.200**	**mg/L**	1	21-Jan-2019 23:01
Lead	U		0.000600	0.00200	mg/L	1	22-Jan-2019 14:03
Magnesium	**1.29**		**0.0100**	**0.200**	**mg/L**	1	21-Jan-2019 23:01
Potassium	**13.1**		**0.0180**	**0.200**	**mg/L**	1	21-Jan-2019 23:01
Selenium	**0.00938**		**0.00110**	**0.00200**	**mg/L**	1	21-Jan-2019 23:01
Sodium	**269**		**0.280**	**4.00**	**mg/L**	20	22-Jan-2019 12:55

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190109-FD-PV10inlet-30-35-40D
Collection Date: 09-Jan-2019 13:15

ANALYTICAL REPORT
WorkOrder:HS19010655
Lab ID:HS19010655-06
Matrix:GW

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 18-Jan-2019		Analyst: ALR
Antimony	**0.0318**		**0.000400**	**0.00200**	**mg/L**	1	21-Jan-2019 23:03
Arsenic	**0.000924**	J	**0.000400**	**0.00200**	**mg/L**	1	22-Jan-2019 14:05
Cadmium	U		0.000200	0.00200	mg/L	1	21-Jan-2019 23:03
Calcium	**186**		**0.680**	**10.0**	**mg/L**	20	22-Jan-2019 12:57
Iron	**0.0893**	J	**0.0120**	**0.200**	**mg/L**	1	21-Jan-2019 23:03
Lead	U		0.000600	0.00200	mg/L	1	22-Jan-2019 14:05
Magnesium	**1.21**		**0.0100**	**0.200**	**mg/L**	1	21-Jan-2019 23:03
Potassium	**13.1**		**0.0180**	**0.200**	**mg/L**	1	21-Jan-2019 23:03
Selenium	**0.00936**		**0.00110**	**0.00200**	**mg/L**	1	21-Jan-2019 23:03
Sodium	**236**		**0.280**	**4.00**	**mg/L**	20	22-Jan-2019 12:57

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190110-FD-PV10mid-controlD
Collection Date: 10-Jan-2019 16:45

ANALYTICAL REPORT
WorkOrder:HS19010655
Lab ID:HS19010655-07
Matrix:GW

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 18-Jan-2019		Analyst: ALR
Antimony	**0.0337**		**0.000400**	**0.00200**	**mg/L**	1	21-Jan-2019 23:05
Arsenic	**0.000858**	J	**0.000400**	**0.00200**	**mg/L**	1	22-Jan-2019 14:07
Cadmium	U		0.000200	0.00200	mg/L	1	21-Jan-2019 23:05
Calcium	**191**		**0.680**	**10.0**	**mg/L**	20	22-Jan-2019 12:59
Iron	**0.0902**	J	**0.0120**	**0.200**	**mg/L**	1	21-Jan-2019 23:05
Lead	U		0.000600	0.00200	mg/L	1	22-Jan-2019 14:07
Magnesium	**1.31**		**0.0100**	**0.200**	**mg/L**	1	21-Jan-2019 23:05
Potassium	**13.0**		**0.0180**	**0.200**	**mg/L**	1	21-Jan-2019 23:05
Selenium	**0.0106**		**0.00110**	**0.00200**	**mg/L**	1	21-Jan-2019 23:05
Sodium	**255**		**0.280**	**4.00**	**mg/L**	20	22-Jan-2019 12:59

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190110-FD-PV10mid-30D
Collection Date: 10-Jan-2019 16:45

ANALYTICAL REPORT
WorkOrder:HS19010655
Lab ID:HS19010655-08
Matrix:GW

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 18-Jan-2019		Analyst: ALR
Antimony	U		0.000400	0.00200	mg/L	1	21-Jan-2019 23:07
Arsenic	U		0.000400	0.00200	mg/L	1	22-Jan-2019 14:09
Cadmium	U		0.000200	0.00200	mg/L	1	21-Jan-2019 23:07
Calcium	**205**		**0.680**	**10.0**	**mg/L**	20	22-Jan-2019 13:01
Iron	**0.111**	J	**0.0120**	**0.200**	**mg/L**	1	21-Jan-2019 23:07
Lead	U		0.000600	0.00200	mg/L	1	22-Jan-2019 14:09
Magnesium	**1.00**		**0.0100**	**0.200**	**mg/L**	1	21-Jan-2019 23:07
Potassium	**13.6**		**0.0180**	**0.200**	**mg/L**	1	21-Jan-2019 23:07
Selenium	**0.00370**		**0.00110**	**0.00200**	**mg/L**	1	21-Jan-2019 23:07
Sodium	**277**		**0.280**	**4.00**	**mg/L**	20	22-Jan-2019 13:01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190110-FD-PV10mid-35D
Collection Date: 10-Jan-2019 16:45

ANALYTICAL REPORT
WorkOrder:HS19010655
Lab ID:HS19010655-09
Matrix:GW

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 18-Jan-2019		Analyst: ALR
Antimony	U		0.000400	0.00200	mg/L	1	21-Jan-2019 23:09
Arsenic	U		0.000400	0.00200	mg/L	1	22-Jan-2019 14:38
Cadmium	U		0.000200	0.00200	mg/L	1	21-Jan-2019 23:09
Calcium	**195**		**0.680**	**10.0**	**mg/L**	20	22-Jan-2019 13:03
Iron	**0.167**	J	**0.0120**	**0.200**	**mg/L**	1	21-Jan-2019 23:09
Lead	U		0.000600	0.00200	mg/L	1	22-Jan-2019 14:38
Magnesium	**1.09**		**0.0100**	**0.200**	**mg/L**	1	21-Jan-2019 23:09
Potassium	**13.2**		**0.0180**	**0.200**	**mg/L**	1	21-Jan-2019 23:09
Selenium	**0.00345**		**0.00110**	**0.00200**	**mg/L**	1	21-Jan-2019 23:09
Sodium	**263**		**0.280**	**4.00**	**mg/L**	20	22-Jan-2019 13:03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190110-FD-PV10mid-40D
Collection Date: 10-Jan-2019 16:45

ANALYTICAL REPORT
WorkOrder:HS19010655
Lab ID:HS19010655-10
Matrix:GW

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 18-Jan-2019		Analyst: ALR
Antimony	U		0.000400	0.00200	mg/L	1	21-Jan-2019 23:11
Arsenic	U		0.000400	0.00200	mg/L	1	22-Jan-2019 14:40
Cadmium	U		0.000200	0.00200	mg/L	1	21-Jan-2019 23:11
Calcium	**189**		**0.680**	**10.0**	**mg/L**	20	22-Jan-2019 13:05
Iron	**0.165**	J	**0.0120**	**0.200**	**mg/L**	1	21-Jan-2019 23:11
Lead	U		0.000600	0.00200	mg/L	1	22-Jan-2019 14:40
Magnesium	**1.19**		**0.0100**	**0.200**	**mg/L**	1	21-Jan-2019 23:11
Potassium	**14.0**		**0.0180**	**0.200**	**mg/L**	1	21-Jan-2019 23:11
Selenium	**0.00389**		**0.00110**	**0.00200**	**mg/L**	1	21-Jan-2019 23:11
Sodium	**252**		**0.280**	**4.00**	**mg/L**	20	22-Jan-2019 13:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010655

Batch ID: 136804 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19010655-01	1	10	10 (mL)	1
HS19010655-02	1	10	10 (mL)	1
HS19010655-03	1	10	10 (mL)	1
HS19010655-04	1	10	10 (mL)	1
HS19010655-05	1	10	10 (mL)	1
HS19010655-06	1	10	10 (mL)	1
HS19010655-07	1	10	10 (mL)	1
HS19010655-08	1	10	10 (mL)	1
HS19010655-09	1	10	10 (mL)	1
HS19010655-10	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010655

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 136804	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** GW		
HS19010655-01	20190108-FD-PV10out-controlD	08 Jan 2019 10:10		18 Jan 2019 10:00	22 Jan 2019 12:39	20
HS19010655-01	20190108-FD-PV10out-controlD	08 Jan 2019 10:10		18 Jan 2019 10:00	21 Jan 2019 22:41	1
HS19010655-02	20190108-FD-PV10out-30D	08 Jan 2019 10:10		18 Jan 2019 10:00	22 Jan 2019 13:56	1
HS19010655-02	20190108-FD-PV10out-30D	08 Jan 2019 10:10		18 Jan 2019 10:00	22 Jan 2019 12:45	20
HS19010655-02	20190108-FD-PV10out-30D	08 Jan 2019 10:10		18 Jan 2019 10:00	21 Jan 2019 22:55	1
HS19010655-03	20190108-FD-PV10out-35D	08 Jan 2019 10:10		18 Jan 2019 10:00	22 Jan 2019 13:58	1
HS19010655-03	20190108-FD-PV10out-35D	08 Jan 2019 10:10		18 Jan 2019 10:00	22 Jan 2019 12:47	20
HS19010655-03	20190108-FD-PV10out-35D	08 Jan 2019 10:10		18 Jan 2019 10:00	21 Jan 2019 22:57	1
HS19010655-04	20190108-FD-PV10out-40D	08 Jan 2019 10:10		18 Jan 2019 10:00	22 Jan 2019 14:00	1
HS19010655-04	20190108-FD-PV10out-40D	08 Jan 2019 10:10		18 Jan 2019 10:00	22 Jan 2019 12:53	20
HS19010655-04	20190108-FD-PV10out-40D	08 Jan 2019 10:10		18 Jan 2019 10:00	21 Jan 2019 22:59	1
HS19010655-05	20190109-FD-PV10inlet-controlD	09 Jan 2019 13:15		18 Jan 2019 10:00	22 Jan 2019 14:03	1
HS19010655-05	20190109-FD-PV10inlet-controlD	09 Jan 2019 13:15		18 Jan 2019 10:00	22 Jan 2019 12:55	20
HS19010655-05	20190109-FD-PV10inlet-controlD	09 Jan 2019 13:15		18 Jan 2019 10:00	21 Jan 2019 23:01	1
HS19010655-06	20190109-FD-PV10inlet-30-35-40D	09 Jan 2019 13:15		18 Jan 2019 10:00	22 Jan 2019 14:05	1
HS19010655-06	20190109-FD-PV10inlet-30-35-40D	09 Jan 2019 13:15		18 Jan 2019 10:00	22 Jan 2019 12:57	20
HS19010655-06	20190109-FD-PV10inlet-30-35-40D	09 Jan 2019 13:15		18 Jan 2019 10:00	21 Jan 2019 23:03	1
HS19010655-07	20190110-FD-PV10mid-controlD	10 Jan 2019 16:45		18 Jan 2019 10:00	22 Jan 2019 14:07	1
HS19010655-07	20190110-FD-PV10mid-controlD	10 Jan 2019 16:45		18 Jan 2019 10:00	22 Jan 2019 12:59	20
HS19010655-07	20190110-FD-PV10mid-controlD	10 Jan 2019 16:45		18 Jan 2019 10:00	21 Jan 2019 23:05	1
HS19010655-08	20190110-FD-PV10mid-30D	10 Jan 2019 16:45		18 Jan 2019 10:00	22 Jan 2019 14:09	1
HS19010655-08	20190110-FD-PV10mid-30D	10 Jan 2019 16:45		18 Jan 2019 10:00	22 Jan 2019 13:01	20
HS19010655-08	20190110-FD-PV10mid-30D	10 Jan 2019 16:45		18 Jan 2019 10:00	21 Jan 2019 23:07	1
HS19010655-09	20190110-FD-PV10mid-35D	10 Jan 2019 16:45		18 Jan 2019 10:00	22 Jan 2019 14:38	1
HS19010655-09	20190110-FD-PV10mid-35D	10 Jan 2019 16:45		18 Jan 2019 10:00	22 Jan 2019 13:03	20
HS19010655-09	20190110-FD-PV10mid-35D	10 Jan 2019 16:45		18 Jan 2019 10:00	21 Jan 2019 23:09	1
HS19010655-10	20190110-FD-PV10mid-40D	10 Jan 2019 16:45		18 Jan 2019 10:00	22 Jan 2019 14:40	1
HS19010655-10	20190110-FD-PV10mid-40D	10 Jan 2019 16:45		18 Jan 2019 10:00	22 Jan 2019 13:05	20
HS19010655-10	20190110-FD-PV10mid-40D	10 Jan 2019 16:45		18 Jan 2019 10:00	21 Jan 2019 23:11	1

WorkOrder: HS19010655
InstrumentID: ICPMS05
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000555	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000460	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000554	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0537	0.0340	0.500
A	Iron	7439-89-6	0.0500	0.0549	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.00100	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0680	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0542	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00280	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0459	0.0140	0.200

WorkOrder: HS19010655
InstrumentID: ICPMS04
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Arsenic	7440-38-2	0.000500	0.000340	0.000400	0.00200
A	Lead	7439-92-1	0.00100	0.000916	0.000600	0.00200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010655

QC BATCH REPORT

Batch ID: 136804 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLKF1-136804** Units: **mg/L** Analysis Date: **21-Jan-2019 22:31**
Client ID: Run ID: **ICPMS05_331390** SeqNo: **4918277** PrepDate: **18-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	U	0.200								
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	U	0.200								

MBLK Sample ID: **MBLK-136804** Units: **mg/L** Analysis Date: **21-Jan-2019 22:33**
Client ID: Run ID: **ICPMS05_331390** SeqNo: **4918278** PrepDate: **18-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	0.000934	0.00200								J
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	U	0.200								
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	U	0.200								

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010655

QC BATCH REPORT

Batch ID: 136804 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

LCS Sample ID: **LCS-136804** Units: **mg/L** Analysis Date: **21-Jan-2019 22:35**
Client ID: Run ID: **ICPMS05_331390** SeqNo: **4918279** PrepDate: **18-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05145	0.00200	0.05	0	103	80 - 120				
Arsenic	0.04801	0.00200	0.05	0	96.0	80 - 120				
Cadmium	0.05346	0.00200	0.05	0	107	80 - 120				
Calcium	5.506	0.500	5	0	110	80 - 120				
Iron	5.34	0.200	5	0	107	80 - 120				
Lead	0.05316	0.00200	0.05	0	106	80 - 120				
Magnesium	5.575	0.200	5	0	111	80 - 120				
Potassium	5.412	0.200	5	0	108	80 - 120				
Selenium	0.05249	0.00200	0.05	0	105	80 - 120				
Sodium	5.432	0.200	5	0	109	80 - 120				

MS Sample ID: **HS19010655-01MS** Units: **mg/L** Analysis Date: **21-Jan-2019 22:45**
Client ID: **20190108-FD-PV10out-controlD** Run ID: **ICPMS05_331390** SeqNo: **4918284** PrepDate: **18-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.08901	0.00200	0.05	0.03504	108	75 - 125				
Arsenic	0.061	0.00200	0.05	0.00565	111	75 - 125				
Cadmium	0.05461	0.00200	0.05	0	109	75 - 125				
Calcium	219.9	0.500	5	209	217	75 - 125				SEO
Iron	5.388	0.200	5	0.06976	106	75 - 125				
Magnesium	6.746	0.200	5	1.32	109	75 - 125				
Potassium	19.33	0.200	5	13.18	123	75 - 125				
Selenium	0.06344	0.00200	0.05	0.008894	109	75 - 125				
Sodium	294.6	0.200	5	278	331	75 - 125				SEO

MS Sample ID: **HS19010655-01MS** Units: **mg/L** Analysis Date: **22-Jan-2019 14:49**
Client ID: **20190108-FD-PV10out-controlD** Run ID: **ICPMS04_331465** SeqNo: **4919658** PrepDate: **18-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.05085	0.00200	0.05	0	102	75 - 125				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010655

QC BATCH REPORT

Batch ID: 136804 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MSD Sample ID: **HS19010655-01MSD** Units: **mg/L** Analysis Date: **21-Jan-2019 22:47**
Client ID: **20190108-FD-PV10out-controlD** Run ID: **ICPMS05_331390** SeqNo: **4918285** PrepDate: **18-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.08426	0.00200	0.05	0.03504	98.4	75 - 125	0.08901	5.49	20	
Arsenic	0.06143	0.00200	0.05	0.00565	112	75 - 125	0.061	0.691	20	
Cadmium	0.05381	0.00200	0.05	0	108	75 - 125	0.05461	1.48	20	
Calcium	219.8	0.500	5	209	215	75 - 125	219.9	0.0425	20	SEO
Iron	5.412	0.200	5	0.06976	107	75 - 125	5.388	0.438	20	
Magnesium	7.009	0.200	5	1.32	114	75 - 125	6.746	3.81	20	
Potassium	19.09	0.200	5	13.18	118	75 - 125	19.33	1.25	20	
Selenium	0.06216	0.00200	0.05	0.008894	107	75 - 125	0.06344	2.04	20	
Sodium	292.8	0.200	5	278	294	75 - 125	294.6	0.629	20	SEO

MSD Sample ID: **HS19010655-01MSD** Units: **mg/L** Analysis Date: **22-Jan-2019 13:53**
Client ID: **20190108-FD-PV10out-controlD** Run ID: **ICPMS04_331465** SeqNo: **4919533** PrepDate: **18-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.05301	0.00200	0.05	0	106	75 - 125	0.05085	4.17	20	

PDS Sample ID: **HS19010655-01PDS** Units: **mg/L** Analysis Date: **21-Jan-2019 22:49**
Client ID: **20190108-FD-PV10out-controlD** Run ID: **ICPMS05_331390** SeqNo: **4918286** PrepDate: **18-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1331	0.00200	0.1	0.03504	98.0	75 - 125				
Arsenic	0.1206	0.00200	0.1	0.00565	115	75 - 125				
Cadmium	0.1128	0.00200	0.1	0.000054	113	75 - 125				
Iron	11.18	0.200	10	0.06976	111	75 - 125				
Lead	0.08005	0.00200	0.1	0.000035	80.0	75 - 125				
Magnesium	13.01	0.200	10	1.32	117	75 - 125				
Potassium	25.12	0.200	10	13.18	119	75 - 125				
Selenium	0.1214	0.00200	0.1	0.008894	113	75 - 125				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010655

QC BATCH REPORT

Batch ID: 136804 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

PDS Sample ID: **HS19010655-01PDS** Units: **mg/L** Analysis Date: **22-Jan-2019 12:43**
Client ID: **20190108-FD-PV10out-controlD** Run ID: **ICPMS05_331472** SeqNo: **4919346** PrepDate: **18-Jan-2019** DF: **20**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	410.2	10.0	200	206.4	102	75 - 125				
Sodium	485.7	4.00	200	273.9	106	75 - 125				

SD Sample ID: **HS19010655-01SD** Units: **mg/L** Analysis Date: **21-Jan-2019 22:43**
Client ID: **20190108-FD-PV10out-controlD** Run ID: **ICPMS05_331390** SeqNo: **4918283** PrepDate: **18-Jan-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	0.03488	0.0100					0.03504	0.468	10	
Arsenic	0.03988	0.0100					0.00565	0	10	
Cadmium	U	0.0100					0.000054	0	10	
Iron	0.3961	1.00					0.06976	0	10	J
Lead	U	0.0100					0.000035	0	10	
Magnesium	1.361	1.00					1.32	3.08	10	
Potassium	13.38	1.00					13.18	1.53	10	
Selenium	0.009823	0.0100					0.008894	0	10	J

SD Sample ID: **HS19010655-01SD** Units: **mg/L** Analysis Date: **22-Jan-2019 14:40**
Client ID: **20190108-FD-PV10out-controlD** Run ID: **ICPMS05_331472** SeqNo: **4919746** PrepDate: **18-Jan-2019** DF: **100**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	210.7	50.0					206.4	2.08	10	
Sodium	278.7	20.0					273.9	1.76	10	

The following samples were analyzed in this batch:

HS19010655-01	HS19010655-02	HS19010655-03	HS19010655-04
HS19010655-05	HS19010655-06	HS19010655-07	HS19010655-08
HS19010655-09	HS19010655-10		

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19010655**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19010655
Date/Time Received: **15-Jan-2019 08:50**
Received by: **JRM**

Checklist completed by: *Pablo Marinez* eSignature 15-Jan-2019 Date
Reviewed by: *Dane J. Wacasey* eSignature 21-Jan-2019 Date

Matrices: **WATER**
Carrier name: **FedEx International Priority**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	4.0C/4.4C UC/C	IR # 11	
Cooler(s)/Kit(s):	43317		
Date/Time sample(s) sent to storage:	1/15/19 18:45		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070

Chain of Custody Form

Page ____ of ____

COC ID: 194454

HS19010655

Golder Associates
Exide Column Studies

Customer Information		Project Information		ALS Project Manager:
Purchase Order	130-2086-06	Project Name	Exide Column Studies	
Work Order		Project Number	130-2086	
Company Name	Golder Associates	Bill To Company	Golder Associates	
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P	
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit	
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021	
Phone	(314) 984-8800	Phone	(314) 984-8800	
Fax		Fax		
e-Mail Address	Emily_White@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com	

A	300_W (300 Cl, SO4, [*NO3* *48hr HT*])
B	TDS_W 2540C (2540C TDS)
C	ALK_W 2320B (2320B Alkalinity)
D	HARD (2340B Hardness (calc))
E	ICP_TW (6020A Total Metals (6)+Cations)
F	ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
G	
H	
I	
J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190103-FD-PV10 out-control D	2019/01/08	10:10	GW	2	1						X					
2	20190108-FD-PV10 out-30D	"	"	"	2	1						X					
3	20190108-FD-PV10 out-35D	"	"	"	2	1						X					
4	20190108-FD-PV10 out-40D	"	"	"	2	1						X					
5	20190109-FD-PV10 inlet-control D	2019/01/09	13:15	"	2	1						X					
6	20190109-FD-PV10 inlet-30-35-40D	"	"	"	2	1						X					
7	20190110-FD-PV10 mid-control D	2019/01/10	16:45	"	2	1						X					
8	20190110-FD-PV10 mid-30D	"	"	"	2	1						X					
9	20190110-FD-PV10 mid-35D	"	"	"	2	1						X					
10	20190110-FD-PV10 mid-40D	"	"	"	2	1						X					

Sampler(s) Please Print & Sign: [signature]

Shipment Method:

Required Turnaround Time: (Check Box) ☐ Other ____ ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour

Results Due Date:

Relinquished by: [signature] Date: 2019/01/14 Time: 15:30

Relinquished by: Date: Time:

Received by:

Received by (Laboratory): JM 01/15/19 08:50

Logged by (Laboratory): Date: Time:

Checked by (Laboratory):

Notes: Exide Column Studies

Cooler ID	Cooler Temp.
43317	4.0

QC Package: (Check One Box Below)
☐ Level II Std QC
☐ Level III Std QC/Raw Data
☐ Level IV SW846/CLP
☐ Other
☒ TRRP Checklist
☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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ORIGIN ID:YUXA (514) 383-0990
Audrey Etheves
Golder Associates Ltd
7250 rue du Mile End
3e etage
MONTREAL, PQ H2R3A4
CANADA, CA

Ship Date: 14JAN19
ActWgt: 21.50 LB
CAD: 108680724/INET4042

BILL RECIPIENT
EIN/VAT:

TO Dane Wacasey
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

(281) 530-5656

FedEx Express

(US)

E

AWB

NH SGRA

PKG:YOUR PKG

TRK# 7741 8624 2354 Form 0430

10:30A
INTL PRIORITY

REF:
DESC1:Bouteille d'eau
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: Audrey Etheves
T/C: R 967554812
D/T: R 967554812

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2. Placez l'étiquette dans la pochette d'expédition et fixez-la à votre paquet.

ALS 10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887 43317	CUSTODY SEAL Date: 2019/01/14 Time: 3:30 Name: Company: Golder Associates	Seal Broken By: SM Date: 01/15/19

43317 JAN 15 2019

ALS 10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887 43317	CUSTODY SEAL Date: 2019/01/14 Time: 15:30 Name: Company: Golder Associates	Seal Broken By: SM Date: 01/15/19

FedEx
TRK# 0430 7741 8624 2354

NH SGRA

0A
INTL PRIORITY CLR
CLR
77099
TX-US
IAH

5062794 IND 01/15 547G2/D74C/53C)

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

January 22, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19010657**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 10 sample(s) on Jan 15, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DAYNA.FISHER
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19010657**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS19010657**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data								
Laboratory Name: ALS Laboratory Group			LRC Date: 01/22/2019					
Project Name: Exide Column Studies			Laboratory Job Number: HS19010657					
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 136718, R331521					
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?	X				
		Were analytical duplicates analyzed at the appropriate frequency?	X				
		Were RPDs or relative standard deviations within the laboratory QC limits?	X				
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 01/22/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19010657				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 136718, R331521				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			2
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		X			3
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports	
Laboratory Name: ALS Laboratory Group	LRC Date: 01/22/2019
Project Name: Exide Column Studies	Laboratory Job Number: HS19010657
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 136718, R331521

ER#[5]	Description
1	Batch 136718, Metals Method SW6020, sample HS19010377-01, MS and MSD were performed on unrelated sample.
2	See Run Log and CCB Exceptions Report.
3	Batch 136718, Metals Method SW6020, sample HS19010377-01, PDS was performed on unrelated sample.

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010657
Start Date: 22-Jan-2019 End Date: 22-Jan-2019

Run ID:ICPMS05_331472
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	22-Jan-2019 12:12	016_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	22-Jan-2019 12:14	017SMPL.d	AS CA CD FE K MG NA SB SE
LLICV5	1	22-Jan-2019 12:16	018LICV.d	AS CA CD FE K MG NA SB SE
ICB	1	22-Jan-2019 12:18	019_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	22-Jan-2019 12:29	021ICSA.d	AS CA CD FE K MG NA SB SE
ICSAB	1	22-Jan-2019 12:31	022ICSB.d	AS CA CD FE K MG NA SB SE
CCV 1	1	22-Jan-2019 12:49	029_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	22-Jan-2019 12:51	030_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	22-Jan-2019 13:09	039_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	22-Jan-2019 13:11	040_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-136718	1	22-Jan-2019 13:28	042SMPL.d	AS CA CD FE K MG NA SB SE
LCS-136718	1	22-Jan-2019 13:30	043SMPL.d	AS CA CD FE K MG NA SB SE
ZZZZZZSD	5	22-Jan-2019 13:33	045SMPL.d	AS CD FE K MG SB SE
ZZZZZZMS	1	22-Jan-2019 13:35	046SMPL.d	AS CA CD FE K MG NA SB SE
ZZZZZZMSD	1	22-Jan-2019 13:37	047SMPL.d	AS CA CD FE K MG NA SB SE
ZZZZZZPDS	1	22-Jan-2019 13:39	048SMPL.d	AS CD FE K MG SB SE
CCB 3	1	22-Jan-2019 13:46	051_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	22-Jan-2019 13:50	052_CCV.d	AS CA CD FE K MG NA PB SB SE
20190108-FD-PV10out-controlT	1	22-Jan-2019 13:52	053SMPL.d	AS CD FE K MG SB SE
20190108-FD-PV10out-30T	1	22-Jan-2019 13:54	054SMPL.d	AS CD FE K MG SB SE
20190108-FD-PV10out-35T	1	22-Jan-2019 13:56	055SMPL.d	AS CD FE K MG SB SE
20190108-FD-PV10out-40T	1	22-Jan-2019 13:58	056SMPL.d	AS CD FE K MG SB SE
20190109-FD-PV10inlet-controlT	1	22-Jan-2019 14:00	057SMPL.d	AS CD FE K MG SB SE
20190109-FD-PV10inlet-30-35-40T	1	22-Jan-2019 14:02	058SMPL.d	AS CD FE K MG SB SE
20190110-FD-PV10mid-controlT	1	22-Jan-2019 14:04	059SMPL.d	AS CD FE K MG SB SE
20190110-FD-PV10mid-30T	1	22-Jan-2019 14:06	060SMPL.d	AS CD FE K MG SB SE
20190110-FD-PV10mid-35T	1	22-Jan-2019 14:08	061SMPL.d	AS CD FE K MG SB SE
20190110-FD-PV10mid-40T	1	22-Jan-2019 14:10	062SMPL.d	AS CD FE K MG SB SE
CCV 4	1	22-Jan-2019 14:12	063_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	22-Jan-2019 14:22	066_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	22-Jan-2019 14:44	077_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	22-Jan-2019 14:46	078_CCB.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZSD	100	22-Jan-2019 15:11	083SMPL.d	CA NA
ZZZZZZPDS	20	22-Jan-2019 15:13	084SMPL.d	CA NA
20190108-FD-PV10out-controlT	20	22-Jan-2019 15:15	085SMPL.d	CA NA
20190108-FD-PV10out-30T	20	22-Jan-2019 15:17	086SMPL.d	CA NA
20190108-FD-PV10out-35T	20	22-Jan-2019 15:19	087SMPL.d	CA NA
20190108-FD-PV10out-40T	20	22-Jan-2019 15:21	088SMPL.d	CA NA
CCV 6	1	22-Jan-2019 15:23	089_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	22-Jan-2019 15:25	090_CCB.d	AS CA CD FE K MG NA PB SB SE
20190109-FD-PV10inlet-controlT	20	22-Jan-2019 15:32	092SMPL.d	CA NA
20190109-FD-PV10inlet-30-35-40T	20	22-Jan-2019 15:34	093SMPL.d	CA NA
20190110-FD-PV10mid-controlT	20	22-Jan-2019 15:36	094SMPL.d	CA NA
20190110-FD-PV10mid-30T	20	22-Jan-2019 15:38	095SMPL.d	CA NA
20190110-FD-PV10mid-35T	20	22-Jan-2019 15:40	096SMPL.d	CA NA
20190110-FD-PV10mid-40T	20	22-Jan-2019 15:42	097SMPL.d	CA NA
CCV 7	1	22-Jan-2019 15:46	099_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	22-Jan-2019 15:48	100_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 8	1	22-Jan-2019 16:19	115_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV5	1	22-Jan-2019 16:21	116LICV.d	AS CA CD FE K MG NA SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010657

Run ID:ICPMS05_331472
Instrument:ICPMS05
Method:SW6020

CCB 1	Date: 22-Jan-2019 12:51	Seq: 4919350	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	24.35	18	200	
Sodium	22.43	14	200	

CCB 2	Date: 22-Jan-2019 13:11	Seq: 4919360	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	21.68	14	200	

CCB 3	Date: 22-Jan-2019 13:46	Seq: 4919495	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	44.97	34	500	
Sodium	59.02	14	200	

CCB 4	Date: 22-Jan-2019 14:22	Seq: 4919580	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	120.6	14	200	

CCB 5	Date: 22-Jan-2019 14:46	Seq: 4919749	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	34.48	34	500	
Potassium	21.82	18	200	
Sodium	64.24	14	200	

CCB 6	Date: 22-Jan-2019 15:25	Seq: 4919913	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	40.21	14	200	

CCB 7	Date: 22-Jan-2019 15:48	Seq: 4919923	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	33.92	14	200	

CCB 9	Date: 22-Jan-2019 16:50	Seq: 4920130	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	39.64	34	500	
Potassium	19.9	18	200	
Sodium	226	14	200	

CCB 10	Date: 22-Jan-2019 17:08	Seq: 4920137	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	37.3	34	500	
Potassium	40.05	18	200	
Sodium	169.9	14	200	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19010657

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19010657-01	20190108-FD-PV10out-controlT	GW		08-Jan-2019 10:10	15-Jan-2019 08:50	☐
HS19010657-02	20190108-FD-PV10out-30T	GW		08-Jan-2019 10:10	15-Jan-2019 08:50	☐
HS19010657-03	20190108-FD-PV10out-35T	GW		08-Jan-2019 10:10	15-Jan-2019 08:50	☐
HS19010657-04	20190108-FD-PV10out-40T	GW		08-Jan-2019 10:10	15-Jan-2019 08:50	☐
HS19010657-05	20190109-FD-PV10inlet-controlT	GW		09-Jan-2019 13:15	15-Jan-2019 08:50	☐
HS19010657-06	20190109-FD-PV10inlet-30-35-40T	GW		09-Jan-2019 13:15	15-Jan-2019 08:50	☐
HS19010657-07	20190110-FD-PV10mid-controlT	GW		10-Jan-2019 16:45	15-Jan-2019 08:50	☐
HS19010657-08	20190110-FD-PV10mid-30T	GW		10-Jan-2019 16:45	15-Jan-2019 08:50	☐
HS19010657-09	20190110-FD-PV10mid-35T	GW		10-Jan-2019 16:45	15-Jan-2019 08:50	☐
HS19010657-10	20190110-FD-PV10mid-40T	GW		10-Jan-2019 16:45	15-Jan-2019 08:50	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190108-FD-PV10out-controlT
Collection Date: 08-Jan-2019 10:10

ANALYTICAL REPORT
WorkOrder:HS19010657
Lab ID:HS19010657-01
Matrix:GW

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**430**		**2.00**	**2.00**	**mg/L**	1	22-Jan-2019 16:03
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 17-Jan-2019		Analyst: JHD
Antimony	**0.0358**		**0.000400**	**0.00200**	**mg/L**	1	22-Jan-2019 13:52
Arsenic	**0.00187**	J	**0.000400**	**0.00200**	**mg/L**	1	22-Jan-2019 13:52
Cadmium	U		0.000200	0.00200	mg/L	1	22-Jan-2019 13:52
Calcium	**170**		**0.680**	**10.0**	**mg/L**	20	22-Jan-2019 15:15
Iron	U		0.0120	0.200	mg/L	1	22-Jan-2019 13:52
Lead	U		0.000600	0.00200	mg/L	1	22-Jan-2019 15:31
Magnesium	**1.25**		**0.0100**	**0.200**	**mg/L**	1	22-Jan-2019 13:52
Potassium	**12.6**		**0.0180**	**0.200**	**mg/L**	1	22-Jan-2019 13:52
Selenium	**0.00654**		**0.00110**	**0.00200**	**mg/L**	1	22-Jan-2019 13:52
Sodium	**226**		**0.280**	**4.00**	**mg/L**	20	22-Jan-2019 15:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190108-FD-PV10out-30T
Collection Date: 08-Jan-2019 10:10

ANALYTICAL REPORT
WorkOrder:HS19010657
Lab ID:HS19010657-02
Matrix:GW

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**426**		**2.00**	**2.00**	**mg/L**	1	22-Jan-2019 16:03
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 17-Jan-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	22-Jan-2019 13:54
Arsenic	**0.000496**	J	**0.000400**	**0.00200**	**mg/L**	1	22-Jan-2019 13:54
Cadmium	U		0.000200	0.00200	mg/L	1	22-Jan-2019 13:54
Calcium	**169**		**0.680**	**10.0**	**mg/L**	20	22-Jan-2019 15:17
Iron	**0.0574**	J	**0.0120**	**0.200**	**mg/L**	1	22-Jan-2019 13:54
Lead	U		0.000600	0.00200	mg/L	1	22-Jan-2019 15:41
Magnesium	**0.941**		**0.0100**	**0.200**	**mg/L**	1	22-Jan-2019 13:54
Potassium	**13.3**		**0.0180**	**0.200**	**mg/L**	1	22-Jan-2019 13:54
Selenium	U		0.00110	0.00200	mg/L	1	22-Jan-2019 13:54
Sodium	**225**		**0.280**	**4.00**	**mg/L**	20	22-Jan-2019 15:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190108-FD-PV10out-35T
Collection Date: 08-Jan-2019 10:10

ANALYTICAL REPORT
WorkOrder:HS19010657
Lab ID:HS19010657-03
Matrix:GW

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**426**		**2.00**	**2.00**	**mg/L**	1	22-Jan-2019 16:03
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 17-Jan-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	22-Jan-2019 13:56
Arsenic	**0.000490**	J	**0.000400**	**0.00200**	**mg/L**	1	22-Jan-2019 13:56
Cadmium	U		0.000200	0.00200	mg/L	1	22-Jan-2019 13:56
Calcium	**169**		**0.680**	**10.0**	**mg/L**	20	22-Jan-2019 15:19
Iron	**0.0671**	J	**0.0120**	**0.200**	**mg/L**	1	22-Jan-2019 13:56
Lead	U		0.000600	0.00200	mg/L	1	22-Jan-2019 15:43
Magnesium	**1.08**		**0.0100**	**0.200**	**mg/L**	1	22-Jan-2019 13:56
Potassium	**13.3**		**0.0180**	**0.200**	**mg/L**	1	22-Jan-2019 13:56
Selenium	U		0.00110	0.00200	mg/L	1	22-Jan-2019 13:56
Sodium	**237**		**0.280**	**4.00**	**mg/L**	20	22-Jan-2019 15:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190108-FD-PV10out-40T
Collection Date: 08-Jan-2019 10:10

ANALYTICAL REPORT
WorkOrder:HS19010657
Lab ID:HS19010657-04
Matrix:GW

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**472**		**2.00**	**2.00**	**mg/L**	1	22-Jan-2019 16:03
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 17-Jan-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	22-Jan-2019 13:58
Arsenic	**0.000531**	J	**0.000400**	**0.00200**	**mg/L**	1	22-Jan-2019 13:58
Cadmium	U		0.000200	0.00200	mg/L	1	22-Jan-2019 13:58
Calcium	**187**		**0.680**	**10.0**	**mg/L**	20	22-Jan-2019 15:21
Iron	**0.0179**	J	**0.0120**	**0.200**	**mg/L**	1	22-Jan-2019 13:58
Lead	U		0.000600	0.00200	mg/L	1	22-Jan-2019 15:45
Magnesium	**1.15**		**0.0100**	**0.200**	**mg/L**	1	22-Jan-2019 13:58
Potassium	**13.6**		**0.0180**	**0.200**	**mg/L**	1	22-Jan-2019 13:58
Selenium	U		0.00110	0.00200	mg/L	1	22-Jan-2019 13:58
Sodium	**251**		**0.280**	**4.00**	**mg/L**	20	22-Jan-2019 15:21

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190109-FD-PV10inlet-controlT
Collection Date: 09-Jan-2019 13:15

ANALYTICAL REPORT
WorkOrder:HS19010657
Lab ID:HS19010657-05
Matrix:GW

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**472**		**2.00**	**2.00**	**mg/L**	1	22-Jan-2019 16:03
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 17-Jan-2019		Analyst: JHD
Antimony	**0.0366**		**0.000400**	**0.00200**	**mg/L**	1	22-Jan-2019 14:00
Arsenic	**0.00173**	J	**0.000400**	**0.00200**	**mg/L**	1	22-Jan-2019 14:00
Cadmium	U		0.000200	0.00200	mg/L	1	22-Jan-2019 14:00
Calcium	**187**		**0.680**	**10.0**	**mg/L**	20	22-Jan-2019 15:32
Iron	**0.0153**	J	**0.0120**	**0.200**	**mg/L**	1	22-Jan-2019 14:00
Lead	**0.000987**	J	**0.000600**	**0.00200**	**mg/L**	1	22-Jan-2019 15:47
Magnesium	**1.27**		**0.0100**	**0.200**	**mg/L**	1	22-Jan-2019 14:00
Potassium	**12.7**		**0.0180**	**0.200**	**mg/L**	1	22-Jan-2019 14:00
Selenium	**0.00684**		**0.00110**	**0.00200**	**mg/L**	1	22-Jan-2019 14:00
Sodium	**251**		**0.280**	**4.00**	**mg/L**	20	22-Jan-2019 15:32

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190109-FD-PV10inlet-30-35-40T
Collection Date: 09-Jan-2019 13:15

ANALYTICAL REPORT
WorkOrder:HS19010657
Lab ID:HS19010657-06
Matrix:GW

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**467**		**2.00**	**2.00**	**mg/L**	1	22-Jan-2019 16:03
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 17-Jan-2019		Analyst: JHD
Antimony	**0.0358**		**0.000400**	**0.00200**	**mg/L**	1	22-Jan-2019 14:02
Arsenic	**0.00154**	J	**0.000400**	**0.00200**	**mg/L**	1	22-Jan-2019 14:02
Cadmium	U		0.000200	0.00200	mg/L	1	22-Jan-2019 14:02
Calcium	**185**		**0.680**	**10.0**	**mg/L**	20	22-Jan-2019 15:34
Iron	**0.0131**	J	**0.0120**	**0.200**	**mg/L**	1	22-Jan-2019 14:02
Lead	U		0.000600	0.00200	mg/L	1	22-Jan-2019 15:50
Magnesium	**1.17**		**0.0100**	**0.200**	**mg/L**	1	22-Jan-2019 14:02
Potassium	**12.6**		**0.0180**	**0.200**	**mg/L**	1	22-Jan-2019 14:02
Selenium	**0.00706**		**0.00110**	**0.00200**	**mg/L**	1	22-Jan-2019 14:02
Sodium	**251**		**0.280**	**4.00**	**mg/L**	20	22-Jan-2019 15:34

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190110-FD-PV10mid-controlT
Collection Date: 10-Jan-2019 16:45

ANALYTICAL REPORT
WorkOrder:HS19010657
Lab ID:HS19010657-07
Matrix:GW

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**477**		**2.00**	**2.00**	**mg/L**	1	22-Jan-2019 16:03
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 17-Jan-2019		Analyst: JHD
Antimony	**0.0374**		**0.000400**	**0.00200**	**mg/L**	1	22-Jan-2019 14:04
Arsenic	**0.00184**	J	**0.000400**	**0.00200**	**mg/L**	1	22-Jan-2019 14:04
Cadmium	U		0.000200	0.00200	mg/L	1	22-Jan-2019 14:04
Calcium	**189**		**0.680**	**10.0**	**mg/L**	20	22-Jan-2019 15:36
Iron	U		0.0120	0.200	mg/L	1	22-Jan-2019 14:04
Lead	U		0.000600	0.00200	mg/L	1	22-Jan-2019 15:52
Magnesium	**1.31**		**0.0100**	**0.200**	**mg/L**	1	22-Jan-2019 14:04
Potassium	**12.5**		**0.0180**	**0.200**	**mg/L**	1	22-Jan-2019 14:04
Selenium	**0.00707**		**0.00110**	**0.00200**	**mg/L**	1	22-Jan-2019 14:04
Sodium	**252**		**0.280**	**4.00**	**mg/L**	20	22-Jan-2019 15:36

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190110-FD-PV10mid-30T
Collection Date: 10-Jan-2019 16:45

ANALYTICAL REPORT
WorkOrder:HS19010657
Lab ID:HS19010657-08
Matrix:GW

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**438**		**2.00**	**2.00**	**mg/L**	1	22-Jan-2019 16:03
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 17-Jan-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	22-Jan-2019 14:06
Arsenic	**0.000528**	J	**0.000400**	**0.00200**	**mg/L**	1	22-Jan-2019 14:06
Cadmium	U		0.000200	0.00200	mg/L	1	22-Jan-2019 14:06
Calcium	**174**		**0.680**	**10.0**	**mg/L**	20	22-Jan-2019 15:38
Iron	**0.859**		**0.0120**	**0.200**	**mg/L**	1	22-Jan-2019 14:06
Lead	U		0.000600	0.00200	mg/L	1	22-Jan-2019 15:54
Magnesium	**0.925**		**0.0100**	**0.200**	**mg/L**	1	22-Jan-2019 14:06
Potassium	**13.3**		**0.0180**	**0.200**	**mg/L**	1	22-Jan-2019 14:06
Selenium	U		0.00110	0.00200	mg/L	1	22-Jan-2019 14:06
Sodium	**242**		**0.280**	**4.00**	**mg/L**	20	22-Jan-2019 15:38

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190110-FD-PV10mid-35T
Collection Date: 10-Jan-2019 16:45

ANALYTICAL REPORT
WorkOrder:HS19010657
Lab ID:HS19010657-09
Matrix:GW

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**466**		**2.00**	**2.00**	**mg/L**	1	22-Jan-2019 16:03
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 17-Jan-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	22-Jan-2019 14:08
Arsenic	**0.000473**	J	**0.000400**	**0.00200**	**mg/L**	1	22-Jan-2019 14:08
Cadmium	U		0.000200	0.00200	mg/L	1	22-Jan-2019 14:08
Calcium	**185**		**0.680**	**10.0**	**mg/L**	20	22-Jan-2019 15:40
Iron	**1.21**		**0.0120**	**0.200**	**mg/L**	1	22-Jan-2019 14:08
Lead	U		0.000600	0.00200	mg/L	1	22-Jan-2019 15:56
Magnesium	**0.995**		**0.0100**	**0.200**	**mg/L**	1	22-Jan-2019 14:08
Potassium	**12.6**		**0.0180**	**0.200**	**mg/L**	1	22-Jan-2019 14:08
Selenium	U		0.00110	0.00200	mg/L	1	22-Jan-2019 14:08
Sodium	**255**		**0.280**	**4.00**	**mg/L**	20	22-Jan-2019 15:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190110-FD-PV10mid-40T
Collection Date: 10-Jan-2019 16:45

ANALYTICAL REPORT
WorkOrder:HS19010657
Lab ID:HS19010657-10
Matrix:GW

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**479**		**2.00**	**2.00**	**mg/L**	1	22-Jan-2019 16:03
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 17-Jan-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	22-Jan-2019 14:10
Arsenic	**0.000515**	J	**0.000400**	**0.00200**	**mg/L**	1	22-Jan-2019 14:10
Cadmium	U		0.000200	0.00200	mg/L	1	22-Jan-2019 14:10
Calcium	**190**		**0.680**	**10.0**	**mg/L**	20	22-Jan-2019 15:42
Iron	**0.507**		**0.0120**	**0.200**	**mg/L**	1	22-Jan-2019 14:10
Lead	U		0.000600	0.00200	mg/L	1	22-Jan-2019 15:59
Magnesium	**1.04**		**0.0100**	**0.200**	**mg/L**	1	22-Jan-2019 14:10
Potassium	**12.6**		**0.0180**	**0.200**	**mg/L**	1	22-Jan-2019 14:10
Selenium	U		0.00110	0.00200	mg/L	1	22-Jan-2019 14:10
Sodium	**265**		**0.280**	**4.00**	**mg/L**	20	22-Jan-2019 15:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010657

Batch ID: 136718 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19010657-01	1	10	10 (mL)	1
HS19010657-02	1	10	10 (mL)	1
HS19010657-03	1	10	10 (mL)	1
HS19010657-04	1	10	10 (mL)	1
HS19010657-05	1	10	10 (mL)	1
HS19010657-06	1	10	10 (mL)	1
HS19010657-07	1	10	10 (mL)	1
HS19010657-08	1	10	10 (mL)	1
HS19010657-09	1	10	10 (mL)	1
HS19010657-10	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010657

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 136718	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** GW		
HS19010657-01	20190108-FD-PV10out-controlT	08 Jan 2019 10:10		17 Jan 2019 08:30	22 Jan 2019 15:31	1
HS19010657-01	20190108-FD-PV10out-controlT	08 Jan 2019 10:10		17 Jan 2019 08:30	22 Jan 2019 15:15	20
HS19010657-01	20190108-FD-PV10out-controlT	08 Jan 2019 10:10		17 Jan 2019 08:30	22 Jan 2019 13:52	1
HS19010657-02	20190108-FD-PV10out-30T	08 Jan 2019 10:10		17 Jan 2019 08:30	22 Jan 2019 15:41	1
HS19010657-02	20190108-FD-PV10out-30T	08 Jan 2019 10:10		17 Jan 2019 08:30	22 Jan 2019 15:17	20
HS19010657-02	20190108-FD-PV10out-30T	08 Jan 2019 10:10		17 Jan 2019 08:30	22 Jan 2019 13:54	1
HS19010657-03	20190108-FD-PV10out-35T	08 Jan 2019 10:10		17 Jan 2019 08:30	22 Jan 2019 15:43	1
HS19010657-03	20190108-FD-PV10out-35T	08 Jan 2019 10:10		17 Jan 2019 08:30	22 Jan 2019 15:19	20
HS19010657-03	20190108-FD-PV10out-35T	08 Jan 2019 10:10		17 Jan 2019 08:30	22 Jan 2019 13:56	1
HS19010657-04	20190108-FD-PV10out-40T	08 Jan 2019 10:10		17 Jan 2019 08:30	22 Jan 2019 15:45	1
HS19010657-04	20190108-FD-PV10out-40T	08 Jan 2019 10:10		17 Jan 2019 08:30	22 Jan 2019 15:21	20
HS19010657-04	20190108-FD-PV10out-40T	08 Jan 2019 10:10		17 Jan 2019 08:30	22 Jan 2019 13:58	1
HS19010657-05	20190109-FD-PV10inlet-controlT	09 Jan 2019 13:15		17 Jan 2019 08:30	22 Jan 2019 15:47	1
HS19010657-05	20190109-FD-PV10inlet-controlT	09 Jan 2019 13:15		17 Jan 2019 08:30	22 Jan 2019 15:32	20
HS19010657-05	20190109-FD-PV10inlet-controlT	09 Jan 2019 13:15		17 Jan 2019 08:30	22 Jan 2019 14:00	1
HS19010657-06	20190109-FD-PV10inlet-30-35-40T	09 Jan 2019 13:15		17 Jan 2019 08:30	22 Jan 2019 15:50	1
HS19010657-06	20190109-FD-PV10inlet-30-35-40T	09 Jan 2019 13:15		17 Jan 2019 08:30	22 Jan 2019 15:34	20
HS19010657-06	20190109-FD-PV10inlet-30-35-40T	09 Jan 2019 13:15		17 Jan 2019 08:30	22 Jan 2019 14:02	1
HS19010657-07	20190110-FD-PV10mid-controlT	10 Jan 2019 16:45		17 Jan 2019 08:30	22 Jan 2019 15:52	1
HS19010657-07	20190110-FD-PV10mid-controlT	10 Jan 2019 16:45		17 Jan 2019 08:30	22 Jan 2019 15:36	20
HS19010657-07	20190110-FD-PV10mid-controlT	10 Jan 2019 16:45		17 Jan 2019 08:30	22 Jan 2019 14:04	1
HS19010657-08	20190110-FD-PV10mid-30T	10 Jan 2019 16:45		17 Jan 2019 08:30	22 Jan 2019 15:54	1
HS19010657-08	20190110-FD-PV10mid-30T	10 Jan 2019 16:45		17 Jan 2019 08:30	22 Jan 2019 15:38	20
HS19010657-08	20190110-FD-PV10mid-30T	10 Jan 2019 16:45		17 Jan 2019 08:30	22 Jan 2019 14:06	1
HS19010657-09	20190110-FD-PV10mid-35T	10 Jan 2019 16:45		17 Jan 2019 08:30	22 Jan 2019 15:56	1
HS19010657-09	20190110-FD-PV10mid-35T	10 Jan 2019 16:45		17 Jan 2019 08:30	22 Jan 2019 15:40	20
HS19010657-09	20190110-FD-PV10mid-35T	10 Jan 2019 16:45		17 Jan 2019 08:30	22 Jan 2019 14:08	1
HS19010657-10	20190110-FD-PV10mid-40T	10 Jan 2019 16:45		17 Jan 2019 08:30	22 Jan 2019 15:59	1
HS19010657-10	20190110-FD-PV10mid-40T	10 Jan 2019 16:45		17 Jan 2019 08:30	22 Jan 2019 15:42	20
HS19010657-10	20190110-FD-PV10mid-40T	10 Jan 2019 16:45		17 Jan 2019 08:30	22 Jan 2019 14:10	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010657

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R331521	**Test Name :** HARDNESS, TOTAL AS CACO3 BY SM2340B			**Matrix:** GW		
HS19010657-01	20190108-FD-PV10out-controlT	08 Jan 2019 10:10			22 Jan 2019 16:03	1
HS19010657-02	20190108-FD-PV10out-30T	08 Jan 2019 10:10			22 Jan 2019 16:03	1
HS19010657-03	20190108-FD-PV10out-35T	08 Jan 2019 10:10			22 Jan 2019 16:03	1
HS19010657-04	20190108-FD-PV10out-40T	08 Jan 2019 10:10			22 Jan 2019 16:03	1
HS19010657-05	20190109-FD-PV10inlet-controlT	09 Jan 2019 13:15			22 Jan 2019 16:03	1
HS19010657-06	20190109-FD-PV10inlet-30-35-40T	09 Jan 2019 13:15			22 Jan 2019 16:03	1
HS19010657-07	20190110-FD-PV10mid-controlT	10 Jan 2019 16:45			22 Jan 2019 16:03	1
HS19010657-08	20190110-FD-PV10mid-30T	10 Jan 2019 16:45			22 Jan 2019 16:03	1
HS19010657-09	20190110-FD-PV10mid-35T	10 Jan 2019 16:45			22 Jan 2019 16:03	1
HS19010657-10	20190110-FD-PV10mid-40T	10 Jan 2019 16:45			22 Jan 2019 16:03	1

WorkOrder: HS19010657
InstrumentID: ICPMS05
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000555	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000460	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000554	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0537	0.0340	0.500
A	Iron	7439-89-6	0.0500	0.0549	0.0120	0.200
A	Magnesium	7439-95-4	0.0500	0.0680	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0542	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00280	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0459	0.0140	0.200

WorkOrder: HS19010657
InstrumentID: ICPMS04
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Lead	7439-92-1	0.00100	0.000916	0.000600	0.00200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010657

QC BATCH REPORT

Batch ID: 136718 **Instrument: ICPMS05** **Method: SW6020**

MBLK Sample ID: **MBLK-136718** Units: **mg/L** Analysis Date: **22-Jan-2019 13:28**
Client ID: Run ID: **ICPMS05_331472** SeqNo: **4919486** PrepDate: **17-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Magnesium	0.01252	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	U	0.200								

MBLK Sample ID: **MBLK-136718** Units: **mg/L** Analysis Date: **22-Jan-2019 15:15**
Client ID: Run ID: **ICPMS04_331465** SeqNo: **4919855** PrepDate: **17-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	U	0.00200								

LCS Sample ID: **LCS-136718** Units: **mg/L** Analysis Date: **22-Jan-2019 13:30**
Client ID: Run ID: **ICPMS05_331472** SeqNo: **4919487** PrepDate: **17-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05074	0.00200	0.05	0	101	80 - 120				
Arsenic	0.05259	0.00200	0.05	0	105	80 - 120				
Cadmium	0.05463	0.00200	0.05	0	109	80 - 120				
Calcium	5.599	0.500	5	0	112	80 - 120				
Iron	5.425	0.200	5	0	108	80 - 120				
Magnesium	5.457	0.200	5	0	109	80 - 120				
Potassium	5.437	0.200	5	0	109	80 - 120				
Selenium	0.05178	0.00200	0.05	0	104	80 - 120				
Sodium	5.527	0.200	5	0	111	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010657

QC BATCH REPORT

Batch ID: 136718 **Instrument: ICPMS05** **Method: SW6020**

LCS Sample ID: **LCS-136718** Units: **mg/L** Analysis Date: **22-Jan-2019 15:18**
Client ID: Run ID: **ICPMS04_331465** SeqNo: **4919856** PrepDate: **17-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.05123	0.00200	0.05	0	102	80 - 120				

MS Sample ID: **HS19010377-01MS** Units: **mg/L** Analysis Date: **22-Jan-2019 13:35**
Client ID: Run ID: **ICPMS05_331472** SeqNo: **4919490** PrepDate: **17-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05285	0.00200	0.05	0.000102	105	80 - 120				
Arsenic	0.05546	0.00200	0.05	0.000548	110	80 - 120				
Cadmium	0.05224	0.00200	0.05	0.000022	104	80 - 120				
Calcium	605.6	0.500	5	594.2	228	80 - 120				SEO
Iron	5.336	0.200	5	0.7894	90.9	80 - 120				
Magnesium	102.7	0.200	5	96.74	119	80 - 120				O
Potassium	16.41	0.200	5	10.8	112	80 - 120				
Selenium	0.06129	0.00200	0.05	0.000361	122	80 - 120				S
Sodium	251.2	0.200	5	245.8	108	80 - 120				EO

MS Sample ID: **HS19010377-01MS** Units: **mg/L** Analysis Date: **22-Jan-2019 15:24**
Client ID: Run ID: **ICPMS04_331465** SeqNo: **4919859** PrepDate: **17-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.04976	0.00200	0.05	0.000085	99.3	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010657

QC BATCH REPORT

Batch ID: 136718 **Instrument: ICPMS05** **Method: SW6020**

MSD Sample ID: **HS19010377-01MSD** Units: **mg/L** Analysis Date: **22-Jan-2019 13:37**
Client ID: Run ID: **ICPMS05_331472** SeqNo: **4919491** PrepDate: **17-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05232	0.00200	0.05	0.000102	104	80 - 120	0.05285	1.02	20	
Arsenic	0.05361	0.00200	0.05	0.000548	106	80 - 120	0.05546	3.38	20	
Cadmium	0.05132	0.00200	0.05	0.000022	103	80 - 120	0.05224	1.78	20	
Calcium	604.8	0.500	5	594.2	213	80 - 120	605.6	0.125	20	SEO
Iron	5.21	0.200	5	0.7894	88.4	80 - 120	5.336	2.39	20	
Magnesium	101.7	0.200	5	96.74	98.3	80 - 120	102.7	1.03	20	O
Potassium	16.17	0.200	5	10.8	107	80 - 120	16.41	1.47	20	
Selenium	0.05839	0.00200	0.05	0.000361	116	80 - 120	0.06129	4.85	20	
Sodium	249	0.200	5	245.8	64.1	80 - 120	251.2	0.881	20	SEO

MSD Sample ID: **HS19010377-01MSD** Units: **mg/L** Analysis Date: **22-Jan-2019 15:27**
Client ID: Run ID: **ICPMS04_331465** SeqNo: **4919860** PrepDate: **17-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.05028	0.00200	0.05	0.000085	100	80 - 120	0.04976	1.05	20	

PDS Sample ID: **HS19010377-01PDS** Units: **mg/L** Analysis Date: **22-Jan-2019 13:39**
Client ID: Run ID: **ICPMS05_331472** SeqNo: **4919492** PrepDate: **17-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09813	0.00200	0.1	0.000102	98.0	75 - 125				
Arsenic	0.1068	0.00200	0.1	0.000548	106	75 - 125				
Cadmium	0.1016	0.00200	0.1	0.000022	102	75 - 125				
Iron	10.16	0.200	10	0.7894	93.7	75 - 125				
Magnesium	103.1	0.200	10	96.74	63.2	75 - 125				SO
Potassium	21.19	0.200	10	10.8	104	75 - 125				
Selenium	0.1133	0.00200	0.1	0.000361	113	75 - 125				

PDS Sample ID: **HS19010377-01PDS** Units: **mg/L** Analysis Date: **22-Jan-2019 15:13**
Client ID: Run ID: **ICPMS05_331472** SeqNo: **4919907** PrepDate: **17-Jan-2019** DF: **20**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	704.6	10.0	200	533	85.8	75 - 125				
Sodium	415.7	4.00	200	223.4	96.2	75 - 125				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010657

QC BATCH REPORT

Batch ID: 136718 **Instrument: ICPMS05** **Method: SW6020**

PDS Sample ID: **HS19010377-01PDS** Units: **mg/L** Analysis Date: **22-Jan-2019 15:29**
Client ID: Run ID: **ICPMS04_331465** SeqNo: **4919861** PrepDate: **17-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.1012	0.00200	0.1	0.000085	101	75 - 125				

SD Sample ID: **HS19010377-01SD** Units: **mg/L** Analysis Date: **22-Jan-2019 13:33**
Client ID: Run ID: **ICPMS05_331472** SeqNo: **4919489** PrepDate: **17-Jan-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000102	0	10	
Arsenic	U	0.0100					0.000548	0	10	
Cadmium	U	0.0100					0.000022	0	10	
Iron	0.7824	1.00					0.7894	0	10	J
Magnesium	94.9	1.00					96.74	1.9	10	
Potassium	10.86	1.00					10.8	0.567	10	
Selenium	U	0.0100					0.000361	0	10	

SD Sample ID: **HS19010377-01SD** Units: **mg/L** Analysis Date: **22-Jan-2019 15:11**
Client ID: Run ID: **ICPMS05_331472** SeqNo: **4919906** PrepDate: **17-Jan-2019** DF: **100**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	531.3	50.0					533	0.325	10	
Sodium	233	20.0					223.4	4.28	10	

SD Sample ID: **HS19010377-01SD** Units: **mg/L** Analysis Date: **22-Jan-2019 15:22**
Client ID: Run ID: **ICPMS04_331465** SeqNo: **4919858** PrepDate: **17-Jan-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Lead	U	0.0100					0.000085	0	10	

The following samples were analyzed in this batch:

HS19010657-01	HS19010657-02	HS19010657-03	HS19010657-04
HS19010657-05	HS19010657-06	HS19010657-07	HS19010657-08
HS19010657-09	HS19010657-10		

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19010657**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19010657

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19010657-01	20190108-FD-PV10out-controlT	Login	1/15/2019 6:46:43 PM	PJM	MET050
HS19010657-02	20190108-FD-PV10out-30T	Login	1/15/2019 6:46:43 PM	PJM	MET050
HS19010657-03	20190108-FD-PV10out-35T	Login	1/15/2019 6:46:43 PM	PJM	MET050
HS19010657-04	20190108-FD-PV10out-40T	Login	1/15/2019 6:46:43 PM	PJM	MET050
HS19010657-05	20190109-FD-PV10inlet-controlT	Login	1/15/2019 6:46:43 PM	PJM	MET050
HS19010657-06	20190109-FD-PV10inlet-30-35-40T	Login	1/15/2019 6:46:43 PM	PJM	MET050
HS19010657-07	20190110-FD-PV10mid-controlT	Login	1/15/2019 6:46:43 PM	PJM	MET050
HS19010657-08	20190110-FD-PV10mid-30T	Login	1/15/2019 6:46:43 PM	PJM	MET050
HS19010657-09	20190110-FD-PV10mid-35T	Login	1/15/2019 6:46:43 PM	PJM	MET050
HS19010657-10	20190110-FD-PV10mid-40T	Login	1/15/2019 6:46:43 PM	PJM	MET050

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19010657
Date/Time Received: **15-Jan-2019 08:50**
Received by: **JRM**

Checklist completed by: *Pablo Marinez* eSignature 15-Jan-2019 Date
Reviewed by: *Dane J. Wacasey* eSignature 21-Jan-2019 Date

Matrices: **WATER**
Carrier name: **FedEx International Priority**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☐	No ☑	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	4.0C/4.4C UC/C	IR # 11	
Cooler(s)/Kit(s):	43317		
Date/Time sample(s) sent to storage:	1/15/19 19:00		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070

Chain of Custody Form

Page ____ of ____

COC ID: 194453

HS19010657

Golder Associates
Exide Column Studies

Customer Information		Project Information		ALS Project Manager:
Purchase Order	130-2086-06	Project Name	Exide Column Studies	
Work Order		Project Number	130-2086	
Company Name	Golder Associates	Bill To Company	Golder Associates	
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P	
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit	
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021	
Phone	(314) 984-8800	Phone	(314) 984-8800	
Fax		Fax		
e-Mail Address	Emily_White@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com	

A	300_W (300 Cl, SO4, [*NO3* *48hr HT*])
B	TDS_W 2540C (2540C TDS)
C	ALK_W 2320B (2320B Alkalinity)
D	HARD (2340B Hardness (calc))
E	ICP_TW (6020A Total Metals (6)+Cations)
F	ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
G	
H	
I	
J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190108-FD-PV10out-control T	2019/01/08	10:10	GW	2	1				X	X						
2	20190108-FD-PV10out-30T	"	"	"	2	1				X	X						
3	20190108-FD-PV10out-35T	"	"	"	2	1				X	X						
4	20190108-FD-PV10out-40T	"	"	"	2	1				X	X						
5	20190109-FD-PV10inlet-control T	2019/01/09	13:15	"	2	1				X	X						
6	20190109-FD-PV10inlet-30-35-40T	"	"	"	2	1				X	X						
7	20190110-FD-PV10mid-control T	2019/01/10	16:45	"	2	1				X	X						
8	20190110-FD-PV10mid-30T	"	"	"	2	1				X	X						
9	20190110-FD-PV10mid-35T	"	"	"	2	1				X	X						
10	20190110-FD-PV10mid-40T	"	"	"	2	1				X	X						

Sampler(s) Please Print & Sign

Shipment Method

Required Turnaround Time: (Check Box) ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other ____

Results Due Date:

Relinquished by:	Date:	Time:	Received by:	
Relinquished by:	Date:	Time:	Received by (Laboratory): SM 03:50	01/15/19
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	

Notes: Exide Column Studies

Cooler ID	Cooler Temp.
43317	4.0

QC Package: (Check One Box Below)

☐ Level II Std QC
☐ Level III Std QC/Raw Data
☐ Level IV SW846/CLP
☐ Other
☒ TRRP Checklist
☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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ORIGIN ID:YULA (514) 383-0990
Audrey Elheves
Golder Associates Ltd
7250 rue du Mile End
3e etage
MONTREAL, PQ H2R3A4
CANADA, CA

Ship Date: 14JAN19
ActWgt: 21.50 LB
CAD: 106680724/INET4042

BILL RECIPIENT
EIN/VAT:

TO Dane Wacasey
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

(281) 530-5656

FedEx Express

(US)

AWB

E

TRK# 7741 8624 2354 Form 0430

NH SGRA

PKG:YOUR PKG

10:30A
INTL PRIORITY

REF:
DESC1:Bouteille d'eau
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: Audrey Elheves
T/C: R 967654812
D/T: R 967654812

COPIE DU DESTINATAIRE - VEUILLEZ LA GLISSER DANS LA POCHETTE

Après l'impression de cette étiquette :
COPIE DU BORDEREAU FEDEX - VEUILLEZ LA PLACER DERRIÈRE LA COPIE DU DESTINATAIRE
1. Pliez la page imprimée le long de la ligne horizontale.
2. Placez l'étiquette dans la pochette d'expédition et fixez-la à votre paquet.

ALS 10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887 U3317	CUSTODY SEAL Date: 2019/01/14 Time: 15:30 Name: Jacques Tauzer Company: Golder Associates	Seal Broken By: SM Date: 01/15/19

U3317

JAN 15 2019

ALS 10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887 U3317	CUSTODY SEAL Date: 2019/01/14 Time: 15:30 Name: Jacques Tauzer Company: Golder Associates	Seal Broken By: SM Date: 01/15/19

FedEx
TRK# 0430 7741 8624 2354

NH SGRA

OA
INTL PRIORITY CLR
CLR
77099
TX-US
IAH

5062794 IND 01/15 547G2/074C/53C1

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

January 23, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19010658**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 2 sample(s) on Jan 15, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19010658**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS19010658**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data								
Laboratory Name: ALS Laboratory Group			LRC Date: 01/22/2019					
Project Name: Exide Column Studies			Laboratory Job Number: HS19010658					
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 136717,136804,R331521					
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]	
R1	OI	**Chain-of-custody (C-O-C)**						
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X					
		Were all departures from standard conditions described in an exception report?	X					
R2	OI	**Sample and quality control (QC) identification**						
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X					
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X					
R3	OI	**Test reports**						
		Were all samples prepared and analyzed within holding times?	X					
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X					
		Were calculations checked by a peer or supervisor?	X					
		Were all analyte identifications checked by a peer or supervisor?	X					
		Were sample detection limits reported for all analytes not detected?	X					
		Were all results for soil and sediment samples reported on a dry weight basis?			X			
		Were % moisture (or solids) reported for all soil and sediment samples?			X			
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?						
		If required for the project, TICs reported?			X			
R4	O	**Surrogate recovery data**						
		Were surrogates added prior to extraction?			X			
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X			
R5	OI	**Test reports/summary forms for blank samples**						
		Were appropriate type(s) of blanks analyzed?	X					
		Were blanks analyzed at the appropriate frequency?	X					
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X					
		Were blank concentrations < MQL?	X					
R6	OI	**Laboratory control samples (LCS):**						
		Were all COCs included in the LCS?	X					
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X					
		Were LCSs analyzed at the required frequency?	X					
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X					
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X					
		Was the LCSD RPD within QC limits?	X					
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**						
		Were the project/method specified analytes included in the MS and MSD?	X					
		Were MS/MSD analyzed at the appropriate frequency?	X					
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1	
		Were MS/MSD RPDs within laboratory QC limits?	X					
R8	OI	**Analytical duplicate data**						
		Were appropriate analytical duplicates analyzed for each matrix?			X			
		Were analytical duplicates analyzed at the appropriate frequency?			X			
		Were RPDs or relative standard deviations within the laboratory QC limits?			X			
R9	OI	**Method quantitation limits (MQLs):**						
		Are the MQLs for each method analyte included in the laboratory data package?	X					
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X					
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X					
R10	OI	**Other problems/anomalies**						
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X					
		Were all necessary corrective actions performed for the reported data?	X					
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X					
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X					

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 01/22/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19010658				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 136717,136804,R331521				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			2
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports		
Laboratory Name: ALS Laboratory Group		LRC Date: 01/22/2019
Project Name: Exide Column Studies		Laboratory Job Number: HS19010658
Reviewer Name: Dane Wacasey		Prep Batch Number(s): 136717,136804,R331521
ER#[5]	**Description**	
1	Batch 136717, Metals Method SW6020, sample HS19010627-01, MS and MSD were performed on unrelated sample. Batch 136804, Metals Method SW6020, sample HS19010655-01, MS and MSD were performed on unrelated sample.	
2	See Run Log and CCB Exceptions Report.	

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010658
Start Date: 21-Jan-2019 End Date: 21-Jan-2019

Run ID:ICPMS05_331390
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ZZZZZZSD	5	21-Jan-2019 22:43	243SMPL.d	AS CD FE K MG PB SB SE
ZZZZZZMS	1	21-Jan-2019 22:45	244SMPL.d	AS CA CD FE K MG NA SB SE
ZZZZZZMSD	1	21-Jan-2019 22:47	245SMPL.d	AS CA CD FE K MG NA SB SE
ZZZZZZPDS	1	21-Jan-2019 22:49	246SMPL.d	AS CD FE K MG PB SB SE
CCV 18	1	21-Jan-2019 22:51	247_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 18	1	21-Jan-2019 22:53	248_CCB.d	AS CA CD FE K MG NA PB SB SE
20190109-FD-PV10out-40D-DUP	1	21-Jan-2019 23:13	258SMPL.d	CD FE K MG SB SE
CCV 19	1	21-Jan-2019 23:15	259_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 19	1	21-Jan-2019 23:17	260_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 20	1	21-Jan-2019 23:39	271_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 20	1	21-Jan-2019 23:41	272_CCB.d	AS CA CD FE K MG NA PB SB SE
LLCCV5	1	21-Jan-2019 23:47	275LICV.d	CD FE K MG SB SE
LLCCV2	1	21-Jan-2019 23:49	276SMPL.d	CD FE K MG SB SE
ICSA	1	21-Jan-2019 23:51	277ICSA.d	CD FE K MG SB SE
ICSAB	1	21-Jan-2019 23:53	278ICSB.d	CD FE K MG SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010658

Run ID:ICPMS05_331390
Instrument:ICPMS05
Method:SW6020

CCB 15	Date: 21-Jan-2019 21:16	Seq: 4917905	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.045	0.4	2	
Potassium	33.11	18	200	
Sodium	76.62	14	200	

ICCB 16	Date: 21-Jan-2019 22:29	Seq: 4918276	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Arsenic	-0.878	0.4	2	
Calcium	40.02	34	500	

CCB 17	Date: 21-Jan-2019 22:39	Seq: 4918281	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.722	0.4	2	
Arsenic	-1.478	0.4	2	

CCB 18	Date: 21-Jan-2019 22:53	Seq: 4918288	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.086	0.4	2	
Arsenic	0.903	0.4	2	
Sodium	122.2	14	200	

CCB 19	Date: 21-Jan-2019 23:17	Seq: 4918309	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.737	0.4	2	
Arsenic	4.846	0.4	2	
Iron	18.31	12	200	
Potassium	64.62	18	200	
Sodium	239.2	14	200	

CCB 20	Date: 21-Jan-2019 23:41	Seq: 4918321	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.66	0.4	2	
Arsenic	9.191	0.4	2	
Calcium	48.06	34	500	
Potassium	54.39	18	200	
Sodium	112.8	14	200	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010658
Start Date: 22-Jan-2019 End Date: 23-Jan-2019

Run ID:ICPMS05_331472
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	22-Jan-2019 12:12	016_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	22-Jan-2019 12:14	017SMPL.d	AS CA CD FE K MG NA PB SB SE
LLICV5	1	22-Jan-2019 12:16	018LICV.d	AS CA CD FE K MG NA PB SB SE
ICB	1	22-Jan-2019 12:18	019_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	22-Jan-2019 12:29	021ICSA.d	AS CA CD FE K MG NA PB SB SE
ICSAB	1	22-Jan-2019 12:31	022ICSB.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZPDS	20	22-Jan-2019 12:43	026SMPL.d	CA NA
CCV 1	1	22-Jan-2019 12:49	029_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	22-Jan-2019 12:51	030_CCB.d	AS CA CD FE K MG NA PB SB SE
20190109-FD-PV10out-40D-DUP	20	22-Jan-2019 13:07	038SMPL.d	CA NA
CCV 2	1	22-Jan-2019 13:09	039_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	22-Jan-2019 13:11	040_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	22-Jan-2019 13:46	051_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	22-Jan-2019 13:50	052_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	22-Jan-2019 14:12	063_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	22-Jan-2019 14:22	066_CCB.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZSD	100	22-Jan-2019 14:40	075SMPL.d	CA NA
CCV 5	1	22-Jan-2019 14:44	077_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	22-Jan-2019 14:46	078_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	22-Jan-2019 15:23	089_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	22-Jan-2019 15:25	090_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	22-Jan-2019 15:46	099_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	22-Jan-2019 15:48	100_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 8	1	22-Jan-2019 16:19	115_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV5	1	22-Jan-2019 16:21	116LICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	22-Jan-2019 16:23	117SMPL.d	AS CA CD FE K MG NA PB SB SE
ICCB 8	1	22-Jan-2019 16:25	118_ICB.d	AS CA CD FE K MG NA PB SB SE
MBLK-136717	1	22-Jan-2019 16:33	120SMPL.d	AS CA CD FE K MG NA PB SB SE
LCS-136717	1	22-Jan-2019 16:35	121SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZSD	5	22-Jan-2019 16:39	123SMPL.d	AS CA CD FE K MG PB SB SE
ZZZZZZMS	1	22-Jan-2019 16:41	124SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZMSD	1	22-Jan-2019 16:42	125SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZPDS	1	22-Jan-2019 16:44	126SMPL.d	AS CA CD FE K MG PB SB SE
CCV 9	1	22-Jan-2019 16:48	128_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	22-Jan-2019 16:50	129_CCB.d	AS CA CD FE K MG NA PB SB SE
20190109-FD-PV10out-40T-DUP	1	22-Jan-2019 17:00	133SMPL.d	AS CD FE K MG PB SB SE
CCV 10	1	22-Jan-2019 17:06	135_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	22-Jan-2019 17:08	136_CCB.d	AS CA CD FE K MG NA PB SB SE
20190109-FD-PV10out-40T-DUP	20	22-Jan-2019 17:14	139SMPL.d	CA NA
ZZZZZZSD	250	22-Jan-2019 17:18	141SMPL.d	NA
ZZZZZZPDS	50	22-Jan-2019 17:20	142SMPL.d	NA
CCV 11	1	22-Jan-2019 17:28	146_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	22-Jan-2019 17:30	147_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 12	1	22-Jan-2019 17:44	154_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 12	1	22-Jan-2019 17:46	155_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 13	1	22-Jan-2019 18:08	166_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 13	1	22-Jan-2019 18:10	167_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 14	1	22-Jan-2019 18:26	174_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 14	1	22-Jan-2019 18:28	175_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 15	1	22-Jan-2019 18:40	177_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 16	1	22-Jan-2019 19:03	187_CCV.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010658

Run ID:ICPMS05_331472
Instrument:ICPMS05
Method:SW6020

CCB 1	Date: 22-Jan-2019 12:51	Seq: 4919350	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	24.35	18	200	
Sodium	22.43	14	200	

CCB 2	Date: 22-Jan-2019 13:11	Seq: 4919360	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	21.68	14	200	

CCB 3	Date: 22-Jan-2019 13:46	Seq: 4919495	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	44.97	34	500	
Sodium	59.02	14	200	

CCB 4	Date: 22-Jan-2019 14:22	Seq: 4919580	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	120.6	14	200	

CCB 5	Date: 22-Jan-2019 14:46	Seq: 4919749	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	34.48	34	500	
Potassium	21.82	18	200	
Sodium	64.24	14	200	

CCB 6	Date: 22-Jan-2019 15:25	Seq: 4919913	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	40.21	14	200	

CCB 7	Date: 22-Jan-2019 15:48	Seq: 4919923	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	33.92	14	200	

CCB 9	Date: 22-Jan-2019 16:50	Seq: 4920130	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	39.64	34	500	
Potassium	19.9	18	200	
Sodium	226	14	200	

CCB 10	Date: 22-Jan-2019 17:08	Seq: 4920137	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	37.3	34	500	
Potassium	40.05	18	200	
Sodium	169.9	14	200	

CCB 11	Date: 22-Jan-2019 17:30	Seq: 4920175	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	37.96	34	500	
Potassium	38.89	18	200	
Sodium	61.34	14	200	

CCB 12	Date: 22-Jan-2019 17:46	Seq: 4920292	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	48.29	34	500	
Potassium	44.37	18	200	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19010658

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19010658-01	20190109-FD-PV10out-40T-DUP	GW		09-Jan-2019 11:30	15-Jan-2019 08:50	☐
HS19010658-02	20190109-FD-PV10out-40D-DUP	GW		09-Jan-2019 11:30	15-Jan-2019 08:50	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190109-FD-PV10out-40T-DUP
Collection Date: 09-Jan-2019 11:30

ANALYTICAL REPORT
WorkOrder:HS19010658
Lab ID:HS19010658-01
Matrix:GW

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**542**		**2.00**	**2.00**	**mg/L**	1	22-Jan-2019 16:03
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 17-Jan-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	22-Jan-2019 17:00
Arsenic	**0.000463**	J	**0.000400**	**0.00200**	**mg/L**	1	22-Jan-2019 17:00
Cadmium	U		0.000200	0.00200	mg/L	1	22-Jan-2019 17:00
Calcium	**215**		**0.680**	**10.0**	**mg/L**	20	22-Jan-2019 17:14
Iron	**0.0172**	J	**0.0120**	**0.200**	**mg/L**	1	22-Jan-2019 17:00
Lead	U		0.000600	0.00200	mg/L	1	22-Jan-2019 17:00
Magnesium	**1.22**		**0.0100**	**0.200**	**mg/L**	1	22-Jan-2019 17:00
Potassium	**13.7**		**0.0180**	**0.200**	**mg/L**	1	22-Jan-2019 17:00
Selenium	U		0.00110	0.00200	mg/L	1	22-Jan-2019 17:00
Sodium	**287**		**0.280**	**4.00**	**mg/L**	20	22-Jan-2019 17:14

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190109-FD-PV10out-40D-DUP
Collection Date: 09-Jan-2019 11:30

ANALYTICAL REPORT
WorkOrder:HS19010658
Lab ID:HS19010658-02
Matrix:GW

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 18-Jan-2019		Analyst: ALR
Antimony	U		0.000400	0.00200	mg/L	1	21-Jan-2019 23:13
Arsenic	U		0.000400	0.00200	mg/L	1	22-Jan-2019 14:43
Cadmium	U		0.000200	0.00200	mg/L	1	21-Jan-2019 23:13
Calcium	**197**		**0.680**	**10.0**	**mg/L**	20	22-Jan-2019 13:07
Iron	**0.302**		**0.0120**	**0.200**	**mg/L**	1	21-Jan-2019 23:13
Lead	U		0.000600	0.00200	mg/L	1	22-Jan-2019 14:43
Magnesium	**1.14**		**0.0100**	**0.200**	**mg/L**	1	21-Jan-2019 23:13
Potassium	**13.8**		**0.0180**	**0.200**	**mg/L**	1	21-Jan-2019 23:13
Selenium	**0.00483**		**0.00110**	**0.00200**	**mg/L**	1	21-Jan-2019 23:13
Sodium	**268**		**0.280**	**4.00**	**mg/L**	20	22-Jan-2019 13:07

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010658

Batch ID: 136717 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19010658-01	1	10	10 (mL)	1

Batch ID: 136804 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19010658-02	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010658

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 136717	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** GW		
HS19010658-01	20190109-FD-PV10out-40T-DUP	09 Jan 2019 11:30		17 Jan 2019 08:30	22 Jan 2019 17:14	20
HS19010658-01	20190109-FD-PV10out-40T-DUP	09 Jan 2019 11:30		17 Jan 2019 08:30	22 Jan 2019 17:00	1
Batch ID 136804	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** GW		
HS19010658-02	20190109-FD-PV10out-40D-DUP	09 Jan 2019 11:30		18 Jan 2019 10:00	22 Jan 2019 14:43	1
HS19010658-02	20190109-FD-PV10out-40D-DUP	09 Jan 2019 11:30		18 Jan 2019 10:00	22 Jan 2019 13:07	20
HS19010658-02	20190109-FD-PV10out-40D-DUP	09 Jan 2019 11:30		18 Jan 2019 10:00	21 Jan 2019 23:13	1
Batch ID R331521	**Test Name :** HARDNESS, TOTAL AS CACO3 BY SM2340B			**Matrix:** GW		
HS19010658-01	20190109-FD-PV10out-40T-DUP	09 Jan 2019 11:30			22 Jan 2019 16:03	1

WorkOrder: HS19010658
InstrumentID: MISC-Metals
Test Code: HARD
Test Number: M2340 B
Test Name: Hardness, Total as CaCO3 by

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Hardness (As CaCO3)	HARD	0	0	2.00	2.00

WorkOrder: HS19010658
InstrumentID: ICPMS05
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000555	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000554	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0537	0.0340	0.500
A	Iron	7439-89-6	0.0500	0.0549	0.0120	0.200
A	Magnesium	7439-95-4	0.0500	0.0680	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0542	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00280	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0459	0.0140	0.200

WorkOrder: HS19010658
InstrumentID: ICPMS04
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Arsenic	7440-38-2	0.000500	0.000340	0.000400	0.00200
A	Lead	7439-92-1	0.00100	0.000916	0.000600	0.00200

WorkOrder: HS19010658
InstrumentID: ICPMS05
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000555	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000460	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000554	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0537	0.0340	0.500
A	Iron	7439-89-6	0.0500	0.0549	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.00100	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0680	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0542	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00280	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0459	0.0140	0.200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010658

QC BATCH REPORT

Batch ID: 136717 **Instrument: ICPMS05** **Method: SW6020**

MBLK Sample ID: **MBLK-136717** Units: **mg/L** Analysis Date: **22-Jan-2019 16:33**
Client ID: Run ID: **ICPMS05_331472** SeqNo: **4920121** PrepDate: **17-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	U	0.200								
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	U	0.200								

LCS Sample ID: **LCS-136717** Units: **mg/L** Analysis Date: **22-Jan-2019 16:35**
Client ID: Run ID: **ICPMS05_331472** SeqNo: **4920122** PrepDate: **17-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04974	0.00200	0.05	0	99.5	80 - 120				
Arsenic	0.05211	0.00200	0.05	0	104	80 - 120				
Cadmium	0.05429	0.00200	0.05	0	109	80 - 120				
Calcium	5.553	0.500	5	0	111	80 - 120				
Iron	5.355	0.200	5	0	107	80 - 120				
Lead	0.05367	0.00200	0.05	0	107	80 - 120				
Magnesium	5.461	0.200	5	0	109	80 - 120				
Potassium	5.353	0.200	5	0	107	80 - 120				
Selenium	0.05346	0.00200	0.05	0	107	80 - 120				
Sodium	5.421	0.200	5	0	108	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010658

QC BATCH REPORT

Batch ID: 136717 **Instrument: ICPMS05** **Method: SW6020**

MS Sample ID: **HS19010627-01MS** Units: **mg/L** Analysis Date: **22-Jan-2019 16:41**
Client ID: Run ID: **ICPMS05_331472** SeqNo: **4920125** PrepDate: **17-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04832	0.00200	0.05	0	96.6	80 - 120				
Arsenic	0.05757	0.00200	0.05	0.003203	109	80 - 120				
Cadmium	0.05318	0.00200	0.05	0.000374	106	80 - 120				
Calcium	37.83	0.500	5	31.76	121	80 - 120				SO
Iron	5.312	0.200	5	0	106	80 - 120				
Lead	0.04375	0.00200	0.05	0	87.5	80 - 120				
Magnesium	5.804	0.200	5	0.2444	111	80 - 120				
Potassium	27.61	0.200	5	22.27	107	80 - 120				O
Selenium	0.0603	0.00200	0.05	0.005057	110	80 - 120				
Sodium	578.6	0.200	5	572.4	123	80 - 120				SEO

MSD Sample ID: **HS19010627-01MSD** Units: **mg/L** Analysis Date: **22-Jan-2019 16:42**
Client ID: Run ID: **ICPMS05_331472** SeqNo: **4920126** PrepDate: **17-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04828	0.00200	0.05	0	96.6	80 - 120	0.04832	0.0807	20	
Arsenic	0.0581	0.00200	0.05	0.003203	110	80 - 120	0.05757	0.92	20	
Cadmium	0.05351	0.00200	0.05	0.000374	106	80 - 120	0.05318	0.628	20	
Calcium	38.2	0.500	5	31.76	129	80 - 120	37.83	0.965	20	SO
Iron	5.346	0.200	5	0	107	80 - 120	5.312	0.654	20	
Lead	0.04683	0.00200	0.05	0	93.7	80 - 120	0.04375	6.81	20	
Magnesium	5.784	0.200	5	0.2444	111	80 - 120	5.804	0.337	20	
Potassium	28.8	0.200	5	22.27	131	80 - 120	27.61	4.22	20	SO
Selenium	0.06142	0.00200	0.05	0.005057	113	80 - 120	0.0603	1.83	20	
Sodium	593.2	0.200	5	572.4	416	80 - 120	578.6	2.5	20	SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010658

QC BATCH REPORT

Batch ID: 136717 **Instrument: ICPMS05** **Method: SW6020**

PDS Sample ID: **HS19010627-01PDS** Units: **mg/L** Analysis Date: **22-Jan-2019 16:44**
Client ID: Run ID: **ICPMS05_331472** SeqNo: **4920127** PrepDate: **17-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.08712	0.00200	0.1	0.000254	86.9	75 - 125				
Arsenic	0.1073	0.00200	0.1	0.003203	104	75 - 125				
Cadmium	0.1023	0.00200	0.1	0.000374	102	75 - 125				
Calcium	40.58	0.500	10	31.76	88.2	75 - 125				
Iron	10.15	0.200	10	0.003686	102	75 - 125				
Lead	0.08872	0.00200	0.1	0.000038	88.7	75 - 125				
Magnesium	10.96	0.200	10	0.2444	107	75 - 125				
Potassium	32.69	0.200	10	22.27	104	75 - 125				
Selenium	0.1112	0.00200	0.1	0.005057	106	75 - 125				

PDS Sample ID: **HS19010627-01PDS** Units: **mg/L** Analysis Date: **22-Jan-2019 17:20**
Client ID: Run ID: **ICPMS05_331472** SeqNo: **4920163** PrepDate: **17-Jan-2019** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	1151	10.0	500	602.6	110	75 - 125				

SD Sample ID: **HS19010627-01SD** Units: **mg/L** Analysis Date: **22-Jan-2019 16:39**
Client ID: Run ID: **ICPMS05_331472** SeqNo: **4920124** PrepDate: **17-Jan-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000254	0	10	
Arsenic	0.003007	0.0100					0.003203	0	10	J
Cadmium	U	0.0100					0.000374	0	10	
Calcium	33.46	2.50					31.76	5.36	10	
Iron	U	1.00					0.003686	0	10	
Lead	U	0.0100					0.000038	0	10	
Magnesium	0.2482	1.00					0.2444	0	10	J
Potassium	23.8	1.00					22.27	6.9	10	
Selenium	0.006942	0.0100					0.005057	0	10	J

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010658

QC BATCH REPORT

Batch ID: 136717 **Instrument: ICPMS05** **Method: SW6020**

SD Sample ID: **HS19010627-01SD** Units: **mg/L** Analysis Date: **22-Jan-2019 17:18**
Client ID: Run ID: **ICPMS05_331472** SeqNo: **4920162** PrepDate: **17-Jan-2019** DF: **250**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Sodium	656.5	50.0					602.6	8.94	10	

The following samples were analyzed in this batch: HS19010658-01

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010658

QC BATCH REPORT

Batch ID: 136804 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLKF1-136804** Units: **mg/L** Analysis Date: **21-Jan-2019 22:31**
Client ID: Run ID: **ICPMS05_331390** SeqNo: **4918277** PrepDate: **18-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	U	0.200								
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	U	0.200								

MBLK Sample ID: **MBLK-136804** Units: **mg/L** Analysis Date: **21-Jan-2019 22:33**
Client ID: Run ID: **ICPMS05_331390** SeqNo: **4918278** PrepDate: **18-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	0.000934	0.00200								J
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	U	0.200								
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	U	0.200								

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010658

QC BATCH REPORT

Batch ID: 136804 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

LCS Sample ID: **LCS-136804** Units: **mg/L** Analysis Date: **21-Jan-2019 22:35**
Client ID: Run ID: **ICPMS05_331390** SeqNo: **4918279** PrepDate: **18-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05145	0.00200	0.05	0	103	80 - 120				
Arsenic	0.04801	0.00200	0.05	0	96.0	80 - 120				
Cadmium	0.05346	0.00200	0.05	0	107	80 - 120				
Calcium	5.506	0.500	5	0	110	80 - 120				
Iron	5.34	0.200	5	0	107	80 - 120				
Lead	0.05316	0.00200	0.05	0	106	80 - 120				
Magnesium	5.575	0.200	5	0	111	80 - 120				
Potassium	5.412	0.200	5	0	108	80 - 120				
Selenium	0.05249	0.00200	0.05	0	105	80 - 120				
Sodium	5.432	0.200	5	0	109	80 - 120				

MS Sample ID: **HS19010655-01MS** Units: **mg/L** Analysis Date: **21-Jan-2019 22:45**
Client ID: Run ID: **ICPMS05_331390** SeqNo: **4918284** PrepDate: **18-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.08901	0.00200	0.05	0.03504	108	75 - 125				
Arsenic	0.061	0.00200	0.05	0.00565	111	75 - 125				
Cadmium	0.05461	0.00200	0.05	0	109	75 - 125				
Calcium	219.9	0.500	5	209	217	75 - 125				SEO
Iron	5.388	0.200	5	0.06976	106	75 - 125				
Magnesium	6.746	0.200	5	1.32	109	75 - 125				
Potassium	19.33	0.200	5	13.18	123	75 - 125				
Selenium	0.06344	0.00200	0.05	0.008894	109	75 - 125				
Sodium	294.6	0.200	5	278	331	75 - 125				SEO

MS Sample ID: **HS19010655-01MS** Units: **mg/L** Analysis Date: **22-Jan-2019 14:49**
Client ID: Run ID: **ICPMS04_331465** SeqNo: **4919658** PrepDate: **18-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.05085	0.00200	0.05	0	102	75 - 125				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010658

QC BATCH REPORT

Batch ID: 136804 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MSD Sample ID: **HS19010655-01MSD** Units: **mg/L** Analysis Date: **21-Jan-2019 22:47**
Client ID: Run ID: **ICPMS05_331390** SeqNo: **4918285** PrepDate: **18-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.08426	0.00200	0.05	0.03504	98.4	75 - 125	0.08901	5.49	20	
Arsenic	0.06143	0.00200	0.05	0.00565	112	75 - 125	0.061	0.691	20	
Cadmium	0.05381	0.00200	0.05	0	108	75 - 125	0.05461	1.48	20	
Calcium	219.8	0.500	5	209	215	75 - 125	219.9	0.0425	20	SEO
Iron	5.412	0.200	5	0.06976	107	75 - 125	5.388	0.438	20	
Magnesium	7.009	0.200	5	1.32	114	75 - 125	6.746	3.81	20	
Potassium	19.09	0.200	5	13.18	118	75 - 125	19.33	1.25	20	
Selenium	0.06216	0.00200	0.05	0.008894	107	75 - 125	0.06344	2.04	20	
Sodium	292.8	0.200	5	278	294	75 - 125	294.6	0.629	20	SEO

MSD Sample ID: **HS19010655-01MSD** Units: **mg/L** Analysis Date: **22-Jan-2019 13:53**
Client ID: Run ID: **ICPMS04_331465** SeqNo: **4919533** PrepDate: **18-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.05301	0.00200	0.05	0	106	75 - 125	0.05085	4.17	20	

PDS Sample ID: **HS19010655-01PDS** Units: **mg/L** Analysis Date: **21-Jan-2019 22:49**
Client ID: Run ID: **ICPMS05_331390** SeqNo: **4918286** PrepDate: **18-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1331	0.00200	0.1	0.03504	98.0	75 - 125				
Arsenic	0.1206	0.00200	0.1	0.00565	115	75 - 125				
Cadmium	0.1128	0.00200	0.1	0.000054	113	75 - 125				
Iron	11.18	0.200	10	0.06976	111	75 - 125				
Lead	0.08005	0.00200	0.1	0.000035	80.0	75 - 125				
Magnesium	13.01	0.200	10	1.32	117	75 - 125				
Potassium	25.12	0.200	10	13.18	119	75 - 125				
Selenium	0.1214	0.00200	0.1	0.008894	113	75 - 125				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19010658

QC BATCH REPORT

Batch ID: 136804 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

PDS Sample ID: **HS19010655-01PDS** Units: **mg/L** Analysis Date: **22-Jan-2019 12:43**
Client ID: Run ID: **ICPMS05_331472** SeqNo: **4919346** PrepDate: **18-Jan-2019** DF: **20**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	410.2	10.0	200	206.4	102	75 - 125				
Sodium	485.7	4.00	200	273.9	106	75 - 125				

SD Sample ID: **HS19010655-01SD** Units: **mg/L** Analysis Date: **21-Jan-2019 22:43**
Client ID: Run ID: **ICPMS05_331390** SeqNo: **4918283** PrepDate: **18-Jan-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	0.03488	0.0100					0.03504	0.468	10	
Arsenic	0.03988	0.0100					0.00565	0	10	
Cadmium	U	0.0100					0.000054	0	10	
Iron	0.3961	1.00					0.06976	0	10	J
Lead	U	0.0100					0.000035	0	10	
Magnesium	1.361	1.00					1.32	3.08	10	
Potassium	13.38	1.00					13.18	1.53	10	
Selenium	0.009823	0.0100					0.008894	0	10	J

SD Sample ID: **HS19010655-01SD** Units: **mg/L** Analysis Date: **22-Jan-2019 14:40**
Client ID: Run ID: **ICPMS05_331472** SeqNo: **4919746** PrepDate: **18-Jan-2019** DF: **100**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	210.7	50.0					206.4	2.08	10	
Sodium	278.7	20.0					273.9	1.76	10	

The following samples were analyzed in this batch: HS19010658-02

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19010658**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19010658
Date/Time Received: **15-Jan-2019 08:50**
Received by: **JRM**

Checklist completed by: *Pablo Marinez* eSignature 15-Jan-2019 Date
Reviewed by: *Dane J. Wacasey* eSignature 21-Jan-2019 Date

Matrices: **WATER**
Carrier name: **FedEx International Priority**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	4.0C/4.4C UC/C	IR # 11	
Cooler(s)/Kit(s):	43317		
Date/Time sample(s) sent to storage:	1/15/19 19:00		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Chain of Custody Form

ALS Environmental

Page ____ of ____

HS19010658
Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086	Project Name	Exide Column Studies	A	300_W (300 Cl, SO4, [*NO3* *48hr HT*])
Work Order		Project Number	130-2086	B	TDS_W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK_W 2320B (2320B Alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B Hardness (calc))
Address	13515 Barrett Parkway Drive Suite 260	Address	13515 Barrett Parkway Drive Suite 260	E	ICP_TW (6020A Total Metals (6)+Cations)
				F	ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	G	
Phone		Phone		H	
Fax		Fax		I	
e-Mail Address	Emily_White@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	~~20190109-FD-PVI00out-40T-DUP~~	~~2019/01/09~~	~~11:30~~	GW	2,8	3	X	X	X	X	X	X					
2	20190109-FD-PVI00out-40T-DUP	2019/01/09	11:30	GW	2	1			[illegible]	X	X		} 2 samples				
3	20190109-FD-PVI00out-40D-DUP	"	"									X					
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s): Please Print & Sign: [signature]

Shipment Method: FedEx

Required Turnaround Time: ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other ____

Results Due Date:

Relinquished by:	Date:	Time:	Received by:	Notes:
[signature]	2019/01/14	15:30		
Relinquished by:	Date:	Time:	Received by (Laboratory): JM 01/15/19 08:50	Cooler Temp. 4.0
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	

QC Package: (Check Box Below)

- Level II: Standard QC
- X TRRP-Checklist
- Level III: Std QC + Raw Data
- TRRP Level IV
- Level IV: SW846 CLP-Like
- Other: ____

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental. Cooler # 43317

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ORIGIN ID:YUXA (514) 383-0990
Audrey Ethèves
Golder Associates Ltd
7250 rue du Mile End
3e etage
MONTREAL, PQ H2R3A4
CANADA, CA

Ship Date: 14JAN19
ActWgt: 21.59 LB
CAD: 108680724/INET4042

BILL RECIPIENT
EIN/VAT:

TO Dane Wacasey
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

(281) 530-5656

(US)

FedEx Express

AWB

E

TRK# 7741 8624 2354 Form 0430

NH SGRA

PKG: YOUR PKG

10:30A
INTL PRIORITY

REF:
DESC1: Bouteille d'eau
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: Audrey Ethèves
T/C: R 967554812
D/T: R 967554812

[illegible]

COPIE DU DESTINATAIRE - VEUILLEZ LA GLISSER DANS LA POCHETTE

Après l'impression de cette étiquette :
COPIE DU BORDEREAU FEDEX - VEUILLEZ LA PLACER DERRIÈRE LA COPIE DU DESTINATAIRE
1. Pliez la page imprimée le long de la ligne horizontale.
2. Placez l'étiquette dans la pochette d'expédition et fixez-la à votre paquet.

ALS	CUSTODY SEAL	Seal Broken By:
ALS 10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887 43317	Date: 2019/01/14 Time: 3:30 Name: Sylvain Uauves Company: Golder Associates	SM Date: 01/15/19

43317 JAN 15 2019

ALS	CUSTODY SEAL	Seal Broken By:
ALS 10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887 43317	Date: 2019/01/14 Time: 15:30 Name: Sylvain Uauves Company: Golder Associates	SM Date: 01/15/19

FedEx
TRK# 0430 7741 8624 2354

NH SGRA

0A
INTL PRIORITY CLR
CLR
77099
TX-US
IAH

5062794 IND 01/15 547G2/D74C/53C1

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

February 04, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19011284**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 22 sample(s) on Jan 25, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DAYNA.FISHER
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19011284**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19011284**	

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 02/04/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19011284				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 137136, 137197, R332189				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?			X		
		Were analytical duplicates analyzed at the appropriate frequency?			X		
		Were RPDs or relative standard deviations within the laboratory QC limits?			X		
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				2
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 02/04/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19011284				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 137136, 137197, R332189				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			3
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		X			4
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports		
Laboratory Name: ALS Laboratory Group		LRC Date: 02/04/2019
Project Name: Exide Column Studies		Laboratory Job Number: HS19011284
Reviewer Name: Dane Wacasey		Prep Batch Number(s): 137136, 137197, R332189
ER#[5]	**Description**	
1	Batch 137136, Metals Method SW6020, sample HS19011117-18, MS and MSD were performed on unrelated sample.	
2	Batch 137136, Metals Method SW6020, samples 20190111-DGW-MW11-PV10out-controlT and 20190111-DGW-MW11-PV10out-30T Were analyzed at 5x dilution due to high concentration of Sodium.	
3	See Run Log and CCB Exceptions Report.	
4	Batch 137136, Metals Method SW6020, sample HS19011117-18, PDS was performed on unrelated sample Batch 137157, Metals Method SW6020, sample 20190111-DGW-MW11-PV10out-35T, PDS recovered below the control limit, however the result in the parent sample is greater than 4x the spike amount.	

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011284
Start Date: 30-Jan-2019 End Date: 30-Jan-2019

Run ID:ICPMS04_331931
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
CCV 16	1	30-Jan-2019 21:59	220_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 16	1	30-Jan-2019 22:02	221_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 17	1	30-Jan-2019 22:27	232_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 17	1	30-Jan-2019 22:29	233_CCB.d	AS CA CD FE K MG NA PB SB SE
20190111-DGW-MW11-PV10out-controlT	5	30-Jan-2019 22:38	237SMPL.d	AS CA CD FE K MG PB SB SE
20190111-DGW-MW11-PV10out-30T	5	30-Jan-2019 22:40	238SMPL.d	AS CA CD FE K MG PB SB SE
CCV 18	1	30-Jan-2019 22:49	242_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 18	1	30-Jan-2019 22:51	243_CCB.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	30-Jan-2019 22:54	244SMPL.d	AS CA CD FE K MG PB SB SE
LLICV5	1	30-Jan-2019 22:56	245LICV.d	AS CA CD FE K MG PB SB SE
ICSA	1	30-Jan-2019 22:58	246ICSA.d	AS CA CD FE K MG PB SB SE
ICSAB	1	30-Jan-2019 23:00	247ICSB.d	AS CA CD FE K MG PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011284

Run ID:ICPMS04_331931
Instrument:ICPMS04
Method:SW6020

CCB 10	Date: 30-Jan-2019 18:57	Seq: 4931342	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.434	0.4	2	
Potassium	73.08	18	200	
Sodium	52.76	14	200	

CCB 11	Date: 30-Jan-2019 19:24	Seq: 4931354	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	56.97	18	200	
Sodium	72.61	14	200	

CCB 12	Date: 30-Jan-2019 19:49	Seq: 4931365	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	-17.53	12	200	
Potassium	37.58	18	200	
Sodium	37.49	14	200	

CCB 13	Date: 30-Jan-2019 20:16	Seq: 4931377	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	51.44	18	200	
Sodium	93.56	14	200	

CCB 14	Date: 30-Jan-2019 20:43	Seq: 4931389	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	43.81	18	200	
Sodium	125.6	14	200	

ICCB 15	Date: 30-Jan-2019 21:23	Seq: 4931403	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	-14.26	12	200	
Sodium	-61.87	14	200	

CCB 16	Date: 30-Jan-2019 22:02	Seq: 4931415	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Magnesium	10.52	10	200	
Potassium	19.73	18	200	
Sodium	60.91	14	200	

CCB 17	Date: 30-Jan-2019 22:29	Seq: 4931427	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	12.43	12	200	
Magnesium	10.06	10	200	
Potassium	48.75	18	200	
Sodium	59.17	14	200	

CCB 18	Date: 30-Jan-2019 22:51	Seq: 4931437	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Magnesium	11.1	10	200	
Potassium	18.62	18	200	
Sodium	18.52	14	200	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011284
Start Date: 31-Jan-2019 End Date: 31-Jan-2019

Run ID:ICPMS04_332035
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	31-Jan-2019 12:10	018_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	31-Jan-2019 12:13	019SMPL.d	NA
LLICV5	1	31-Jan-2019 12:15	020LICV.d	NA
ICB	1	31-Jan-2019 12:17	021_ICB.d	AS CA CD FE K MG NA PB SB SE
ICV	1	31-Jan-2019 12:22	023_ICV.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	31-Jan-2019 12:54	025ICSA.d	NA
ICSAB	1	31-Jan-2019 12:56	026ICSB.d	NA
CCV 1	1	31-Jan-2019 13:33	038_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	31-Jan-2019 13:35	039_CCB.d	AS CA CD FE K MG NA PB SB SE
20190111-DGW-MW11-PV10out-controlT	50	31-Jan-2019 13:55	042SMPL.d	NA
20190111-DGW-MW11-PV10out-30T	50	31-Jan-2019 13:57	043SMPL.d	NA
CCV 2	1	31-Jan-2019 14:02	045_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	31-Jan-2019 14:04	046_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	31-Jan-2019 14:38	057_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	31-Jan-2019 14:40	058_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	31-Jan-2019 15:14	070_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	31-Jan-2019 15:41	072_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	31-Jan-2019 16:10	082_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	31-Jan-2019 16:12	083_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	31-Jan-2019 17:35	088_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	31-Jan-2019 17:38	089_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	31-Jan-2019 18:09	100_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	31-Jan-2019 18:11	101_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 8	1	31-Jan-2019 18:21	103_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	31-Jan-2019 19:11	114_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	31-Jan-2019 19:21	116_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 10	1	31-Jan-2019 19:32	121_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	31-Jan-2019 19:34	122_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 11	1	31-Jan-2019 19:59	133_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	31-Jan-2019 20:01	134_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 12	1	31-Jan-2019 20:26	145_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	31-Jan-2019 20:28	146_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 13	1	31-Jan-2019 20:50	156_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 12	1	31-Jan-2019 20:52	157_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 14	1	31-Jan-2019 21:20	169_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	31-Jan-2019 21:22	170SMPL.d	NA
LLCCV5	1	31-Jan-2019 21:24	171LICV.d	NA
ICCB 13	1	31-Jan-2019 21:27	172_ICB.d	AS CA CD FE K MG NA PB SB SE
CCV 15	1	31-Jan-2019 21:51	183_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 14	1	31-Jan-2019 21:53	184_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 16	1	31-Jan-2019 22:18	195_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 15	1	31-Jan-2019 22:20	196_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 17	1	31-Jan-2019 22:44	207_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 16	1	31-Jan-2019 22:46	208_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 18	1	31-Jan-2019 23:11	219_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 17	1	31-Jan-2019 23:14	220_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 19	1	31-Jan-2019 23:34	229_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 18	1	31-Jan-2019 23:36	230_CCB.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	31-Jan-2019 23:38	231SMPL.d	NA
LLICV5	1	31-Jan-2019 23:41	232LICV.d	NA

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011284

Run ID:ICPMS04_332035
Instrument:ICPMS04
Method:SW6020

CCB 1	Date: 31-Jan-2019 13:35	Seq: 4932292		D/F: 1	Units: ug/L
	Analyte		**Result**	**MDL**	**Report Limit**
	Sodium		33.2	14	200
CCB 2	Date: 31-Jan-2019 14:04	Seq: 4932429		D/F: 1	Units: ug/L
	Analyte		**Result**	**MDL**	**Report Limit**
	Sodium		29.82	14	200
CCB 3	Date: 31-Jan-2019 14:40	Seq: 4932532		D/F: 1	Units: ug/L
	Analyte		**Result**	**MDL**	**Report Limit**
	Sodium		20.88	14	200
CCB 8	Date: 31-Jan-2019 19:11	Seq: 4933466		D/F: 1	Units: ug/L
	Analyte		**Result**	**MDL**	**Report Limit**
	Sodium		74.33	14	200
CCB 9	Date: 31-Jan-2019 19:34	Seq: 4933474		D/F: 1	Units: ug/L
	Analyte		**Result**	**MDL**	**Report Limit**
	Sodium		58.51	14	200
CCB 12	Date: 31-Jan-2019 20:52	Seq: 4933534		D/F: 1	Units: ug/L
	Analyte		**Result**	**MDL**	**Report Limit**
	Sodium		-20.25	14	200
CCB 15	Date: 31-Jan-2019 22:20	Seq: 4933570		D/F: 1	Units: ug/L
	Analyte		**Result**	**MDL**	**Report Limit**
	Sodium		-20.84	14	200
CCB 16	Date: 31-Jan-2019 22:46	Seq: 4933582		D/F: 1	Units: ug/L
	Analyte		**Result**	**MDL**	**Report Limit**
	Sodium		-25.63	14	200
CCB 17	Date: 31-Jan-2019 23:14	Seq: 4933611		D/F: 1	Units: ug/L
	Analyte		**Result**	**MDL**	**Report Limit**
	Sodium		91.54	14	200
CCB 18	Date: 31-Jan-2019 23:36	Seq: 4933621		D/F: 1	Units: ug/L
	Analyte		**Result**	**MDL**	**Report Limit**
	Sodium		54.45	14	200

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011284
Start Date: 30-Jan-2019 End Date: 30-Jan-2019

Run ID:ICPMS05_331929
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	30-Jan-2019 12:01	016_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	30-Jan-2019 12:03	017SMPL.d	CA FE K MG NA
LLICV5	1	30-Jan-2019 12:05	018LICV.d	CA FE K MG NA
ICB	1	30-Jan-2019 12:07	019_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	30-Jan-2019 12:10	020ICSA.d	CA FE K MG NA
ICSAB	1	30-Jan-2019 12:12	021ICSB.d	CA FE K MG NA
CCV 1	1	30-Jan-2019 12:44	033_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	30-Jan-2019 12:46	034_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	30-Jan-2019 13:10	043_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	30-Jan-2019 13:12	044_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	30-Jan-2019 13:40	056_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	30-Jan-2019 13:42	057_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	30-Jan-2019 14:07	068_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	30-Jan-2019 14:10	069_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	30-Jan-2019 14:43	079_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	30-Jan-2019 14:45	080_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 6	1	30-Jan-2019 15:35	097_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	30-Jan-2019 15:38	098SMPL.d	CA FE K MG NA
LLCCV5	1	30-Jan-2019 15:40	099LICV.d	CA FE K MG NA
ICCB 6	1	30-Jan-2019 15:42	100_ICB.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	30-Jan-2019 16:14	110_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	30-Jan-2019 16:16	111_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 8	1	30-Jan-2019 16:45	122_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	30-Jan-2019 16:55	124_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-137197	1	30-Jan-2019 17:36	126SMPL.d	AS CA CD FE K MG NA PB SB SE
LCS-137197	1	30-Jan-2019 17:38	127SMPL.d	AS CA CD FE K MG NA PB SB SE
20190111-DGW-MW11-PV10out-35T	10	30-Jan-2019 17:41	128SMPL.d	CA K MG NA
20190111-DGW-MW11-PV10out-35TSD	50	30-Jan-2019 17:43	129SMPL.d	CA K MG NA
20190111-DGW-MW11-PV10out-35TPDS	10	30-Jan-2019 17:50	132SMPL.d	CA K MG NA
20190111-DGW-MW11-PV10out-40T	10	30-Jan-2019 17:52	133SMPL.d	CA K MG NA
20190111-DGW-MW11-PV10inlet-controlT	10	30-Jan-2019 17:54	134SMPL.d	CA K MG NA
CCV 9	1	30-Jan-2019 17:56	135_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	30-Jan-2019 17:59	136_CCB.d	AS CA CD FE K MG NA PB SB SE
20190111-DGW-MW11-PV10inlet-30-35-40T	10	30-Jan-2019 18:01	137SMPL.d	CA FE K MG NA
20190112-DGW-MW11-PV10mid-controlT	10	30-Jan-2019 18:03	138SMPL.d	CA K MG NA
20190112-DGW-MW11-PV10mid-30T	10	30-Jan-2019 18:05	139SMPL.d	CA FE K MG NA
20190112-DGW-MW11-PV10mid-35T	10	30-Jan-2019 18:08	140SMPL.d	CA FE K MG NA
20190112-DGW-MW11-PV10mid-40T	10	30-Jan-2019 18:10	141SMPL.d	CA K MG NA
20190111-DGW-MW11-PV10inlet-30-35-40T-DUP	10	30-Jan-2019 18:12	142SMPL.d	CA FE K MG NA
20190115-DGW-MW3-PV20out-controlT	10	30-Jan-2019 18:15	143SMPL.d	CA MG NA
20190115-DGW-MW3-PV20out-30T	10	30-Jan-2019 18:17	144SMPL.d	MG NA
20190115-DGW-MW3-PV20out-35T	10	30-Jan-2019 18:19	145SMPL.d	MG NA

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011284
Start Date: 30-Jan-2019 End Date: 30-Jan-2019

Run ID:ICPMS05_331929
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
20190115-DGW-MW3-PV20out-40T	10	30-Jan-2019 18:22	146SMPL.d	MG NA
CCV 10	1	30-Jan-2019 18:24	147_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	30-Jan-2019 18:26	148_CCB.d	AS CA CD FE K MG NA PB SB SE
20190117-DGW-MW3-PV20inlet-controlT	10	30-Jan-2019 18:28	149SMPL.d	CA MG NA
20190117-DGW-MW3-PV20inlet-30-35-40T	10	30-Jan-2019 18:31	150SMPL.d	CA MG NA
20190116-DGW-MW3-PV20mid-controlT	10	30-Jan-2019 18:33	151SMPL.d	CA MG NA
20190117-DGW-MW3-PV20mid-30T	10	30-Jan-2019 18:35	152SMPL.d	MG NA
20190116-DGW-MW3-PV20mid-35T	10	30-Jan-2019 18:37	153SMPL.d	MG NA
20190116-DGW-MW3-PV20mid-40T	10	30-Jan-2019 18:40	154SMPL.d	MG NA
20190117-DGW-MW3-PV20mid-35T-DUP	10	30-Jan-2019 18:42	155SMPL.d	MG NA
CCV 11	1	30-Jan-2019 18:51	159_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	30-Jan-2019 18:53	160_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 12	1	30-Jan-2019 19:40	162_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 12	1	30-Jan-2019 19:42	163_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 13	1	30-Jan-2019 20:07	174_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 13	1	30-Jan-2019 20:09	175_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 14	1	30-Jan-2019 20:34	186_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 14	1	30-Jan-2019 20:36	187_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 15	1	30-Jan-2019 20:45	191_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 15	1	30-Jan-2019 20:47	192_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 16	1	30-Jan-2019 21:17	205_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	30-Jan-2019 21:19	206SMPL.d	CA FE K MG NA
LLCCV5	1	30-Jan-2019 21:21	207LICV.d	CA FE K MG NA
ICCB 16	1	30-Jan-2019 21:23	208_ICB.d	AS CA CD FE K MG NA PB SB SE
CCV 17	1	30-Jan-2019 21:46	218_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 17	1	30-Jan-2019 21:48	219_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 18	1	30-Jan-2019 21:57	223_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 18	1	30-Jan-2019 21:59	224_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 19	1	30-Jan-2019 22:15	231_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 19	1	30-Jan-2019 22:17	232_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 20	1	30-Jan-2019 22:35	240_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 20	1	30-Jan-2019 22:38	241_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 21	1	30-Jan-2019 23:03	252_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 21	1	30-Jan-2019 23:05	253_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 22	1	30-Jan-2019 23:09	255_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 22	1	30-Jan-2019 23:11	256_CCB.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	30-Jan-2019 23:14	257SMPL.d	CA FE K MG NA
LLICV5	1	30-Jan-2019 23:16	258LICV.d	CA FE K MG NA
ICSA	1	30-Jan-2019 23:18	259ICSA.d	CA FE K MG NA
ICSAB	1	30-Jan-2019 23:21	260ICSB.d	CA FE K MG NA

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011284

Run ID:ICPMS05_331929
Instrument:ICPMS05
Method:SW6020

CCB 1	Date: 30-Jan-2019 12:46	Seq: 4930072	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.11	0.4	2	
Sodium	241.5	14	200	

CCB 2	Date: 30-Jan-2019 13:12	Seq: 4930082	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.08	0.4	2	
Calcium	-37.68	34	500	
Sodium	158.4	14	200	

CCB 3	Date: 30-Jan-2019 13:42	Seq: 4930642	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.164	0.4	2	
Calcium	-62.23	34	500	
Potassium	-36.18	18	200	
Sodium	128.6	14	200	

CCB 4	Date: 30-Jan-2019 14:10	Seq: 4930654	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.087	0.4	2	
Arsenic	0.414	0.4	2	
Calcium	-75.7	34	500	
Potassium	-61.58	18	200	
Sodium	98.55	14	200	

CCB 5	Date: 30-Jan-2019 14:45	Seq: 4930675	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.944	0.4	2	
Calcium	-71.78	34	500	
Potassium	-107.1	18	200	
Sodium	182.4	14	200	

ICCB 6	Date: 30-Jan-2019 15:42	Seq: 4930691	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	-29.05	18	200	
Sodium	-28.4	14	200	

CCB 7	Date: 30-Jan-2019 16:16	Seq: 4930963	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.001	0.4	2	
Potassium	78.3	18	200	
Sodium	25.07	14	200	

CCB 8	Date: 30-Jan-2019 16:55	Seq: 4930976	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	81.88	18	200	
Sodium	250.3	14	200	

CCB 9	Date: 30-Jan-2019 17:59	Seq: 4931000	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.798	0.4	2	
Potassium	18.11	18	200	
Sodium	148.7	14	200	

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011284

Run ID:ICPMS05_331929
Instrument:ICPMS05
Method:SW6020

CCB 10	Date: 30-Jan-2019 18:26	Seq: 4931145	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.678	0.4	2	
Sodium	91.77	14	200	

CCB 11	Date: 30-Jan-2019 18:53	Seq: 4931168	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.731	0.4	2	
Potassium	29.84	18	200	
Sodium	25.08	14	200	

CCB 12	Date: 30-Jan-2019 19:42	Seq: 4931190	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.745	0.4	2	
Potassium	61.27	18	200	

CCB 13	Date: 30-Jan-2019 20:09	Seq: 4931202	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.749	0.4	2	

CCB 14	Date: 30-Jan-2019 20:36	Seq: 4931214	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.875	0.4	2	
Sodium	-14.88	14	200	

CCB 15	Date: 30-Jan-2019 20:47	Seq: 4931224	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.783	0.4	2	
Potassium	-34.7	18	200	
Sodium	-20.9	14	200	

CCB 17	Date: 30-Jan-2019 21:48	Seq: 4931457	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.71	0.4	2	
Sodium	22.45	14	200	

CCB 18	Date: 30-Jan-2019 21:59	Seq: 4931462	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.724	0.4	2	
Sodium	21.61	14	200	

CCB 19	Date: 30-Jan-2019 22:17	Seq: 4931470	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.74	0.4	2	
Potassium	21.64	18	200	
Sodium	39.59	14	200	

CCB 20	Date: 30-Jan-2019 22:38	Seq: 4931550	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.097	0.4	2	
Sodium	26.68	14	200	

CCB 21	Date: 30-Jan-2019 23:05	Seq: 4931562	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011284
Start Date: 31-Jan-2019 End Date: 01-Feb-2019

Run ID:ICPMS05_332031
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	31-Jan-2019 12:25	016_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	31-Jan-2019 12:28	017SMPL.d	AS CA CD FE K PB SB SE
LLICV5	1	31-Jan-2019 12:30	018LICV.d	AS CA CD FE K PB SB SE
ICB	1	31-Jan-2019 12:32	019_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	31-Jan-2019 12:34	020ICSA.d	AS CA CD FE K PB SB SE
ICSAB	1	31-Jan-2019 12:59	022ICSB.d	AS CA CD FE K PB SB SE
CCV 1	1	31-Jan-2019 13:34	033_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	31-Jan-2019 13:37	034_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	31-Jan-2019 14:07	045_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	31-Jan-2019 14:09	046_CCB.d	AS CA CD FE K MG NA PB SB SE
20190111-DGW-MW11-PV10out-35T	5	31-Jan-2019 14:26	049SMPL.d	AS CD FE PB SB SE
20190111-DGW-MW11-PV10out-35TSD	25	31-Jan-2019 14:29	050SMPL.d	AS CD FE PB SB SE
20190111-DGW-MW11-PV10out-35TMS	5	31-Jan-2019 14:31	051SMPL.d	AS CD FE PB SB SE
20190111-DGW-MW11-PV10out-35TMSD	5	31-Jan-2019 14:33	052SMPL.d	AS CD FE PB SB SE
20190111-DGW-MW11-PV10out-35TPDS	5	31-Jan-2019 14:36	053SMPL.d	AS CD FE PB SB SE
20190111-DGW-MW11-PV10out-40T	5	31-Jan-2019 14:38	054SMPL.d	AS CD FE PB SB SE
20190111-DGW-MW11-PV10inlet-controlT	5	31-Jan-2019 14:40	055SMPL.d	AS CD FE PB SB SE
20190111-DGW-MW11-PV10inlet-30-35-40T	5	31-Jan-2019 14:43	056SMPL.d	AS CD PB SB SE
20190112-DGW-MW11-PV10mid-controlT	5	31-Jan-2019 14:45	057SMPL.d	AS CD FE PB SB SE
CCV 3	1	31-Jan-2019 14:47	058_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	31-Jan-2019 14:49	059_CCB.d	AS CA CD FE K MG NA PB SB SE
20190112-DGW-MW11-PV10mid-30T	5	31-Jan-2019 14:52	060SMPL.d	AS CD PB SB SE
20190112-DGW-MW11-PV10mid-35T	5	31-Jan-2019 14:55	061SMPL.d	AS CD PB SB SE
20190112-DGW-MW11-PV10mid-40T	5	31-Jan-2019 14:57	062SMPL.d	AS CD FE PB SB SE
20190111-DGW-MW11-PV10inlet-30-35-40T-DUP	5	31-Jan-2019 14:59	063SMPL.d	AS CD PB SB SE
20190115-DGW-MW3-PV20out-controlT	1	31-Jan-2019 15:02	064SMPL.d	AS CD FE K PB SB SE
20190115-DGW-MW3-PV20out-30T	1	31-Jan-2019 15:04	065SMPL.d	AS CA CD FE K PB SB SE
20190115-DGW-MW3-PV20out-35T	1	31-Jan-2019 15:06	066SMPL.d	AS CA CD FE K PB SB SE
20190115-DGW-MW3-PV20out-40T	1	31-Jan-2019 15:08	067SMPL.d	AS CA CD FE K PB SB SE
20190117-DGW-MW3-PV20inlet-controlT	1	31-Jan-2019 15:11	068SMPL.d	AS CD FE K PB SB SE
CCV 4	1	31-Jan-2019 15:15	070_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	31-Jan-2019 15:18	071_CCB.d	AS CA CD FE K MG NA PB SB SE
20190117-DGW-MW3-PV20inlet-30-35-40T	1	31-Jan-2019 15:27	074SMPL.d	AS CD FE K PB SB SE
20190116-DGW-MW3-PV20mid-controlT	1	31-Jan-2019 15:29	075SMPL.d	AS CD FE K PB SB SE
20190117-DGW-MW3-PV20mid-30T	1	31-Jan-2019 15:31	076SMPL.d	AS CA CD FE K PB SB SE
20190116-DGW-MW3-PV20mid-35T	1	31-Jan-2019 15:33	077SMPL.d	AS CA CD FE K PB SB SE
20190116-DGW-MW3-PV20mid-40T	1	31-Jan-2019 15:37	078SMPL.d	AS CA CD FE K PB SB SE

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011284
Start Date: 31-Jan-2019 End Date: 01-Feb-2019

Run ID:ICPMS05_332031
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
20190117-DGW-MW3-PV20mid-35T-DUP	1	31-Jan-2019 15:40	079SMPL.d	AS CA CD FE K PB SB SE
CCB 5	1	31-Jan-2019 15:46	082_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	31-Jan-2019 15:51	084_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	31-Jan-2019 16:28	090_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	31-Jan-2019 16:30	091_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 7	1	31-Jan-2019 17:03	105_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	31-Jan-2019 17:05	106SMPL.d	AS CA CD FE K PB SB SE
LLCCV5	1	31-Jan-2019 17:07	107LICV.d	AS CA CD FE K PB SB SE
ICCB 7	1	31-Jan-2019 17:19	110_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	31-Jan-2019 17:25	112ICSA.d	AS CA CD FE K PB SB SE
ICSAB	1	31-Jan-2019 17:28	113ICSB.d	AS CA CD FE K PB SB SE
CCV 8	1	31-Jan-2019 18:39	123_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	31-Jan-2019 18:41	124_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	31-Jan-2019 19:10	133_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	31-Jan-2019 19:13	134_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 10	1	31-Jan-2019 19:37	145_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	31-Jan-2019 19:40	146_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 11	1	31-Jan-2019 19:51	148_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 12	1	31-Jan-2019 20:20	160_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	31-Jan-2019 20:22	161_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 13	1	31-Jan-2019 20:33	165_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 12	1	31-Jan-2019 20:35	166_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 14	1	31-Jan-2019 20:57	174_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 13	1	31-Jan-2019 20:59	175_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 15	1	31-Jan-2019 21:24	186_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 14	1	31-Jan-2019 21:26	187_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 16	1	31-Jan-2019 21:56	200_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	31-Jan-2019 21:58	201SMPL.d	AS CA CD FE K PB SB SE
LLCCV5	1	31-Jan-2019 22:01	202LICV.d	AS CA CD FE K PB SB SE
ICCB 15	1	31-Jan-2019 22:03	203_ICB.d	AS CA CD FE K MG NA PB SB SE
CCV 17	1	31-Jan-2019 22:23	212_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 16	1	31-Jan-2019 22:25	213_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 18	1	31-Jan-2019 22:50	224_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 17	1	31-Jan-2019 22:53	225_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 19	1	31-Jan-2019 23:13	234_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 18	1	31-Jan-2019 23:15	235_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 20	1	31-Jan-2019 23:33	243_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 19	1	31-Jan-2019 23:36	244_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 21	1	01-Feb-2019 00:00	255_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 20	1	01-Feb-2019 00:03	256_CCB.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	01-Feb-2019 00:12	260SMPL.d	AS CA CD FE K PB SB SE
LLICV5	1	01-Feb-2019 00:14	261LICV.d	AS CA CD FE K PB SB SE
ICSA	1	01-Feb-2019 00:16	262ICSA.d	AS CA CD FE K PB SB SE
ICSAB	1	01-Feb-2019 00:19	263ICSB.d	AS CA CD FE K PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011284

Run ID:ICPMS05_332031
Instrument:ICPMS05
Method:SW6020

CCB 1	Date: 31-Jan-2019 13:37	Seq: 4932827	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	-63.17	34	500	
Potassium	-49.6	18	200	

CCB 2	Date: 31-Jan-2019 14:09	Seq: 4932839	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	-74.94	34	500	
Potassium	47.36	18	200	

CCB 3	Date: 31-Jan-2019 14:49	Seq: 4932852	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Arsenic	-0.759	0.4	2	
Calcium	-85.01	34	500	
Potassium	36.26	18	200	

CCB 4	Date: 31-Jan-2019 15:18	Seq: 4932864	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Arsenic	-0.693	0.4	2	
Calcium	-86.73	34	500	
Potassium	-71.64	18	200	

CCB 5	Date: 31-Jan-2019 15:46	Seq: 4932876	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Arsenic	-0.416	0.4	2	
Calcium	-90.94	34	500	
Potassium	-92.95	18	200	

CCB 6	Date: 31-Jan-2019 16:30	Seq: 4932885	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Arsenic	-0.414	0.4	2	
Calcium	-97.62	34	500	
Potassium	-162.6	18	200	

CCB 8	Date: 31-Jan-2019 18:41	Seq: 4933296	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	41.95	18	200	

CCB 10	Date: 31-Jan-2019 19:40	Seq: 4933318	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	-32.98	18	200	

CCB 11	Date: 31-Jan-2019 20:22	Seq: 4933355	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	-40.45	18	200	

CCB 12	Date: 31-Jan-2019 20:35	Seq: 4933360	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	-49.54	18	200	

CCB 13	Date: 31-Jan-2019 20:59	Seq: 4933369	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	-88.52	18	200	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19011284

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19011284-01	20190111-DGW-MW11-PV10out-controlT	Groundwater		11-Jan-2019 09:00	25-Jan-2019 09:19	☐
HS19011284-02	20190111-DGW-MW11-PV10out-30T	Groundwater		11-Jan-2019 09:00	25-Jan-2019 09:19	☐
HS19011284-03	20190111-DGW-MW11-PV10out-35T	Groundwater		11-Jan-2019 09:00	25-Jan-2019 09:19	☐
HS19011284-04	20190111-DGW-MW11-PV10out-40T	Groundwater		11-Jan-2019 09:00	25-Jan-2019 09:19	☐
HS19011284-05	20190111-DGW-MW11-PV10inlet-controlT	Groundwater		11-Jan-2019 09:20	25-Jan-2019 09:19	☐
HS19011284-06	20190111-DGW-MW11-PV10inlet-30-35-40T	Groundwater		11-Jan-2019 09:20	25-Jan-2019 09:19	☐
HS19011284-07	20190112-DGW-MW11-PV10mid-controlT	Groundwater		12-Jan-2019 10:45	25-Jan-2019 09:19	☐
HS19011284-08	20190112-DGW-MW11-PV10mid-30T	Groundwater		12-Jan-2019 10:45	25-Jan-2019 09:19	☐
HS19011284-09	20190112-DGW-MW11-PV10mid-35T	Groundwater		12-Jan-2019 10:45	25-Jan-2019 09:19	☐
HS19011284-10	20190112-DGW-MW11-PV10mid-40T	Groundwater		12-Jan-2019 10:45	25-Jan-2019 09:19	☐
HS19011284-11	20190111-DGW-MW11-PV10inlet-30-35-40T-DUP	Groundwater		11-Jan-2019 09:20	25-Jan-2019 09:19	☐
HS19011284-12	20190115-DGW-MW3-PV20out-controlT	Groundwater		15-Jan-2019 13:00	25-Jan-2019 09:19	☐
HS19011284-13	20190115-DGW-MW3-PV20out-30T	Groundwater		15-Jan-2019 13:00	25-Jan-2019 09:19	☐
HS19011284-14	20190115-DGW-MW3-PV20out-35T	Groundwater		15-Jan-2019 13:00	25-Jan-2019 09:19	☐
HS19011284-15	20190115-DGW-MW3-PV20out-40T	Groundwater		15-Jan-2019 13:00	25-Jan-2019 09:19	☐
HS19011284-16	20190117-DGW-MW3-PV20inlet-controlT	Groundwater		17-Jan-2019 19:00	25-Jan-2019 09:19	☐
HS19011284-17	20190117-DGW-MW3-PV20inlet-30-35-40T	Groundwater		17-Jan-2019 19:00	25-Jan-2019 09:19	☐
HS19011284-18	20190116-DGW-MW3-PV20mid-controlT	Groundwater		16-Jan-2019 16:30	25-Jan-2019 09:19	☐
HS19011284-19	20190117-DGW-MW3-PV20mid-30T	Groundwater		17-Jan-2019 18:45	25-Jan-2019 09:19	☐
HS19011284-20	20190116-DGW-MW3-PV20mid-35T	Groundwater		16-Jan-2019 16:30	25-Jan-2019 09:19	☐
HS19011284-21	20190116-DGW-MW3-PV20mid-40T	Groundwater		16-Jan-2019 16:30	25-Jan-2019 09:19	☐
HS19011284-22	20190117-DGW-MW3-PV20mid-35T-DUP	Groundwater		16-Jan-2019 18:45	25-Jan-2019 09:19	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190111-DGW-MW11-PV10out-controlT
Collection Date: 11-Jan-2019 09:00

ANALYTICAL REPORT
WorkOrder:HS19011284
Lab ID:HS19011284-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**2,500**		**2.00**	**2.00**	**mg/L**	1	01-Feb-2019 17:01
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 29-Jan-2019		Analyst: JCJ
Antimony	U		0.00200	0.0100	mg/L	5	30-Jan-2019 22:38
Arsenic	U		0.00200	0.0100	mg/L	5	30-Jan-2019 22:38
Cadmium	**0.00912**	J	**0.00100**	**0.0100**	**mg/L**	5	30-Jan-2019 22:38
Calcium	**509**		**0.170**	**2.50**	**mg/L**	5	30-Jan-2019 22:38
Iron	U		0.0600	1.00	mg/L	5	30-Jan-2019 22:38
Lead	U		0.00300	0.0100	mg/L	5	30-Jan-2019 22:38
Magnesium	**298**		**0.0500**	**1.00**	**mg/L**	5	30-Jan-2019 22:38
Potassium	**23.9**		**0.0900**	**1.00**	**mg/L**	5	30-Jan-2019 22:38
Selenium	U		0.00550	0.0100	mg/L	5	30-Jan-2019 22:38
Sodium	**1,530**		**0.700**	**10.0**	**mg/L**	50	31-Jan-2019 13:55

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190111-DGW-MW11-PV10out-30T
Collection Date: 11-Jan-2019 09:00

ANALYTICAL REPORT
WorkOrder:HS19011284
Lab ID:HS19011284-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**2,080**		**2.00**	**2.00**	**mg/L**	1	01-Feb-2019 17:01
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 29-Jan-2019		Analyst: JCJ
Antimony	U		0.00200	0.0100	mg/L	5	30-Jan-2019 22:40
Arsenic	U		0.00200	0.0100	mg/L	5	30-Jan-2019 22:40
Cadmium	U		0.00100	0.0100	mg/L	5	30-Jan-2019 22:40
Calcium	**358**		**0.170**	**2.50**	**mg/L**	5	30-Jan-2019 22:40
Iron	**5.54**		**0.0600**	**1.00**	**mg/L**	5	30-Jan-2019 22:40
Lead	U		0.00300	0.0100	mg/L	5	30-Jan-2019 22:40
Magnesium	**289**		**0.0500**	**1.00**	**mg/L**	5	30-Jan-2019 22:40
Potassium	**21.0**		**0.0900**	**1.00**	**mg/L**	5	30-Jan-2019 22:40
Selenium	U		0.00550	0.0100	mg/L	5	30-Jan-2019 22:40
Sodium	**1,570**		**0.700**	**10.0**	**mg/L**	50	31-Jan-2019 13:57

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190111-DGW-MW11-PV10out-35T
Collection Date: 11-Jan-2019 09:00

ANALYTICAL REPORT
WorkOrder:HS19011284
Lab ID:HS19011284-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**2,220**		**2.00**	**2.00**	**mg/L**	1	01-Feb-2019 17:01
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 30-Jan-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	31-Jan-2019 14:26
Arsenic	U		0.00200	0.0100	mg/L	5	31-Jan-2019 14:26
Cadmium	U		0.00100	0.0100	mg/L	5	31-Jan-2019 14:26
Calcium	**380**		**0.340**	**5.00**	**mg/L**	10	30-Jan-2019 17:41
Iron	**5.61**		**0.0600**	**1.00**	**mg/L**	5	31-Jan-2019 14:26
Lead	U		0.00300	0.0100	mg/L	5	31-Jan-2019 14:26
Magnesium	**309**		**0.100**	**2.00**	**mg/L**	10	30-Jan-2019 17:41
Potassium	**23.5**		**0.180**	**2.00**	**mg/L**	10	30-Jan-2019 17:41
Selenium	U		0.00550	0.0100	mg/L	5	31-Jan-2019 14:26
Sodium	**1,640**		**0.140**	**2.00**	**mg/L**	10	30-Jan-2019 17:41

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190111-DGW-MW11-PV10out-40T
Collection Date: 11-Jan-2019 09:00

ANALYTICAL REPORT
WorkOrder:HS19011284
Lab ID:HS19011284-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**2,310**		**2.00**	**2.00**	**mg/L**	1	01-Feb-2019 17:01
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 30-Jan-2019		Analyst: JHD
Antimony	**0.00418**	J	**0.00200**	**0.0100**	**mg/L**	5	31-Jan-2019 14:38
Arsenic	U		0.00200	0.0100	mg/L	5	31-Jan-2019 14:38
Cadmium	U		0.00100	0.0100	mg/L	5	31-Jan-2019 14:38
Calcium	**400**		**0.340**	**5.00**	**mg/L**	10	30-Jan-2019 17:52
Iron	**1.69**		**0.0600**	**1.00**	**mg/L**	5	31-Jan-2019 14:38
Lead	U		0.00300	0.0100	mg/L	5	31-Jan-2019 14:38
Magnesium	**319**		**0.100**	**2.00**	**mg/L**	10	30-Jan-2019 17:52
Potassium	**25.3**		**0.180**	**2.00**	**mg/L**	10	30-Jan-2019 17:52
Selenium	U		0.00550	0.0100	mg/L	5	31-Jan-2019 14:38
Sodium	**1,730**		**0.140**	**2.00**	**mg/L**	10	30-Jan-2019 17:52

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190111-DGW-MW11-PV10inlet-controlT
Collection Date: 11-Jan-2019 09:20

ANALYTICAL REPORT
WorkOrder:HS19011284
Lab ID:HS19011284-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**2,520**		**2.00**	**2.00**	**mg/L**	1	01-Feb-2019 17:01
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 30-Jan-2019		Analyst: JHD
Antimony	**0.00231**	J	**0.00200**	**0.0100**	**mg/L**	5	31-Jan-2019 14:40
Arsenic	U		0.00200	0.0100	mg/L	5	31-Jan-2019 14:40
Cadmium	**0.00857**	J	**0.00100**	**0.0100**	**mg/L**	5	31-Jan-2019 14:40
Calcium	**511**		**0.340**	**5.00**	**mg/L**	10	30-Jan-2019 17:54
Iron	**6.98**		**0.0600**	**1.00**	**mg/L**	5	31-Jan-2019 14:40
Lead	**0.00970**	J	**0.00300**	**0.0100**	**mg/L**	5	31-Jan-2019 14:40
Magnesium	**302**		**0.100**	**2.00**	**mg/L**	10	30-Jan-2019 17:54
Potassium	**22.0**		**0.180**	**2.00**	**mg/L**	10	30-Jan-2019 17:54
Selenium	U		0.00550	0.0100	mg/L	5	31-Jan-2019 14:40
Sodium	**1,730**		**0.140**	**2.00**	**mg/L**	10	30-Jan-2019 17:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190111-DGW-MW11-PV10inlet-30-35-40T
Collection Date: 11-Jan-2019 09:20

ANALYTICAL REPORT
WorkOrder:HS19011284
Lab ID:HS19011284-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**2,570**		**2.00**	**2.00**	**mg/L**	1	01-Feb-2019 17:01
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 30-Jan-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	31-Jan-2019 14:43
Arsenic	U		0.00200	0.0100	mg/L	5	31-Jan-2019 14:43
Cadmium	**0.00956**	J	**0.00100**	**0.0100**	**mg/L**	5	31-Jan-2019 14:43
Calcium	**512**		**0.340**	**5.00**	**mg/L**	10	30-Jan-2019 18:01
Iron	**20.5**		**0.120**	**2.00**	**mg/L**	10	30-Jan-2019 18:01
Lead	**0.00513**	J	**0.00300**	**0.0100**	**mg/L**	5	31-Jan-2019 14:43
Magnesium	**313**		**0.100**	**2.00**	**mg/L**	10	30-Jan-2019 18:01
Potassium	**22.7**		**0.180**	**2.00**	**mg/L**	10	30-Jan-2019 18:01
Selenium	U		0.00550	0.0100	mg/L	5	31-Jan-2019 14:43
Sodium	**1,630**		**0.140**	**2.00**	**mg/L**	10	30-Jan-2019 18:01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190112-DGW-MW11-PV10mid-controlT
Collection Date: 12-Jan-2019 10:45

ANALYTICAL REPORT
WorkOrder:HS19011284
Lab ID:HS19011284-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**2,260**		**2.00**	**2.00**	**mg/L**	1	01-Feb-2019 17:01
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 30-Jan-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	31-Jan-2019 14:45
Arsenic	U		0.00200	0.0100	mg/L	5	31-Jan-2019 14:45
Cadmium	**0.00861**	J	**0.00100**	**0.0100**	**mg/L**	5	31-Jan-2019 14:45
Calcium	**441**		**0.340**	**5.00**	**mg/L**	10	30-Jan-2019 18:03
Iron	U		0.0600	1.00	mg/L	5	31-Jan-2019 14:45
Lead	U		0.00300	0.0100	mg/L	5	31-Jan-2019 14:45
Magnesium	**282**		**0.100**	**2.00**	**mg/L**	10	30-Jan-2019 18:03
Potassium	**20.9**		**0.180**	**2.00**	**mg/L**	10	30-Jan-2019 18:03
Selenium	U		0.00550	0.0100	mg/L	5	31-Jan-2019 14:45
Sodium	**1,470**		**0.140**	**2.00**	**mg/L**	10	30-Jan-2019 18:03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190112-DGW-MW11-PV10mid-30T
Collection Date: 12-Jan-2019 10:45

ANALYTICAL REPORT
WorkOrder:HS19011284
Lab ID:HS19011284-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**1,970**		**2.00**	**2.00**	**mg/L**	1	01-Feb-2019 17:01
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 30-Jan-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	31-Jan-2019 14:52
Arsenic	U		0.00200	0.0100	mg/L	5	31-Jan-2019 14:52
Cadmium	U		0.00100	0.0100	mg/L	5	31-Jan-2019 14:52
Calcium	**345**		**0.340**	**5.00**	**mg/L**	10	30-Jan-2019 18:05
Iron	**20.8**		**0.120**	**2.00**	**mg/L**	10	30-Jan-2019 18:05
Lead	U		0.00300	0.0100	mg/L	5	31-Jan-2019 14:52
Magnesium	**270**		**0.100**	**2.00**	**mg/L**	10	30-Jan-2019 18:05
Potassium	**18.8**		**0.180**	**2.00**	**mg/L**	10	30-Jan-2019 18:05
Selenium	U		0.00550	0.0100	mg/L	5	31-Jan-2019 14:52
Sodium	**1,420**		**0.140**	**2.00**	**mg/L**	10	30-Jan-2019 18:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190112-DGW-MW11-PV10mid-35T
Collection Date: 12-Jan-2019 10:45

ANALYTICAL REPORT
WorkOrder:HS19011284
Lab ID:HS19011284-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**1,800**		**2.00**	**2.00**	**mg/L**	1	01-Feb-2019 17:01
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 30-Jan-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	31-Jan-2019 14:55
Arsenic	U		0.00200	0.0100	mg/L	5	31-Jan-2019 14:55
Cadmium	U		0.00100	0.0100	mg/L	5	31-Jan-2019 14:55
Calcium	**320**		**0.340**	**5.00**	**mg/L**	10	30-Jan-2019 18:08
Iron	**15.9**		**0.120**	**2.00**	**mg/L**	10	30-Jan-2019 18:08
Lead	U		0.00300	0.0100	mg/L	5	31-Jan-2019 14:55
Magnesium	**242**		**0.100**	**2.00**	**mg/L**	10	30-Jan-2019 18:08
Potassium	**18.2**		**0.180**	**2.00**	**mg/L**	10	30-Jan-2019 18:08
Selenium	U		0.00550	0.0100	mg/L	5	31-Jan-2019 14:55
Sodium	**1,300**		**0.140**	**2.00**	**mg/L**	10	30-Jan-2019 18:08

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190112-DGW-MW11-PV10mid-40T
Collection Date: 12-Jan-2019 10:45

ANALYTICAL REPORT
WorkOrder:HS19011284
Lab ID:HS19011284-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**1,730**		**2.00**	**2.00**	**mg/L**	1	01-Feb-2019 17:01
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 30-Jan-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	31-Jan-2019 14:57
Arsenic	U		0.00200	0.0100	mg/L	5	31-Jan-2019 14:57
Cadmium	U		0.00100	0.0100	mg/L	5	31-Jan-2019 14:57
Calcium	**309**		**0.340**	**5.00**	**mg/L**	10	30-Jan-2019 18:10
Iron	**9.78**		**0.0600**	**1.00**	**mg/L**	5	31-Jan-2019 14:57
Lead	U		0.00300	0.0100	mg/L	5	31-Jan-2019 14:57
Magnesium	**232**		**0.100**	**2.00**	**mg/L**	10	30-Jan-2019 18:10
Potassium	**18.6**		**0.180**	**2.00**	**mg/L**	10	30-Jan-2019 18:10
Selenium	U		0.00550	0.0100	mg/L	5	31-Jan-2019 14:57
Sodium	**1,270**		**0.140**	**2.00**	**mg/L**	10	30-Jan-2019 18:10

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
ANALYTICAL REPORT
Project: Exide Column Studies
WorkOrder:HS19011284
Sample ID: 20190111-DGW-MW11-PV10inlet-30-35-40T-DUP
Lab ID:HS19011284-11
Collection Date: 11-Jan-2019 09:20
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**1,940**		**2.00**	**2.00**	**mg/L**	1	01-Feb-2019 17:01
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 30-Jan-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	31-Jan-2019 14:59
Arsenic	U		0.00200	0.0100	mg/L	5	31-Jan-2019 14:59
Cadmium	**0.00954**	J	**0.00100**	**0.0100**	**mg/L**	5	31-Jan-2019 14:59
Calcium	**376**		**0.340**	**5.00**	**mg/L**	10	30-Jan-2019 18:12
Iron	**16.0**		**0.120**	**2.00**	**mg/L**	10	30-Jan-2019 18:12
Lead	**0.00575**	J	**0.00300**	**0.0100**	**mg/L**	5	31-Jan-2019 14:59
Magnesium	**242**		**0.100**	**2.00**	**mg/L**	10	30-Jan-2019 18:12
Potassium	**17.4**		**0.180**	**2.00**	**mg/L**	10	30-Jan-2019 18:12
Selenium	U		0.00550	0.0100	mg/L	5	31-Jan-2019 14:59
Sodium	**1,280**		**0.140**	**2.00**	**mg/L**	10	30-Jan-2019 18:12

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190115-DGW-MW3-PV20out-controlT
Collection Date: 15-Jan-2019 13:00

ANALYTICAL REPORT
WorkOrder:HS19011284
Lab ID:HS19011284-12
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**303**		**2.00**	**2.00**	**mg/L**	1	01-Feb-2019 17:01
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 30-Jan-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	31-Jan-2019 15:02
Arsenic	**0.000993**	J	**0.000400**	**0.00200**	**mg/L**	1	31-Jan-2019 15:02
Cadmium	U		0.000200	0.00200	mg/L	1	31-Jan-2019 15:02
Calcium	**92.2**		**0.340**	**5.00**	**mg/L**	10	30-Jan-2019 18:15
Iron	**0.111**	J	**0.0120**	**0.200**	**mg/L**	1	31-Jan-2019 15:02
Lead	U		0.000600	0.00200	mg/L	1	31-Jan-2019 15:02
Magnesium	**17.6**		**0.100**	**2.00**	**mg/L**	10	30-Jan-2019 18:15
Potassium	**1.99**		**0.0180**	**0.200**	**mg/L**	1	31-Jan-2019 15:02
Selenium	U		0.00110	0.00200	mg/L	1	31-Jan-2019 15:02
Sodium	**168**		**0.140**	**2.00**	**mg/L**	10	30-Jan-2019 18:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190115-DGW-MW3-PV20out-30T
Collection Date: 15-Jan-2019 13:00

ANALYTICAL REPORT
WorkOrder:HS19011284
Lab ID:HS19011284-13
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**72.9**		**2.00**	**2.00**	**mg/L**	1	01-Feb-2019 17:01
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 30-Jan-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	31-Jan-2019 15:04
Arsenic	U		0.000400	0.00200	mg/L	1	31-Jan-2019 15:04
Cadmium	U		0.000200	0.00200	mg/L	1	31-Jan-2019 15:04
Calcium	**6.61**		**0.0340**	**0.500**	**mg/L**	1	31-Jan-2019 15:04
Iron	**0.310**		**0.0120**	**0.200**	**mg/L**	1	31-Jan-2019 15:04
Lead	U		0.000600	0.00200	mg/L	1	31-Jan-2019 15:04
Magnesium	**13.7**		**0.100**	**2.00**	**mg/L**	10	30-Jan-2019 18:17
Potassium	**2.03**		**0.0180**	**0.200**	**mg/L**	1	31-Jan-2019 15:04
Selenium	U		0.00110	0.00200	mg/L	1	31-Jan-2019 15:04
Sodium	**181**		**0.140**	**2.00**	**mg/L**	10	30-Jan-2019 18:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190115-DGW-MW3-PV20out-35T
Collection Date: 15-Jan-2019 13:00

ANALYTICAL REPORT
WorkOrder:HS19011284
Lab ID:HS19011284-14
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**58.7**		**2.00**	**2.00**	**mg/L**	1	01-Feb-2019 17:01
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 30-Jan-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	31-Jan-2019 15:06
Arsenic	U		0.000400	0.00200	mg/L	1	31-Jan-2019 15:06
Cadmium	U		0.000200	0.00200	mg/L	1	31-Jan-2019 15:06
Calcium	**6.18**		**0.0340**	**0.500**	**mg/L**	1	31-Jan-2019 15:06
Iron	U		0.0120	0.200	mg/L	1	31-Jan-2019 15:06
Lead	U		0.000600	0.00200	mg/L	1	31-Jan-2019 15:06
Magnesium	**10.5**		**0.100**	**2.00**	**mg/L**	10	30-Jan-2019 18:19
Potassium	**1.99**		**0.0180**	**0.200**	**mg/L**	1	31-Jan-2019 15:06
Selenium	U		0.00110	0.00200	mg/L	1	31-Jan-2019 15:06
Sodium	**167**		**0.140**	**2.00**	**mg/L**	10	30-Jan-2019 18:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190115-DGW-MW3-PV20out-40T
Collection Date: 15-Jan-2019 13:00

ANALYTICAL REPORT
WorkOrder:HS19011284
Lab ID:HS19011284-15
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**59.6**		**2.00**	**2.00**	**mg/L**	1	01-Feb-2019 17:01
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 30-Jan-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	31-Jan-2019 15:08
Arsenic	U		0.000400	0.00200	mg/L	1	31-Jan-2019 15:08
Cadmium	U		0.000200	0.00200	mg/L	1	31-Jan-2019 15:08
Calcium	**5.88**		**0.0340**	**0.500**	**mg/L**	1	31-Jan-2019 15:08
Iron	U		0.0120	0.200	mg/L	1	31-Jan-2019 15:08
Lead	U		0.000600	0.00200	mg/L	1	31-Jan-2019 15:08
Magnesium	**10.9**		**0.100**	**2.00**	**mg/L**	10	30-Jan-2019 18:22
Potassium	**2.07**		**0.0180**	**0.200**	**mg/L**	1	31-Jan-2019 15:08
Selenium	U		0.00110	0.00200	mg/L	1	31-Jan-2019 15:08
Sodium	**174**		**0.140**	**2.00**	**mg/L**	10	30-Jan-2019 18:22

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190117-DGW-MW3-PV20inlet-controlT
Collection Date: 17-Jan-2019 19:00

ANALYTICAL REPORT
WorkOrder:HS19011284
Lab ID:HS19011284-16
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**336**		**2.00**	**2.00**	**mg/L**	1	01-Feb-2019 17:01
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 30-Jan-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	31-Jan-2019 15:11
Arsenic	**0.0172**		**0.000400**	**0.00200**	**mg/L**	1	31-Jan-2019 15:11
Cadmium	U		0.000200	0.00200	mg/L	1	31-Jan-2019 15:11
Calcium	**104**		**0.340**	**5.00**	**mg/L**	10	30-Jan-2019 18:28
Iron	**1.12**		**0.0120**	**0.200**	**mg/L**	1	31-Jan-2019 15:11
Lead	U		0.000600	0.00200	mg/L	1	31-Jan-2019 15:11
Magnesium	**18.6**		**0.100**	**2.00**	**mg/L**	10	30-Jan-2019 18:28
Potassium	**1.85**		**0.0180**	**0.200**	**mg/L**	1	31-Jan-2019 15:11
Selenium	U		0.00110	0.00200	mg/L	1	31-Jan-2019 15:11
Sodium	**179**		**0.140**	**2.00**	**mg/L**	10	30-Jan-2019 18:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190117-DGW-MW3-PV20inlet-30-35-40T
Collection Date: 17-Jan-2019 19:00

ANALYTICAL REPORT
WorkOrder:HS19011284
Lab ID:HS19011284-17
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**325**		**2.00**	**2.00**	**mg/L**	1	01-Feb-2019 17:01
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 30-Jan-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	31-Jan-2019 15:27
Arsenic	**0.0167**		**0.000400**	**0.00200**	**mg/L**	1	31-Jan-2019 15:27
Cadmium	U		0.000200	0.00200	mg/L	1	31-Jan-2019 15:27
Calcium	**100**		**0.340**	**5.00**	**mg/L**	10	30-Jan-2019 18:31
Iron	**1.21**		**0.0120**	**0.200**	**mg/L**	1	31-Jan-2019 15:27
Lead	U		0.000600	0.00200	mg/L	1	31-Jan-2019 15:27
Magnesium	**18.4**		**0.100**	**2.00**	**mg/L**	10	30-Jan-2019 18:31
Potassium	**1.83**		**0.0180**	**0.200**	**mg/L**	1	31-Jan-2019 15:27
Selenium	U		0.00110	0.00200	mg/L	1	31-Jan-2019 15:27
Sodium	**177**		**0.140**	**2.00**	**mg/L**	10	30-Jan-2019 18:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190116-DGW-MW3-PV20mid-controlT
Collection Date: 16-Jan-2019 16:30

ANALYTICAL REPORT
WorkOrder:HS19011284
Lab ID:HS19011284-18
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**293**		**2.00**	**2.00**	**mg/L**	1	01-Feb-2019 17:01
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 30-Jan-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	31-Jan-2019 15:29
Arsenic	**0.00447**		**0.000400**	**0.00200**	**mg/L**	1	31-Jan-2019 15:29
Cadmium	U		0.000200	0.00200	mg/L	1	31-Jan-2019 15:29
Calcium	**90.1**		**0.340**	**5.00**	**mg/L**	10	30-Jan-2019 18:33
Iron	**0.138**	J	**0.0120**	**0.200**	**mg/L**	1	31-Jan-2019 15:29
Lead	U		0.000600	0.00200	mg/L	1	31-Jan-2019 15:29
Magnesium	**16.4**		**0.100**	**2.00**	**mg/L**	10	30-Jan-2019 18:33
Potassium	**2.03**		**0.0180**	**0.200**	**mg/L**	1	31-Jan-2019 15:29
Selenium	U		0.00110	0.00200	mg/L	1	31-Jan-2019 15:29
Sodium	**158**		**0.140**	**2.00**	**mg/L**	10	30-Jan-2019 18:33

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190117-DGW-MW3-PV20mid-30T
Collection Date: 17-Jan-2019 18:45

ANALYTICAL REPORT
WorkOrder:HS19011284
Lab ID:HS19011284-19
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**82.5**		**2.00**	**2.00**	**mg/L**	1	01-Feb-2019 17:01
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 30-Jan-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	31-Jan-2019 15:31
Arsenic	U		0.000400	0.00200	mg/L	1	31-Jan-2019 15:31
Cadmium	U		0.000200	0.00200	mg/L	1	31-Jan-2019 15:31
Calcium	**9.12**		**0.0340**	**0.500**	**mg/L**	1	31-Jan-2019 15:31
Iron	**0.0266**	J	**0.0120**	**0.200**	**mg/L**	1	31-Jan-2019 15:31
Lead	U		0.000600	0.00200	mg/L	1	31-Jan-2019 15:31
Magnesium	**14.5**		**0.100**	**2.00**	**mg/L**	10	30-Jan-2019 18:35
Potassium	**2.00**		**0.0180**	**0.200**	**mg/L**	1	31-Jan-2019 15:31
Selenium	U		0.00110	0.00200	mg/L	1	31-Jan-2019 15:31
Sodium	**181**		**0.140**	**2.00**	**mg/L**	10	30-Jan-2019 18:35

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190116-DGW-MW3-PV20mid-35T
Collection Date: 16-Jan-2019 16:30

ANALYTICAL REPORT
WorkOrder:HS19011284
Lab ID:HS19011284-20
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**80.0**		**2.00**	**2.00**	**mg/L**	1	01-Feb-2019 17:01
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 30-Jan-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	31-Jan-2019 15:33
Arsenic	U		0.000400	0.00200	mg/L	1	31-Jan-2019 15:33
Cadmium	U		0.000200	0.00200	mg/L	1	31-Jan-2019 15:33
Calcium	**9.11**		**0.0340**	**0.500**	**mg/L**	1	31-Jan-2019 15:33
Iron	**0.448**		**0.0120**	**0.200**	**mg/L**	1	31-Jan-2019 15:33
Lead	U		0.000600	0.00200	mg/L	1	31-Jan-2019 15:33
Magnesium	**13.9**		**0.100**	**2.00**	**mg/L**	10	30-Jan-2019 18:37
Potassium	**1.89**		**0.0180**	**0.200**	**mg/L**	1	31-Jan-2019 15:33
Selenium	U		0.00110	0.00200	mg/L	1	31-Jan-2019 15:33
Sodium	**180**		**0.140**	**2.00**	**mg/L**	10	30-Jan-2019 18:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190116-DGW-MW3-PV20mid-40T
Collection Date: 16-Jan-2019 16:30

ANALYTICAL REPORT
WorkOrder:HS19011284
Lab ID:HS19011284-21
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**78.2**		**2.00**	**2.00**	**mg/L**	1	01-Feb-2019 17:01
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 30-Jan-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	31-Jan-2019 15:37
Arsenic	U		0.000400	0.00200	mg/L	1	31-Jan-2019 15:37
Cadmium	U		0.000200	0.00200	mg/L	1	31-Jan-2019 15:37
Calcium	**8.54**		**0.0340**	**0.500**	**mg/L**	1	31-Jan-2019 15:37
Iron	**0.363**		**0.0120**	**0.200**	**mg/L**	1	31-Jan-2019 15:37
Lead	U		0.000600	0.00200	mg/L	1	31-Jan-2019 15:37
Magnesium	**13.8**		**0.100**	**2.00**	**mg/L**	10	30-Jan-2019 18:40
Potassium	**1.95**		**0.0180**	**0.200**	**mg/L**	1	31-Jan-2019 15:37
Selenium	U		0.00110	0.00200	mg/L	1	31-Jan-2019 15:37
Sodium	**186**		**0.140**	**2.00**	**mg/L**	10	30-Jan-2019 18:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190117-DGW-MW3-PV20mid-35T-DUP
Collection Date: 16-Jan-2019 18:45

ANALYTICAL REPORT
WorkOrder:HS19011284
Lab ID:HS19011284-22
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: DQ
Hardness (As CaCO3)	**78.8**		**2.00**	**2.00**	**mg/L**	1	01-Feb-2019 17:01
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 30-Jan-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	31-Jan-2019 15:40
Arsenic	U		0.000400	0.00200	mg/L	1	31-Jan-2019 15:40
Cadmium	U		0.000200	0.00200	mg/L	1	31-Jan-2019 15:40
Calcium	**9.14**		**0.0340**	**0.500**	**mg/L**	1	31-Jan-2019 15:40
Iron	**0.193**	J	**0.0120**	**0.200**	**mg/L**	1	31-Jan-2019 15:40
Lead	U		0.000600	0.00200	mg/L	1	31-Jan-2019 15:40
Magnesium	**13.6**		**0.100**	**2.00**	**mg/L**	10	30-Jan-2019 18:42
Potassium	**2.00**		**0.0180**	**0.200**	**mg/L**	1	31-Jan-2019 15:40
Selenium	U		0.00110	0.00200	mg/L	1	31-Jan-2019 15:40
Sodium	**182**		**0.140**	**2.00**	**mg/L**	10	30-Jan-2019 18:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011284

Batch ID: 137136 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19011284-01	1	10	10 (mL)	1
HS19011284-02	1	10	10 (mL)	1

Batch ID: 137197 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19011284-03	1	10	10 (mL)	1
HS19011284-04	1	10	10 (mL)	1
HS19011284-05	1	10	10 (mL)	1
HS19011284-06	1	10	10 (mL)	1
HS19011284-07	1	10	10 (mL)	1
HS19011284-08	1	10	10 (mL)	1
HS19011284-09	1	10	10 (mL)	1
HS19011284-10	1	10	10 (mL)	1
HS19011284-11	1	10	10 (mL)	1
HS19011284-12	1	10	10 (mL)	1
HS19011284-13	1	10	10 (mL)	1
HS19011284-14	1	10	10 (mL)	1
HS19011284-15	1	10	10 (mL)	1
HS19011284-16	1	10	10 (mL)	1
HS19011284-17	1	10	10 (mL)	1
HS19011284-18	1	10	10 (mL)	1
HS19011284-19	1	10	10 (mL)	1
HS19011284-20	1	10	10 (mL)	1
HS19011284-21	1	10	10 (mL)	1
HS19011284-22	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011284

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 137136	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19011284-01	20190111-DGW-MW11-PV10out-controlT	11 Jan 2019 09:00		29 Jan 2019 10:30	31 Jan 2019 13:55	50
HS19011284-01	20190111-DGW-MW11-PV10out-controlT	11 Jan 2019 09:00		29 Jan 2019 10:30	30 Jan 2019 22:38	5
HS19011284-02	20190111-DGW-MW11-PV10out-30T	11 Jan 2019 09:00		29 Jan 2019 10:30	31 Jan 2019 13:57	50
HS19011284-02	20190111-DGW-MW11-PV10out-30T	11 Jan 2019 09:00		29 Jan 2019 10:30	30 Jan 2019 22:40	5

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011284

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 137197	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19011284-03	20190111-DGW-MW11-PV10out-35T	11 Jan 2019 09:00		30 Jan 2019 11:00	31 Jan 2019 14:26	5
HS19011284-03	20190111-DGW-MW11-PV10out-35T	11 Jan 2019 09:00		30 Jan 2019 11:00	30 Jan 2019 17:41	10
HS19011284-04	20190111-DGW-MW11-PV10out-40T	11 Jan 2019 09:00		30 Jan 2019 11:00	31 Jan 2019 14:38	5
HS19011284-04	20190111-DGW-MW11-PV10out-40T	11 Jan 2019 09:00		30 Jan 2019 11:00	30 Jan 2019 17:52	10
HS19011284-05	20190111-DGW-MW11-PV10inlet-controlT	11 Jan 2019 09:20		30 Jan 2019 11:00	31 Jan 2019 14:40	5
HS19011284-05	20190111-DGW-MW11-PV10inlet-controlT	11 Jan 2019 09:20		30 Jan 2019 11:00	30 Jan 2019 17:54	10
HS19011284-06	20190111-DGW-MW11-PV10inlet-30-35-40T	11 Jan 2019 09:20		30 Jan 2019 11:00	31 Jan 2019 14:43	5
HS19011284-06	20190111-DGW-MW11-PV10inlet-30-35-40T	11 Jan 2019 09:20		30 Jan 2019 11:00	30 Jan 2019 18:01	10
HS19011284-07	20190112-DGW-MW11-PV10mid-controlT	12 Jan 2019 10:45		30 Jan 2019 11:00	31 Jan 2019 14:45	5
HS19011284-07	20190112-DGW-MW11-PV10mid-controlT	12 Jan 2019 10:45		30 Jan 2019 11:00	30 Jan 2019 18:03	10
HS19011284-08	20190112-DGW-MW11-PV10mid-30T	12 Jan 2019 10:45		30 Jan 2019 11:00	31 Jan 2019 14:52	5
HS19011284-08	20190112-DGW-MW11-PV10mid-30T	12 Jan 2019 10:45		30 Jan 2019 11:00	30 Jan 2019 18:05	10
HS19011284-09	20190112-DGW-MW11-PV10mid-35T	12 Jan 2019 10:45		30 Jan 2019 11:00	31 Jan 2019 14:55	5
HS19011284-09	20190112-DGW-MW11-PV10mid-35T	12 Jan 2019 10:45		30 Jan 2019 11:00	30 Jan 2019 18:08	10
HS19011284-10	20190112-DGW-MW11-PV10mid-40T	12 Jan 2019 10:45		30 Jan 2019 11:00	31 Jan 2019 14:57	5
HS19011284-10	20190112-DGW-MW11-PV10mid-40T	12 Jan 2019 10:45		30 Jan 2019 11:00	30 Jan 2019 18:10	10
HS19011284-11	20190111-DGW-MW11-PV10inlet-30-35-40T-DUP	11 Jan 2019 09:20		30 Jan 2019 11:00	31 Jan 2019 14:59	5
HS19011284-11	20190111-DGW-MW11-PV10inlet-30-35-40T-DUP	11 Jan 2019 09:20		30 Jan 2019 11:00	30 Jan 2019 18:12	10
HS19011284-12	20190115-DGW-MW3-PV20out-controlT	15 Jan 2019 13:00		30 Jan 2019 11:00	31 Jan 2019 15:02	1
HS19011284-12	20190115-DGW-MW3-PV20out-controlT	15 Jan 2019 13:00		30 Jan 2019 11:00	30 Jan 2019 18:15	10
HS19011284-13	20190115-DGW-MW3-PV20out-30T	15 Jan 2019 13:00		30 Jan 2019 11:00	31 Jan 2019 15:04	1
HS19011284-13	20190115-DGW-MW3-PV20out-30T	15 Jan 2019 13:00		30 Jan 2019 11:00	30 Jan 2019 18:17	10
HS19011284-14	20190115-DGW-MW3-PV20out-35T	15 Jan 2019 13:00		30 Jan 2019 11:00	31 Jan 2019 15:06	1
HS19011284-14	20190115-DGW-MW3-PV20out-35T	15 Jan 2019 13:00		30 Jan 2019 11:00	30 Jan 2019 18:19	10
HS19011284-15	20190115-DGW-MW3-PV20out-40T	15 Jan 2019 13:00		30 Jan 2019 11:00	31 Jan 2019 15:08	1
HS19011284-15	20190115-DGW-MW3-PV20out-40T	15 Jan 2019 13:00		30 Jan 2019 11:00	30 Jan 2019 18:22	10
HS19011284-16	20190117-DGW-MW3-PV20inlet-controlT	17 Jan 2019 19:00		30 Jan 2019 11:00	31 Jan 2019 15:11	1
HS19011284-16	20190117-DGW-MW3-PV20inlet-controlT	17 Jan 2019 19:00		30 Jan 2019 11:00	30 Jan 2019 18:28	10
HS19011284-17	20190117-DGW-MW3-PV20inlet-30-35-40T	17 Jan 2019 19:00		30 Jan 2019 11:00	31 Jan 2019 15:27	1
HS19011284-17	20190117-DGW-MW3-PV20inlet-30-35-40T	17 Jan 2019 19:00		30 Jan 2019 11:00	30 Jan 2019 18:31	10

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011284

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
HS19011284-18	20190116-DGW-MW3-PV20mid-controlT	16 Jan 2019 16:30		30 Jan 2019 11:00	31 Jan 2019 15:29	1
HS19011284-18	20190116-DGW-MW3-PV20mid-controlT	16 Jan 2019 16:30		30 Jan 2019 11:00	30 Jan 2019 18:33	10
HS19011284-19	20190117-DGW-MW3-PV20mid-30T	17 Jan 2019 18:45		30 Jan 2019 11:00	31 Jan 2019 15:31	1
HS19011284-19	20190117-DGW-MW3-PV20mid-30T	17 Jan 2019 18:45		30 Jan 2019 11:00	30 Jan 2019 18:35	10
HS19011284-20	20190116-DGW-MW3-PV20mid-35T	16 Jan 2019 16:30		30 Jan 2019 11:00	31 Jan 2019 15:33	1
HS19011284-20	20190116-DGW-MW3-PV20mid-35T	16 Jan 2019 16:30		30 Jan 2019 11:00	30 Jan 2019 18:37	10
HS19011284-21	20190116-DGW-MW3-PV20mid-40T	16 Jan 2019 16:30		30 Jan 2019 11:00	31 Jan 2019 15:37	1
HS19011284-21	20190116-DGW-MW3-PV20mid-40T	16 Jan 2019 16:30		30 Jan 2019 11:00	30 Jan 2019 18:40	10
HS19011284-22	20190117-DGW-MW3-PV20mid-35T-DUP	16 Jan 2019 18:45		30 Jan 2019 11:00	31 Jan 2019 15:40	1
HS19011284-22	20190117-DGW-MW3-PV20mid-35T-DUP	16 Jan 2019 18:45		30 Jan 2019 11:00	30 Jan 2019 18:42	10

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011284

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R332189	**Test Name :** HARDNESS, TOTAL AS CACO3 BY SM2340B			**Matrix:** Groundwater		
HS19011284-01	20190111-DGW-MW11-PV10out-controlT	11 Jan 2019 09:00			01 Feb 2019 17:01	1
HS19011284-02	20190111-DGW-MW11-PV10out-30T	11 Jan 2019 09:00			01 Feb 2019 17:01	1
HS19011284-03	20190111-DGW-MW11-PV10out-35T	11 Jan 2019 09:00			01 Feb 2019 17:01	1
HS19011284-04	20190111-DGW-MW11-PV10out-40T	11 Jan 2019 09:00			01 Feb 2019 17:01	1
HS19011284-05	20190111-DGW-MW11-PV10inlet-controlT	11 Jan 2019 09:20			01 Feb 2019 17:01	1
HS19011284-06	20190111-DGW-MW11-PV10inlet-30-35-40T	11 Jan 2019 09:20			01 Feb 2019 17:01	1
HS19011284-07	20190112-DGW-MW11-PV10mid-controlT	12 Jan 2019 10:45			01 Feb 2019 17:01	1
HS19011284-08	20190112-DGW-MW11-PV10mid-30T	12 Jan 2019 10:45			01 Feb 2019 17:01	1
HS19011284-09	20190112-DGW-MW11-PV10mid-35T	12 Jan 2019 10:45			01 Feb 2019 17:01	1
HS19011284-10	20190112-DGW-MW11-PV10mid-40T	12 Jan 2019 10:45			01 Feb 2019 17:01	1
HS19011284-11	20190111-DGW-MW11-PV10inlet-30-35-40T-DUP	11 Jan 2019 09:20			01 Feb 2019 17:01	1
HS19011284-12	20190115-DGW-MW3-PV20out-controlT	15 Jan 2019 13:00			01 Feb 2019 17:01	1
HS19011284-13	20190115-DGW-MW3-PV20out-30T	15 Jan 2019 13:00			01 Feb 2019 17:01	1
HS19011284-14	20190115-DGW-MW3-PV20out-35T	15 Jan 2019 13:00			01 Feb 2019 17:01	1
HS19011284-15	20190115-DGW-MW3-PV20out-40T	15 Jan 2019 13:00			01 Feb 2019 17:01	1
HS19011284-16	20190117-DGW-MW3-PV20inlet-controlT	17 Jan 2019 19:00			01 Feb 2019 17:01	1
HS19011284-17	20190117-DGW-MW3-PV20inlet-30-35-40T	17 Jan 2019 19:00			01 Feb 2019 17:01	1
HS19011284-18	20190116-DGW-MW3-PV20mid-controlT	16 Jan 2019 16:30			01 Feb 2019 17:01	1
HS19011284-19	20190117-DGW-MW3-PV20mid-30T	17 Jan 2019 18:45			01 Feb 2019 17:01	1
HS19011284-20	20190116-DGW-MW3-PV20mid-35T	16 Jan 2019 16:30			01 Feb 2019 17:01	1
HS19011284-21	20190116-DGW-MW3-PV20mid-40T	16 Jan 2019 16:30			01 Feb 2019 17:01	1
HS19011284-22	20190117-DGW-MW3-PV20mid-35T-DUP	16 Jan 2019 18:45			01 Feb 2019 17:01	1

WorkOrder: HS19011284
InstrumentID: MISC-Metals
Test Code: HARD
Test Number: M2340 B
Test Name: Hardness, Total as CaCO3 by

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Hardness (As CaCO3)	HARD	0	0	2.00	2.00

WorkOrder: HS19011284
InstrumentID: ICPMS04
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000521	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000340	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000553	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0523	0.0340	0.500
A	Iron	7439-89-6	0.0250	0.0205	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000916	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0700	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0418	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00274	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0556	0.0140	0.200

WorkOrder: HS19011284
InstrumentID: ICPMS05
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000555	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000460	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000554	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0537	0.0340	0.500
A	Iron	7439-89-6	0.0500	0.0549	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.00100	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0680	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0542	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00280	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0459	0.0140	0.200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011284

QC BATCH REPORT

Batch ID: 137136 **Instrument: ICPMS04** **Method: SW6020**

MBLK Sample ID: **MBLK-137136** Units: **mg/L** Analysis Date: **30-Jan-2019 19:43**
Client ID: Run ID: **ICPMS04_331931** SeqNo: **4931362** PrepDate: **29-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	U	0.200								
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	0.02948	0.200								J

LCS Sample ID: **LCS-137136** Units: **mg/L** Analysis Date: **30-Jan-2019 19:45**
Client ID: Run ID: **ICPMS04_331931** SeqNo: **4931363** PrepDate: **29-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05005	0.00200	0.05	0	100	80 - 120				
Arsenic	0.04983	0.00200	0.05	0	99.7	80 - 120				
Cadmium	0.05075	0.00200	0.05	0	102	80 - 120				
Calcium	5.157	0.500	5	0	103	80 - 120				
Iron	5.134	0.200	5	0	103	80 - 120				
Lead	0.04872	0.00200	0.05	0	97.4	80 - 120				
Magnesium	5.206	0.200	5	0	104	80 - 120				
Potassium	5.244	0.200	5	0	105	80 - 120				
Selenium	0.04702	0.00200	0.05	0	94.0	80 - 120				
Sodium	5.276	0.200	5	0	106	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011284

QC BATCH REPORT

Batch ID: 137136 **Instrument: ICPMS04** **Method: SW6020**

MS Sample ID: **HS19011117-18MS** Units: **mg/L** Analysis Date: **30-Jan-2019 19:56**
Client ID: Run ID: **ICPMS04_331931** SeqNo: **4931368** PrepDate: **29-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04567	0.00200	0.05	0.000088	91.2	80 - 120				
Arsenic	0.04787	0.00200	0.05	0.000637	94.5	80 - 120				
Cadmium	0.04665	0.00200	0.05	0.000017	93.3	80 - 120				
Calcium	112.4	0.500	5	111	27.1	80 - 120				SO
Iron	4.692	0.200	5	0.06089	92.6	80 - 120				
Lead	0.04626	0.00200	0.05	0.000333	91.8	80 - 120				
Magnesium	32.9	0.200	5	29.55	67.1	80 - 120				SO
Potassium	5.245	0.200	5	0.4344	96.2	80 - 120				
Selenium	0.04696	0.00200	0.05	0.000237	93.4	80 - 120				
Sodium	136.2	0.200	5	127.9	167	80 - 120				SO

MSD Sample ID: **HS19011117-18MSD** Units: **mg/L** Analysis Date: **30-Jan-2019 19:58**
Client ID: Run ID: **ICPMS04_331931** SeqNo: **4931369** PrepDate: **29-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04633	0.00200	0.05	0.000088	92.5	80 - 120	0.04833	4.23	20	
Arsenic	0.05016	0.00200	0.05	0.000637	99.1	80 - 120	0.04886	2.63	20	
Cadmium	0.04878	0.00200	0.05	0.000017	97.5	80 - 120	0.04581	6.27	20	
Calcium	117.1	0.500	5	111	122	80 - 120	114.9	1.9	20	SO
Iron	4.75	0.200	5	0.06089	93.8	80 - 120	4.941	3.94	20	
Lead	0.04683	0.00200	0.05	0.000333	93.0	80 - 120	0.04625	1.23	20	
Magnesium	34.05	0.200	5	29.55	90.0	80 - 120	32.76	3.86	20	O
Potassium	4.983	0.200	5	0.4344	91.0	80 - 120	5.525	10.3	20	
Selenium	0.04856	0.00200	0.05	0.000237	96.6	80 - 120	0.04678	3.71	20	
Sodium	132.3	0.200	5	127.9	89.9	80 - 120	132.2	0.151	20	O

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011284

QC BATCH REPORT

Batch ID: 137136 **Instrument: ICPMS04** **Method: SW6020**

PDS Sample ID: **HS19011117-18PDS** Units: **mg/L** Analysis Date: **30-Jan-2019 20:01**
Client ID: Run ID: **ICPMS04_331931** SeqNo: **4931370** PrepDate: **29-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.08454	0.00200	0.1	0.000088	84.5	75 - 125				
Arsenic	0.09624	0.00200	0.1	0.000637	95.6	75 - 125				
Cadmium	0.09554	0.00200	0.1	0.000017	95.5	75 - 125				
Calcium	118.6	0.500	10	111	75.3	75 - 125				O
Iron	8.995	0.200	10	0.06089	89.3	75 - 125				
Lead	0.09092	0.00200	0.1	0.000333	90.6	75 - 125				
Magnesium	37.55	0.200	10	29.55	80.0	75 - 125				
Potassium	9.361	0.200	10	0.4344	89.3	75 - 125				
Selenium	0.09288	0.00200	0.1	0.000237	92.6	75 - 125				
Sodium	135.1	0.200	10	127.9	72.6	75 - 125				SO

SD Sample ID: **HS19011117-18SD** Units: **mg/L** Analysis Date: **30-Jan-2019 19:54**
Client ID: Run ID: **ICPMS04_331931** SeqNo: **4931367** PrepDate: **29-Jan-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000088	0	10	
Arsenic	U	0.0100					0.000637	0	10	
Cadmium	U	0.0100					0.000017	0	10	
Calcium	108.4	2.50					111	2.43	10	
Iron	U	1.00					0.06089	0	10	
Lead	U	0.0100					0.000333	0	10	
Magnesium	30.28	1.00					29.55	2.46	10	
Potassium	0.6214	1.00					0.4344	0	10	J
Selenium	U	0.0100					0.000237	0	10	
Sodium	134.9	1.00					127.9	5.54	10	

The following samples were analyzed in this batch: HS19011284-01 HS19011284-02

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011284

QC BATCH REPORT

Batch ID: 137197 **Instrument: ICPMS05** **Method: SW6020**

MBLK Sample ID: **MBLK-137197** Units: **mg/L** Analysis Date: **30-Jan-2019 17:36**
Client ID: Run ID: **ICPMS05_331929** SeqNo: **4930990** PrepDate: **30-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01039	0.200								J
Potassium	0.04953	0.200								J
Selenium	U	0.00200								
Sodium	0.08318	0.200								J

LCS Sample ID: **LCS-137197** Units: **mg/L** Analysis Date: **30-Jan-2019 17:38**
Client ID: Run ID: **ICPMS05_331929** SeqNo: **4930991** PrepDate: **30-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05405	0.00200	0.05	0	108	80 - 120				
Arsenic	0.05047	0.00200	0.05	0	101	80 - 120				
Cadmium	0.05163	0.00200	0.05	0	103	80 - 120				
Calcium	5.521	0.500	5	0	110	80 - 120				
Iron	5.445	0.200	5	0	109	80 - 120				
Lead	0.05098	0.00200	0.05	0	102	80 - 120				
Magnesium	5.576	0.200	5	0	112	80 - 120				
Potassium	5.684	0.200	5	0	114	80 - 120				
Selenium	0.05096	0.00200	0.05	0	102	80 - 120				
Sodium	5.587	0.200	5	0	112	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011284

QC BATCH REPORT

Batch ID: 137197 **Instrument: ICPMS05** **Method: SW6020**

MS Sample ID: **HS19011284-03MS** Units: **mg/L** Analysis Date: **31-Jan-2019 14:31**
Client ID: **20190111-DGW-MW11-PV10out-35T** Run ID: **ICPMS05_332031** SeqNo: **4932844** PrepDate: **30-Jan-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05142	0.0100	0.05	0.000216	102	80 - 120				
Arsenic	0.04844	0.0100	0.05	-0.002252	101	80 - 120				
Cadmium	0.05497	0.0100	0.05	0.00007	110	80 - 120				
Iron	10.15	1.00	5	5.613	90.8	80 - 120				
Lead	0.05189	0.0100	0.05	0.000019	104	80 - 120				
Selenium	0.04666	0.0100	0.05	-0.002601	98.5	80 - 120				

MSD Sample ID: **HS19011284-03MSD** Units: **mg/L** Analysis Date: **31-Jan-2019 14:33**
Client ID: **20190111-DGW-MW11-PV10out-35T** Run ID: **ICPMS05_332031** SeqNo: **4932845** PrepDate: **30-Jan-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.051	0.0100	0.05	0.000216	102	80 - 120	0.05142	0.832	20	
Arsenic	0.04824	0.0100	0.05	-0.002252	101	80 - 120	0.04844	0.416	20	
Cadmium	0.05687	0.0100	0.05	0.00007	114	80 - 120	0.05497	3.4	20	
Iron	10.87	1.00	5	5.613	105	80 - 120	10.15	6.85	20	
Lead	0.0539	0.0100	0.05	0.000019	108	80 - 120	0.05189	3.8	20	
Selenium	0.04794	0.0100	0.05	-0.002601	101	80 - 120	0.04666	2.7	20	

PDS Sample ID: **HS19011284-03PDS** Units: **mg/L** Analysis Date: **31-Jan-2019 14:36**
Client ID: **20190111-DGW-MW11-PV10out-35T** Run ID: **ICPMS05_332031** SeqNo: **4932846** PrepDate: **30-Jan-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.4668	0.0100	0.5	0	93.4	75 - 125				
Arsenic	0.4748	0.0100	0.5	0	95.0	75 - 125				
Cadmium	0.4923	0.0100	0.5	0	98.5	75 - 125				
Iron	53.79	1.00	50	5.613	96.4	75 - 125				
Lead	0.4826	0.0100	0.5	0	96.5	75 - 125				
Selenium	0.4338	0.0100	0.5	0	86.8	75 - 125				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011284

QC BATCH REPORT

Batch ID: 137197 **Instrument: ICPMS05** **Method: SW6020**

PDS Sample ID: **HS19011284-03PDS** Units: **mg/L** Analysis Date: **30-Jan-2019 17:50**
Client ID: **20190111-DGW-MW11-PV10out-35T** Run ID: **ICPMS05_331929** SeqNo: **4930996** PrepDate: **30-Jan-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	493.2	5.00	100	379.9	113	75 - 125				
Magnesium	401	2.00	100	308.9	92.1	75 - 125				
Potassium	132	2.00	100	23.47	109	75 - 125				
Sodium	1707	2.00	100	1642	65.6	75 - 125				SO

SD Sample ID: **HS19011284-03SD** Units: **mg/L** Analysis Date: **31-Jan-2019 14:29**
Client ID: **20190111-DGW-MW11-PV10out-35T** Run ID: **ICPMS05_332031** SeqNo: **4932843** PrepDate: **30-Jan-2019** DF: **25**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0500					0.000216	0	10	
Arsenic	U	0.0500					-0.002252	0	10	
Cadmium	U	0.0500					0.00007	0	10	
Iron	5.391	5.00					5.613	3.96	10	
Lead	U	0.0500					0.000019	0	10	
Selenium	U	0.0500					-0.002601	0	10	

SD Sample ID: **HS19011284-03SD** Units: **mg/L** Analysis Date: **30-Jan-2019 17:43**
Client ID: **20190111-DGW-MW11-PV10out-35T** Run ID: **ICPMS05_331929** SeqNo: **4930993** PrepDate: **30-Jan-2019** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	386.3	25.0					379.9	1.68	10	
Magnesium	303.6	10.0					308.9	1.71	10	
Potassium	24.53	10.0					23.47	4.52	10	
Sodium	1623	10.0					1642	1.16	10	

The following samples were analyzed in this batch:

HS19011284-03	HS19011284-04	HS19011284-05	HS19011284-06
HS19011284-07	HS19011284-08	HS19011284-09	HS19011284-10
HS19011284-11	HS19011284-12	HS19011284-13	HS19011284-14
HS19011284-15	HS19011284-16	HS19011284-17	HS19011284-18
HS19011284-19	HS19011284-20	HS19011284-21	HS19011284-22

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19011284**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19011284
Date/Time Received: **25-Jan-2019 09:19**
Received by: **PMG**

Checklist completed by: *Jared R. Makan* eSignature 26-Jan-2019 Date
Reviewed by: *Dane J. Wacasey* eSignature 31-Jan-2019 Date

Matrices: **Water**
Carrier name: **FedEx International Priority**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	4.3c/4.6c UC/C	IR25	
Cooler(s)/Kit(s):	24830		
Date/Time sample(s) sent to storage:	01/26/2019 15:45		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

ALS Environmental

Chain of Custody Form

Page 1 of 3

HS19011284

Golder Associates
Exide Column Studies

Work Order #:

ALS Project Manager:

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086	Project Name	Exide Column Studies	A	300_W (300 Cl, SO4, [*NO3* *48hr HT*])
Work Order		Project Number	130-2086	B	TDS_W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK_W 2320B (2320B Alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B Hardness (calc))
Address	13515 Barrett Parkway Drive Suite 260	Address	13515 Barrett Parkway Drive Suite 260	E	ICP_TW (6020A Total Metals (6)+Cations)
				F	ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	G	
Phone		Phone		H	
Fax		Fax		I	
e-Mail Address	Emily_White@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190111-DEW-MW11-PV10out-control	2019/01/11	9:00	GW	2	1	X	X	X	X	X	X					
2	20190111-DEW-MW11-PV10out-30T	"	"	"	"	1				X	X						
3	20190111-DEW-MW11-PV10out-35T	"	"	"	"	1				X	X						
4	20190111-DEW-MW11-PV10out-40T	"	"	"	"	1				X	X						
5	20190111-DEW-MW11-PV10inlet-control	2019/01/11	9:20	"	"	1				X	X						
6	20190111-DEW-MW11-PV10inlet-30-35-40T	"	9:20	"	"	1				X	X						
7	20190112-DEW-MW11-PV10mid-control	2019/01/12	10:45	"	"	1				X	X						
8	20190112-DEW-MW11-PV10mid-30T	"	"	"	"	1				X	X						
9	20190112-DEW-MW11-PV10mid-35T	"	"	"	"	1				X	X						
10	20190112-DEW-MW11-PV10mid-40T	"	"	"	"	1				X	X						

Sampler(s): Please Print & Sign

Shipment Method: FedEx

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
	1/11/19	15:50	
Relinquished by:	Date:	Time:	Received by (Laboratory):
			1/25/19 09:19
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes:

Cooler Temp. 0k, 4.3°C +2j

QC Package: (Check Box Below)

- ☐ Level II: Standard QC
- ☐ Level III: Std QC + Raw Data
- ☐ Level IV: SW846 CLP-Like
- ☐ Other: _____
- X TRRP-Checklist
- ☐ TRRP Level IV

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035 cpr. 3d

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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Chain of Custody Form

Page 3 of 3

HS19011284

Golder Associates
Exide Column Studies

ALS Project Manager:

Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086	Project Name	Exide Column Studies	A	300_W (300 Cl, SO4, [*NO3* *48hr HT*])
Work Order		Project Number	130-2086	B	TDS_W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK_W 2320B (2320B Alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B Hardness (calc))
Address	13515 Barrett Parkway Drive Suite 260	Address	13515 Barrett Parkway Drive Suite 260	E	ICP_TW (6020A Total Metals (6)+Cations)
				F	ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	G	
Phone		Phone		H	
Fax		Fax		I	
e-Mail Address	Emily_White@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	~~35~~			GW	2,8	3	X	X	X	X	X	X					
2	20190111-DGW-MW11-PW10Inlet-~~30-35~~	TDOP 2019 01/11	9:20							X	X						
3	20190111-DGW-MW11-PW10Inlet-30-35 40DUP	"	"									X					
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s): Please Print & Sign

Shipment Method: FedEx

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
	20/01/11	15:30	
Relinquished by:	Date:	Time:	Received by (Laboratory):
			1/25/19 09:19
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes:

Cooler Temp.

QC Package: (Check Box Below)

	Level II: Standard QC	X	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other: _____		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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Chain of Custody Form

Page 1 of 3

HS19011284

Golder Associates
Exide Column Studies

Work Order #:

ALS Project Manager:

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086	Project Name	Exide Column Studies	A	300_W (300 Cl, SO4, [*NO3* *48hr HT*])
Work Order		Project Number	130-2086	B	TDS_W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK_W 2320B (2320B Alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B Hardness (calc))
Address	13515 Barrett Parkway Drive Suite 260	Address	13515 Barrett Parkway Drive Suite 260	E	ICP_TW (6020A Total Metals (6)+Cations)
				F	ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	G	
Phone		Phone		H	
Fax		Fax		I	
e-Mail Address	Emily_White@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190115-DGW-MW3-PV20out-control	2019/01/15	13:00	GW	2,F	1	X	X	X	X	X	X					
2	20190115-DGW-MW3-PV20out-30T	2019/01/15	13:00	GW	2	1				X	X						
3	20190115-DGW-MW3-PV20out-35T	2019/01/15	13:00	GW	2	1				X	X						
4	20190115-DGW-MW3-PV20out-40T	2019/01/15	13:00	GW	2	1				X	X						
5	20190117-DGW-MW3-PV20inlet-control	2019/01/17	19:00	GW	2	1				X	X						
6	20190117-DGW-MW3-PV20inlet-30-35-40T	2019/01/17	19:00	GW	2	1				X	X						
7	20190116-DGW-MW3-PV20mid-control	2019/01/16	16:30	GW	2	1				X	X						
8	20190117-DGW-MW3-PV20mid-30T	2019/01/17	16:45	GW	2	1				X	X						
9	20190116-DGW-MW3-PV20mid-35T	2019/01/16	16:30	GW	2	1				X	X						
10	20190116-DGW-MW3-PV20mid-40T	2019/01/16	16:30	GW	2	1				X	X						

Sampler(s): Please Print & Sign
Brad Erlanson

Shipment Method: FedEx

Required Turnaround Time: ☐STD 10 Wk Days ☑5 Wk Days ☐2 Wk Days ☐24 Hour ☐Other _____

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
Brad Erlanson	2019/01/23	15:30	
Relinquished by:	Date:	Time:	Received by (Laboratory):
			1/25/19 09:19
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes:

Cooler Temp. 0.1°C. 4.3° +4.2°

QC Package: (Check Box Below)

	Level II: Standard QC	X	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other: _____		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035 Cl: 3.3

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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Chain of Custody Form

Page 3 of 3

HS19011284

Golder Associates
Exide Column Studies

Work Order #:

ALS Project Manager:

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086	Project Name	Exide Column Studies	A	300_W (300 Cl, SO4, [*NO3* *48hr HT*])
Work Order		Project Number	130-2086	B	TDS_W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK_W 2320B (2320B Alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B Hardness (calc))
Address	13515 Barrett Parkway Drive Suite 260	Address	13515 Barrett Parkway Drive Suite 260	E	ICP_TW (6020A Total Metals (6)+Cations)
				F	ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	G	
Phone		Phone		H	
Fax		Fax		I	
e-Mail Address	Emily_White@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190117-DGW-MW3-PW20mid-35T-DUP	2019/01/17	18:45	GW	2	1	X	X	X	X	X	X					
2	20190117-DGW-MW3-PW20mid-35D-DUP	2019/01/17	18:45	GW	2	1						X					
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s): Please Print & Sign: Jason Clemons

Shipment Method: FedEx

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
Jason Clemons	2019/01/23	15:30	
Relinquished by:	Date:	Time:	Received by (Laboratory):
			1/25/19 07:19
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes:

Cooler Temp.

QC Package: (Check Box Below)

- ☐ Level II: Standard QC
- ☐ Level III: Std QC + Raw Data
- ☐ Level IV: SW846 CLP-Like
- ☐ Other: _____
- X TRRP-Checklist
- ☐ TRRP Level IV

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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ORIGIN ID:YUXA
AUDREY ETHEVES
GOLDER ASSOCIATES LTD
7250 RUE DU MILE END
3E ETAGE
MONTREAL, PQ H2R2Y4
CANADA CA

(514) 383-0993

SHIP DATE: 23JAN19
ACTWGT: 1.10 LB
CAD: 103680724/INET4102

BILL RECIPIENT

TO **DANE WACASEY**
ALS HOUSTON LABORATORY
10450 STANCLIFF RD
STE 210
HOUSTON TX 77099
(281) 530-5656

REF:
INV:
PO:
DEPT:

(US)

565J2JD74C/23A0

FedEx Express

J191219010220Y

TRK# 7742 9190 4457

0430

NH SGRA

INTL PRIORITY

10:30A

77099

TX-US IAH

2A B30

JAN 25 2019

Après l'impression de cette étiquette :
COPIE DU DESTINATAIRE - VEUILLEZ LA PLACER DEVANT LA POCHETTE
1. Pliez la page imprimée le long de la ligne horizontale.
2. Placez l'étiquette dans la pochette d'expédition et fixez-la à votre paquet.

DÉFINITIONS Dans la présente lettre de transport aérien, « Nous », « notre », « nos » et « FedEx » se rapportent à Federal Express Corporation, ses filiales, ses mandataires et prestataires externes. « Vous », « et » votre » se rapportent à l'expéditeur, ses employés, donneurs d'ordre et mandataires. Si l'envoi ne prévoit pas des États-Unis, votre contrat d'expédition est conclu avec la filiale, la succursale ou les prestataires externes de FedEx ayant établi la propriété de produire à l'expédition. « Colis » s'entend de tout contenant ou de toute enveloppe dont nous acceptons d'effectuer la livraison, notamment les marchandises remises au transport par vos soins par le biais de nos systèmes automatisés, comptoirs, machines ou lignes de transport. « Envoi » s'entend de tout colis pour nous étant remis au transport sur une même lettre de transport aérien. REMARQUE RELATIVE AU TRANSPORT AÉRIEN La Convention de Varsovie régissant est applicable à tout envoi aérien international. La Convention, de Varsovie s'appelle régit et limite dans la plupart des cas la responsabilité de FedEx en cas de perte, retard du dommage affectant votre envoi. La Convention de Varsovie s'applique limite la responsabilité de FedEx. Par exemple, à la Poste-Unie, la responsabilité est limitée à 9,07 $ par livre (20 $ par kilogramme) à moins qu'une valeur d'expédition supérieure ne soit déclarée comme décrit ci-dessous, auquel cas supplémentaire(s) étant alors à votre charge. L'interprétation et la mise en application des dispositions relatives aux limites de responsabilité de la Convention de Varsovie peuvent varier d'un pays à l'autre. FedEx se réserve le droit d'augmenter limitera emprunts et les vôtres à sa convenance. REMARQUE RELATIVE AU TRANSPORT AÉRIEN : Les envois transportés uniquement par voie terrestre vers ou depuis un pays ayant ratifié la Convention de Varsovie ou la Convention relative au contrat de transport international de marchandises par route (« CMR ») sont soumis aux termes et conditions de la CMR, sauf stipulation contraire de la présente lettre de transport aérien. Concernant les envois transportés exclusivement par voie terrestre, les clauses de la CMR prévalent en cas de conflit entre les dispositions de la CMR et celles de la présente lettre de transport aérien. LIMITATION DE RESPONSABILITÉ : La responsabilité maximale de FedEx en cas de dommage, perte, retard, manque, erreur de livraison, défaut de livraison, information incomplète ou défaut d'exécution relativement à l'envoi est limitée par le présent Contrat et conforme aux lettres et conditions du contrat d'expédition, à moins responsabilité n'exige régie par la Convention de Varsovie, la CMR ou toute autre législation internationale, les dispositions réglementaires, décrets ou circulaire Veuillez vous référer au contrat d'expédition mentionné dans le Guide des Services FedEx en vigueur ou document équivalent afin de déterminer les limites internationales. FedEx ne propose pas de responsabilité maximale ni assurance tous risque, mais il vous est possible de payer des frais supplémentaires par tranche de 100 $US supplémentaires (ou équivalent en monnaie locale de, pays d'origine) de valeur d'expédition déclarée. Si la valeur d'expédition déclarée est supérieure et que les supplémentaires sont acquittés, la responsabilité de FedEx équivaut alors à la valeur la plus faible entre la valeur déclarée et les dommages réels. EXCLUSION DE RESPONSABILITÉ : FEDEX NE SAURAIT EN AUCUN CAS ÊTRE TENU POUR RESPONSABLE DE TOUT DOMMAGE DIRECT, INDIRECT ACCESSOIRE, SPÉCIAL OU CONSÉCUTIF SUPÉRIEUR À LA VALEUR D'EXPÉDITION DÉCLARÉE (Y COMPRIS, SANS QUE CELA SOIT LIMITATIF, DE PERTES DE REVENUS OU BÉNÉFICES) OU À LA VALEUR RÉELLE DE L'ENVOI, SI CELLE-CI EST INFÉRIEURE, QUE FEDEX AIT PU OU NON SAVOIR QUE DE TELS DOMMAGES POURRAIENT SURVENIR. FedEx ne saurait en aucun cas être tenu pour responsable de vos agissements ou omissions, y compris, sans que cela soit limitatif, de déclaration inexacte de marchandises, d'emballage, sélection, marquage ou adressage non adéquats ou inefficients de l'envoi, ni de également ou circonstances du destinataire ou de quelconque pourrait être concerné par cet envoi, ni de la violation par l'une des parties des clauses du présent contrat. FedEx ne saurait en aucun cas être tenu pour responsable de tous dommages, pertes, retards, manques, erreurs de livraison, défauts de livraison, information incomplète ou défaut d'exécution relativement aux envois de bijoutiers, devises ou autres marchandises interdites ni d'événements hors de notre contrôle tels que les catastrophes naturelles, mouvements sociaux, actes de terrorisme, guerre, grèves, désordre public, ni des agissements ou omissions des autorités publiques (notamment des douanes et... responsables de la santé publique) ayant autorité.
DÉFAUT DE GARANTIE Nous n'accordons aucune garantie expresse ou tacite. RECOURS EN CAS DE PERTE, DOMMAGE OU RETARD TOUT RECOURS DOIT ÊTRE EXERCÉ PAR ÉCRIT ET DANS LES DÉLAIS STRICTS. VOIR NOS TARIFS, LE GUIDE DES SERVICES FEDEX EN VIGUEUR OU LES CONDITIONS STANDARD D'EXPÉDITION POUR PLUS D'INFORMATIONS. La Convention de Varsovie prévoit des procédures de recours écrites spécifiques en cas de dommages, retard ou défaut de livraison des envois. En outre, l'application et la mise en application des dispositions relatives aux voies de recours de la Convention de Varsovie peuvent varier d'un pays à l'autre. Veuillez vous référer à la Convention pour déterminer les délais de recours applicables à votre envoi. La perte à dommages intérêts d'intérêt, sauf si un recours est formé dans un délai de deux ans, comme spécifié dans la Convention. FedEx n'est pas tenu de répondre à un recours avant que soit les frais d'expédition aient été acquittés. Le montant du recours peut ne pas être déduit des frais d'expédition. Si le destinataire accepte l'envoi sans noter aucun dommage sur le bulletin de livraison, FedEx considérera alors que la marchandise a été livrée dans de bonnes conditions. Afin que nous puissions répondre au bien-fondé du dommage, nous vous demandons de mettre à notre disposition les contenus, cartons d'expédition et emballages d'origine à des fins d'inspection. DROIT INTERNATIONAL Dès lors que l'une des dispositions énoncées ou citées dans la présente lettre de transport aérien va à l'encontre des traités, dispositions réglementaires, clauses ou décrets internationaux, lesdites dispositions restent en vigueur dans la mesure du possible dans le cadre du présent contrat, dans la mesure où cela n'est pas annulé. Le fait que l'une des dispositions soit invalide ou inapplicable n'affecte pas les autres parties de la présente lettre de transport aérien. Sauf indication contraire, FEDERAL EXPRESS CORPORATION, 2005 Corporate Avenue, Memphis, TN 38132, USA, est le premier transporteur du présent envoi.

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

February 01, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19011286**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 22 sample(s) on Jan 25, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DAYNA.FISHER
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19011286**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS19011286**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 02/01/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19011286				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 137096, 137200				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?	X				
		Were analytical duplicates analyzed at the appropriate frequency?	X				
		Were RPDs or relative standard deviations within the laboratory QC limits?	X				
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				2
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 02/01/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19011286				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 137096, 137200				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			3
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		X			4
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports		
Laboratory Name: ALS Laboratory Group		LRC Date: 02/01/2019
Project Name: Exide Column Studies		Laboratory Job Number: HS19011286
Reviewer Name: Dane Wacasey		Prep Batch Number(s): 137096, 137200
ER#[5]	**Description**	
1	Batch 137096, Dissolved Metals by Method SW6020, Sample HS19011270-01, MS and MSD were performed on an unrelated sample	
2	Batch 137096, Dissolved Metals by Method SW6020, select samples: Sample diluted at 5x due to high sodium concentration.	
3	See Run Log and CCB Exception Reports	
4	Batch 137096, Dissolved Metals by Method SW6020, Sample HS19011270-01, PDS was performed on an unrelated sample	

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011286
Start Date: 29-Jan-2019 End Date: 29-Jan-2019

Run ID:ICPMS05_331852
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	29-Jan-2019 12:16	016_ICV.d	CA K MG NA
LLICV2	1	29-Jan-2019 12:18	017SMPL.d	CA K MG NA
LLICV5	1	29-Jan-2019 12:20	018LICV.d	CA K MG NA
ICB	1	29-Jan-2019 12:22	019_ICB.d	CA K MG NA
ICSA	1	29-Jan-2019 12:33	022ICSA.d	CA K MG NA
ICSAB	1	29-Jan-2019 12:36	023ICSB.d	CA K MG NA
CCV 1	1	29-Jan-2019 13:08	035_CCV.d	CA K MG NA
CCB 1	1	29-Jan-2019 13:10	036_CCB.d	CA K MG NA
CCB 2	1	29-Jan-2019 13:33	044_CCB.d	CA K MG NA
CCV 2	1	29-Jan-2019 13:37	045_CCV.d	CA K MG NA
CCB 3	1	29-Jan-2019 14:04	056_CCB.d	CA K MG NA
CCV 3	1	29-Jan-2019 14:11	058_CCV.d	CA K MG NA
CCV 4	1	29-Jan-2019 14:38	067_CCV.d	CA K MG NA
CCB 4	1	29-Jan-2019 14:57	072_CCB.d	CA K MG NA
CCV 5	1	29-Jan-2019 15:25	082_CCV.d	CA K MG NA
CCB 5	1	29-Jan-2019 15:34	085_CCB.d	CA K MG NA
MBLKF1-137096	1	29-Jan-2019 15:37	086SMPL.d	
MBLK-137096	1	29-Jan-2019 15:39	087SMPL.d	
LCS-137096	1	29-Jan-2019 15:41	088SMPL.d	
ZZZZZZSD	50	29-Jan-2019 15:46	090SMPL.d	CA MG NA
ZZZZZZMS	10	29-Jan-2019 15:48	091SMPL.d	CA MG NA
ZZZZZZMSD	10	29-Jan-2019 15:50	092SMPL.d	CA MG NA
ZZZZZZPDS	10	29-Jan-2019 15:52	093SMPL.d	CA MG NA
CCB 6	1	29-Jan-2019 16:01	097_CCB.d	CA K MG NA
CCV 6	1	29-Jan-2019 16:10	099_CCV.d	CA K MG NA
ICCV 7	1	29-Jan-2019 16:44	112_ICV.d	CA K MG NA
LLCCV2	1	29-Jan-2019 16:46	113SMPL.d	CA K MG NA
LLCCV5	1	29-Jan-2019 16:49	114LICV.d	CA K MG NA
ICCB 7	1	29-Jan-2019 16:51	115_ICB.d	CA K MG NA
CCV 8	1	29-Jan-2019 17:02	118_CCV.d	CA K MG NA
CCB 8	1	29-Jan-2019 17:04	119_CCB.d	CA K MG NA
CCV 9	1	29-Jan-2019 17:26	127_CCV.d	CA K MG NA
CCB 9	1	29-Jan-2019 17:28	128_CCB.d	CA K MG NA
CCV 10	1	29-Jan-2019 17:46	136_CCV.d	CA K MG NA
CCB 10	1	29-Jan-2019 17:49	137_CCB.d	CA K MG NA
ICCV 11	1	29-Jan-2019 19:00	165_ICV.d	CA K MG NA
LLCCV2	1	29-Jan-2019 19:02	166SMPL.d	CA K MG NA
LLCCV5	1	29-Jan-2019 19:05	167LICV.d	CA K MG NA
ICCB 11	1	29-Jan-2019 19:07	168_ICB.d	CA K MG NA
CCV 12	1	29-Jan-2019 19:26	176_CCV.d	CA K MG NA
CCB 12	1	29-Jan-2019 19:28	177_CCB.d	CA K MG NA
CCV 13	1	29-Jan-2019 19:53	188_CCV.d	CA K MG NA
CCB 13	1	29-Jan-2019 19:55	189_CCB.d	CA K MG NA
CCV 14	1	29-Jan-2019 20:21	200_CCV.d	CA K MG NA
CCB 14	1	29-Jan-2019 20:24	201_CCB.d	CA K MG NA
CCV 15	1	29-Jan-2019 20:48	212_CCV.d	CA K MG NA
CCB 15	1	29-Jan-2019 20:51	213_CCB.d	CA K MG NA
CCV 16	1	29-Jan-2019 21:07	220_CCV.d	CA K MG NA
CCB 16	1	29-Jan-2019 21:09	221_CCB.d	CA K MG NA
20190111-DGW-MW11-PV10out-controlD	10	29-Jan-2019 21:12	222SMPL.d	CA K MG NA

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011286
Start Date: 29-Jan-2019 End Date: 29-Jan-2019

Run ID:ICPMS05_331852
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
20190111-DGW-MW11-PV10out30D	10	29-Jan-2019 21:14	223SMPL.d	CA K MG NA
20190111-DGW-MW11-PV10out-35D	10	29-Jan-2019 21:16	224SMPL.d	CA K MG NA
20190111-DGW-MW11-PV10out-40D	10	29-Jan-2019 21:18	225SMPL.d	CA K MG NA
20190111-DGW-MW11-PV10inlet-controlD	10	29-Jan-2019 21:21	226SMPL.d	CA K MG NA
20190111-DGW-MW11-PV10inlet-30-35-40D	10	29-Jan-2019 21:23	227SMPL.d	CA K MG NA
20190112-DGW-MW11-PV10mid-controlD	10	29-Jan-2019 21:25	228SMPL.d	CA K MG NA
20190112-DGW-MW11-PV10mid-30D	10	29-Jan-2019 21:27	229SMPL.d	CA K MG NA
20190112-DGW-MW11-PV10mid-35D	10	29-Jan-2019 21:30	230SMPL.d	CA K MG NA
CCV 17	1	29-Jan-2019 21:34	232_CCV.d	CA K MG NA
CCB 17	1	29-Jan-2019 21:36	233_CCB.d	CA K MG NA
20190112-DGW-MW11-PV10mid-40D	10	29-Jan-2019 21:39	234SMPL.d	CA K MG NA
20190111-DGW-MW11-PV10inlet-30-35-40D-DUP	10	29-Jan-2019 21:41	235SMPL.d	CA K MG NA
20190115-DGW-MW3-PV20out-controlD	10	29-Jan-2019 21:43	236SMPL.d	CA MG NA
20190115-DGW-MW3-PV20out-30D	10	29-Jan-2019 21:45	237SMPL.d	NA
20190115-DGW-MW3-PV20out-35D	10	29-Jan-2019 21:48	238SMPL.d	NA
20190115-DGW-MW3-PV20out-40D	10	29-Jan-2019 21:50	239SMPL.d	NA
20190117-DGW-MW3-PV20inlet-controlD	10	29-Jan-2019 21:52	240SMPL.d	CA MG NA
CCV 18	1	29-Jan-2019 22:01	244_CCV.d	CA K MG NA
CCB 18	1	29-Jan-2019 22:03	245_CCB.d	CA K MG NA
CCV 19	1	29-Jan-2019 22:28	256_CCV.d	CA K MG NA
CCB 19	1	29-Jan-2019 22:30	257_CCB.d	CA K MG NA
CCV 20	1	29-Jan-2019 22:55	268_CCV.d	CA K MG NA
CCB 20	1	29-Jan-2019 22:57	269_CCB.d	CA K MG NA
CCV 21	1	29-Jan-2019 23:13	276_CCV.d	CA K MG NA
CCB 21	1	29-Jan-2019 23:15	277_CCB.d	CA K MG NA
LLICV2	1	29-Jan-2019 23:18	278SMPL.d	CA K MG NA
LLICV5	1	29-Jan-2019 23:20	279LICV.d	CA K MG NA
ICSA	1	29-Jan-2019 23:22	280ICSA.d	CA K MG NA
ICSAB	1	29-Jan-2019 23:25	281ICSB.d	CA K MG NA

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011286

Run ID:ICPMS05_331852
Instrument:ICPMS05
Method:SW6020

CCB 14	Date: 29-Jan-2019 20:24	Seq: 4929163	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	-22.91	18	200	
Sodium	-22.88	14	200	

CCB 15	Date: 29-Jan-2019 20:51	Seq: 4929175	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	-41.59	14	200	

CCB 16	Date: 29-Jan-2019 21:09	Seq: 4929183	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	-29.25	18	200	
Sodium	-69.25	14	200	

CCB 17	Date: 29-Jan-2019 21:36	Seq: 4929263	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	-43.22	18	200	

CCB 18	Date: 29-Jan-2019 22:03	Seq: 4929422	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	-55.01	18	200	
Sodium	-49.19	14	200	

CCB 19	Date: 29-Jan-2019 22:30	Seq: 4929434	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	-48.89	18	200	
Sodium	-66.03	14	200	

CCB 20	Date: 29-Jan-2019 22:57	Seq: 4929446	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	-52.39	18	200	
Sodium	-82.65	14	200	

CCB 21	Date: 29-Jan-2019 23:15	Seq: 4929454	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	-47.49	18	200	
Sodium	-71.77	14	200	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011286
Start Date: 30-Jan-2019 End Date: 30-Jan-2019

Run ID:ICPMS05_331929
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	30-Jan-2019 12:01	016_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	30-Jan-2019 12:03	017SMPL.d	AS CA CD FE K MG NA PB SB SE
LLICV5	1	30-Jan-2019 12:05	018LICV.d	AS CA CD FE K MG NA PB SB SE
ICB	1	30-Jan-2019 12:07	019_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	30-Jan-2019 12:10	020ICSA.d	AS CA CD FE K MG NA PB SB SE
ICSAB	1	30-Jan-2019 12:12	021ICSB.d	AS CA CD FE K MG NA PB SB SE
20190111-DGW-MW11-PV10out-controlD	5	30-Jan-2019 12:21	023SMPL.d	AS CD FE PB SB SE
20190111-DGW-MW11-PV10out30D	5	30-Jan-2019 12:23	024SMPL.d	AS CD FE PB SB SE
20190111-DGW-MW11-PV10out-35D	5	30-Jan-2019 12:26	025SMPL.d	AS CD FE PB SB SE
20190111-DGW-MW11-PV10out-40D	5	30-Jan-2019 12:28	026SMPL.d	AS CD FE PB SB SE
20190111-DGW-MW11-PV10inlet-controlD	5	30-Jan-2019 12:30	027SMPL.d	AS CD FE PB SB SE
20190111-DGW-MW11-PV10inlet-30-35-40D	5	30-Jan-2019 12:32	028SMPL.d	AS CD FE PB SB SE
20190112-DGW-MW11-PV10mid-controlD	5	30-Jan-2019 12:35	029SMPL.d	AS CD FE PB SB SE
20190112-DGW-MW11-PV10mid-30D	5	30-Jan-2019 12:37	030SMPL.d	AS CD FE PB SB SE
20190112-DGW-MW11-PV10mid-35D	5	30-Jan-2019 12:39	031SMPL.d	AS CD FE PB SB SE
CCV 1	1	30-Jan-2019 12:44	033_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	30-Jan-2019 12:46	034_CCB.d	AS CA CD FE K MG NA PB SB SE
20190112-DGW-MW11-PV10mid-40D	5	30-Jan-2019 12:51	035SMPL.d	AS CD FE PB SB SE
20190111-DGW-MW11-PV10inlet-30-35-40D-DUP	5	30-Jan-2019 12:54	036SMPL.d	AS CD FE PB SB SE
20190115-DGW-MW3-PV20out-controlD	5	30-Jan-2019 12:56	037SMPL.d	AS CD FE K PB SB SE
20190115-DGW-MW3-PV20out-30D	5	30-Jan-2019 12:58	038SMPL.d	AS CA CD FE K MG PB SB SE
20190115-DGW-MW3-PV20out-35D	5	30-Jan-2019 13:01	039SMPL.d	AS CA CD FE K MG PB SB SE
20190115-DGW-MW3-PV20out-40D	5	30-Jan-2019 13:03	040SMPL.d	AS CA CD FE K MG PB SB SE
20190117-DGW-MW3-PV20inlet-controlD	5	30-Jan-2019 13:05	041SMPL.d	AS CD FE K PB SB SE
CCV 2	1	30-Jan-2019 13:10	043_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	30-Jan-2019 13:12	044_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	30-Jan-2019 13:40	056_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	30-Jan-2019 13:42	057_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	30-Jan-2019 14:07	068_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	30-Jan-2019 14:10	069_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	30-Jan-2019 14:43	079_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	30-Jan-2019 14:45	080_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 6	1	30-Jan-2019 15:35	097_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	30-Jan-2019 15:38	098SMPL.d	AS CA CD FE K MG NA PB SB SE
LLCCV5	1	30-Jan-2019 15:40	099LICV.d	AS CA CD FE K MG NA PB SB SE
ICCB 6	1	30-Jan-2019 15:42	100_ICB.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	30-Jan-2019 16:14	110_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	30-Jan-2019 16:16	111_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 8	1	30-Jan-2019 16:45	122_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	30-Jan-2019 16:55	124_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	30-Jan-2019 17:56	135_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	30-Jan-2019 17:59	136_CCB.d	AS CA CD FE K MG NA PB SB SE

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011286
Start Date: 30-Jan-2019 End Date: 30-Jan-2019

Run ID:ICPMS05_331929
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
CCV 10	1	30-Jan-2019 18:24	147_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	30-Jan-2019 18:26	148_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 11	1	30-Jan-2019 18:51	159_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	30-Jan-2019 18:53	160_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 12	1	30-Jan-2019 19:40	162_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 12	1	30-Jan-2019 19:42	163_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 13	1	30-Jan-2019 20:07	174_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 13	1	30-Jan-2019 20:09	175_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 14	1	30-Jan-2019 20:34	186_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 14	1	30-Jan-2019 20:36	187_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 15	1	30-Jan-2019 20:45	191_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 15	1	30-Jan-2019 20:47	192_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 16	1	30-Jan-2019 21:17	205_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	30-Jan-2019 21:19	206SMPL.d	AS CA CD FE K MG NA PB SB SE
LLCCV5	1	30-Jan-2019 21:21	207LICV.d	AS CA CD FE K MG NA PB SB SE
ICCB 16	1	30-Jan-2019 21:23	208_ICB.d	AS CA CD FE K MG NA PB SB SE
MBLK-137200	1	30-Jan-2019 21:26	209SMPL.d	AS CA CD FE K MG NA PB SB SE
LCS-137200	1	30-Jan-2019 21:28	210SMPL.d	AS CA CD FE K MG NA PB SB SE
20190117-DGW-MW3-PV20inlet-30-35-40D	5	30-Jan-2019 21:30	211SMPL.d	MG
20190117-DGW-MW3-PV20inlet-30-35-40DSD	25	30-Jan-2019 21:32	212SMPL.d	MG NA
20190117-DGW-MW3-PV20inlet-30-35-40DMS	5	30-Jan-2019 21:35	213SMPL.d	
20190117-DGW-MW3-PV20inlet-30-35-40DMSD	5	30-Jan-2019 21:37	214SMPL.d	
20190117-DGW-MW3-PV20inlet-30-35-40DPDS	5	30-Jan-2019 21:39	215SMPL.d	MG
20190116-DGW-MW3-PV20mid-controlD	5	30-Jan-2019 21:41	216SMPL.d	CA MG NA
20190117-DGW-MW3-PV20mid-30D	5	30-Jan-2019 21:44	217SMPL.d	CA MG NA
CCV 17	1	30-Jan-2019 21:46	218_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 17	1	30-Jan-2019 21:48	219_CCB.d	AS CA CD FE K MG NA PB SB SE
20190116-DGW-MW3-PV20mid-35D	5	30-Jan-2019 21:50	220SMPL.d	CA MG NA
20190116-DGW-MW3-PV20mid-40D	5	30-Jan-2019 21:53	221SMPL.d	CA MG NA
20190117-DGW-MW3-PV20mid-35D-DUP	5	30-Jan-2019 21:55	222SMPL.d	CA MG NA
CCV 18	1	30-Jan-2019 21:57	223_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 18	1	30-Jan-2019 21:59	224_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 19	1	30-Jan-2019 22:15	231_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 19	1	30-Jan-2019 22:17	232_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 20	1	30-Jan-2019 22:35	240_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 20	1	30-Jan-2019 22:38	241_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 21	1	30-Jan-2019 23:03	252_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 21	1	30-Jan-2019 23:05	253_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 22	1	30-Jan-2019 23:09	255_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 22	1	30-Jan-2019 23:11	256_CCB.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	30-Jan-2019 23:14	257SMPL.d	AS CA CD FE K MG NA PB SB SE
LLICV5	1	30-Jan-2019 23:16	258LICV.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	30-Jan-2019 23:18	259ICSA.d	AS CA CD FE K MG NA PB SB SE
ICSAB	1	30-Jan-2019 23:21	260ICSB.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011286

Run ID:ICPMS05_331929
Instrument:ICPMS05
Method:SW6020

CCB 1	Date: 30-Jan-2019 12:46	Seq: 4930072	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.11	0.4	2	
Sodium	241.5	14	200	

CCB 2	Date: 30-Jan-2019 13:12	Seq: 4930082	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.08	0.4	2	
Calcium	-37.68	34	500	
Sodium	158.4	14	200	

CCB 3	Date: 30-Jan-2019 13:42	Seq: 4930642	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.164	0.4	2	
Calcium	-62.23	34	500	
Potassium	-36.18	18	200	
Sodium	128.6	14	200	

CCB 4	Date: 30-Jan-2019 14:10	Seq: 4930654	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.087	0.4	2	
Arsenic	0.414	0.4	2	
Calcium	-75.7	34	500	
Potassium	-61.58	18	200	
Sodium	98.55	14	200	

CCB 5	Date: 30-Jan-2019 14:45	Seq: 4930675	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.944	0.4	2	
Calcium	-71.78	34	500	
Potassium	-107.1	18	200	
Sodium	182.4	14	200	

ICCB 6	Date: 30-Jan-2019 15:42	Seq: 4930691	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	-29.05	18	200	
Sodium	-28.4	14	200	

CCB 7	Date: 30-Jan-2019 16:16	Seq: 4930963	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.001	0.4	2	
Potassium	78.3	18	200	
Sodium	25.07	14	200	

CCB 8	Date: 30-Jan-2019 16:55	Seq: 4930976	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	81.88	18	200	
Sodium	250.3	14	200	

CCB 9	Date: 30-Jan-2019 17:59	Seq: 4931000	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.798	0.4	2	
Potassium	18.11	18	200	
Sodium	148.7	14	200	

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011286

Run ID:ICPMS05_331929
Instrument:ICPMS05
Method:SW6020

CCB 10	Date: 30-Jan-2019 18:26	Seq: 4931145	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.678	0.4	2	
Sodium	91.77	14	200	

CCB 11	Date: 30-Jan-2019 18:53	Seq: 4931168	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.731	0.4	2	
Potassium	29.84	18	200	
Sodium	25.08	14	200	

CCB 12	Date: 30-Jan-2019 19:42	Seq: 4931190	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.745	0.4	2	
Potassium	61.27	18	200	

CCB 13	Date: 30-Jan-2019 20:09	Seq: 4931202	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.749	0.4	2	

CCB 14	Date: 30-Jan-2019 20:36	Seq: 4931214	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.875	0.4	2	
Sodium	-14.88	14	200	

CCB 15	Date: 30-Jan-2019 20:47	Seq: 4931224	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.783	0.4	2	
Potassium	-34.7	18	200	
Sodium	-20.9	14	200	

CCB 17	Date: 30-Jan-2019 21:48	Seq: 4931457	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.71	0.4	2	
Sodium	22.45	14	200	

CCB 18	Date: 30-Jan-2019 21:59	Seq: 4931462	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.724	0.4	2	
Sodium	21.61	14	200	

CCB 19	Date: 30-Jan-2019 22:17	Seq: 4931470	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.74	0.4	2	
Potassium	21.64	18	200	
Sodium	39.59	14	200	

CCB 20	Date: 30-Jan-2019 22:38	Seq: 4931550	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.097	0.4	2	
Sodium	26.68	14	200	

CCB 21	Date: 30-Jan-2019 23:05	Seq: 4931562	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011286
Start Date: 31-Jan-2019 End Date: 31-Jan-2019

Run ID:ICPMS05_332031
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	31-Jan-2019 12:25	016_ICV.d	AS CA CD FE K NA PB SB SE
LLICV2	1	31-Jan-2019 12:28	017SMPL.d	AS CA CD FE K NA PB SB SE
LLICV5	1	31-Jan-2019 12:30	018LICV.d	AS CA CD FE K NA PB SB SE
ICB	1	31-Jan-2019 12:32	019_ICB.d	AS CA CD FE K NA PB SB SE
ICSA	1	31-Jan-2019 12:34	020ICSA.d	AS CA CD FE K NA PB SB SE
ICSAB	1	31-Jan-2019 12:59	022ICSB.d	AS CA CD FE K NA PB SB SE
MBLK-137200	1	31-Jan-2019 13:19	026SMPL.d	
20190117-DGW-MW3-PV20inlet-30-35-40D	50	31-Jan-2019 13:21	027SMPL.d	CA NA
20190117-DGW-MW3-PV20inlet-30-35-40DSD	250	31-Jan-2019 13:23	028SMPL.d	CA
20190117-DGW-MW3-PV20inlet-30-35-40DPDS	50	31-Jan-2019 13:25	029SMPL.d	CA NA
CCV 1	1	31-Jan-2019 13:34	033_CCV.d	AS CA CD FE K NA PB SB SE
CCB 1	1	31-Jan-2019 13:37	034_CCB.d	AS CA CD FE K NA PB SB SE
20190117-DGW-MW3-PV20inlet-30-35-40D	1	31-Jan-2019 13:44	035SMPL.d	AS CD FE K PB SB SE
20190117-DGW-MW3-PV20inlet-30-35-40DSD	5	31-Jan-2019 13:46	036SMPL.d	AS CD FE K PB SB SE
20190117-DGW-MW3-PV20inlet-30-35-40DMS	1	31-Jan-2019 13:49	037SMPL.d	AS CD FE K PB SB SE
20190117-DGW-MW3-PV20inlet-30-35-40DMSD	1	31-Jan-2019 13:51	038SMPL.d	AS CD FE K PB SB SE
20190117-DGW-MW3-PV20inlet-30-35-40DPDS	1	31-Jan-2019 13:53	039SMPL.d	AS CD FE K PB SB SE
20190116-DGW-MW3-PV20mid-controlD	1	31-Jan-2019 13:55	040SMPL.d	AS CD FE K PB SB SE
20190117-DGW-MW3-PV20mid-30D	1	31-Jan-2019 13:58	041SMPL.d	AS CD FE K PB SB SE
20190116-DGW-MW3-PV20mid-35D	1	31-Jan-2019 14:00	042SMPL.d	AS CD FE K PB SB SE
20190116-DGW-MW3-PV20mid-40D	1	31-Jan-2019 14:02	043SMPL.d	AS CD FE K PB SB SE
20190117-DGW-MW3-PV20mid-35D-DUP	1	31-Jan-2019 14:05	044SMPL.d	AS CD FE K PB SB SE
CCV 2	1	31-Jan-2019 14:07	045_CCV.d	AS CA CD FE K NA PB SB SE
CCB 2	1	31-Jan-2019 14:09	046_CCB.d	AS CA CD FE K NA PB SB SE
CCV 3	1	31-Jan-2019 14:47	058_CCV.d	AS CA CD FE K NA PB SB SE
CCB 3	1	31-Jan-2019 14:49	059_CCB.d	AS CA CD FE K NA PB SB SE
CCV 4	1	31-Jan-2019 15:15	070_CCV.d	AS CA CD FE K NA PB SB SE
CCB 4	1	31-Jan-2019 15:18	071_CCB.d	AS CA CD FE K NA PB SB SE
CCB 5	1	31-Jan-2019 15:46	082_CCB.d	AS CA CD FE K NA PB SB SE
CCV 5	1	31-Jan-2019 15:51	084_CCV.d	AS CA CD FE K NA PB SB SE
CCV 6	1	31-Jan-2019 16:28	090_CCV.d	AS CA CD FE K NA PB SB SE
CCB 6	1	31-Jan-2019 16:30	091_CCB.d	AS CA CD FE K NA PB SB SE
ICCV 7	1	31-Jan-2019 17:03	105_ICV.d	AS CA CD FE K NA PB SB SE
LLCCV2	1	31-Jan-2019 17:05	106SMPL.d	AS CA CD FE K NA PB SB SE
LLCCV5	1	31-Jan-2019 17:07	107LICV.d	AS CA CD FE K NA PB SB SE
ICCB 7	1	31-Jan-2019 17:19	110_ICB.d	AS CA CD FE K NA PB SB SE
ICSA	1	31-Jan-2019 17:25	112ICSA.d	AS CA CD FE K NA PB SB SE
ICSAB	1	31-Jan-2019 17:28	113ICSB.d	AS CA CD FE K NA PB SB SE
CCV 8	1	31-Jan-2019 18:39	123_CCV.d	AS CA CD FE K NA PB SB SE
CCB 8	1	31-Jan-2019 18:41	124_CCB.d	AS CA CD FE K NA PB SB SE
CCV 9	1	31-Jan-2019 19:10	133_CCV.d	AS CA CD FE K NA PB SB SE
CCB 9	1	31-Jan-2019 19:13	134_CCB.d	AS CA CD FE K NA PB SB SE
CCV 10	1	31-Jan-2019 19:37	145_CCV.d	AS CA CD FE K NA PB SB SE
CCB 10	1	31-Jan-2019 19:40	146_CCB.d	AS CA CD FE K NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011286

Run ID:ICPMS05_332031
Instrument:ICPMS05
Method:SW6020

ICB	Date: 31-Jan-2019 12:32	Seq: 4932028	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	-93.57	14	200	

CCB 1	Date: 31-Jan-2019 13:37	Seq: 4932827	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	-63.17	34	500	
Potassium	-49.6	18	200	
Sodium	-103.3	14	200	

CCB 2	Date: 31-Jan-2019 14:09	Seq: 4932839	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	-74.94	34	500	
Potassium	47.36	18	200	
Sodium	181.9	14	200	

CCB 3	Date: 31-Jan-2019 14:49	Seq: 4932852	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Arsenic	-0.759	0.4	2	
Calcium	-85.01	34	500	
Potassium	36.26	18	200	
Sodium	386.4	14	200	

CCB 4	Date: 31-Jan-2019 15:18	Seq: 4932864	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Arsenic	-0.693	0.4	2	
Calcium	-86.73	34	500	
Potassium	-71.64	18	200	
Sodium	155.6	14	200	

CCB 5	Date: 31-Jan-2019 15:46	Seq: 4932876	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Arsenic	-0.416	0.4	2	
Calcium	-90.94	34	500	
Potassium	-92.95	18	200	
Sodium	37.2	14	200	

CCB 6	Date: 31-Jan-2019 16:30	Seq: 4932885	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Arsenic	-0.414	0.4	2	
Calcium	-97.62	34	500	
Potassium	-162.6	18	200	
Sodium	-249.9	14	200	

ICCB 7	Date: 31-Jan-2019 17:19	Seq: 4933282	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	-33.55	14	200	

CCB 8	Date: 31-Jan-2019 18:41	Seq: 4933296	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	41.95	18	200	
Sodium	102.2	14	200	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19011286

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19011286-01	20190111-DGW-MW11-PV10out-controlD	Groundwater		11-Jan-2019 09:00	25-Jan-2019 09:19	☐
HS19011286-02	20190111-DGW-MW11-PV10out30D	Groundwater		11-Jan-2019 09:00	25-Jan-2019 09:19	☐
HS19011286-03	20190111-DGW-MW11-PV10out-35D	Groundwater		11-Jan-2019 09:00	25-Jan-2019 09:19	☐
HS19011286-04	20190111-DGW-MW11-PV10out-40D	Groundwater		11-Jan-2019 09:00	25-Jan-2019 09:19	☐
HS19011286-05	20190111-DGW-MW11-PV10inlet-controlD	Groundwater		11-Jan-2019 09:20	25-Jan-2019 09:19	☐
HS19011286-06	20190111-DGW-MW11-PV10inlet-30-35-40D	Groundwater		11-Jan-2019 09:20	25-Jan-2019 09:19	☐
HS19011286-07	20190112-DGW-MW11-PV10mid-controlD	Groundwater		12-Jan-2019 10:45	25-Jan-2019 09:19	☐
HS19011286-08	20190112-DGW-MW11-PV10mid-30D	Groundwater		12-Jan-2019 10:45	25-Jan-2019 09:19	☐
HS19011286-09	20190112-DGW-MW11-PV10mid-35D	Groundwater		12-Jan-2019 10:45	25-Jan-2019 09:19	☐
HS19011286-10	20190112-DGW-MW11-PV10mid-40D	Groundwater		12-Jan-2019 10:45	25-Jan-2019 09:19	☐
HS19011286-11	20190111-DGW-MW11-PV10inlet-30-35-40D-DUP	Groundwater		11-Jan-2019 09:20	25-Jan-2019 09:19	☐
HS19011286-12	20190115-DGW-MW3-PV20out-controlD	Groundwater		15-Jan-2019 13:00	25-Jan-2019 09:19	☐
HS19011286-13	20190115-DGW-MW3-PV20out-30D	Groundwater		15-Jan-2019 13:00	25-Jan-2019 09:19	☐
HS19011286-14	20190115-DGW-MW3-PV20out-35D	Groundwater		15-Jan-2019 13:00	25-Jan-2019 09:19	☐
HS19011286-15	20190115-DGW-MW3-PV20out-40D	Groundwater		15-Jan-2019 13:00	25-Jan-2019 09:19	☐
HS19011286-16	20190117-DGW-MW3-PV20inlet-controlD	Groundwater		17-Jan-2019 19:00	25-Jan-2019 09:19	☐
HS19011286-17	20190117-DGW-MW3-PV20inlet-30-35-40D	Groundwater		17-Jan-2019 19:00	25-Jan-2019 09:19	☐
HS19011286-18	20190116-DGW-MW3-PV20mid-controlD	Groundwater		16-Jan-2019 16:30	25-Jan-2019 09:19	☐
HS19011286-19	20190117-DGW-MW3-PV20mid-30D	Groundwater		17-Jan-2019 18:45	25-Jan-2019 09:19	☐
HS19011286-20	20190116-DGW-MW3-PV20mid-35D	Groundwater		16-Jan-2019 16:30	25-Jan-2019 09:19	☐
HS19011286-21	20190116-DGW-MW3-PV20mid-40D	Groundwater		16-Jan-2019 16:30	25-Jan-2019 09:19	☐
HS19011286-22	20190117-DGW-MW3-PV20mid-35D-DUP	Groundwater		16-Jan-2019 18:45	25-Jan-2019 09:19	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190111-DGW-MW11-PV10out-controlD
Collection Date: 11-Jan-2019 09:00

ANALYTICAL REPORT
WorkOrder:HS19011286
Lab ID:HS19011286-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 28-Jan-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	30-Jan-2019 12:21
Arsenic	U		0.00200	0.0100	mg/L	5	30-Jan-2019 12:21
Cadmium	**0.0107**		**0.00100**	**0.0100**	**mg/L**	5	30-Jan-2019 12:21
Calcium	**458**		**0.340**	**5.00**	**mg/L**	10	29-Jan-2019 21:12
Iron	U		0.0600	1.00	mg/L	5	30-Jan-2019 12:21
Lead	U		0.00300	0.0100	mg/L	5	30-Jan-2019 12:21
Magnesium	**286**		**0.100**	**2.00**	**mg/L**	10	29-Jan-2019 21:12
Potassium	**21.7**		**0.180**	**2.00**	**mg/L**	10	29-Jan-2019 21:12
Selenium	U		0.00550	0.0100	mg/L	5	30-Jan-2019 12:21
Sodium	**1,410**		**0.140**	**2.00**	**mg/L**	10	29-Jan-2019 21:12

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190111-DGW-MW11-PV10out30D
Collection Date: 11-Jan-2019 09:00

ANALYTICAL REPORT
WorkOrder:HS19011286
Lab ID:HS19011286-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 28-Jan-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	30-Jan-2019 12:23
Arsenic	U		0.00200	0.0100	mg/L	5	30-Jan-2019 12:23
Cadmium	U		0.00100	0.0100	mg/L	5	30-Jan-2019 12:23
Calcium	**300**		**0.340**	**5.00**	**mg/L**	10	29-Jan-2019 21:14
Iron	**0.699**	J	**0.0600**	**1.00**	**mg/L**	5	30-Jan-2019 12:23
Lead	U		0.00300	0.0100	mg/L	5	30-Jan-2019 12:23
Magnesium	**231**		**0.100**	**2.00**	**mg/L**	10	29-Jan-2019 21:14
Potassium	**18.4**		**0.180**	**2.00**	**mg/L**	10	29-Jan-2019 21:14
Selenium	U		0.00550	0.0100	mg/L	5	30-Jan-2019 12:23
Sodium	**1,250**		**0.140**	**2.00**	**mg/L**	10	29-Jan-2019 21:14

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190111-DGW-MW11-PV10out-35D
Collection Date: 11-Jan-2019 09:00

ANALYTICAL REPORT
WorkOrder:HS19011286
Lab ID:HS19011286-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 28-Jan-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	30-Jan-2019 12:26
Arsenic	U		0.00200	0.0100	mg/L	5	30-Jan-2019 12:26
Cadmium	U		0.00100	0.0100	mg/L	5	30-Jan-2019 12:26
Calcium	**357**		**0.340**	**5.00**	**mg/L**	10	29-Jan-2019 21:16
Iron	**1.19**		**0.0600**	**1.00**	**mg/L**	5	30-Jan-2019 12:26
Lead	U		0.00300	0.0100	mg/L	5	30-Jan-2019 12:26
Magnesium	**262**		**0.100**	**2.00**	**mg/L**	10	29-Jan-2019 21:16
Potassium	**21.7**		**0.180**	**2.00**	**mg/L**	10	29-Jan-2019 21:16
Selenium	U		0.00550	0.0100	mg/L	5	30-Jan-2019 12:26
Sodium	**1,420**		**0.140**	**2.00**	**mg/L**	10	29-Jan-2019 21:16

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190111-DGW-MW11-PV10out-40D
Collection Date: 11-Jan-2019 09:00

ANALYTICAL REPORT
WorkOrder:HS19011286
Lab ID:HS19011286-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 28-Jan-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	30-Jan-2019 12:28
Arsenic	U		0.00200	0.0100	mg/L	5	30-Jan-2019 12:28
Cadmium	U		0.00100	0.0100	mg/L	5	30-Jan-2019 12:28
Calcium	**326**		**0.340**	**5.00**	**mg/L**	10	29-Jan-2019 21:18
Iron	U		0.0600	1.00	mg/L	5	30-Jan-2019 12:28
Lead	U		0.00300	0.0100	mg/L	5	30-Jan-2019 12:28
Magnesium	**246**		**0.100**	**2.00**	**mg/L**	10	29-Jan-2019 21:18
Potassium	**19.8**		**0.180**	**2.00**	**mg/L**	10	29-Jan-2019 21:18
Selenium	U		0.00550	0.0100	mg/L	5	30-Jan-2019 12:28
Sodium	**1,350**		**0.140**	**2.00**	**mg/L**	10	29-Jan-2019 21:18

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190111-DGW-MW11-PV10inlet-controlD
Collection Date: 11-Jan-2019 09:20

ANALYTICAL REPORT
WorkOrder:HS19011286
Lab ID:HS19011286-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 28-Jan-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	30-Jan-2019 12:30
Arsenic	U		0.00200	0.0100	mg/L	5	30-Jan-2019 12:30
Cadmium	**0.00972**	J	**0.00100**	**0.0100**	**mg/L**	5	30-Jan-2019 12:30
Calcium	**370**		**0.340**	**5.00**	**mg/L**	10	29-Jan-2019 21:21
Iron	**1.65**		**0.0600**	**1.00**	**mg/L**	5	30-Jan-2019 12:30
Lead	U		0.00300	0.0100	mg/L	5	30-Jan-2019 12:30
Magnesium	**211**		**0.100**	**2.00**	**mg/L**	10	29-Jan-2019 21:21
Potassium	**16.2**		**0.180**	**2.00**	**mg/L**	10	29-Jan-2019 21:21
Selenium	U		0.00550	0.0100	mg/L	5	30-Jan-2019 12:30
Sodium	**1,220**		**0.140**	**2.00**	**mg/L**	10	29-Jan-2019 21:21

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190111-DGW-MW11-PV10inlet-30-35-40D
Collection Date: 11-Jan-2019 09:20

ANALYTICAL REPORT
WorkOrder:HS19011286
Lab ID:HS19011286-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 28-Jan-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	30-Jan-2019 12:32
Arsenic	U		0.00200	0.0100	mg/L	5	30-Jan-2019 12:32
Cadmium	**0.00876**	J	**0.00100**	**0.0100**	**mg/L**	5	30-Jan-2019 12:32
Calcium	**370**		**0.340**	**5.00**	**mg/L**	10	29-Jan-2019 21:23
Iron	**20.5**		**0.0600**	**1.00**	**mg/L**	5	30-Jan-2019 12:32
Lead	U		0.00300	0.0100	mg/L	5	30-Jan-2019 12:32
Magnesium	**229**		**0.100**	**2.00**	**mg/L**	10	29-Jan-2019 21:23
Potassium	**17.2**		**0.180**	**2.00**	**mg/L**	10	29-Jan-2019 21:23
Selenium	U		0.00550	0.0100	mg/L	5	30-Jan-2019 12:32
Sodium	**1,220**		**0.140**	**2.00**	**mg/L**	10	29-Jan-2019 21:23

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190112-DGW-MW11-PV10mid-controlD
Collection Date: 12-Jan-2019 10:45

ANALYTICAL REPORT
WorkOrder:HS19011286
Lab ID:HS19011286-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 28-Jan-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	30-Jan-2019 12:35
Arsenic	U		0.00200	0.0100	mg/L	5	30-Jan-2019 12:35
Cadmium	**0.00752**	J	**0.00100**	**0.0100**	**mg/L**	5	30-Jan-2019 12:35
Calcium	**361**		**0.340**	**5.00**	**mg/L**	10	29-Jan-2019 21:25
Iron	**0.385**	J	**0.0600**	**1.00**	**mg/L**	5	30-Jan-2019 12:35
Lead	U		0.00300	0.0100	mg/L	5	30-Jan-2019 12:35
Magnesium	**221**		**0.100**	**2.00**	**mg/L**	10	29-Jan-2019 21:25
Potassium	**15.9**		**0.180**	**2.00**	**mg/L**	10	29-Jan-2019 21:25
Selenium	U		0.00550	0.0100	mg/L	5	30-Jan-2019 12:35
Sodium	**1,140**		**0.140**	**2.00**	**mg/L**	10	29-Jan-2019 21:25

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190112-DGW-MW11-PV10mid-30D
Collection Date: 12-Jan-2019 10:45

ANALYTICAL REPORT
WorkOrder:HS19011286
Lab ID:HS19011286-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 28-Jan-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	30-Jan-2019 12:37
Arsenic	U		0.00200	0.0100	mg/L	5	30-Jan-2019 12:37
Cadmium	U		0.00100	0.0100	mg/L	5	30-Jan-2019 12:37
Calcium	**404**		**0.340**	**5.00**	**mg/L**	10	29-Jan-2019 21:27
Iron	**11.3**		**0.0600**	**1.00**	**mg/L**	5	30-Jan-2019 12:37
Lead	U		0.00300	0.0100	mg/L	5	30-Jan-2019 12:37
Magnesium	**285**		**0.100**	**2.00**	**mg/L**	10	29-Jan-2019 21:27
Potassium	**21.4**		**0.180**	**2.00**	**mg/L**	10	29-Jan-2019 21:27
Selenium	U		0.00550	0.0100	mg/L	5	30-Jan-2019 12:37
Sodium	**1,500**		**0.140**	**2.00**	**mg/L**	10	29-Jan-2019 21:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190112-DGW-MW11-PV10mid-35D
Collection Date: 12-Jan-2019 10:45

ANALYTICAL REPORT
WorkOrder:HS19011286
Lab ID:HS19011286-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 28-Jan-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	30-Jan-2019 12:39
Arsenic	U		0.00200	0.0100	mg/L	5	30-Jan-2019 12:39
Cadmium	U		0.00100	0.0100	mg/L	5	30-Jan-2019 12:39
Calcium	**379**		**0.340**	**5.00**	**mg/L**	10	29-Jan-2019 21:30
Iron	**9.36**		**0.0600**	**1.00**	**mg/L**	5	30-Jan-2019 12:39
Lead	U		0.00300	0.0100	mg/L	5	30-Jan-2019 12:39
Magnesium	**275**		**0.100**	**2.00**	**mg/L**	10	29-Jan-2019 21:30
Potassium	**20.6**		**0.180**	**2.00**	**mg/L**	10	29-Jan-2019 21:30
Selenium	U		0.00550	0.0100	mg/L	5	30-Jan-2019 12:39
Sodium	**1,470**		**0.140**	**2.00**	**mg/L**	10	29-Jan-2019 21:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190112-DGW-MW11-PV10mid-40D
Collection Date: 12-Jan-2019 10:45

ANALYTICAL REPORT
WorkOrder:HS19011286
Lab ID:HS19011286-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 28-Jan-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	30-Jan-2019 12:51
Arsenic	U		0.00200	0.0100	mg/L	5	30-Jan-2019 12:51
Cadmium	U		0.00100	0.0100	mg/L	5	30-Jan-2019 12:51
Calcium	**356**		**0.340**	**5.00**	**mg/L**	10	29-Jan-2019 21:39
Iron	**3.96**		**0.0600**	**1.00**	**mg/L**	5	30-Jan-2019 12:51
Lead	U		0.00300	0.0100	mg/L	5	30-Jan-2019 12:51
Magnesium	**258**		**0.100**	**2.00**	**mg/L**	10	29-Jan-2019 21:39
Potassium	**18.9**		**0.180**	**2.00**	**mg/L**	10	29-Jan-2019 21:39
Selenium	U		0.00550	0.0100	mg/L	5	30-Jan-2019 12:51
Sodium	**1,370**		**0.140**	**2.00**	**mg/L**	10	29-Jan-2019 21:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190111-DGW-MW11-PV10inlet-30-35-40D-DUP
Collection Date: 11-Jan-2019 09:20

ANALYTICAL REPORT
WorkOrder:HS19011286
Lab ID:HS19011286-11
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 28-Jan-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	30-Jan-2019 12:54
Arsenic	U		0.00200	0.0100	mg/L	5	30-Jan-2019 12:54
Cadmium	**0.00963**	J	**0.00100**	**0.0100**	**mg/L**	5	30-Jan-2019 12:54
Calcium	**462**		**0.340**	**5.00**	**mg/L**	10	29-Jan-2019 21:41
Iron	**20.0**		**0.0600**	**1.00**	**mg/L**	5	30-Jan-2019 12:54
Lead	U		0.00300	0.0100	mg/L	5	30-Jan-2019 12:54
Magnesium	**289**		**0.100**	**2.00**	**mg/L**	10	29-Jan-2019 21:41
Potassium	**20.7**		**0.180**	**2.00**	**mg/L**	10	29-Jan-2019 21:41
Selenium	U		0.00550	0.0100	mg/L	5	30-Jan-2019 12:54
Sodium	**1,520**		**0.140**	**2.00**	**mg/L**	10	29-Jan-2019 21:41

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190115-DGW-MW3-PV20out-controlD
Collection Date: 15-Jan-2019 13:00

ANALYTICAL REPORT
WorkOrder:HS19011286
Lab ID:HS19011286-12
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 28-Jan-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	30-Jan-2019 12:56
Arsenic	**0.00224**	J	**0.00200**	**0.0100**	**mg/L**	5	30-Jan-2019 12:56
Cadmium	U		0.00100	0.0100	mg/L	5	30-Jan-2019 12:56
Calcium	**100**		**0.340**	**5.00**	**mg/L**	10	29-Jan-2019 21:43
Iron	U		0.0600	1.00	mg/L	5	30-Jan-2019 12:56
Lead	U		0.00300	0.0100	mg/L	5	30-Jan-2019 12:56
Magnesium	**18.5**		**0.100**	**2.00**	**mg/L**	10	29-Jan-2019 21:43
Potassium	**2.29**		**0.0900**	**1.00**	**mg/L**	5	30-Jan-2019 12:56
Selenium	U		0.00550	0.0100	mg/L	5	30-Jan-2019 12:56
Sodium	**168**		**0.140**	**2.00**	**mg/L**	10	29-Jan-2019 21:43

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190115-DGW-MW3-PV20out-30D
Collection Date: 15-Jan-2019 13:00

ANALYTICAL REPORT
WorkOrder:HS19011286
Lab ID:HS19011286-13
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 28-Jan-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	30-Jan-2019 12:58
Arsenic	U		0.00200	0.0100	mg/L	5	30-Jan-2019 12:58
Cadmium	U		0.00100	0.0100	mg/L	5	30-Jan-2019 12:58
Calcium	**7.40**		**0.170**	**2.50**	**mg/L**	5	30-Jan-2019 12:58
Iron	U		0.0600	1.00	mg/L	5	30-Jan-2019 12:58
Lead	U		0.00300	0.0100	mg/L	5	30-Jan-2019 12:58
Magnesium	**17.2**		**0.0500**	**1.00**	**mg/L**	5	30-Jan-2019 12:58
Potassium	**2.18**		**0.0900**	**1.00**	**mg/L**	5	30-Jan-2019 12:58
Selenium	U		0.00550	0.0100	mg/L	5	30-Jan-2019 12:58
Sodium	**171**		**0.140**	**2.00**	**mg/L**	10	29-Jan-2019 21:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190115-DGW-MW3-PV20out-35D
Collection Date: 15-Jan-2019 13:00

ANALYTICAL REPORT
WorkOrder:HS19011286
Lab ID:HS19011286-14
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 28-Jan-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	30-Jan-2019 13:01
Arsenic	U		0.00200	0.0100	mg/L	5	30-Jan-2019 13:01
Cadmium	U		0.00100	0.0100	mg/L	5	30-Jan-2019 13:01
Calcium	**6.26**		**0.170**	**2.50**	**mg/L**	5	30-Jan-2019 13:01
Iron	U		0.0600	1.00	mg/L	5	30-Jan-2019 13:01
Lead	U		0.00300	0.0100	mg/L	5	30-Jan-2019 13:01
Magnesium	**14.0**		**0.0500**	**1.00**	**mg/L**	5	30-Jan-2019 13:01
Potassium	**2.09**		**0.0900**	**1.00**	**mg/L**	5	30-Jan-2019 13:01
Selenium	U		0.00550	0.0100	mg/L	5	30-Jan-2019 13:01
Sodium	**172**		**0.140**	**2.00**	**mg/L**	10	29-Jan-2019 21:48

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190115-DGW-MW3-PV20out-40D
Collection Date: 15-Jan-2019 13:00

ANALYTICAL REPORT
WorkOrder:HS19011286
Lab ID:HS19011286-15
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 28-Jan-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	30-Jan-2019 13:03
Arsenic	U		0.00200	0.0100	mg/L	5	30-Jan-2019 13:03
Cadmium	U		0.00100	0.0100	mg/L	5	30-Jan-2019 13:03
Calcium	**5.94**		**0.170**	**2.50**	**mg/L**	5	30-Jan-2019 13:03
Iron	U		0.0600	1.00	mg/L	5	30-Jan-2019 13:03
Lead	U		0.00300	0.0100	mg/L	5	30-Jan-2019 13:03
Magnesium	**13.8**		**0.0500**	**1.00**	**mg/L**	5	30-Jan-2019 13:03
Potassium	**2.06**		**0.0900**	**1.00**	**mg/L**	5	30-Jan-2019 13:03
Selenium	U		0.00550	0.0100	mg/L	5	30-Jan-2019 13:03
Sodium	**148**		**0.140**	**2.00**	**mg/L**	10	29-Jan-2019 21:50

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190117-DGW-MW3-PV20inlet-controlD
Collection Date: 17-Jan-2019 19:00

ANALYTICAL REPORT
WorkOrder:HS19011286
Lab ID:HS19011286-16
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 28-Jan-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	30-Jan-2019 13:05
Arsenic	**0.00837**	J	**0.00200**	**0.0100**	**mg/L**	5	30-Jan-2019 13:05
Cadmium	U		0.00100	0.0100	mg/L	5	30-Jan-2019 13:05
Calcium	**97.3**		**0.340**	**5.00**	**mg/L**	10	29-Jan-2019 21:52
Iron	U		0.0600	1.00	mg/L	5	30-Jan-2019 13:05
Lead	U		0.00300	0.0100	mg/L	5	30-Jan-2019 13:05
Magnesium	**18.0**		**0.100**	**2.00**	**mg/L**	10	29-Jan-2019 21:52
Potassium	**2.16**		**0.0900**	**1.00**	**mg/L**	5	30-Jan-2019 13:05
Selenium	U		0.00550	0.0100	mg/L	5	30-Jan-2019 13:05
Sodium	**164**		**0.140**	**2.00**	**mg/L**	10	29-Jan-2019 21:52

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190117-DGW-MW3-PV20inlet-30-35-40D
Collection Date: 17-Jan-2019 19:00

ANALYTICAL REPORT
WorkOrder:HS19011286
Lab ID:HS19011286-17
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 30-Jan-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	31-Jan-2019 13:44
Arsenic	**0.00704**		**0.000400**	**0.00200**	**mg/L**	1	31-Jan-2019 13:44
Cadmium	U		0.000200	0.00200	mg/L	1	31-Jan-2019 13:44
Calcium	**119**		**1.70**	**25.0**	**mg/L**	50	31-Jan-2019 13:21
Iron	**0.0223**	J	**0.0120**	**0.200**	**mg/L**	1	31-Jan-2019 13:44
Lead	U		0.000600	0.00200	mg/L	1	31-Jan-2019 13:44
Magnesium	**21.2**		**0.0500**	**1.00**	**mg/L**	5	30-Jan-2019 21:30
Potassium	**1.96**		**0.0180**	**0.200**	**mg/L**	1	31-Jan-2019 13:44
Selenium	U		0.00110	0.00200	mg/L	1	31-Jan-2019 13:44
Sodium	**238**		**0.700**	**10.0**	**mg/L**	50	31-Jan-2019 13:21

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190116-DGW-MW3-PV20mid-controlD
Collection Date: 16-Jan-2019 16:30

ANALYTICAL REPORT
WorkOrder:HS19011286
Lab ID:HS19011286-18
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 30-Jan-2019		Analyst: JHD
Antimony	**0.000701**	J	**0.000400**	**0.00200**	**mg/L**	1	31-Jan-2019 13:55
Arsenic	**0.00402**		**0.000400**	**0.00200**	**mg/L**	1	31-Jan-2019 13:55
Cadmium	U		0.000200	0.00200	mg/L	1	31-Jan-2019 13:55
Calcium	**101**		**0.170**	**2.50**	**mg/L**	5	30-Jan-2019 21:41
Iron	**0.0136**	J	**0.0120**	**0.200**	**mg/L**	1	31-Jan-2019 13:55
Lead	U		0.000600	0.00200	mg/L	1	31-Jan-2019 13:55
Magnesium	**19.6**		**0.0500**	**1.00**	**mg/L**	5	30-Jan-2019 21:41
Potassium	**2.18**		**0.0180**	**0.200**	**mg/L**	1	31-Jan-2019 13:55
Selenium	U		0.00110	0.00200	mg/L	1	31-Jan-2019 13:55
Sodium	**181**		**0.0700**	**1.00**	**mg/L**	5	30-Jan-2019 21:41

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190117-DGW-MW3-PV20mid-30D
Collection Date: 17-Jan-2019 18:45

ANALYTICAL REPORT
WorkOrder:HS19011286
Lab ID:HS19011286-19
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 30-Jan-2019		Analyst: JHD
Antimony	**0.000437**	J	**0.000400**	**0.00200**	**mg/L**	1	31-Jan-2019 13:58
Arsenic	**0.000511**	J	**0.000400**	**0.00200**	**mg/L**	1	31-Jan-2019 13:58
Cadmium	U		0.000200	0.00200	mg/L	1	31-Jan-2019 13:58
Calcium	**9.59**		**0.170**	**2.50**	**mg/L**	5	30-Jan-2019 21:44
Iron	U		0.0120	0.200	mg/L	1	31-Jan-2019 13:58
Lead	U		0.000600	0.00200	mg/L	1	31-Jan-2019 13:58
Magnesium	**16.2**		**0.0500**	**1.00**	**mg/L**	5	30-Jan-2019 21:44
Potassium	**2.35**		**0.0180**	**0.200**	**mg/L**	1	31-Jan-2019 13:58
Selenium	U		0.00110	0.00200	mg/L	1	31-Jan-2019 13:58
Sodium	**198**		**0.0700**	**1.00**	**mg/L**	5	30-Jan-2019 21:44

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190116-DGW-MW3-PV20mid-35D
Collection Date: 16-Jan-2019 16:30

ANALYTICAL REPORT
WorkOrder:HS19011286
Lab ID:HS19011286-20
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 30-Jan-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	31-Jan-2019 14:00
Arsenic	U		0.000400	0.00200	mg/L	1	31-Jan-2019 14:00
Cadmium	U		0.000200	0.00200	mg/L	1	31-Jan-2019 14:00
Calcium	**9.00**		**0.170**	**2.50**	**mg/L**	5	30-Jan-2019 21:50
Iron	U		0.0120	0.200	mg/L	1	31-Jan-2019 14:00
Lead	U		0.000600	0.00200	mg/L	1	31-Jan-2019 14:00
Magnesium	**14.5**		**0.0500**	**1.00**	**mg/L**	5	30-Jan-2019 21:50
Potassium	**2.11**		**0.0180**	**0.200**	**mg/L**	1	31-Jan-2019 14:00
Selenium	U		0.00110	0.00200	mg/L	1	31-Jan-2019 14:00
Sodium	**182**		**0.0700**	**1.00**	**mg/L**	5	30-Jan-2019 21:50

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190116-DGW-MW3-PV20mid-40D
Collection Date: 16-Jan-2019 16:30

ANALYTICAL REPORT
WorkOrder:HS19011286
Lab ID:HS19011286-21
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 30-Jan-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	31-Jan-2019 14:02
Arsenic	**0.000563**	J	**0.000400**	**0.00200**	**mg/L**	1	31-Jan-2019 14:02
Cadmium	U		0.000200	0.00200	mg/L	1	31-Jan-2019 14:02
Calcium	**8.74**		**0.170**	**2.50**	**mg/L**	5	30-Jan-2019 21:53
Iron	U		0.0120	0.200	mg/L	1	31-Jan-2019 14:02
Lead	U		0.000600	0.00200	mg/L	1	31-Jan-2019 14:02
Magnesium	**15.4**		**0.0500**	**1.00**	**mg/L**	5	30-Jan-2019 21:53
Potassium	**2.18**		**0.0180**	**0.200**	**mg/L**	1	31-Jan-2019 14:02
Selenium	U		0.00110	0.00200	mg/L	1	31-Jan-2019 14:02
Sodium	**198**		**0.0700**	**1.00**	**mg/L**	5	30-Jan-2019 21:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190117-DGW-MW3-PV20mid-35D-DUP
Collection Date: 16-Jan-2019 18:45

ANALYTICAL REPORT
WorkOrder:HS19011286
Lab ID:HS19011286-22
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 30-Jan-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	31-Jan-2019 14:05
Arsenic	**0.000463**	J	**0.000400**	**0.00200**	**mg/L**	1	31-Jan-2019 14:05
Cadmium	U		0.000200	0.00200	mg/L	1	31-Jan-2019 14:05
Calcium	**8.88**		**0.170**	**2.50**	**mg/L**	5	30-Jan-2019 21:55
Iron	U		0.0120	0.200	mg/L	1	31-Jan-2019 14:05
Lead	U		0.000600	0.00200	mg/L	1	31-Jan-2019 14:05
Magnesium	**15.2**		**0.0500**	**1.00**	**mg/L**	5	30-Jan-2019 21:55
Potassium	**2.12**		**0.0180**	**0.200**	**mg/L**	1	31-Jan-2019 14:05
Selenium	U		0.00110	0.00200	mg/L	1	31-Jan-2019 14:05
Sodium	**190**		**0.0700**	**1.00**	**mg/L**	5	30-Jan-2019 21:55

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011286

Batch ID: 137096 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19011286-01	1	10	10 (mL)	1
HS19011286-02	1	10	10 (mL)	1
HS19011286-03	1	10	10 (mL)	1
HS19011286-04	1	10	10 (mL)	1
HS19011286-05	1	10	10 (mL)	1
HS19011286-06	1	10	10 (mL)	1
HS19011286-07	1	10	10 (mL)	1
HS19011286-08	1	10	10 (mL)	1
HS19011286-09	1	10	10 (mL)	1
HS19011286-10	1	10	10 (mL)	1
HS19011286-11	1	10	10 (mL)	1
HS19011286-12	1	10	10 (mL)	1
HS19011286-13	1	10	10 (mL)	1
HS19011286-14	1	10	10 (mL)	1
HS19011286-15	1	10	10 (mL)	1
HS19011286-16	1	10	10 (mL)	1

Batch ID: 137200 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19011286-17	1	10	10 (mL)	1
HS19011286-18	1	10	10 (mL)	1
HS19011286-19	1	10	10 (mL)	1
HS19011286-20	1	10	10 (mL)	1
HS19011286-21	1	10	10 (mL)	1
HS19011286-22	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011286

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011286

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 137096	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS19011286-01	20190111-DGW-MW11-PV10out-controlD	11 Jan 2019 09:00		28 Jan 2019 10:30	30 Jan 2019 12:21	5
HS19011286-01	20190111-DGW-MW11-PV10out-controlD	11 Jan 2019 09:00		28 Jan 2019 10:30	29 Jan 2019 21:12	10
HS19011286-02	20190111-DGW-MW11-PV10out30D	11 Jan 2019 09:00		28 Jan 2019 10:30	30 Jan 2019 12:23	5
HS19011286-02	20190111-DGW-MW11-PV10out30D	11 Jan 2019 09:00		28 Jan 2019 10:30	29 Jan 2019 21:14	10
HS19011286-03	20190111-DGW-MW11-PV10out-35D	11 Jan 2019 09:00		28 Jan 2019 10:30	30 Jan 2019 12:26	5
HS19011286-03	20190111-DGW-MW11-PV10out-35D	11 Jan 2019 09:00		28 Jan 2019 10:30	29 Jan 2019 21:16	10
HS19011286-04	20190111-DGW-MW11-PV10out-40D	11 Jan 2019 09:00		28 Jan 2019 10:30	30 Jan 2019 12:28	5
HS19011286-04	20190111-DGW-MW11-PV10out-40D	11 Jan 2019 09:00		28 Jan 2019 10:30	29 Jan 2019 21:18	10
HS19011286-05	20190111-DGW-MW11-PV10inlet-controlD	11 Jan 2019 09:20		28 Jan 2019 10:30	30 Jan 2019 12:30	5
HS19011286-05	20190111-DGW-MW11-PV10inlet-controlD	11 Jan 2019 09:20		28 Jan 2019 10:30	29 Jan 2019 21:21	10
HS19011286-06	20190111-DGW-MW11-PV10inlet-30-35-40D	11 Jan 2019 09:20		28 Jan 2019 10:30	30 Jan 2019 12:32	5
HS19011286-06	20190111-DGW-MW11-PV10inlet-30-35-40D	11 Jan 2019 09:20		28 Jan 2019 10:30	29 Jan 2019 21:23	10
HS19011286-07	20190112-DGW-MW11-PV10mid-controlD	12 Jan 2019 10:45		28 Jan 2019 10:30	30 Jan 2019 12:35	5
HS19011286-07	20190112-DGW-MW11-PV10mid-controlD	12 Jan 2019 10:45		28 Jan 2019 10:30	29 Jan 2019 21:25	10
HS19011286-08	20190112-DGW-MW11-PV10mid-30D	12 Jan 2019 10:45		28 Jan 2019 10:30	30 Jan 2019 12:37	5
HS19011286-08	20190112-DGW-MW11-PV10mid-30D	12 Jan 2019 10:45		28 Jan 2019 10:30	29 Jan 2019 21:27	10
HS19011286-09	20190112-DGW-MW11-PV10mid-35D	12 Jan 2019 10:45		28 Jan 2019 10:30	30 Jan 2019 12:39	5
HS19011286-09	20190112-DGW-MW11-PV10mid-35D	12 Jan 2019 10:45		28 Jan 2019 10:30	29 Jan 2019 21:30	10
HS19011286-10	20190112-DGW-MW11-PV10mid-40D	12 Jan 2019 10:45		28 Jan 2019 10:30	30 Jan 2019 12:51	5
HS19011286-10	20190112-DGW-MW11-PV10mid-40D	12 Jan 2019 10:45		28 Jan 2019 10:30	29 Jan 2019 21:39	10
HS19011286-11	20190111-DGW-MW11-PV10inlet-30-35-40D-DUP	11 Jan 2019 09:20		28 Jan 2019 10:30	30 Jan 2019 12:54	5
HS19011286-11	20190111-DGW-MW11-PV10inlet-30-35-40D-DUP	11 Jan 2019 09:20		28 Jan 2019 10:30	29 Jan 2019 21:41	10
HS19011286-12	20190115-DGW-MW3-PV20out-controlD	15 Jan 2019 13:00		28 Jan 2019 10:30	30 Jan 2019 12:56	5
HS19011286-12	20190115-DGW-MW3-PV20out-controlD	15 Jan 2019 13:00		28 Jan 2019 10:30	29 Jan 2019 21:43	10
HS19011286-13	20190115-DGW-MW3-PV20out-30D	15 Jan 2019 13:00		28 Jan 2019 10:30	30 Jan 2019 12:58	5
HS19011286-13	20190115-DGW-MW3-PV20out-30D	15 Jan 2019 13:00		28 Jan 2019 10:30	29 Jan 2019 21:45	10
HS19011286-14	20190115-DGW-MW3-PV20out-35D	15 Jan 2019 13:00		28 Jan 2019 10:30	30 Jan 2019 13:01	5
HS19011286-14	20190115-DGW-MW3-PV20out-35D	15 Jan 2019 13:00		28 Jan 2019 10:30	29 Jan 2019 21:48	10
HS19011286-15	20190115-DGW-MW3-PV20out-40D	15 Jan 2019 13:00		28 Jan 2019 10:30	30 Jan 2019 13:03	5
HS19011286-15	20190115-DGW-MW3-PV20out-40D	15 Jan 2019 13:00		28 Jan 2019 10:30	29 Jan 2019 21:50	10

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011286

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
HS19011286-16	20190117-DGW-MW3-PV20inlet-controlD	17 Jan 2019 19:00		28 Jan 2019 10:30	30 Jan 2019 13:05	5
HS19011286-16	20190117-DGW-MW3-PV20inlet-controlD	17 Jan 2019 19:00		28 Jan 2019 10:30	29 Jan 2019 21:52	10
Batch ID 137200	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS19011286-17	20190117-DGW-MW3-PV20inlet-30-35-40D	17 Jan 2019 19:00		30 Jan 2019 11:00	31 Jan 2019 13:44	1
HS19011286-17	20190117-DGW-MW3-PV20inlet-30-35-40D	17 Jan 2019 19:00		30 Jan 2019 11:00	31 Jan 2019 13:21	50
HS19011286-17	20190117-DGW-MW3-PV20inlet-30-35-40D	17 Jan 2019 19:00		30 Jan 2019 11:00	30 Jan 2019 21:30	5
HS19011286-18	20190116-DGW-MW3-PV20mid-controlD	16 Jan 2019 16:30		30 Jan 2019 11:00	31 Jan 2019 13:55	1
HS19011286-18	20190116-DGW-MW3-PV20mid-controlD	16 Jan 2019 16:30		30 Jan 2019 11:00	30 Jan 2019 21:41	5
HS19011286-19	20190117-DGW-MW3-PV20mid-30D	17 Jan 2019 18:45		30 Jan 2019 11:00	31 Jan 2019 13:58	1
HS19011286-19	20190117-DGW-MW3-PV20mid-30D	17 Jan 2019 18:45		30 Jan 2019 11:00	30 Jan 2019 21:44	5
HS19011286-20	20190116-DGW-MW3-PV20mid-35D	16 Jan 2019 16:30		30 Jan 2019 11:00	31 Jan 2019 14:00	1
HS19011286-20	20190116-DGW-MW3-PV20mid-35D	16 Jan 2019 16:30		30 Jan 2019 11:00	30 Jan 2019 21:50	5
HS19011286-21	20190116-DGW-MW3-PV20mid-40D	16 Jan 2019 16:30		30 Jan 2019 11:00	31 Jan 2019 14:02	1
HS19011286-21	20190116-DGW-MW3-PV20mid-40D	16 Jan 2019 16:30		30 Jan 2019 11:00	30 Jan 2019 21:53	5
HS19011286-22	20190117-DGW-MW3-PV20mid-35D-DUP	16 Jan 2019 18:45		30 Jan 2019 11:00	31 Jan 2019 14:05	1
HS19011286-22	20190117-DGW-MW3-PV20mid-35D-DUP	16 Jan 2019 18:45		30 Jan 2019 11:00	30 Jan 2019 21:55	5

WorkOrder: HS19011286
InstrumentID: ICPMS05
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000555	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000460	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000554	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0537	0.0340	0.500
A	Iron	7439-89-6	0.0500	0.0549	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.00100	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0680	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0542	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00280	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0459	0.0140	0.200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011286

QC BATCH REPORT

Batch ID: 137096 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLKF1-137096** Units: **mg/L** Analysis Date: **29-Jan-2019 13:27**
Client ID: Run ID: **ICPMS04_331831** SeqNo: **4928441** PrepDate: **28-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01353	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	0.02894	0.200								J

MBLK Sample ID: **MBLK-137096** Units: **mg/L** Analysis Date: **29-Jan-2019 13:29**
Client ID: Run ID: **ICPMS04_331831** SeqNo: **4928442** PrepDate: **28-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01069	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	0.0289	0.200								J

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011286

QC BATCH REPORT

Batch ID: 137096 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

LCS Sample ID: **LCS-137096** Units: **mg/L** Analysis Date: **29-Jan-2019 13:31**
Client ID: Run ID: **ICPMS04_331831** SeqNo: **4928443** PrepDate: **28-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05489	0.00200	0.05	0	110	80 - 120				
Arsenic	0.05381	0.00200	0.05	0	108	80 - 120				
Cadmium	0.052	0.00200	0.05	0	104	80 - 120				
Calcium	5.552	0.500	5	0	111	80 - 120				
Iron	5.767	0.200	5	0	115	80 - 120				
Lead	0.05157	0.00200	0.05	0	103	80 - 120				
Magnesium	5.485	0.200	5	0	110	80 - 120				
Potassium	5.541	0.200	5	0	111	80 - 120				
Selenium	0.05474	0.00200	0.05	0	109	80 - 120				
Sodium	5.3	0.200	5	0	106	80 - 120				

MS Sample ID: **HS19011270-01MS** Units: **mg/L** Analysis Date: **29-Jan-2019 13:38**
Client ID: Run ID: **ICPMS04_331831** SeqNo: **4928446** PrepDate: **29-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05389	0.00200	0.05	0.000246	107	75 - 125				
Arsenic	0.05393	0.00200	0.05	0.001208	105	75 - 125				
Cadmium	0.05242	0.00200	0.05	0.000097	105	75 - 125				
Calcium	811.8	0.500	5	815.1	-66.4	75 - 125				SEO
Iron	5.487	0.200	5	0.1181	107	75 - 125				
Lead	0.0531	0.00200	0.05	-0.000018	106	75 - 125				
Magnesium	410.1	0.200	5	416.6	-129	75 - 125				SEO
Potassium	8.626	0.200	5	3.428	104	75 - 125				
Selenium	0.05178	0.00200	0.05	0.000766	102	75 - 125				
Sodium	683.3	0.200	5	677.6	114	75 - 125				EO

MS Sample ID: **HS19011270-01MS** Units: **mg/L** Analysis Date: **29-Jan-2019 15:48**
Client ID: Run ID: **ICPMS05_331852** SeqNo: **4928744** PrepDate: **29-Jan-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	789.1	5.00	5	778.4	213	75 - 125				SO
Magnesium	390.1	2.00	5	380.5	192	75 - 125				SO
Sodium	646.7	2.00	5	644	54.7	75 - 125				SO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011286

QC BATCH REPORT

Batch ID: 137096 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

MSD Sample ID: **HS19011270-01MSD** Units: **mg/L** Analysis Date: **29-Jan-2019 13:40**
Client ID: Run ID: **ICPMS04_331831** SeqNo: **4928447** PrepDate: **29-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Antimony	0.05356	0.00200	0.05	0.000246	107	75 - 125	0.05389	0.614	20	
Arsenic	0.05468	0.00200	0.05	0.001208	107	75 - 125	0.05393	1.37	20	
Cadmium	0.0514	0.00200	0.05	0.000097	103	75 - 125	0.05242	1.98	20	
Calcium	827.1	0.500	5	815.1	241	75 - 125	811.8	1.87	20	SEO
Iron	5.883	0.200	5	0.1181	115	75 - 125	5.487	6.95	20	
Lead	0.05239	0.00200	0.05	-0.000018	105	75 - 125	0.0531	1.35	20	
Magnesium	410.4	0.200	5	416.6	-124	75 - 125	410.1	0.0684	20	SEO
Potassium	8.62	0.200	5	3.428	104	75 - 125	8.626	0.0754	20	
Selenium	0.04997	0.00200	0.05	0.000766	98.4	75 - 125	0.05178	3.56	20	
Sodium	U	0.200	5	677.6	-13600	75 - 125	683.3	0	20	SO

MSD Sample ID: **HS19011270-01MSD** Units: **mg/L** Analysis Date: **29-Jan-2019 15:50**
Client ID: Run ID: **ICPMS05_331852** SeqNo: **4928745** PrepDate: **29-Jan-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Calcium	771.9	5.00	5	778.4	-131	75 - 125	789.1	2.21	20	SO
Magnesium	388.1	2.00	5	380.5	152	75 - 125	390.1	0.508	20	SO
Sodium	643.2	2.00	5	644	-15.0	75 - 125	646.7	0.541	20	SO

PDS Sample ID: **HS19011270-01PDS** Units: **mg/L** Analysis Date: **29-Jan-2019 13:43**
Client ID: Run ID: **ICPMS04_331831** SeqNo: **4928448** PrepDate: **29-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Antimony	0.09929	0.00200	0.1	0.000246	99.0	75 - 125				
Arsenic	0.09989	0.00200	0.1	0.001208	98.7	75 - 125				
Cadmium	0.09725	0.00200	0.1	0.000097	97.2	75 - 125				
Iron	10.04	0.200	10	0.1181	99.3	75 - 125				
Lead	0.09953	0.00200	0.1	-0.000018	99.5	75 - 125				
Potassium	12.47	0.200	10	3.428	90.4	75 - 125				
Selenium	0.09348	0.00200	0.1	0.000766	92.7	75 - 125				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011286

QC BATCH REPORT

Batch ID: 137096 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

PDS Sample ID: **HS19011270-01PDS** Units: **mg/L** Analysis Date: **29-Jan-2019 15:52**
Client ID: Run ID: **ICPMS05_331852** SeqNo: **4928746** PrepDate: **29-Jan-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	853.2	5.00	100	778.4	74.8	75 - 125				SO
Magnesium	467.4	2.00	100	380.5	87.0	75 - 125				
Sodium	718.9	2.00	100	644	74.9	75 - 125				SO

SD Sample ID: **HS19011270-01SD** Units: **mg/L** Analysis Date: **29-Jan-2019 13:36**
Client ID: Run ID: **ICPMS04_331831** SeqNo: **4928445** PrepDate: **29-Jan-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000246	0	10	
Arsenic	U	0.0100					0.001208	0	10	
Cadmium	U	0.0100					0.000097	0	10	
Iron	0.2758	1.00					0.1181	0	10	J
Lead	U	0.0100					-0.000018	0	10	
Potassium	3.485	1.00					3.428	1.66	10	
Selenium	U	0.0100					0.000766	0	10	

SD Sample ID: **HS19011270-01SD** Units: **mg/L** Analysis Date: **29-Jan-2019 15:46**
Client ID: Run ID: **ICPMS05_331852** SeqNo: **4928743** PrepDate: **29-Jan-2019** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	765.6	25.0					778.4	1.65	10	
Magnesium	388.4	10.0					380.5	2.07	10	
Sodium	654.3	10.0					644	1.61	10	

The following samples were analyzed in this batch:

HS19011286-01	HS19011286-02	HS19011286-03	HS19011286-04
HS19011286-05	HS19011286-06	HS19011286-07	HS19011286-08
HS19011286-09	HS19011286-10	HS19011286-11	HS19011286-12
HS19011286-13	HS19011286-14	HS19011286-15	HS19011286-16

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011286

QC BATCH REPORT

Batch ID: 137200 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLK-137200** Units: **mg/L** Analysis Date: **30-Jan-2019 21:26**
Client ID: Run ID: **ICPMS05_331929** SeqNo: **4931447** PrepDate: **30-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01151	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	U	0.200								

LCS Sample ID: **LCS-137200** Units: **mg/L** Analysis Date: **30-Jan-2019 21:28**
Client ID: Run ID: **ICPMS05_331929** SeqNo: **4931448** PrepDate: **30-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05165	0.00200	0.05	0	103	80 - 120				
Arsenic	0.05087	0.00200	0.05	0	102	80 - 120				
Cadmium	0.05036	0.00200	0.05	0	101	80 - 120				
Calcium	5.355	0.500	5	0	107	80 - 120				
Iron	5.22	0.200	5	0	104	80 - 120				
Lead	0.05012	0.00200	0.05	0	100	80 - 120				
Magnesium	5.344	0.200	5	0	107	80 - 120				
Potassium	5.254	0.200	5	0	105	80 - 120				
Selenium	0.05096	0.00200	0.05	0	102	80 - 120				
Sodium	5.299	0.200	5	0	106	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011286

QC BATCH REPORT

Batch ID: 137200 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MS Sample ID: **HS19011286-17MS** Units: **mg/L** Analysis Date: **31-Jan-2019 13:49**
Client ID: **20190117-DGW-MW3-PV20inlet-30-35-40D** Run ID: **ICPMS05_332031** SeqNo: **4932830** PrepDate: **30-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05166	0.00200	0.05	0.000183	103	75 - 125				
Arsenic	0.05983	0.00200	0.05	0.007039	106	75 - 125				
Cadmium	0.05253	0.00200	0.05	0.000006	105	75 - 125				
Iron	5.193	0.200	5	0.02235	103	75 - 125				
Lead	0.05269	0.00200	0.05	0.000009	105	75 - 125				
Potassium	7.609	0.200	5	1.96	113	75 - 125				
Selenium	0.05161	0.00200	0.05	0.000359	103	75 - 125				

MSD Sample ID: **HS19011286-17MSD** Units: **mg/L** Analysis Date: **31-Jan-2019 13:51**
Client ID: **20190117-DGW-MW3-PV20inlet-30-35-40D** Run ID: **ICPMS05_332031** SeqNo: **4932831** PrepDate: **30-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05073	0.00200	0.05	0.000183	101	75 - 125	0.05166	1.83	20	
Arsenic	0.05856	0.00200	0.05	0.007039	103	75 - 125	0.05983	2.16	20	
Cadmium	0.05312	0.00200	0.05	0.000006	106	75 - 125	0.05253	1.11	20	
Iron	5.229	0.200	5	0.02235	104	75 - 125	5.193	0.686	20	
Lead	0.05202	0.00200	0.05	0.000009	104	75 - 125	0.05269	1.27	20	
Potassium	7.376	0.200	5	1.96	108	75 - 125	7.609	3.11	20	
Selenium	0.05207	0.00200	0.05	0.000359	103	75 - 125	0.05161	0.88	20	

PDS Sample ID: **HS19011286-17PDS** Units: **mg/L** Analysis Date: **31-Jan-2019 13:53**
Client ID: **20190117-DGW-MW3-PV20inlet-30-35-40D** Run ID: **ICPMS05_332031** SeqNo: **4932832** PrepDate: **30-Jan-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09399	0.00200	0.1	0.000183	93.8	75 - 125				
Arsenic	0.1055	0.00200	0.1	0.007039	98.5	75 - 125				
Cadmium	0.09908	0.00200	0.1	0.000006	99.1	75 - 125				
Iron	9.74	0.200	10	0.02235	97.2	75 - 125				
Lead	0.09557	0.00200	0.1	0.000009	95.6	75 - 125				
Potassium	12.28	0.200	10	1.96	103	75 - 125				
Selenium	0.0977	0.00200	0.1	0.000359	97.3	75 - 125				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19011286

QC BATCH REPORT

Batch ID: 137200 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

PDS Sample ID: **HS19011286-17PDS** Units: **mg/L** Analysis Date: **31-Jan-2019 13:25**
Client ID: **20190117-DGW-MW3-PV20inlet-30-35-40D** Run ID: **ICPMS05_332031** SeqNo: **4932822** PrepDate: **30-Jan-2019** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	634	25.0	500	119.1	103	75 - 125				
Sodium	787.2	10.0	500	237.9	110	75 - 125				

PDS Sample ID: **HS19011286-17PDS** Units: **mg/L** Analysis Date: **30-Jan-2019 21:39**
Client ID: **20190117-DGW-MW3-PV20inlet-30-35-40D** Run ID: **ICPMS05_331929** SeqNo: **4931453** PrepDate: **30-Jan-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Magnesium	70.4	1.00	50	21.24	98.3	75 - 125				

SD Sample ID: **HS19011286-17SD** Units: **mg/L** Analysis Date: **31-Jan-2019 13:46**
Client ID: **20190117-DGW-MW3-PV20inlet-30-35-40D** Run ID: **ICPMS05_332031** SeqNo: **4932829** PrepDate: **30-Jan-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000183	0	10	
Arsenic	0.009818	0.0100					0.007039	0	10	J
Cadmium	U	0.0100					0.000006	0	10	
Iron	U	1.00					0.02235	0	10	
Lead	U	0.0100					0.000009	0	10	
Potassium	1.95	1.00					1.96	0.49	10	
Selenium	U	0.0100					0.000359	0	10	

SD Sample ID: **HS19011286-17SD** Units: **mg/L** Analysis Date: **31-Jan-2019 13:23**
Client ID: **20190117-DGW-MW3-PV20inlet-30-35-40D** Run ID: **ICPMS05_332031** SeqNo: **4932821** PrepDate: **30-Jan-2019** DF: **250**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	107.6	125					116.5	0	10	J

SD Sample ID: **HS19011286-17SD** Units: **mg/L** Analysis Date: **30-Jan-2019 21:32**
Client ID: **20190117-DGW-MW3-PV20inlet-30-35-40D** Run ID: **ICPMS05_331929** SeqNo: **4931450** PrepDate: **30-Jan-2019** DF: **25**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Magnesium	21.48	5.00					21.24	1.11	10	
Sodium	201.4	5.00					197.8	1.83	10	

The following samples were analyzed in this batch: HS19011286-17 HS19011286-18 HS19011286-19 HS19011286-20 HS19011286-21 HS19011286-22

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19011286**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19011286

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19011286-01	20190111-DGW-MW11-PV10out-controlD	Login	1/26/2019 3:41:57 PM	JRM	MET011
HS19011286-02	20190111-DGW-MW11-PV10out30D	Login	1/26/2019 3:41:57 PM	JRM	MET011
HS19011286-03	20190111-DGW-MW11-PV10out-35D	Login	1/26/2019 3:41:57 PM	JRM	MET011
HS19011286-04	20190111-DGW-MW11-PV10out-40D	Login	1/26/2019 3:41:57 PM	JRM	MET011
HS19011286-05	20190111-DGW-MW11-PV10inlet-controlD	Login	1/26/2019 3:41:57 PM	JRM	MET011
HS19011286-06	20190111-DGW-MW11-PV10inlet-30-35-40D	Login	1/26/2019 3:41:57 PM	JRM	MET011
HS19011286-07	20190112-DGW-MW11-PV10mid-controlD	Login	1/26/2019 3:41:57 PM	JRM	MET011
HS19011286-08	20190112-DGW-MW11-PV10mid-30D	Login	1/26/2019 3:41:57 PM	JRM	MET011
HS19011286-09	20190112-DGW-MW11-PV10mid-35D	Login	1/26/2019 3:41:57 PM	JRM	MET011
HS19011286-10	20190112-DGW-MW11-PV10mid-40D	Login	1/26/2019 3:41:57 PM	JRM	MET011
HS19011286-11	20190111-DGW-MW11-PV10inlet-30-35-40D-DUP	Login	1/26/2019 3:41:57 PM	JRM	MET011
HS19011286-12	20190115-DGW-MW3-PV20out-controlD	Login	1/26/2019 3:41:57 PM	JRM	MET011
HS19011286-13	20190115-DGW-MW3-PV20out-30D	Login	1/26/2019 3:41:57 PM	JRM	MET011
HS19011286-14	20190115-DGW-MW3-PV20out-35D	Login	1/26/2019 3:41:57 PM	JRM	MET011
HS19011286-15	20190115-DGW-MW3-PV20out-40D	Login	1/26/2019 3:41:57 PM	JRM	MET011
HS19011286-16	20190117-DGW-MW3-PV20inlet-controlD	Login	1/26/2019 3:41:57 PM	JRM	MET011
HS19011286-17	20190117-DGW-MW3-PV20inlet-30-35-40D	Login	1/26/2019 3:41:57 PM	JRM	MET011
HS19011286-18	20190116-DGW-MW3-PV20mid-controlD	Login	1/26/2019 3:41:57 PM	JRM	MET011
HS19011286-19	20190117-DGW-MW3-PV20mid-30D	Login	1/26/2019 3:41:57 PM	JRM	MET011
HS19011286-20	20190116-DGW-MW3-PV20mid-35D	Login	1/26/2019 3:41:57 PM	JRM	MET011
HS19011286-21	20190116-DGW-MW3-PV20mid-40D	Login	1/26/2019 3:41:57 PM	JRM	MET011
HS19011286-22	20190117-DGW-MW3-PV20mid-35D-DUP	Login	1/26/2019 3:41:57 PM	JRM	MET011

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19011286
Date/Time Received: **25-Jan-2019 09:19**
Received by: **PMG**

Checklist completed by: *Jared R. Makan* eSignature 26-Jan-2019 Date
Reviewed by: *Dane J. Wacasey* eSignature 31-Jan-2019 Date

Matrices: **Water**
Carrier name: **FedEx International Priority**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	4.3c/4.6c UC/C	IR25	
Cooler(s)/Kit(s):	24830		
Date/Time sample(s) sent to storage:	01/26/2019 15:45		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

ALS Environmental

Chain of Custody Form

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HS19011286

Golder Associates
Exide Column Studies

Work Order #:

ALS Project Manager:

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086	Project Name	Exide Column Studies	A	300_W (300 Cl, SO4, [*NO3* *48hr HT*])
Work Order		Project Number	130-2086	B	TDS_W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK_W 2320B (2320B Alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B Hardness (calc))
Address	13515 Barrett Parkway Drive Suite 260	Address	13515 Barrett Parkway Drive Suite 260	E	ICP_TW (6020A Total Metals (6)+Cations)
				F	ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	G	
Phone		Phone		H	
Fax		Fax		I	
e-Mail Address	Emily_White@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190111-DGW-MW11-PV10out-control	2019/01/11	9:00	GW	2,3	3 /	X	X	X	X	X	X					
2	20190111-DGW-MW11-PV10out-50D	"	"	"	2	1						X					
3	20190111-DGW-MW11-PV10out-35D	"	"	"	2	1						X					
4	20190111-DGW-MW11-PV10out-40D	"	"	"	2	1						X					
5	20190111-DGW-MW11-PV10inlet control	2019/01/11	9:20	"	2	1						X					
6	20190111-DGW-MW11-PV10inlet-30-35 40D	"	9:22	"	2	1						X					
7	20190112-DGW-MW11-PV10mid-control	2019/01/12	10:45	"	2	1						X					
8	20190112-DGW-MW11-PV10mid-30D	"	"	"	2	1						X					
9	20190112-DGW-MW11-PV10mid-35D	"	"	"	2	1						X					
10	20190112-DGW-MW11-PV10mid-40D	"	"	"	2	1						X					

Sampler(s): Please Print & Sign: Sarah Klemas

Shipment Method: FedEx

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by:	Date:	Time:	Received by:	Notes:
Sarah Klemas	2019/01/23	15:30		
Relinquished by:	Date:	Time:	Received by (Laboratory):	Cooler Temp.
			11/25/19 09:19	
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	

QC Package: (Check Box Below)

	Level II: Standard QC	X	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other: _____		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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Chain of Custody Form

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HS19011286

Golder Associates
Exide Column Studies

ALS Project Manager:

Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086	Project Name	Exide Column Studies	A	300_W (300 Cl, SO4, [*NO3* *48hr HT*])
Work Order		Project Number	130-2086	B	TDS_W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK_W 2320B (2320B Alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B Hardness (calc))
Address	13515 Barrett Parkway Drive Suite 260	Address	13515 Barrett Parkway Drive Suite 260	E	ICP_TW (6020A Total Metals (6)+Cations)
				F	ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	G	
Phone		Phone		H	
Fax		Fax		I	
e-Mail Address	Emily_White@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	~~20190111-D6W-MW11-PW10inlet-30-35-40-TDOP~~			GW	2,8	3	X	X	X	X	X	X					
2	20190111-D6W-MW11-PW10inlet-30-35-40-TDOP	01/11/2019	9:20							X	X						
3	20190111-D6W-MW11-PW10inlet-30-35-40-DOP	"	"									X					
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s): Please Print & Sign: Thomas Clawson

Shipment Method: FedEx

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by: Thomas Clawson	Date: 20/01/11	Time: 15:30	Received by:	Notes:
Relinquished by:	Date:	Time:	Received by (Laboratory): 1/25/19 09:19	Cooler Temp.
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	

QC Package: (Check Box Below)

- ☐ Level II: Standard QC
- ☐ Level III: Std QC + Raw Data
- ☐ Level IV: SW846 CLP-Like
- ☐ Other: _____
- X TRRP-Checklist
- ☐ TRRP Level IV

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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Chain of Custody Form

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HS19011286

Golder Associates
Exide Column Studies

Work Order #:

ALS Project Manager:

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086	Project Name	Exide Column Studies	A	300_W (300 Cl, SO4, [*NO3* *48hr HT*])
Work Order		Project Number	130-2086	B	TDS_W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK_W 2320B (2320B Alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B Hardness (calc))
Address	13515 Barrett Parkway Drive Suite 260	Address	13515 Barrett Parkway Drive Suite 260	E	ICP_TW (6020A Total Metals (6)+Cations)
				F	ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	G	
Phone		Phone		H	
Fax		Fax		I	
e-Mail Address	Emily_White@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190115-DGW-MW3-PV20out-controlD	2019/01/15	13:00	GW	2	1						X					
2	20190115-DGW-MW3-PV20out-30D	2019/01/15	13:00	GW	2	1						X					
3	20190115-DGW-MW3-PV20out-35D	2019/01/15	13:00	GW	2	1						X					
4	20190115-DGW-MW3-PV20out-40D	2019/01/15	13:00	GW	2	1						X					
5	20190117-DGW-MW3-PV20inlet-controlD	2019/01/17	19:00	GW	2	1						X					
6	20190117-DGW-MW3-PV20inlet-30-35-40D	2019/01/17	19:00	GW	2	1						X					
7	20190116-DGW-MW3-PV20mid-controlD	2019/01/16	16:30	GW	2	1						X					
8	20190117-DGW-MW3-PV20mid-30D	2019/01/17	18:45	GW	2	1						X					
9	20190116-DGW-MW3-PV20mid-35D	2019/01/16	16:30	GW	2	1						X					
10	20190116-DGW-MW3-PV20mid-40D	2019/01/16	16:30	GW	2	1						X					

Sampler(s): Please Print & Sign

Shipment Method: FedEx

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
	2019/01/23	15:30	
Relinquished by:	Date:	Time:	Received by (Laboratory):
—			11/25/19 09:17
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes:

Cooler Temp.

QC Package: (Check Box Below)

- ☐ Level II: Standard QC
- ☐ Level III: Std QC + Raw Data
- ☐ Level IV: SW846 CLP-Like
- ☐ Other: _____
- X TRRP-Checklist
- ☐ TRRP Level IV

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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ALS Environmental

Chain of Custody Form

Page 3 of 3

HS19011286

Golder Associates
Exide Column Studies

ALS Project Manager:

Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086	Project Name	Exide Column Studies	A	300_W (300 Cl, SO4, [^NO3^ ^48hr HT^])
Work Order		Project Number	130-2086	B	TDS_W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK_W 2320B (2320B Alkalinity)
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P	D	HARD (2340B Hardness (calc))
Address	13515 Barrett Parkway Drive Suite 260	Address	13515 Barrett Parkway Drive Suite 260	E	ICP_TW (6020A Total Metals (6)+Cations)
				F	ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	G	
Phone		Phone		H	
Fax		Fax		I	
e-Mail Address	Emily_White@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190117-DGW-MW3-PV20mid-35T-DUP	2019/01/17	18:45	GW	2	1	X	X	X	X	X	X					
2	20190117-DGW-MW3-PV20mid-35D-DUP	2019/01/17	18:45	GW	2	1						X					
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s): Please Print & Sign: Jenni Clemons

Shipment Method: FedEx

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
Jenni Clemons	2019/01/23	15:30	
Relinquished by:	Date:	Time:	Received by (Laboratory): 1/25/19 09:19
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes:

Cooler Temp.

QC Package: (Check Box Below)

	Level II: Standard QC	X	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other: _____		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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MONTREAL, PQ H2R3A4
CANADA, CA

SHIP DATE: 23JAN19
ACTWGT: 17.10 LB
CAD: 108680724/INET4102

BILL RECIPIENT
EIN/VAT:

TO Dane Wacasey
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

(281) 530-5656

FedEx Express

(US)

J19019010720uv

AWB

NH SGRA

PKG:YOUR PKG

TRK# 7742 9190 4457

Form 0430

10:30A
INTL PRIORITY

REF:
DESC1:Échantillon d'eau
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: audrey etheves
T/C: R 967554812
D/T: R 967554812

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10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

February 21, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19020256**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 68 sample(s) on Feb 06, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DANE.WACASEY
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19020256**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS19020256**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data								
Laboratory Name: ALS Laboratory Group			LRC Date: 02/14/2019					
Project Name: Exide Column Studies			Laboratory Job Number: HS19020256					
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 137506,137507,137509,137611,R332664,R332744,R332779,R332817,R332818,R332827,R332873					
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?		X			1
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			2
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?	X				
		Were analytical duplicates analyzed at the appropriate frequency?	X				
		Were RPDs or relative standard deviations within the laboratory QC limits?	X				
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				5
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 02/14/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19020256				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 137506,137507,137509,137611,R332664,R332744,R332779,R332817,R332818,R332827,R332873				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			3
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		X			4
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports	
Laboratory Name: ALS Laboratory Group	LRC Date: 02/14/2019
Project Name: Exide Column Studies	Laboratory Job Number: HS19020256
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 137506,137507,137509,137611,R332664,R332744,R332779,R332817,R332818,R332827,R332873

ER#[5]	Description
1	Batch R332818, Anions Method E300: Samples collected February 4, 2019 for the analysis of nitrate by method E300 were received with limited holding time remaining. Samples were analyzed as soon as possible upon receipt, however, were analyzed outside of 48-hour holding time.
2	Batch 137506, Metals Method SW6020, sample 20190122-DGW-MW11PV15outcontrolT, MS and or MSD recovered outside the control limits for Calcium, Magnesium Sodium and Potassium, however the result in the parent sample is greater than 4x the spike amount. Batch 137507, Metals Method SW6020, sample 20190129-DGW-MW3-PV25outcontrolT, MS and or MSD recovered outside the control limits for Calcium and Sodium, however the result in the parent sample is greater than 4x the spike amount. Batch 137509, Metals Method SW6020, sample 20190122-DGW-MW11-PV15outcontrolD, MS and or MSD recovered outside the control limits for Selenium due to suspect matrix effect. For Calcium, Magnesium, Potassium and Sodium, the result in the parent sample is greater than 4x the spike amount. Batch 137611, Metals Method SW6020, sample HS19020255-04, MS and MSD were performed on unrelated sample. Batch R332779, Sulfate Method E300, sample HS19020311-01, MSD was performed on unrelated sample. Batch R332817, Anions Method E300, sample HS19020263-01, MS and MSD were performed on unrelated sample. Batch R332818, Anions Method E300, sample 20190204-FD-PV20Out-35, MS and MSD recovered outside the control limits for Nitrogen, Nitrate (As N) and Sulfate, however, the result in the parent sample is greater than 4x the spike amount for Sulfate Batch R332873, Anions Method E300, sample HS19020648-01, MSD was performed on unrelated sample
3	See Run Log and CCB Exceptions Report.
4	Batch 137507, Metals Method SW6020, sample 20190129-DGW-MW3-PV25outcontrolT, PDS recovered outside the control limit for Calcium, however the result in the parent sample is greater than 4x the spike amount. Batch 137611, Metals Method SW6020, sample HS19020255-04, PDS was performed on unrelated sample.
5	This report was revised in order to adjust sample names and/or collection dates/times.

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256
Start Date: 12-Feb-2019 End Date: 13-Feb-2019

Run ID:ICS2100_332779
Instrument:ICS2100
Method:E300

Sample No.	D/F	Time	FileID	Analytes
CCV 1	1	12-Feb-2019 11:24		CL SO4
CCB 1	1	12-Feb-2019 11:39		CL SO4
WBLKW1-021219	1	12-Feb-2019 11:53		CL SO4
WLCSW1-021219	1	12-Feb-2019 12:08		CL SO4
WLCSDW1-021219	1	12-Feb-2019 12:23		CL SO4
ZZZZZZMS	500	12-Feb-2019 13:52		CL SO4
ZZZZZZMSD	500	12-Feb-2019 14:07		CL SO4
CCB 2	1	12-Feb-2019 14:36		CL SO4
CCV 2	1	12-Feb-2019 17:16		CL SO4
CCB 3	1	12-Feb-2019 17:31		CL SO4
CCB 4	1	13-Feb-2019 02:30		CL SO4
ZZZZZZMS	1	13-Feb-2019 02:59		CL SO4
ZZZZZZMSD	1	13-Feb-2019 03:14		CL SO4
20190204-FD-PV20Out-Control	20	13-Feb-2019 04:12		SO4
20190204-DGW-MW11-PV20out-30	200	13-Feb-2019 04:27		SO4
20190204-DGW-MW11-PV20out-35	200	13-Feb-2019 04:41		SO4
20190204-DGW-MW11-PV20out-40	200	13-Feb-2019 04:56		SO4
CCB 5	1	13-Feb-2019 05:25		CL SO4
CCV 3	1	13-Feb-2019 16:07		CL SO4
CCB 6	1	13-Feb-2019 16:22		CL SO4
CCB 7	1	13-Feb-2019 20:20		CL SO4

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

Run ID:ICS2100_332779
Instrument:ICS2100
Method:E300

CCB 1	Date: 12-Feb-2019 11:39	Seq: 4948062		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Chloride	252	200	500	
CCB 2	Date: 12-Feb-2019 14:36	Seq: 4948084		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Chloride	265	200	500	
	Sulfate	269	200	500	
CCB 3	Date: 12-Feb-2019 17:31	Seq: 4948094		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Chloride	235	200	500	
CCB 4	Date: 13-Feb-2019 02:30	Seq: 4948096		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Chloride	290	200	500	
	Sulfate	273	200	500	
CCB 5	Date: 13-Feb-2019 05:25	Seq: 4948107		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Chloride	246	200	500	
CCB 6	Date: 13-Feb-2019 16:22	Seq: 4948858		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Chloride	650	200	500	
CCB 7	Date: 13-Feb-2019 20:20	Seq: 4950011		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Chloride	218	200	500	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256
Start Date: 06-Feb-2019 End Date: 07-Feb-2019

Run ID:ICS2100_332817
Instrument:ICS2100
Method:E300

Sample No.	D/F	Time	FileID	Analytes
CCV 1	1	06-Feb-2019 16:02		CL NO3N SO4
CCB 1	1	06-Feb-2019 16:16		CL NO3N SO4
WBLKW1-020619	1	06-Feb-2019 16:57		CL NO3N SO4
WLCSW1-020619	1	06-Feb-2019 17:31		CL NO3N SO4
WLCSDW1-020619	1	06-Feb-2019 17:46		CL NO3N SO4
ZZZZZZMS	2	06-Feb-2019 18:18		CL NO3N SO4
ZZZZZZMSD	2	06-Feb-2019 18:33		CL NO3N SO4
CCB 2	1	06-Feb-2019 20:00		CL NO3N SO4
CCV 2	1	06-Feb-2019 22:40		CL NO3N SO4
CCB 3	1	06-Feb-2019 22:54		CL NO3N SO4
ZZZZZZMS	1	06-Feb-2019 23:24		CL NO3N SO4
ZZZZZZMSD	1	06-Feb-2019 23:38		CL NO3N SO4
20190204-DGW-MW11-PV20out-30	1	07-Feb-2019 00:07		NO3N
20190204-DGW-MW11-PV20out-30	10	07-Feb-2019 00:22		CL
20190204-DGW-MW11-PV20out-35	1	07-Feb-2019 00:36		NO3N
20190204-DGW-MW11-PV20out-35	10	07-Feb-2019 00:51		CL
20190204-DGW-MW11-PV20out-40	1	07-Feb-2019 01:05		NO3N
20190204-DGW-MW11-PV20out-40	10	07-Feb-2019 01:20		CL
CCB 4	1	07-Feb-2019 01:49		CL NO3N SO4

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

Run ID:ICS2100_332817
Instrument:ICS2100
Method:E300

CCB 1	Date: 06-Feb-2019 16:16	Seq: 4948672	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	212	200	500	

CCB 2	Date: 06-Feb-2019 20:00	Seq: 4948683	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	240	200	500	
Sulfate	260	200	500	

CCB 3	Date: 06-Feb-2019 22:54	Seq: 4948693	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	216	200	500	

CCB 4	Date: 07-Feb-2019 01:49	Seq: 4948708	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	211	200	500	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256
Start Date: 07-Feb-2019 End Date: 07-Feb-2019

Run ID:ICS2100_332818
Instrument:ICS2100
Method:E300

Sample No.	D/F	Time	FileID	Analytes
CCB 1	1	07-Feb-2019 01:49		CL NO3N SO4
20190204-FD-PV20Out-Control	1	07-Feb-2019 02:04		CL NO3N
20190204-FD-PV20Out-30	1	07-Feb-2019 02:33		CL NO3N
20190204-FD-PV20Out-30	10	07-Feb-2019 02:47		SO4
20190204-FD-PV20Out-35	1	07-Feb-2019 03:02		CL NO3N
20190204-FD-PV20Out-35MS	1	07-Feb-2019 03:16		CL NO3N SO4
20190204-FD-PV20Out-35MSD	1	07-Feb-2019 03:31		CL NO3N SO4
20190204-FD-PV20Out-35	10	07-Feb-2019 03:45		SO4
20190204-FD-PV20Out-40	1	07-Feb-2019 04:00		CL NO3N
20190204-FD-PV20Out-40	10	07-Feb-2019 04:14		SO4
CCV 1	1	07-Feb-2019 04:29		CL NO3N SO4
CCB 2	1	07-Feb-2019 04:44		CL NO3N SO4
WLCSW2-020619	1	07-Feb-2019 05:13		CL NO3N SO4
WLCSDW2-020619	1	07-Feb-2019 05:27		CL NO3N SO4
20190204-DGW-MW11-PV20out-control	1	07-Feb-2019 05:42		NO3N
20190204-DGW-MW11-PV20out-control	10	07-Feb-2019 05:56		CL
CCB 3	1	07-Feb-2019 07:09		CL NO3N SO4
CCV 2	1	07-Feb-2019 11:47		CL NO3N SO4
CCB 4	1	07-Feb-2019 12:02		CL NO3N SO4
WBLKW2-020619	1	07-Feb-2019 15:29		CL NO3N SO4
CCB 5	1	07-Feb-2019 16:44		CL NO3N SO4

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

Run ID:ICS2100_332818
Instrument:ICS2100
Method:E300

CCB 1	Date: 07-Feb-2019 01:49	Seq: 4948759	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	211	200	500	

CCB 2	Date: 07-Feb-2019 04:44	Seq: 4948771	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	213	200	500	
Sulfate	313	200	500	

CCB 3	Date: 07-Feb-2019 07:09	Seq: 4948779	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	248	200	500	
Sulfate	270	200	500	

CCB 4	Date: 07-Feb-2019 12:02	Seq: 4948781	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	215	200	500	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256
Start Date: 07-Feb-2019 End Date: 07-Feb-2019

Run ID:ICPMS05_332483
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	07-Feb-2019 11:52	018_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV5	1	07-Feb-2019 11:57	020LICV.d	AS CA CD FE K MG PB SB SE
ICB	1	07-Feb-2019 11:59	021_ICB.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	07-Feb-2019 12:08	023SMPL.d	AS CA CD FE K MG PB SB SE
ICSA	1	07-Feb-2019 12:30	025ICSA.d	AS CA CD FE K MG PB SB SE
ICSAB	1	07-Feb-2019 12:32	026ICSB.d	AS CA CD FE K MG PB SB SE
CCV 1	1	07-Feb-2019 13:16	038_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	07-Feb-2019 13:18	039_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	07-Feb-2019 13:35	046_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	07-Feb-2019 13:38	047_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	07-Feb-2019 14:13	058_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	07-Feb-2019 14:15	059_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	07-Feb-2019 14:37	065_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	07-Feb-2019 14:50	068_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	07-Feb-2019 15:16	074_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	07-Feb-2019 15:18	075_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	07-Feb-2019 16:46	087_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	07-Feb-2019 16:48	088_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	07-Feb-2019 17:15	097_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	07-Feb-2019 17:17	098_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 8	1	07-Feb-2019 17:31	104_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	07-Feb-2019 17:33	105_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	07-Feb-2019 17:46	111_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	07-Feb-2019 17:49	112_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 10	1	07-Feb-2019 18:44	127_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	07-Feb-2019 18:46	128SMPL.d	AS CA CD FE K MG PB SB SE
LLCCV5	1	07-Feb-2019 18:48	129LICV.d	AS CA CD FE K MG PB SB SE
ICCB 10	1	07-Feb-2019 18:50	130_ICB.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	07-Feb-2019 19:15	141SMPL.d	AS CA CD FE K MG PB SB SE
CCV 11	1	07-Feb-2019 19:20	143_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	07-Feb-2019 19:22	144_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 12	1	07-Feb-2019 19:38	150_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 12	1	07-Feb-2019 19:40	151_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 13	1	07-Feb-2019 19:54	157_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 13	1	07-Feb-2019 19:56	158_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 14	1	07-Feb-2019 20:21	169_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 14	1	07-Feb-2019 20:23	170_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 15	1	07-Feb-2019 20:41	178_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 15	1	07-Feb-2019 20:44	179_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 16	1	07-Feb-2019 21:07	189_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 16	1	07-Feb-2019 21:10	190_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 17	1	07-Feb-2019 21:23	196_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 17	1	07-Feb-2019 21:26	197_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-137507	1	07-Feb-2019 21:47	206SMPL.d	AS CA CD FE K MG NA PB SB SE
LCS-137507	1	07-Feb-2019 21:49	207SMPL.d	AS CA CD FE K MG NA PB SB SE
CCV 18	1	07-Feb-2019 21:51	208_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 18	1	07-Feb-2019 21:53	209_CCB.d	AS CA CD FE K MG NA PB SB SE
20190129-DGW-MW3-PV25out-controlT	1	07-Feb-2019 21:56	210SMPL.d	AS CA CD FE K MG PB SB SE
20190129-DGW-MW3-PV25out-controlTSD	5	07-Feb-2019 21:58	211SMPL.d	AS CA CD FE K MG PB SB SE
20190129-DGW-MW3-PV25out-controlTMS	1	07-Feb-2019 22:00	212SMPL.d	AS CA CD FE K MG NA PB SB SE

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256
Start Date: 07-Feb-2019 End Date: 07-Feb-2019

Run ID:ICPMS05_332483
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
20190129-DGW-MW3-PV25out-controlTMSD	1	07-Feb-2019 22:02	213SMPL.d	AS CA CD FE K MG NA PB SB SE
20190129-DGW-MW3-PV25out-controlTPDS	1	07-Feb-2019 22:05	214SMPL.d	AS CA CD FE K MG PB SB SE
CCV 19	1	07-Feb-2019 22:14	218_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 19	1	07-Feb-2019 22:16	219_CCB.d	AS CA CD FE K MG NA PB SB SE
20190129-DGW-MW3-PV25out-30T	1	07-Feb-2019 22:18	220SMPL.d	AS CA CD FE K MG PB SB SE
20190129-DGW-MW3-PV25out-35T	1	07-Feb-2019 22:20	221SMPL.d	AS CA CD FE K MG PB SB SE
20190129-DGW-MW3-PV25out-40T	1	07-Feb-2019 22:23	222SMPL.d	AS CA CD FE K MG PB SB SE
20190129-DGW-MW3-PV25inlet-controlT	1	07-Feb-2019 22:25	223SMPL.d	AS CA CD FE K MG PB SB SE
20190129-DGW-MW3-PV25inlet-30-35-40T	1	07-Feb-2019 22:27	224SMPL.d	AS CA CD FE K MG PB SB SE
20190130-DGW-MW3-PV25mid-controlT	1	07-Feb-2019 22:29	225SMPL.d	AS CA CD FE K MG PB SB SE
20190130-DGW-MW3-PV25mid-30T	1	07-Feb-2019 22:32	226SMPL.d	AS CA CD FE K MG PB SB SE
20190130-DGW-MW3-PV25mid-35T	1	07-Feb-2019 22:34	227SMPL.d	AS CA CD FE K MG PB SB SE
20190130-DGW-MW3-PV25mid-40T	1	07-Feb-2019 22:36	228SMPL.d	AS CA CD FE K MG PB SB SE
CCV 20	1	07-Feb-2019 22:41	230_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 20	1	07-Feb-2019 22:43	231_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 21	1	07-Feb-2019 23:06	241_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 21	1	07-Feb-2019 23:08	242_CCB.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	07-Feb-2019 23:10	243SMPL.d	AS CA CD FE K MG PB SB SE
LLICV5	1	07-Feb-2019 23:12	244LICV.d	AS CA CD FE K MG PB SB SE
ICSA	1	07-Feb-2019 23:15	245ICSA.d	AS CA CD FE K MG PB SB SE
ICSAB	1	07-Feb-2019 23:17	246ICSB.d	AS CA CD FE K MG PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

Run ID:ICPMS05_332483
Instrument:ICPMS05
Method:SW6020

CCB 11	Date: 07-Feb-2019 19:22	Seq: 4942433	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.47	0.4	2	
Sodium	23.93	14	200	

CCB 12	Date: 07-Feb-2019 19:40	Seq: 4942440	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.436	0.4	2	
Sodium	27.74	14	200	

CCB 13	Date: 07-Feb-2019 19:56	Seq: 4942447	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.71	0.4	2	
Sodium	43.22	14	200	

CCB 14	Date: 07-Feb-2019 20:23	Seq: 4942528	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	24.3	18	200	
Sodium	92.67	14	200	

CCB 15	Date: 07-Feb-2019 20:44	Seq: 4942537	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	38.97	18	200	
Selenium	1.253	1.1	2	
Sodium	108.7	14	200	

CCB 16	Date: 07-Feb-2019 21:10	Seq: 4942548	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.492	0.4	2	
Potassium	27.65	18	200	
Sodium	36.96	14	200	

CCB 17	Date: 07-Feb-2019 21:26	Seq: 4942555	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.473	0.4	2	
Potassium	34.04	18	200	
Sodium	70.91	14	200	

CCB 18	Date: 07-Feb-2019 21:53	Seq: 4942567	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	24.29	18	200	
Sodium	47.87	14	200	

CCB 19	Date: 07-Feb-2019 22:16	Seq: 4942611	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.434	0.4	2	
Sodium	66.68	14	200	

CCB 20	Date: 07-Feb-2019 22:43	Seq: 4942623	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	28.05	18	200	
Sodium	172.5	14	200	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256
Start Date: 08-Feb-2019 End Date: 09-Feb-2019

Run ID:ICPMS05_332566
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
LLICV2	1	08-Feb-2019 13:14	021SMPL.d	AS CA CD FE K MG NA PB SB SE
LLICV5	1	08-Feb-2019 13:17	022LICV.d	AS CA CD FE K MG NA PB SB SE
ICB	1	08-Feb-2019 13:19	023_ICB.d	AS CA CD FE K MG NA PB SB SE
ICV	1	08-Feb-2019 13:27	025_ICV.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	08-Feb-2019 13:33	026ICSA.d	AS CA CD FE K MG NA PB SB SE
ICSAB	1	08-Feb-2019 13:36	027ICSB.d	AS CA CD FE K MG NA PB SB SE
20190129-DGW-MW3-PV25out-controlT	10	08-Feb-2019 13:48	029SMPL.d	NA
20190129-DGW-MW3-PV25out-controlTSD	50	08-Feb-2019 13:50	030SMPL.d	NA
20190129-DGW-MW3-PV25out-controlTPDS	10	08-Feb-2019 13:52	031SMPL.d	NA
20190129-DGW-MW3-PV25out-30T	20	08-Feb-2019 13:54	032SMPL.d	NA
20190129-DGW-MW3-PV25out-35T	20	08-Feb-2019 13:57	033SMPL.d	NA
20190129-DGW-MW3-PV25out-40T	20	08-Feb-2019 13:59	034SMPL.d	NA
20190129-DGW-MW3-PV25inlet-controlT	20	08-Feb-2019 14:01	035SMPL.d	NA
20190129-DGW-MW3-PV25inlet-30-35-40T	20	08-Feb-2019 14:04	036SMPL.d	NA
20190130-DGW-MW3-PV25mid-controlT	20	08-Feb-2019 14:06	037SMPL.d	NA
20190130-DGW-MW3-PV25mid-30T	20	08-Feb-2019 14:08	038SMPL.d	NA
CCV 1	1	08-Feb-2019 14:10	039_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	08-Feb-2019 14:13	040_CCB.d	AS CA CD FE K MG NA PB SB SE
20190130-DGW-MW3-PV25mid-35T	20	08-Feb-2019 14:15	041SMPL.d	NA
20190130-DGW-MW3-PV25mid-40T	20	08-Feb-2019 14:18	042SMPL.d	NA
CCV 2	1	08-Feb-2019 14:33	048_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	08-Feb-2019 14:35	049_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-137509	1	08-Feb-2019 14:39	050SMPL.d	AS CA CD FE K MG NA PB SB SE
LCS-137509	1	08-Feb-2019 14:41	051SMPL.d	AS CA CD FE K MG NA PB SB SE
20190122-DGW-MW11-PV15out-controlD	5	08-Feb-2019 15:09	055SMPL.d	AS CA CD FE K MG PB SB SE
20190122-DGW-MW11-PV15out-controlDSD	25	08-Feb-2019 15:12	056SMPL.d	AS CA CD FE K MG PB SB SE
20190122-DGW-MW11-PV15out-controlDMS	5	08-Feb-2019 15:14	057SMPL.d	AS CA CD FE K MG NA PB SB SE
20190122-DGW-MW11-PV15out-controlDMSD	5	08-Feb-2019 15:16	058SMPL.d	AS CA CD FE K MG NA PB SB SE
20190122-DGW-MW11-PV15out-controlDPDS	5	08-Feb-2019 15:19	059SMPL.d	AS CA CD FE K MG PB SB SE
CCV 3	1	08-Feb-2019 15:21	060_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	08-Feb-2019 15:23	061_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	08-Feb-2019 15:30	063_CCB.d	AS CA CD FE K MG NA PB SB SE
20190122-DGW-MW11-PV15out-30D	5	08-Feb-2019 15:32	064SMPL.d	AS CA CD FE K MG PB SB SE
20190122-DGW-MW11-PV15out-35D	5	08-Feb-2019 15:35	065SMPL.d	AS CA CD FE K MG PB SB SE
20190122-DGW-MW11-PV15out-40D	5	08-Feb-2019 15:37	066SMPL.d	AS CA CD FE K MG PB SB SE
20190122-DGW-MW11-PV15inlet-controlD	5	08-Feb-2019 15:39	067SMPL.d	AS CA CD FE K MG PB SB SE
20190122-DGW-MW11-PV15inlet-30-35-40D	5	08-Feb-2019 15:41	068SMPL.d	AS CA CD FE K MG PB SB SE
20190123-DGW-MW11-PV15mid-controlD	5	08-Feb-2019 15:44	069SMPL.d	AS CA CD FE K MG PB SB SE

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256
Start Date: 08-Feb-2019 End Date: 09-Feb-2019

Run ID:ICPMS05_332566
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
20190123-DGW-MW11-PV15mid-30D	5	08-Feb-2019 15:46	070SMPL.d	AS CA CD FE K MG PB SB SE
20190123-DGW-MW11-PV15mid-35D	5	08-Feb-2019 15:48	071SMPL.d	AS CA CD FE K MG PB SB SE
20190123-DGW-MW11-PV15mid-40D	5	08-Feb-2019 15:51	072SMPL.d	AS CA CD FE K MG PB SB SE
CCV 4	1	08-Feb-2019 15:55	074_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	08-Feb-2019 15:57	075_CCB.d	AS CA CD FE K MG NA PB SB SE
20190122-FD-PV15out-controlD	5	08-Feb-2019 16:05	076SMPL.d	CA K NA
20190122-FD-PV15out-30D	5	08-Feb-2019 16:07	077SMPL.d	CA K NA
20190122-FD-PV15out-35D	5	08-Feb-2019 16:10	078SMPL.d	CA K NA
20190122-FD-PV15out-40D	5	08-Feb-2019 16:12	079SMPL.d	CA K NA
20190122-FD-PV15inlet-controlD	5	08-Feb-2019 16:14	080SMPL.d	CA K NA
20190122-FD-PV15inlet-30-35-40D	5	08-Feb-2019 16:16	081SMPL.d	CA K NA
20190123-FD-PV15mid-controlD	5	08-Feb-2019 16:19	082SMPL.d	CA K NA
20190123-FD-PV15mid-30D	5	08-Feb-2019 16:21	083SMPL.d	CA K NA
20190123-FD-PV15mid-35D	5	08-Feb-2019 16:23	084SMPL.d	CA K NA
CCV 5	1	08-Feb-2019 16:28	086_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	08-Feb-2019 16:30	087_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	08-Feb-2019 19:51	093_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	08-Feb-2019 19:53	094_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-137509	1	08-Feb-2019 19:55	095SMPL.d	
20190122-DGW-MW11-PV15out-controlD	100	08-Feb-2019 19:58	096SMPL.d	NA
20190122-DGW-MW11-PV15out-controlDSD	500	08-Feb-2019 20:00	097SMPL.d	NA
20190122-DGW-MW11-PV15out-controlDPDS	100	08-Feb-2019 20:02	098SMPL.d	NA
20190122-DGW-MW11-PV15out-30D	100	08-Feb-2019 20:04	099SMPL.d	NA
20190122-DGW-MW11-PV15out-35D	100	08-Feb-2019 20:07	100SMPL.d	NA
20190122-DGW-MW11-PV15out-40D	100	08-Feb-2019 20:09	101SMPL.d	NA
20190122-DGW-MW11-PV15inlet-controlD	100	08-Feb-2019 20:11	102SMPL.d	NA
20190122-DGW-MW11-PV15inlet-30-35-40D	100	08-Feb-2019 20:13	103SMPL.d	NA
20190123-DGW-MW11-PV15mid-controlD	100	08-Feb-2019 20:16	104SMPL.d	NA
CCV 7	1	08-Feb-2019 20:18	105_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	08-Feb-2019 20:20	106_CCB.d	AS CA CD FE K MG NA PB SB SE
20190123-DGW-MW11-PV15mid-30D	100	08-Feb-2019 20:22	107SMPL.d	NA
20190123-DGW-MW11-PV15mid-35D	100	08-Feb-2019 20:25	108SMPL.d	NA
20190123-DGW-MW11-PV15mid-40D	100	08-Feb-2019 20:27	109SMPL.d	NA
CCV 8	1	08-Feb-2019 20:31	111_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	08-Feb-2019 20:33	112_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-137506	1	08-Feb-2019 20:36	113SMPL.d	AS CA CD FE K MG NA PB SB SE
LCS-137506	1	08-Feb-2019 20:38	114SMPL.d	AS CA CD FE K MG NA PB SB SE
20190122-DGW-MW11-PV15out-controlT	5	08-Feb-2019 20:40	115SMPL.d	AS CA CD FE K MG PB SB SE
20190122-DGW-MW11-PV15out-controlTSD	25	08-Feb-2019 20:43	116SMPL.d	AS CA CD FE K MG PB SB SE
20190122-DGW-MW11-PV15out-controlTMS	5	08-Feb-2019 20:45	117SMPL.d	AS CA CD FE K MG NA PB SB SE

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256
Start Date: 08-Feb-2019 End Date: 09-Feb-2019

Run ID:ICPMS05_332566
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
20190122-DGW-MW11-PV15out-controlTMSD	5	08-Feb-2019 20:47	118SMPL.d	AS CA CD FE K MG NA PB SB SE
20190122-DGW-MW11-PV15out-controlTPDS	5	08-Feb-2019 20:49	119SMPL.d	AS CA CD FE K MG PB SB SE
CCV 9	1	08-Feb-2019 20:52	120_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	08-Feb-2019 20:54	121_CCB.d	AS CA CD FE K MG NA PB SB SE
20190122-DGW-MW11-PV15out-30T	5	08-Feb-2019 20:56	122SMPL.d	AS CA CD FE K MG PB SB SE
20190122-DGW-MW11-PV15out-35T	5	08-Feb-2019 20:58	123SMPL.d	AS CA CD FE K MG PB SB SE
20190122-DGW-MW11-PV15out-40T	5	08-Feb-2019 21:01	124SMPL.d	AS CA CD FE K MG PB SB SE
20190122-DGW-MW11-PV15inlet-controlT	5	08-Feb-2019 21:03	125SMPL.d	AS CA CD FE K MG PB SB SE
20190122-DGW-MW11-PV15inlet-30-35-40T	5	08-Feb-2019 21:05	126SMPL.d	AS CA CD FE K MG PB SB SE
20190123-DGW-MW11-PV15mid-controlT	5	08-Feb-2019 21:08	127SMPL.d	AS CA CD FE K MG PB SB SE
20190123-DGW-MW11-PV15mid-30T	5	08-Feb-2019 21:10	128SMPL.d	AS CA CD FE K MG PB SB SE
20190123-DGW-MW11-PV15mid-35T	5	08-Feb-2019 21:12	129SMPL.d	AS CA CD FE K MG PB SB SE
20190123-DGW-MW11-PV15mid-40T	5	08-Feb-2019 21:14	130SMPL.d	AS CA CD FE K MG PB SB SE
20190122-FD-PV15out-controlT	5	08-Feb-2019 21:17	131SMPL.d	CA K NA
CCV 10	1	08-Feb-2019 21:19	132_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	08-Feb-2019 21:21	133_CCB.d	AS CA CD FE K MG NA PB SB SE
20190122-FD-PV15out-30T	5	08-Feb-2019 21:23	134SMPL.d	CA K NA
20190122-FD-PV15out-35T	5	08-Feb-2019 21:26	135SMPL.d	CA K NA
20190122-FD-PV15out-40T	5	08-Feb-2019 21:28	136SMPL.d	CA K NA
20190122-FD-PV15inlet-controlT	5	08-Feb-2019 21:30	137SMPL.d	CA K NA
20190122-FD-PV15inlet-30-35-40T	5	08-Feb-2019 21:32	138SMPL.d	CA K NA
20190123-FD-PV15mid-controlT	5	08-Feb-2019 21:35	139SMPL.d	CA K NA
20190123-FD-PV15mid-30T	5	08-Feb-2019 21:37	140SMPL.d	CA K NA
20190123-FD-PV15mid-35T	5	08-Feb-2019 21:39	141SMPL.d	CA K NA
20190123-FD-PV15mid-40T	5	08-Feb-2019 21:42	142SMPL.d	CA K NA
CCV 11	1	08-Feb-2019 21:46	144_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 12	1	08-Feb-2019 21:48	145_CCB.d	AS CA CD FE K MG NA PB SB SE
20190122-FD-PV15out-controlD	1	08-Feb-2019 21:51	146SMPL.d	AS CD FE MG PB SB
20190122-FD-PV15out-30D	1	08-Feb-2019 21:53	147SMPL.d	AS CD FE MG PB SB
20190122-FD-PV15out-35D	1	08-Feb-2019 21:55	148SMPL.d	AS CD FE MG PB SB
20190122-FD-PV15out-40D	1	08-Feb-2019 21:57	149SMPL.d	AS CD FE MG PB SB
CCV 12	1	08-Feb-2019 22:02	151_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 13	1	08-Feb-2019 22:04	152_CCB.d	AS CA CD FE K MG NA PB SB SE
20190122-FD-PV15inlet-controlD	1	08-Feb-2019 22:07	153SMPL.d	AS CD FE MG PB SB
20190122-FD-PV15inlet-30-35-40D	1	08-Feb-2019 22:09	154SMPL.d	AS CD FE MG PB SB
20190123-FD-PV15mid-controlD	1	08-Feb-2019 22:11	155SMPL.d	AS CD FE MG PB SB
20190123-FD-PV15mid-30D	1	08-Feb-2019 22:13	156SMPL.d	AS CD FE MG PB SB
20190123-FD-PV15mid-35D	1	08-Feb-2019 22:16	157SMPL.d	AS CD FE MG PB SB
CCV 13	1	08-Feb-2019 22:22	160_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 14	1	08-Feb-2019 22:25	161_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 14	1	08-Feb-2019 22:50	172_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	08-Feb-2019 22:52	173SMPL.d	AS CA CD FE K MG NA PB SB SE
LLCCV5	1	08-Feb-2019 22:54	174LICV.d	AS CA CD FE K MG NA PB SB SE
ICCB 15	1	08-Feb-2019 22:56	175_ICB.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

Run ID:ICPMS05_332566
Instrument:ICPMS05
Method:SW6020

CCB 1	Date: 08-Feb-2019 14:13	Seq: 4943433	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.531	0.4	2	
Sodium	41.7	14	200	

CCB 2	Date: 08-Feb-2019 14:35	Seq: 4943442	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.517	0.4	2	
Calcium	-34.19	34	500	
Sodium	23.08	14	200	

CCB 3	Date: 08-Feb-2019 15:23	Seq: 4943815	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.684	0.4	2	
Sodium	155.3	14	200	

CCB 4	Date: 08-Feb-2019 15:30	Seq: 4943817	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	-42.29	34	500	
Sodium	94.6	14	200	

CCB 5	Date: 08-Feb-2019 15:57	Seq: 4943829	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.468	0.4	2	
Calcium	-65.81	34	500	
Sodium	161.2	14	200	

CCB 6	Date: 08-Feb-2019 16:30	Seq: 4943841	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.413	0.4	2	
Calcium	-65.36	34	500	
Sodium	106.1	14	200	

CCB 7	Date: 08-Feb-2019 19:53	Seq: 4943959	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.983	0.4	2	
Calcium	-34.26	34	500	
Potassium	-20.77	18	200	

CCB 8	Date: 08-Feb-2019 20:20	Seq: 4943971	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.246	0.4	2	
Calcium	-39	34	500	
Sodium	14.22	14	200	

CCB 9	Date: 08-Feb-2019 20:33	Seq: 4943977	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.241	0.4	2	
Calcium	-44.27	34	500	
Sodium	18	14	200	

CCB 10	Date: 08-Feb-2019 20:54	Seq: 4943986	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.718	0.4	2	

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

Run ID:ICPMS05_332566
Instrument:ICPMS05
Method:SW6020

Calcium	-57.74	34	500	
Sodium	112.5	14	200	

CCB 11	Date: 08-Feb-2019 21:21	Seq: 4944257	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.077	0.4	2	
Calcium	-60.49	34	500	
Sodium	192.4	14	200	

CCB 12	Date: 08-Feb-2019 21:48	Seq: 4944269	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.043	0.4	2	
Calcium	-80.34	34	500	
Potassium	-30.17	18	200	
Sodium	45.83	14	200	

CCB 13	Date: 08-Feb-2019 22:04	Seq: 4944319	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.83	0.4	2	
Calcium	-72.82	34	500	
Potassium	-19.27	18	200	
Sodium	100.6	14	200	

CCB 14	Date: 08-Feb-2019 22:25	Seq: 4944328	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.885	0.4	2	
Calcium	-62.02	34	500	
Sodium	136.8	14	200	

ICCB 15	Date: 08-Feb-2019 22:56	Seq: 4944445	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	-54.2	14	200	

CCB 16	Date: 08-Feb-2019 23:10	Seq: 4944451	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.69	0.4	2	
Calcium	43.91	34	500	
Magnesium	11.63	10	200	
Potassium	31.26	18	200	
Sodium	276.7	14	200	

CCB 17	Date: 08-Feb-2019 23:37	Seq: 4944463	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.749	0.4	2	
Potassium	69.15	18	200	
Sodium	288.1	14	200	

CCB 18	Date: 08-Feb-2019 23:51	Seq: 4944469	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.079	0.4	2	
Potassium	56.58	18	200	
Sodium	104.6	14	200	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256
Start Date: 11-Feb-2019 End Date: 11-Feb-2019

Run ID:ICPMS05_332637
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
LLICV2	1	11-Feb-2019 11:38	017SMPL.d	AS CD FE MG NA PB SB SE
LLICV5	1	11-Feb-2019 11:41	018LICV.d	AS CD FE MG NA PB SB SE
ICB	1	11-Feb-2019 11:43	019_ICB.d	AS CA CD FE K MG NA PB SB SE
ICV	1	11-Feb-2019 12:17	021_ICV.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	11-Feb-2019 12:21	022ICSA.d	AS CD FE MG NA PB SB SE
ICSAB	1	11-Feb-2019 12:24	023ICSB.d	AS CD FE MG NA PB SB SE
20190122-DGW-MW11-PV15out-controlT	100	11-Feb-2019 12:37	025SMPL.d	NA
20190122-DGW-MW11-PV15out-controlTSD	500	11-Feb-2019 12:39	026SMPL.d	NA
20190122-DGW-MW11-PV15out-controlTPDS	100	11-Feb-2019 12:42	027SMPL.d	NA
20190122-DGW-MW11-PV15out-30T	100	11-Feb-2019 12:44	028SMPL.d	NA
20190122-DGW-MW11-PV15out-35T	100	11-Feb-2019 12:46	029SMPL.d	NA
20190122-DGW-MW11-PV15out-40T	100	11-Feb-2019 12:48	030SMPL.d	NA
20190122-DGW-MW11-PV15inlet-controlT	100	11-Feb-2019 12:51	031SMPL.d	NA
20190122-DGW-MW11-PV15inlet-30-35-40T	100	11-Feb-2019 12:53	032SMPL.d	NA
20190123-DGW-MW11-PV15mid-controlT	100	11-Feb-2019 12:55	033SMPL.d	NA
20190123-DGW-MW11-PV15mid-30T	100	11-Feb-2019 12:57	034SMPL.d	NA
CCV 1	1	11-Feb-2019 13:00	035_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	11-Feb-2019 13:02	036_CCB.d	AS CA CD FE K MG NA PB SB SE
20190123-DGW-MW11-PV15mid-35T	100	11-Feb-2019 13:11	037SMPL.d	NA
20190123-DGW-MW11-PV15mid-40T	100	11-Feb-2019 13:13	038SMPL.d	NA
20190122-FD-PV15out-controlT	1	11-Feb-2019 13:15	039SMPL.d	AS CD FE MG PB SB SE
20190122-FD-PV15out-30T	1	11-Feb-2019 13:18	040SMPL.d	AS CD FE MG PB SB SE
20190122-FD-PV15out-35T	1	11-Feb-2019 13:20	041SMPL.d	AS CD FE MG PB SB SE
20190122-FD-PV15out-40T	1	11-Feb-2019 13:22	042SMPL.d	AS CD FE MG PB SB SE
20190122-FD-PV15inlet-controlT	1	11-Feb-2019 13:24	043SMPL.d	AS CD FE MG PB SB SE
20190122-FD-PV15inlet-30-35-40T	1	11-Feb-2019 13:27	044SMPL.d	AS CD FE MG PB SB SE
20190123-FD-PV15mid-controlT	1	11-Feb-2019 13:29	045SMPL.d	AS CD FE MG PB SB SE
CCV 2	1	11-Feb-2019 13:34	047_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	11-Feb-2019 13:36	048_CCB.d	AS CA CD FE K MG NA PB SB SE
20190123-FD-PV15mid-30T	1	11-Feb-2019 13:41	049SMPL.d	AS CD FE MG PB SB SE
20190123-FD-PV15mid-35T	1	11-Feb-2019 13:44	050SMPL.d	AS CD FE MG PB SB SE
20190123-FD-PV15mid-40T	1	11-Feb-2019 13:46	051SMPL.d	AS CD FE MG PB SB SE
20190122-FD-PV15out-controlD	1	11-Feb-2019 13:48	052SMPL.d	SE
20190122-FD-PV15out-30D	1	11-Feb-2019 13:50	053SMPL.d	SE
20190122-FD-PV15out-35D	1	11-Feb-2019 13:53	054SMPL.d	SE
20190122-FD-PV15out-40D	1	11-Feb-2019 13:55	055SMPL.d	SE
20190122-FD-PV15inlet-controlD	1	11-Feb-2019 13:57	056SMPL.d	SE
20190122-FD-PV15inlet-30-35-40D	1	11-Feb-2019 13:59	057SMPL.d	SE
CCV 3	1	11-Feb-2019 14:06	059_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	11-Feb-2019 14:08	060_CCB.d	AS CA CD FE K MG NA PB SB SE
20190123-FD-PV15mid-controlD	1	11-Feb-2019 14:12	061SMPL.d	SE
20190123-FD-PV15mid-30D	1	11-Feb-2019 14:14	062SMPL.d	SE
20190123-FD-PV15mid-35D	1	11-Feb-2019 14:16	063SMPL.d	SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

Run ID:ICPMS05_332637
Instrument:ICPMS05
Method:SW6020

CCB 2	Date: 11-Feb-2019 13:36	Seq: 4944933		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		277.8	14	200	
CCB 3	Date: 11-Feb-2019 14:08	Seq: 4944958		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		98.04	14	200	
CCB 4	Date: 11-Feb-2019 14:41	Seq: 4944976		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		155	14	200	
CCB 6	Date: 11-Feb-2019 16:09	Seq: 4945224		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		-49.9	14	200	
CCB 8	Date: 11-Feb-2019 17:12	Seq: 4945438		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		108.8	14	200	
ICCB 9	Date: 11-Feb-2019 20:57	Seq: 4945498		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		18.13	14	200	
CCB 10	Date: 11-Feb-2019 21:13	Seq: 4945505		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		18.96	14	200	
CCB 11	Date: 11-Feb-2019 21:31	Seq: 4945513		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		25.79	14	200	
CCB 12	Date: 11-Feb-2019 22:02	Seq: 4945572		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		20.05	14	200	
CCB 13	Date: 11-Feb-2019 22:29	Seq: 4945718		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		51.59	14	200	
CCB 14	Date: 11-Feb-2019 22:50	Seq: 4945727		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		42.72	14	200	
CCB 15	Date: 11-Feb-2019 23:10	Seq: 4945749		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		33.61	14	200	
CCB 16	Date: 11-Feb-2019 23:37	Seq: 4945761		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		214	14	200	
CCB 17	Date: 11-Feb-2019 23:44	Seq: 4945764		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		115.2	14	200	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256
Start Date: 12-Feb-2019 End Date: 13-Feb-2019

Run ID:ICPMS05_332704
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	12-Feb-2019 12:05	020_ICV.d	AS CA CD FE K MG NA P PB SB SE
LLICV2	1	12-Feb-2019 12:07	021SMPL.d	AS CA CD FE K MG NA P PB SB SE
LLICV5	1	12-Feb-2019 12:09	022LICV.d	AS CA CD FE K MG NA P PB SB SE
ICB	1	12-Feb-2019 12:11	023_ICB.d	AS CA CD FE K MG NA P PB SB SE
ICSA	1	12-Feb-2019 12:15	024ICSA.d	AS CA CD FE K MG NA P PB SB SE
ICSAB	1	12-Feb-2019 12:18	025ICSB.d	AS CA CD FE K MG NA P PB SB SE
CCV 1	1	12-Feb-2019 12:54	036_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 1	1	12-Feb-2019 12:57	037_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 2	1	12-Feb-2019 13:14	044_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 2	1	12-Feb-2019 13:16	045_CCB.d	AS CA CD FE K MG NA P PB SB SE
MBLKF1-137611	1	12-Feb-2019 14:18	047SMPL.d	AS CA CD FE K MG NA PB SB SE
MBLK-137611	1	12-Feb-2019 14:20	048SMPL.d	AS CA CD FE K MG NA PB SB SE
LCS-137611	1	12-Feb-2019 14:23	049SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZSD	5	12-Feb-2019 14:27	051SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZMS	1	12-Feb-2019 14:29	052SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZMSD	1	12-Feb-2019 14:32	053SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZPDS	1	12-Feb-2019 14:34	054SMPL.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	12-Feb-2019 14:46	057_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 3	1	12-Feb-2019 14:48	058_CCB.d	AS CA CD FE K MG NA P PB SB SE
20190123-FD-PV15mid-40D	5	12-Feb-2019 15:04	064SMPL.d	CA NA
20190129-DGW-MW3-PV25out-controlD	5	12-Feb-2019 15:06	065SMPL.d	CA NA
20190129-DGW-MW3-PV25out-30D	5	12-Feb-2019 15:08	066SMPL.d	NA
CCV 4	1	12-Feb-2019 15:15	069_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 4	1	12-Feb-2019 15:17	070_CCB.d	AS CA CD FE K MG NA P PB SB SE
20190123-FD-PV15mid-40D	1	12-Feb-2019 15:20	071SMPL.d	AS CD FE K MG P PB SB SE
20190129-DGW-MW3-PV25out-controlD	1	12-Feb-2019 15:22	072SMPL.d	AS CD FE K MG P PB SB SE
20190129-DGW-MW3-PV25out-30D	1	12-Feb-2019 15:24	073SMPL.d	AS CA CD FE K MG P PB SB SE
20190129-DGW-MW3-PV25out-35D	1	12-Feb-2019 15:27	074SMPL.d	AS CA CD FE K MG P PB SB SE
20190129-DGW-MW3-PV25out-40D	1	12-Feb-2019 15:35	075SMPL.d	AS CA CD FE K MG P PB SB SE
20190129-DGW-MW3-PV25inlet-controlD	1	12-Feb-2019 15:39	076SMPL.d	AS CA CD FE K MG P PB SB SE
20190129-DGW-MW3-PV25inlet-30-35-40D	1	12-Feb-2019 15:41	077SMPL.d	AS CA CD FE K MG P PB SB SE
20190130-DGW-MW3-PV25mid-controlD	1	12-Feb-2019 15:43	078SMPL.d	AS CA CD FE K MG P PB SB SE
20190130-DGW-MW3-PV25mid-30D	1	12-Feb-2019 15:46	079SMPL.d	AS CA CD FE K MG P PB SB SE
CCV 5	1	12-Feb-2019 15:52	081_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 5	1	12-Feb-2019 15:54	082_CCB.d	AS CA CD FE K MG NA P PB SB SE
20190130-DGW-MW3-PV25mid-35D	1	12-Feb-2019 15:59	083SMPL.d	AS CA CD FE K MG P PB SB SE
20190130-DGW-MW3-PV25mid-40D	1	12-Feb-2019 16:01	084SMPL.d	AS CA CD FE K MG P PB SB SE
CCV 6	1	12-Feb-2019 16:22	092_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 6	1	12-Feb-2019 16:24	093_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 7	1	12-Feb-2019 16:50	104_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 7	1	12-Feb-2019 16:53	105_CCB.d	AS CA CD FE K MG NA P PB SB SE
MBLK-137611	1	12-Feb-2019 16:56	106SMPL.d	
20190129-DGW-MW3-PV25out-35D	20	12-Feb-2019 16:58	107SMPL.d	NA

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256
Start Date: 12-Feb-2019 End Date: 13-Feb-2019

Run ID:ICPMS05_332704
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
20190129-DGW-MW3-PV25out-40D	20	12-Feb-2019 17:00	108SMPL.d	NA
20190129-DGW-MW3-PV25inlet-controlD	20	12-Feb-2019 17:02	109SMPL.d	NA
20190129-DGW-MW3-PV25inlet-30-35-40D	20	12-Feb-2019 17:05	110SMPL.d	NA
20190130-DGW-MW3-PV25mid-controlD	20	12-Feb-2019 17:07	111SMPL.d	NA
20190130-DGW-MW3-PV25mid-30D	20	12-Feb-2019 17:09	112SMPL.d	NA
20190130-DGW-MW3-PV25mid-35D	20	12-Feb-2019 17:11	113SMPL.d	NA
20190130-DGW-MW3-PV25mid-40D	20	12-Feb-2019 17:14	114SMPL.d	NA
CCV 8	1	12-Feb-2019 17:18	116_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 8	1	12-Feb-2019 17:20	117_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 9	1	12-Feb-2019 18:26	121_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 9	1	12-Feb-2019 18:28	122_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 10	1	12-Feb-2019 18:53	133_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 10	1	12-Feb-2019 18:56	134_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 11	1	12-Feb-2019 19:18	144_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 11	1	12-Feb-2019 19:20	145_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 12	1	12-Feb-2019 19:45	156_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 12	1	12-Feb-2019 19:48	157_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 13	1	12-Feb-2019 20:10	167_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 13	1	12-Feb-2019 20:12	168_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 14	1	12-Feb-2019 20:26	174_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 14	1	12-Feb-2019 20:28	175_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 15	1	12-Feb-2019 20:50	184_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 15	1	12-Feb-2019 20:52	185_CCB.d	AS CA CD FE K MG NA P PB SB SE
ICCV 16	1	12-Feb-2019 21:31	196_ICV.d	AS CA CD FE K MG NA P PB SB SE
LLCCV2	1	12-Feb-2019 21:34	197SMPL.d	AS CA CD FE K MG NA P PB SB SE
LLCCV5	1	12-Feb-2019 21:36	198LICV.d	AS CA CD FE K MG NA P PB SB SE
ICCB 16	1	12-Feb-2019 21:38	199_ICB.d	AS CA CD FE K MG NA P PB SB SE
CCV 17	1	12-Feb-2019 21:56	207_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 17	1	12-Feb-2019 21:59	208_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 18	1	12-Feb-2019 22:24	219_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 18	1	12-Feb-2019 22:26	220_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 19	1	12-Feb-2019 22:51	231_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 19	1	12-Feb-2019 22:53	232_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 20	1	12-Feb-2019 23:13	241_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 20	1	12-Feb-2019 23:16	242_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 21	1	12-Feb-2019 23:38	252_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 21	1	12-Feb-2019 23:40	253_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 22	1	12-Feb-2019 23:54	259_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 22	1	12-Feb-2019 23:56	260_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 23	1	13-Feb-2019 00:07	265_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 23	1	13-Feb-2019 00:10	266_CCB.d	AS CA CD FE K MG NA P PB SB SE
LLICV2	1	13-Feb-2019 00:12	267SMPL.d	AS CA CD FE K MG NA P PB SB SE
LLICV5	1	13-Feb-2019 00:14	268LICV.d	AS CA CD FE K MG NA P PB SB SE
ICSA	1	13-Feb-2019 00:16	269ICSA.d	AS CA CD FE K MG NA P PB SB SE
ICSAB	1	13-Feb-2019 00:19	270ICSB.d	AS CA CD FE K MG NA P PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

Run ID:ICPMS05_332704
Instrument:ICPMS05
Method:SW6020

CCB 2	Date: 12-Feb-2019 13:16	Seq: 4946710	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	51.43	14	200	

CCB 4	Date: 12-Feb-2019 15:17	Seq: 4947225	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	-18.49	18	200	

CCB 5	Date: 12-Feb-2019 15:54	Seq: 4947237	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	27.33	14	200	

CCB 6	Date: 12-Feb-2019 16:24	Seq: 4947333	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	-17.38	14	200	

CCB 8	Date: 12-Feb-2019 17:20	Seq: 4947470	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	-37.66	14	200	

CCB 9	Date: 12-Feb-2019 18:28	Seq: 4947558	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	-50.36	14	200	

CCB 11	Date: 12-Feb-2019 19:20	Seq: 4947581	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	-26.57	18	200	

CCB 12	Date: 12-Feb-2019 19:48	Seq: 4947593	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	-25.52	14	200	

CCB 13	Date: 12-Feb-2019 20:12	Seq: 4947604	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	-51.44	14	200	

CCB 14	Date: 12-Feb-2019 20:28	Seq: 4947611	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.559	0.4	2	
Potassium	-21.74	18	200	
Sodium	-23.59	14	200	

CCB 15	Date: 12-Feb-2019 20:52	Seq: 4947621	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	-27.48	18	200	
Sodium	-27.74	14	200	

CCB 17	Date: 12-Feb-2019 21:59	Seq: 4947801	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	22.95	14	200	

CCB 18	Date: 12-Feb-2019 22:26	Seq: 4947813	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	-28.02	18	200	
Sodium	15.95	14	200	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19020256

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19020256-01	20190204-FD-PV20Out-Control	Groundwater		04-Feb-2019 11:40	06-Feb-2019 09:35	☐
HS19020256-02	20190204-FD-PV20Out-30	Groundwater		04-Feb-2019 11:40	06-Feb-2019 09:35	☐
HS19020256-03	20190204-FD-PV20Out-35	Groundwater		04-Feb-2019 11:40	06-Feb-2019 09:35	☐
HS19020256-04	20190204-FD-PV20Out-40	Groundwater		04-Feb-2019 11:40	06-Feb-2019 09:35	☐
HS19020256-05	20190204-DGW-MW11-PV20out-control	Groundwater		04-Feb-2019 11:50	06-Feb-2019 09:35	☐
HS19020256-06	20190204-DGW-MW11-PV20out-30	Groundwater		04-Feb-2019 11:50	06-Feb-2019 09:35	☐
HS19020256-07	20190204-DGW-MW11-PV20out-35	Groundwater		04-Feb-2019 11:50	06-Feb-2019 09:35	☐
HS19020256-08	20190204-DGW-MW11-PV20out-40	Groundwater		04-Feb-2019 11:50	06-Feb-2019 09:35	☐
HS19020256-09	20190122-DGW-MW11-PV15out-controlD	Groundwater		22-Jan-2019 11:50	06-Feb-2019 09:35	☐
HS19020256-10	20190122-DGW-MW11-PV15out-30D	Groundwater		22-Jan-2019 11:50	06-Feb-2019 09:35	☐
HS19020256-11	20190122-DGW-MW11-PV15out-35D	Groundwater		22-Jan-2019 11:50	06-Feb-2019 09:35	☐
HS19020256-12	20190122-DGW-MW11-PV15out-40D	Groundwater		22-Jan-2019 11:50	06-Feb-2019 09:35	☐
HS19020256-13	20190122-DGW-MW11-PV15inlet-controlD	Groundwater		22-Jan-2019 12:00	06-Feb-2019 09:35	☐
HS19020256-14	20190122-DGW-MW11-PV15inlet-30-35-40D	Groundwater		22-Jan-2019 12:00	06-Feb-2019 09:35	☐
HS19020256-15	20190123-DGW-MW11-PV15mid-controlD	Groundwater		23-Jan-2019 17:15	06-Feb-2019 09:35	☐
HS19020256-16	20190123-DGW-MW11-PV15mid-30D	Groundwater		23-Jan-2019 17:15	06-Feb-2019 09:35	☐
HS19020256-17	20190123-DGW-MW11-PV15mid-35D	Groundwater		23-Jan-2019 17:15	06-Feb-2019 09:35	☐
HS19020256-18	20190123-DGW-MW11-PV15mid-40D	Groundwater		23-Jan-2019 17:15	06-Feb-2019 09:35	☐
HS19020256-19	20190122-DGW-MW11-PV15out-controlT	Groundwater		22-Jan-2019 11:50	06-Feb-2019 09:35	☐
HS19020256-20	20190122-DGW-MW11-PV15out-30T	Groundwater		22-Jan-2019 11:50	06-Feb-2019 09:35	☐
HS19020256-21	20190122-DGW-MW11-PV15out-35T	Groundwater		22-Jan-2019 11:50	06-Feb-2019 09:35	☐
HS19020256-22	20190122-DGW-MW11-PV15out-40T	Groundwater		22-Jan-2019 11:50	06-Feb-2019 09:35	☐
HS19020256-23	20190122-DGW-MW11-PV15inlet-controlT	Groundwater		22-Jan-2019 12:00	06-Feb-2019 09:35	☐
HS19020256-24	20190122-DGW-MW11-PV15inlet-30-35-40T	Groundwater		22-Jan-2019 12:00	06-Feb-2019 09:35	☐
HS19020256-25	20190123-DGW-MW11-PV15mid-controlT	Groundwater		23-Jan-2019 17:15	06-Feb-2019 09:35	☐
HS19020256-26	20190123-DGW-MW11-PV15mid-30T	Groundwater		23-Jan-2019 17:15	06-Feb-2019 09:35	☐

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19020256

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19020256-27	20190123-DGW-MW11-PV15mid-35T	Groundwater		23-Jan-2019 17:15	06-Feb-2019 09:35	☐
HS19020256-28	20190123-DGW-MW11-PV15mid-40T	Groundwater		23-Jan-2019 17:15	06-Feb-2019 09:35	☐
HS19020256-29	20190122-FD-PV15out-controlD	Groundwater		22-Jan-2019 11:50	06-Feb-2019 09:35	☐
HS19020256-30	20190122-FD-PV15out-30D	Groundwater		22-Jan-2019 11:50	06-Feb-2019 09:35	☐
HS19020256-31	20190122-FD-PV15out-35D	Groundwater		22-Jan-2019 11:50	06-Feb-2019 09:35	☐
HS19020256-32	20190122-FD-PV15out-40D	Groundwater		22-Jan-2019 11:50	06-Feb-2019 09:35	☐
HS19020256-33	20190122-FD-PV15inlet-controlD	Groundwater		22-Jan-2019 12:00	06-Feb-2019 09:35	☐
HS19020256-34	20190122-FD-PV15inlet-30-35-40D	Groundwater		22-Jan-2019 12:00	06-Feb-2019 09:35	☐
HS19020256-35	20190123-FD-PV15mid-controlD	Groundwater		23-Jan-2019 17:30	06-Feb-2019 09:35	☐
HS19020256-36	20190123-FD-PV15mid-30D	Groundwater		23-Jan-2019 17:30	06-Feb-2019 09:35	☐
HS19020256-37	20190123-FD-PV15mid-35D	Groundwater		23-Jan-2019 17:30	06-Feb-2019 09:35	☐
HS19020256-38	20190123-FD-PV15mid-40D	Groundwater		23-Jan-2019 17:30	06-Feb-2019 09:35	☐
HS19020256-39	20190122-FD-PV15out-controlT	Groundwater		22-Jan-2019 11:50	06-Feb-2019 09:35	☐
HS19020256-40	20190122-FD-PV15out-30T	Groundwater		22-Jan-2019 11:50	06-Feb-2019 09:35	☐
HS19020256-41	20190122-FD-PV15out-35T	Groundwater		22-Jan-2019 11:50	06-Feb-2019 09:35	☐
HS19020256-42	20190122-FD-PV15out-40T	Groundwater		22-Jan-2019 11:50	06-Feb-2019 09:35	☐
HS19020256-43	20190122-FD-PV15inlet-controlT	Groundwater		22-Jan-2019 12:00	06-Feb-2019 09:35	☐
HS19020256-44	20190122-FD-PV15inlet-30-35-40T	Groundwater		22-Jan-2019 12:00	06-Feb-2019 09:35	☐
HS19020256-45	20190123-FD-PV15mid-controlT	Groundwater		23-Jan-2019 17:30	06-Feb-2019 09:35	☐
HS19020256-46	20190123-FD-PV15mid-30T	Groundwater		23-Jan-2019 17:30	06-Feb-2019 09:35	☐
HS19020256-47	20190123-FD-PV15mid-35T	Groundwater		23-Jan-2019 17:30	06-Feb-2019 09:35	☐
HS19020256-48	20190123-FD-PV15mid-40T	Groundwater		23-Jan-2019 17:30	06-Feb-2019 09:35	☐
HS19020256-49	20190129-DGW-MW3-PV25out-controlD	Groundwater		29-Jan-2019 12:05	06-Feb-2019 09:35	☐
HS19020256-50	20190129-DGW-MW3-PV25out-30D	Groundwater		29-Jan-2019 12:05	06-Feb-2019 09:35	☐
HS19020256-51	20190129-DGW-MW3-PV25out-35D	Groundwater		29-Jan-2019 12:05	06-Feb-2019 09:35	☐
HS19020256-52	20190129-DGW-MW3-PV25out-40D	Groundwater		29-Jan-2019 12:05	06-Feb-2019 09:35	☐
HS19020256-53	20190129-DGW-MW3-PV25inlet-controlD	Groundwater		29-Jan-2019 12:20	06-Feb-2019 09:35	☐

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19020256

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19020256-54	20190129-DGW-MW3-PV25inlet-30-35-40D	Groundwater		29-Jan-2019 12:20	06-Feb-2019 09:35	☐
HS19020256-55	20190130-DGW-MW3-PV25mid-controlD	Groundwater		30-Jan-2019 16:25	06-Feb-2019 09:35	☐
HS19020256-56	20190130-DGW-MW3-PV25mid-30D	Groundwater		30-Jan-2019 16:25	06-Feb-2019 09:35	☐
HS19020256-57	20190130-DGW-MW3-PV25mid-35D	Groundwater		30-Jan-2019 16:25	06-Feb-2019 09:35	☐
HS19020256-58	20190130-DGW-MW3-PV25mid-40D	Groundwater		30-Jan-2019 16:25	06-Feb-2019 09:35	☐
HS19020256-59	20190129-DGW-MW3-PV25out-controlT	Groundwater		29-Jan-2019 12:05	06-Feb-2019 09:35	☐
HS19020256-60	20190129-DGW-MW3-PV25out-30T	Groundwater		29-Jan-2019 12:05	06-Feb-2019 09:35	☐
HS19020256-61	20190129-DGW-MW3-PV25out-35T	Groundwater		29-Jan-2019 12:05	06-Feb-2019 09:35	☐
HS19020256-62	20190129-DGW-MW3-PV25out-40T	Groundwater		29-Jan-2019 12:05	06-Feb-2019 09:35	☐
HS19020256-63	20190129-DGW-MW3-PV25inlet-controlT	Groundwater		29-Jan-2019 12:20	06-Feb-2019 09:35	☐
HS19020256-64	20190129-DGW-MW3-PV25inlet-30-35-40T	Groundwater		29-Jan-2019 12:20	06-Feb-2019 09:35	☐
HS19020256-65	20190130-DGW-MW3-PV25mid-controlT	Groundwater		30-Jan-2019 16:25	06-Feb-2019 09:35	☐
HS19020256-66	20190130-DGW-MW3-PV25mid-30T	Groundwater		30-Jan-2019 16:25	06-Feb-2019 09:35	☐
HS19020256-67	20190130-DGW-MW3-PV25mid-35T	Groundwater		30-Jan-2019 16:25	06-Feb-2019 09:35	☐
HS19020256-68	20190130-DGW-MW3-PV25mid-40T	Groundwater		30-Jan-2019 16:25	06-Feb-2019 09:35	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190204-FD-PV20Out-Control
Collection Date: 04-Feb-2019 11:40

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**28.4**		**0.200**	**0.500**	**mg/L**	1	07-Feb-2019 02:04
Nitrogen, Nitrate (As N)	U	H	0.0300	0.100	mg/L	1	07-Feb-2019 02:04
Sulfate	**968**		**4.00**	**10.0**	**mg/L**	20	13-Feb-2019 04:12
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	**1,540**		**5.00**	**10.0**	**mg/L**	1	11-Feb-2019 11:00
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**24.7**		**5.00**	**5.00**	**mg/L**	1	09-Feb-2019 14:12
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	09-Feb-2019 14:12
Alkalinity, Total (As CaCO3)	**24.7**		**5.00**	**5.00**	**mg/L**	1	09-Feb-2019 14:12

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190204-FD-PV20Out-30
Collection Date: 04-Feb-2019 11:40

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**27.9**		**0.200**	**0.500**	**mg/L**	1	07-Feb-2019 02:33
Nitrogen, Nitrate (As N)	U	H	0.0300	0.100	mg/L	1	07-Feb-2019 02:33
Sulfate	**951**		**2.00**	**5.00**	**mg/L**	10	07-Feb-2019 02:47
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	**1,440**		**5.00**	**10.0**	**mg/L**	1	11-Feb-2019 11:00
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**15.4**		**5.00**	**5.00**	**mg/L**	1	09-Feb-2019 14:19
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	09-Feb-2019 14:19
Alkalinity, Total (As CaCO3)	**15.4**		**5.00**	**5.00**	**mg/L**	1	09-Feb-2019 14:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190204-FD-PV20Out-35
Collection Date: 04-Feb-2019 11:40

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**27.9**		**0.200**	**0.500**	**mg/L**	1	07-Feb-2019 03:02
Nitrogen, Nitrate (As N)	U	H	0.0300	0.100	mg/L	1	07-Feb-2019 03:02
Sulfate	**970**		**2.00**	**5.00**	**mg/L**	10	07-Feb-2019 03:45
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	**1,430**		**5.00**	**10.0**	**mg/L**	1	11-Feb-2019 11:00
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**15.0**		**5.00**	**5.00**	**mg/L**	1	09-Feb-2019 14:27
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	09-Feb-2019 14:27
Alkalinity, Total (As CaCO3)	**15.0**		**5.00**	**5.00**	**mg/L**	1	09-Feb-2019 14:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190204-FD-PV20Out-40
Collection Date: 04-Feb-2019 11:40

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**27.3**		**0.200**	**0.500**	**mg/L**	1	07-Feb-2019 04:00
Nitrogen, Nitrate (As N)	U	H	0.0300	0.100	mg/L	1	07-Feb-2019 04:00
Sulfate	**963**		**2.00**	**5.00**	**mg/L**	10	07-Feb-2019 04:14
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	**1,440**		**5.00**	**10.0**	**mg/L**	1	11-Feb-2019 11:00
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**20.4**		**5.00**	**5.00**	**mg/L**	1	09-Feb-2019 14:34
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	09-Feb-2019 14:34
Alkalinity, Total (As CaCO3)	**20.4**		**5.00**	**5.00**	**mg/L**	1	09-Feb-2019 14:34

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190204-DGW-MW11-PV20out-control
Collection Date: 04-Feb-2019 11:50

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**215**		**2.00**	**5.00**	**mg/L**	10	07-Feb-2019 05:56
Nitrogen, Nitrate (As N)	U	H	0.0300	0.100	mg/L	1	07-Feb-2019 05:42
Sulfate	**4,990**		**20.0**	**50.0**	**mg/L**	100	13-Feb-2019 18:08
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	**8,280**		**5.00**	**10.0**	**mg/L**	1	11-Feb-2019 11:00
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**303**		**5.00**	**5.00**	**mg/L**	1	09-Feb-2019 14:41
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	09-Feb-2019 14:41
Alkalinity, Total (As CaCO3)	**303**		**5.00**	**5.00**	**mg/L**	1	09-Feb-2019 14:41

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190204-DGW-MW11-PV20out-30
Collection Date: 04-Feb-2019 11:50

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**219**		**2.00**	**5.00**	**mg/L**	10	07-Feb-2019 00:22
Nitrogen, Nitrate (As N)	U	H	0.0300	0.100	mg/L	1	07-Feb-2019 00:07
Sulfate	**5,390**		**40.0**	**100**	**mg/L**	200	13-Feb-2019 04:27
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	**7,920**		**5.00**	**10.0**	**mg/L**	1	11-Feb-2019 11:00
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**70.4**		**5.00**	**5.00**	**mg/L**	1	09-Feb-2019 15:04
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	09-Feb-2019 15:04
Alkalinity, Total (As CaCO3)	**70.4**		**5.00**	**5.00**	**mg/L**	1	09-Feb-2019 15:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190204-DGW-MW11-PV20out-35
Collection Date: 04-Feb-2019 11:50

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**206**		**2.00**	**5.00**	**mg/L**	10	07-Feb-2019 00:51
Nitrogen, Nitrate (As N)	U	H	0.0300	0.100	mg/L	1	07-Feb-2019 00:36
Sulfate	**5,240**		**40.0**	**100**	**mg/L**	200	13-Feb-2019 04:41
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	**7,760**		**5.00**	**10.0**	**mg/L**	1	11-Feb-2019 11:00
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**63.8**		**5.00**	**5.00**	**mg/L**	1	09-Feb-2019 15:11
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	09-Feb-2019 15:11
Alkalinity, Total (As CaCO3)	**63.8**		**5.00**	**5.00**	**mg/L**	1	09-Feb-2019 15:11

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190204-DGW-MW11-PV20out-40
Collection Date: 04-Feb-2019 11:50

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**206**		**2.00**	**5.00**	**mg/L**	10	07-Feb-2019 01:20
Nitrogen, Nitrate (As N)	U	H	0.0300	0.100	mg/L	1	07-Feb-2019 01:05
Sulfate	**5,050**		**40.0**	**100**	**mg/L**	200	13-Feb-2019 04:56
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	**7,740**		**5.00**	**10.0**	**mg/L**	1	11-Feb-2019 11:00
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**57.9**		**5.00**	**5.00**	**mg/L**	1	09-Feb-2019 15:18
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	09-Feb-2019 15:18
Alkalinity, Total (As CaCO3)	**57.9**		**5.00**	**5.00**	**mg/L**	1	09-Feb-2019 15:18

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190122-DGW-MW11-PV15out-controlD
Collection Date: 22-Jan-2019 11:50

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	08-Feb-2019 15:09
Arsenic	U		0.00200	0.0100	mg/L	5	08-Feb-2019 15:09
Cadmium	**0.0101**		**0.00100**	**0.0100**	**mg/L**	5	08-Feb-2019 15:09
Calcium	**497**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 15:09
Iron	U		0.0600	1.00	mg/L	5	08-Feb-2019 15:09
Lead	U		0.00300	0.0100	mg/L	5	08-Feb-2019 15:09
Magnesium	**299**		**0.0500**	**1.00**	**mg/L**	5	08-Feb-2019 15:09
Potassium	**20.7**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 15:09
Selenium	U		0.00550	0.0100	mg/L	5	08-Feb-2019 15:09
Sodium	**1,670**		**1.40**	**20.0**	**mg/L**	100	08-Feb-2019 19:58

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190122-DGW-MW11-PV15out-30D
Collection Date: 22-Jan-2019 11:50

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	08-Feb-2019 15:32
Arsenic	U		0.00200	0.0100	mg/L	5	08-Feb-2019 15:32
Cadmium	U		0.00100	0.0100	mg/L	5	08-Feb-2019 15:32
Calcium	**388**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 15:32
Iron	U		0.0600	1.00	mg/L	5	08-Feb-2019 15:32
Lead	U		0.00300	0.0100	mg/L	5	08-Feb-2019 15:32
Magnesium	**297**		**0.0500**	**1.00**	**mg/L**	5	08-Feb-2019 15:32
Potassium	**21.1**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 15:32
Selenium	U		0.00550	0.0100	mg/L	5	08-Feb-2019 15:32
Sodium	**1,560**		**1.40**	**20.0**	**mg/L**	100	08-Feb-2019 20:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190122-DGW-MW11-PV15out-35D
Collection Date: 22-Jan-2019 11:50

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-11
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	08-Feb-2019 15:35
Arsenic	U		0.00200	0.0100	mg/L	5	08-Feb-2019 15:35
Cadmium	U		0.00100	0.0100	mg/L	5	08-Feb-2019 15:35
Calcium	**393**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 15:35
Iron	**0.193**	J	**0.0600**	**1.00**	**mg/L**	5	08-Feb-2019 15:35
Lead	U		0.00300	0.0100	mg/L	5	08-Feb-2019 15:35
Magnesium	**315**		**0.0500**	**1.00**	**mg/L**	5	08-Feb-2019 15:35
Potassium	**21.7**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 15:35
Selenium	U		0.00550	0.0100	mg/L	5	08-Feb-2019 15:35
Sodium	**1,630**		**1.40**	**20.0**	**mg/L**	100	08-Feb-2019 20:07

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190122-DGW-MW11-PV15out-40D
Collection Date: 22-Jan-2019 11:50

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-12
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	08-Feb-2019 15:37
Arsenic	U		0.00200	0.0100	mg/L	5	08-Feb-2019 15:37
Cadmium	U		0.00100	0.0100	mg/L	5	08-Feb-2019 15:37
Calcium	**424**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 15:37
Iron	U		0.0600	1.00	mg/L	5	08-Feb-2019 15:37
Lead	U		0.00300	0.0100	mg/L	5	08-Feb-2019 15:37
Magnesium	**322**		**0.0500**	**1.00**	**mg/L**	5	08-Feb-2019 15:37
Potassium	**22.5**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 15:37
Selenium	U		0.00550	0.0100	mg/L	5	08-Feb-2019 15:37
Sodium	**1,670**		**1.40**	**20.0**	**mg/L**	100	08-Feb-2019 20:09

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190122-DGW-MW11-PV15inlet-controlD
Collection Date: 22-Jan-2019 12:00

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-13
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	08-Feb-2019 15:39
Arsenic	U		0.00200	0.0100	mg/L	5	08-Feb-2019 15:39
Cadmium	**0.00984**	J	**0.00100**	**0.0100**	**mg/L**	5	08-Feb-2019 15:39
Calcium	**509**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 15:39
Iron	**17.1**		**0.0600**	**1.00**	**mg/L**	5	08-Feb-2019 15:39
Lead	U		0.00300	0.0100	mg/L	5	08-Feb-2019 15:39
Magnesium	**316**		**0.0500**	**1.00**	**mg/L**	5	08-Feb-2019 15:39
Potassium	**21.9**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 15:39
Selenium	U		0.00550	0.0100	mg/L	5	08-Feb-2019 15:39
Sodium	**1,580**		**1.40**	**20.0**	**mg/L**	100	08-Feb-2019 20:11

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190122-DGW-MW11-PV15inlet-30-35-40D
Collection Date: 22-Jan-2019 12:00

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-14
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	08-Feb-2019 15:41
Arsenic	U		0.00200	0.0100	mg/L	5	08-Feb-2019 15:41
Cadmium	**0.00773**	J	**0.00100**	**0.0100**	**mg/L**	5	08-Feb-2019 15:41
Calcium	**519**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 15:41
Iron	**19.8**		**0.0600**	**1.00**	**mg/L**	5	08-Feb-2019 15:41
Lead	U		0.00300	0.0100	mg/L	5	08-Feb-2019 15:41
Magnesium	**323**		**0.0500**	**1.00**	**mg/L**	5	08-Feb-2019 15:41
Potassium	**22.0**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 15:41
Selenium	U		0.00550	0.0100	mg/L	5	08-Feb-2019 15:41
Sodium	**1,660**		**1.40**	**20.0**	**mg/L**	100	08-Feb-2019 20:13

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190123-DGW-MW11-PV15mid-controlD
Collection Date: 23-Jan-2019 17:15

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-15
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	08-Feb-2019 15:44
Arsenic	U		0.00200	0.0100	mg/L	5	08-Feb-2019 15:44
Cadmium	**0.00983**	J	**0.00100**	**0.0100**	**mg/L**	5	08-Feb-2019 15:44
Calcium	**581**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 15:44
Iron	U		0.0600	1.00	mg/L	5	08-Feb-2019 15:44
Lead	U		0.00300	0.0100	mg/L	5	08-Feb-2019 15:44
Magnesium	**353**		**0.0500**	**1.00**	**mg/L**	5	08-Feb-2019 15:44
Potassium	**24.5**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 15:44
Selenium	U		0.00550	0.0100	mg/L	5	08-Feb-2019 15:44
Sodium	**1,700**		**1.40**	**20.0**	**mg/L**	100	08-Feb-2019 20:16

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190123-DGW-MW11-PV15mid-30D
Collection Date: 23-Jan-2019 17:15

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-16
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	08-Feb-2019 15:46
Arsenic	U		0.00200	0.0100	mg/L	5	08-Feb-2019 15:46
Cadmium	U		0.00100	0.0100	mg/L	5	08-Feb-2019 15:46
Calcium	**457**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 15:46
Iron	**3.24**		**0.0600**	**1.00**	**mg/L**	5	08-Feb-2019 15:46
Lead	U		0.00300	0.0100	mg/L	5	08-Feb-2019 15:46
Magnesium	**347**		**0.0500**	**1.00**	**mg/L**	5	08-Feb-2019 15:46
Potassium	**22.9**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 15:46
Selenium	U		0.00550	0.0100	mg/L	5	08-Feb-2019 15:46
Sodium	**1,680**		**1.40**	**20.0**	**mg/L**	100	08-Feb-2019 20:22

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190123-DGW-MW11-PV15mid-35D
Collection Date: 23-Jan-2019 17:15

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-17
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	08-Feb-2019 15:48
Arsenic	U		0.00200	0.0100	mg/L	5	08-Feb-2019 15:48
Cadmium	U		0.00100	0.0100	mg/L	5	08-Feb-2019 15:48
Calcium	**459**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 15:48
Iron	**0.960**	J	**0.0600**	**1.00**	**mg/L**	5	08-Feb-2019 15:48
Lead	U		0.00300	0.0100	mg/L	5	08-Feb-2019 15:48
Magnesium	**340**		**0.0500**	**1.00**	**mg/L**	5	08-Feb-2019 15:48
Potassium	**24.1**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 15:48
Selenium	U		0.00550	0.0100	mg/L	5	08-Feb-2019 15:48
Sodium	**1,630**		**1.40**	**20.0**	**mg/L**	100	08-Feb-2019 20:25

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190123-DGW-MW11-PV15mid-40D
Collection Date: 23-Jan-2019 17:15

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-18
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	08-Feb-2019 15:51
Arsenic	U		0.00200	0.0100	mg/L	5	08-Feb-2019 15:51
Cadmium	U		0.00100	0.0100	mg/L	5	08-Feb-2019 15:51
Calcium	**401**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 15:51
Iron	**0.0974**	J	**0.0600**	**1.00**	**mg/L**	5	08-Feb-2019 15:51
Lead	U		0.00300	0.0100	mg/L	5	08-Feb-2019 15:51
Magnesium	**306**		**0.0500**	**1.00**	**mg/L**	5	08-Feb-2019 15:51
Potassium	**21.4**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 15:51
Selenium	U		0.00550	0.0100	mg/L	5	08-Feb-2019 15:51
Sodium	**1,550**		**1.40**	**20.0**	**mg/L**	100	08-Feb-2019 20:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190122-DGW-MW11-PV15out-controlT
Collection Date: 22-Jan-2019 11:50

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-19
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,570**		**2.00**	**2.00**	**mg/L**	1	13-Feb-2019 17:13
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	08-Feb-2019 20:40
Arsenic	U		0.00200	0.0100	mg/L	5	08-Feb-2019 20:40
Cadmium	**0.0118**		**0.00100**	**0.0100**	**mg/L**	5	08-Feb-2019 20:40
Calcium	**513**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 20:40
Iron	U		0.0600	1.00	mg/L	5	08-Feb-2019 20:40
Lead	U		0.00300	0.0100	mg/L	5	08-Feb-2019 20:40
Magnesium	**312**		**0.0500**	**1.00**	**mg/L**	5	08-Feb-2019 20:40
Potassium	**21.6**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 20:40
Selenium	U		0.00550	0.0100	mg/L	5	08-Feb-2019 20:40
Sodium	**1,640**		**1.40**	**20.0**	**mg/L**	100	11-Feb-2019 12:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190122-DGW-MW11-PV15out-30T
Collection Date: 22-Jan-2019 11:50

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-20
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,240**		**2.00**	**2.00**	**mg/L**	1	13-Feb-2019 17:13
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	**0.00282**	J	**0.00200**	**0.0100**	**mg/L**	5	08-Feb-2019 20:56
Arsenic	U		0.00200	0.0100	mg/L	5	08-Feb-2019 20:56
Cadmium	U		0.00100	0.0100	mg/L	5	08-Feb-2019 20:56
Calcium	**395**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 20:56
Iron	**5.08**		**0.0600**	**1.00**	**mg/L**	5	08-Feb-2019 20:56
Lead	U		0.00300	0.0100	mg/L	5	08-Feb-2019 20:56
Magnesium	**305**		**0.0500**	**1.00**	**mg/L**	5	08-Feb-2019 20:56
Potassium	**21.3**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 20:56
Selenium	U		0.00550	0.0100	mg/L	5	08-Feb-2019 20:56
Sodium	**1,720**		**1.40**	**20.0**	**mg/L**	100	11-Feb-2019 12:44

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190122-DGW-MW11-PV15out-35T
Collection Date: 22-Jan-2019 11:50

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-21
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,280**		**2.00**	**2.00**	**mg/L**	1	13-Feb-2019 17:13
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	08-Feb-2019 20:58
Arsenic	U		0.00200	0.0100	mg/L	5	08-Feb-2019 20:58
Cadmium	U		0.00100	0.0100	mg/L	5	08-Feb-2019 20:58
Calcium	**399**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 20:58
Iron	**4.84**		**0.0600**	**1.00**	**mg/L**	5	08-Feb-2019 20:58
Lead	U		0.00300	0.0100	mg/L	5	08-Feb-2019 20:58
Magnesium	**312**		**0.0500**	**1.00**	**mg/L**	5	08-Feb-2019 20:58
Potassium	**21.8**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 20:58
Selenium	U		0.00550	0.0100	mg/L	5	08-Feb-2019 20:58
Sodium	**1,640**		**1.40**	**20.0**	**mg/L**	100	11-Feb-2019 12:46

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190122-DGW-MW11-PV15out-40T
Collection Date: 22-Jan-2019 11:50

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-22
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,190**		**2.00**	**2.00**	**mg/L**	1	13-Feb-2019 17:13
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	**0.00219**	J	**0.00200**	**0.0100**	**mg/L**	5	08-Feb-2019 21:01
Arsenic	U		0.00200	0.0100	mg/L	5	08-Feb-2019 21:01
Cadmium	U		0.00100	0.0100	mg/L	5	08-Feb-2019 21:01
Calcium	**387**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 21:01
Iron	**1.60**		**0.0600**	**1.00**	**mg/L**	5	08-Feb-2019 21:01
Lead	U		0.00300	0.0100	mg/L	5	08-Feb-2019 21:01
Magnesium	**298**		**0.0500**	**1.00**	**mg/L**	5	08-Feb-2019 21:01
Potassium	**20.2**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 21:01
Selenium	U		0.00550	0.0100	mg/L	5	08-Feb-2019 21:01
Sodium	**1,530**		**1.40**	**20.0**	**mg/L**	100	11-Feb-2019 12:48

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190122-DGW-MW11-PV15inlet-controlT
Collection Date: 22-Jan-2019 12:00

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-23
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,530**		**2.00**	**2.00**	**mg/L**	1	13-Feb-2019 17:13
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	08-Feb-2019 21:03
Arsenic	U		0.00200	0.0100	mg/L	5	08-Feb-2019 21:03
Cadmium	**0.00943**	J	**0.00100**	**0.0100**	**mg/L**	5	08-Feb-2019 21:03
Calcium	**497**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 21:03
Iron	**24.0**		**0.0600**	**1.00**	**mg/L**	5	08-Feb-2019 21:03
Lead	**0.00574**	J	**0.00300**	**0.0100**	**mg/L**	5	08-Feb-2019 21:03
Magnesium	**313**		**0.0500**	**1.00**	**mg/L**	5	08-Feb-2019 21:03
Potassium	**21.7**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 21:03
Selenium	U		0.00550	0.0100	mg/L	5	08-Feb-2019 21:03
Sodium	**1,470**		**1.40**	**20.0**	**mg/L**	100	11-Feb-2019 12:51

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190122-DGW-MW11-PV15inlet-30-35-40T
Collection Date: 22-Jan-2019 12:00

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-24
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,500**		**2.00**	**2.00**	**mg/L**	1	13-Feb-2019 17:13
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	08-Feb-2019 21:05
Arsenic	U		0.00200	0.0100	mg/L	5	08-Feb-2019 21:05
Cadmium	**0.00710**	J	**0.00100**	**0.0100**	**mg/L**	5	08-Feb-2019 21:05
Calcium	**492**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 21:05
Iron	**29.8**		**0.0600**	**1.00**	**mg/L**	5	08-Feb-2019 21:05
Lead	**0.0131**		**0.00300**	**0.0100**	**mg/L**	5	08-Feb-2019 21:05
Magnesium	**309**		**0.0500**	**1.00**	**mg/L**	5	08-Feb-2019 21:05
Potassium	**20.8**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 21:05
Selenium	U		0.00550	0.0100	mg/L	5	08-Feb-2019 21:05
Sodium	**1,720**		**1.40**	**20.0**	**mg/L**	100	11-Feb-2019 12:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190123-DGW-MW11-PV15mid-controlT
Collection Date: 23-Jan-2019 17:15

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-25
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,540**		**2.00**	**2.00**	**mg/L**	1	13-Feb-2019 17:13
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	08-Feb-2019 21:08
Arsenic	U		0.00200	0.0100	mg/L	5	08-Feb-2019 21:08
Cadmium	**0.00928**	J	**0.00100**	**0.0100**	**mg/L**	5	08-Feb-2019 21:08
Calcium	**495**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 21:08
Iron	U		0.0600	1.00	mg/L	5	08-Feb-2019 21:08
Lead	U		0.00300	0.0100	mg/L	5	08-Feb-2019 21:08
Magnesium	**316**		**0.0500**	**1.00**	**mg/L**	5	08-Feb-2019 21:08
Potassium	**21.9**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 21:08
Selenium	U		0.00550	0.0100	mg/L	5	08-Feb-2019 21:08
Sodium	**1,720**		**1.40**	**20.0**	**mg/L**	100	11-Feb-2019 12:55

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190123-DGW-MW11-PV15mid-30T
Collection Date: 23-Jan-2019 17:15

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-26
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,270**		**2.00**	**2.00**	**mg/L**	1	13-Feb-2019 17:13
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	08-Feb-2019 21:10
Arsenic	U		0.00200	0.0100	mg/L	5	08-Feb-2019 21:10
Cadmium	U		0.00100	0.0100	mg/L	5	08-Feb-2019 21:10
Calcium	**398**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 21:10
Iron	**16.6**		**0.0600**	**1.00**	**mg/L**	5	08-Feb-2019 21:10
Lead	U		0.00300	0.0100	mg/L	5	08-Feb-2019 21:10
Magnesium	**310**		**0.0500**	**1.00**	**mg/L**	5	08-Feb-2019 21:10
Potassium	**20.4**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 21:10
Selenium	U		0.00550	0.0100	mg/L	5	08-Feb-2019 21:10
Sodium	**1,670**		**1.40**	**20.0**	**mg/L**	100	11-Feb-2019 12:57

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190123-DGW-MW11-PV15mid-35T
Collection Date: 23-Jan-2019 17:15

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-27
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,220**		**2.00**	**2.00**	**mg/L**	1	13-Feb-2019 17:13
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	08-Feb-2019 21:12
Arsenic	U		0.00200	0.0100	mg/L	5	08-Feb-2019 21:12
Cadmium	U		0.00100	0.0100	mg/L	5	08-Feb-2019 21:12
Calcium	**393**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 21:12
Iron	**11.0**		**0.0600**	**1.00**	**mg/L**	5	08-Feb-2019 21:12
Lead	U		0.00300	0.0100	mg/L	5	08-Feb-2019 21:12
Magnesium	**300**		**0.0500**	**1.00**	**mg/L**	5	08-Feb-2019 21:12
Potassium	**20.4**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 21:12
Selenium	U		0.00550	0.0100	mg/L	5	08-Feb-2019 21:12
Sodium	**1,610**		**1.40**	**20.0**	**mg/L**	100	11-Feb-2019 13:11

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190123-DGW-MW11-PV15mid-40T
Collection Date: 23-Jan-2019 17:15

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-28
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,240**		**2.00**	**2.00**	**mg/L**	1	13-Feb-2019 17:13
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	08-Feb-2019 21:14
Arsenic	U		0.00200	0.0100	mg/L	5	08-Feb-2019 21:14
Cadmium	U		0.00100	0.0100	mg/L	5	08-Feb-2019 21:14
Calcium	**397**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 21:14
Iron	**3.82**		**0.0600**	**1.00**	**mg/L**	5	08-Feb-2019 21:14
Lead	U		0.00300	0.0100	mg/L	5	08-Feb-2019 21:14
Magnesium	**304**		**0.0500**	**1.00**	**mg/L**	5	08-Feb-2019 21:14
Potassium	**20.5**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 21:14
Selenium	U		0.00550	0.0100	mg/L	5	08-Feb-2019 21:14
Sodium	**1,540**		**1.40**	**20.0**	**mg/L**	100	11-Feb-2019 13:13

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190122-FD-PV15out-controlD
Collection Date: 22-Jan-2019 11:50

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-29
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	**0.0380**		**0.000400**	**0.00200**	**mg/L**	1	08-Feb-2019 21:51
Arsenic	**0.00172**	J	**0.000400**	**0.00200**	**mg/L**	1	08-Feb-2019 21:51
Cadmium	U		0.000200	0.00200	mg/L	1	08-Feb-2019 21:51
Calcium	**207**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 16:05
Iron	U		0.0120	0.200	mg/L	1	08-Feb-2019 21:51
Lead	U		0.000600	0.00200	mg/L	1	08-Feb-2019 21:51
Magnesium	**1.21**		**0.0100**	**0.200**	**mg/L**	1	08-Feb-2019 21:51
Potassium	**13.2**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 16:05
Selenium	**0.00561**		**0.00110**	**0.00200**	**mg/L**	1	11-Feb-2019 13:48
Sodium	**290**		**0.0700**	**1.00**	**mg/L**	5	08-Feb-2019 16:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190122-FD-PV15out-30D
Collection Date: 22-Jan-2019 11:50

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-30
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	08-Feb-2019 21:53
Arsenic	U		0.000400	0.00200	mg/L	1	08-Feb-2019 21:53
Cadmium	U		0.000200	0.00200	mg/L	1	08-Feb-2019 21:53
Calcium	**199**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 16:07
Iron	U		0.0120	0.200	mg/L	1	08-Feb-2019 21:53
Lead	U		0.000600	0.00200	mg/L	1	08-Feb-2019 21:53
Magnesium	**0.814**		**0.0100**	**0.200**	**mg/L**	1	08-Feb-2019 21:53
Potassium	**13.5**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 16:07
Selenium	U		0.00110	0.00200	mg/L	1	11-Feb-2019 13:50
Sodium	**275**		**0.0700**	**1.00**	**mg/L**	5	08-Feb-2019 16:07

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190122-FD-PV15out-35D
Collection Date: 22-Jan-2019 11:50

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-31
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	08-Feb-2019 21:55
Arsenic	U		0.000400	0.00200	mg/L	1	08-Feb-2019 21:55
Cadmium	U		0.000200	0.00200	mg/L	1	08-Feb-2019 21:55
Calcium	**201**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 16:10
Iron	U		0.0120	0.200	mg/L	1	08-Feb-2019 21:55
Lead	U		0.000600	0.00200	mg/L	1	08-Feb-2019 21:55
Magnesium	**1.04**		**0.0100**	**0.200**	**mg/L**	1	08-Feb-2019 21:55
Potassium	**13.4**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 16:10
Selenium	U		0.00110	0.00200	mg/L	1	11-Feb-2019 13:53
Sodium	**277**		**0.0700**	**1.00**	**mg/L**	5	08-Feb-2019 16:10

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190122-FD-PV15out-40D
Collection Date: 22-Jan-2019 11:50

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-32
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	08-Feb-2019 21:57
Arsenic	U		0.000400	0.00200	mg/L	1	08-Feb-2019 21:57
Cadmium	U		0.000200	0.00200	mg/L	1	08-Feb-2019 21:57
Calcium	**192**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 16:12
Iron	U		0.0120	0.200	mg/L	1	08-Feb-2019 21:57
Lead	U		0.000600	0.00200	mg/L	1	08-Feb-2019 21:57
Magnesium	**0.954**		**0.0100**	**0.200**	**mg/L**	1	08-Feb-2019 21:57
Potassium	**13.2**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 16:12
Selenium	U		0.00110	0.00200	mg/L	1	11-Feb-2019 13:55
Sodium	**265**		**0.0700**	**1.00**	**mg/L**	5	08-Feb-2019 16:12

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190122-FD-PV15inlet-controlD
Collection Date: 22-Jan-2019 12:00

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-33
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	**0.0392**		**0.000400**	**0.00200**	**mg/L**	1	08-Feb-2019 22:07
Arsenic	**0.00135**	J	**0.000400**	**0.00200**	**mg/L**	1	08-Feb-2019 22:07
Cadmium	U		0.000200	0.00200	mg/L	1	08-Feb-2019 22:07
Calcium	**223**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 16:14
Iron	U		0.0120	0.200	mg/L	1	08-Feb-2019 22:07
Lead	U		0.000600	0.00200	mg/L	1	08-Feb-2019 22:07
Magnesium	**1.22**		**0.0100**	**0.200**	**mg/L**	1	08-Feb-2019 22:07
Potassium	**13.8**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 16:14
Selenium	**0.00686**		**0.00110**	**0.00200**	**mg/L**	1	11-Feb-2019 13:57
Sodium	**290**		**0.0700**	**1.00**	**mg/L**	5	08-Feb-2019 16:14

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190122-FD-PV15inlet-30-35-40D
Collection Date: 22-Jan-2019 12:00

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-34
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	**0.0387**		**0.000400**	**0.00200**	**mg/L**	1	08-Feb-2019 22:09
Arsenic	**0.00128**	J	**0.000400**	**0.00200**	**mg/L**	1	08-Feb-2019 22:09
Cadmium	U		0.000200	0.00200	mg/L	1	08-Feb-2019 22:09
Calcium	**198**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 16:16
Iron	U		0.0120	0.200	mg/L	1	08-Feb-2019 22:09
Lead	U		0.000600	0.00200	mg/L	1	08-Feb-2019 22:09
Magnesium	**1.16**		**0.0100**	**0.200**	**mg/L**	1	08-Feb-2019 22:09
Potassium	**12.9**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 16:16
Selenium	**0.00654**		**0.00110**	**0.00200**	**mg/L**	1	11-Feb-2019 13:59
Sodium	**268**		**0.0700**	**1.00**	**mg/L**	5	08-Feb-2019 16:16

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190123-FD-PV15mid-controlD
Collection Date: 23-Jan-2019 17:30

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-35
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	**0.0381**		**0.000400**	**0.00200**	**mg/L**	1	08-Feb-2019 22:11
Arsenic	**0.00149**	J	**0.000400**	**0.00200**	**mg/L**	1	08-Feb-2019 22:11
Cadmium	U		0.000200	0.00200	mg/L	1	08-Feb-2019 22:11
Calcium	**217**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 16:19
Iron	U		0.0120	0.200	mg/L	1	08-Feb-2019 22:11
Lead	U		0.000600	0.00200	mg/L	1	08-Feb-2019 22:11
Magnesium	**1.21**		**0.0100**	**0.200**	**mg/L**	1	08-Feb-2019 22:11
Potassium	**13.5**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 16:19
Selenium	**0.00609**		**0.00110**	**0.00200**	**mg/L**	1	11-Feb-2019 14:12
Sodium	**286**		**0.0700**	**1.00**	**mg/L**	5	08-Feb-2019 16:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190123-FD-PV15mid-30D
Collection Date: 23-Jan-2019 17:30

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-36
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	08-Feb-2019 22:13
Arsenic	U		0.000400	0.00200	mg/L	1	08-Feb-2019 22:13
Cadmium	U		0.000200	0.00200	mg/L	1	08-Feb-2019 22:13
Calcium	**204**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 16:21
Iron	U		0.0120	0.200	mg/L	1	08-Feb-2019 22:13
Lead	U		0.000600	0.00200	mg/L	1	08-Feb-2019 22:13
Magnesium	**0.814**		**0.0100**	**0.200**	**mg/L**	1	08-Feb-2019 22:13
Potassium	**13.0**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 16:21
Selenium	U		0.00110	0.00200	mg/L	1	11-Feb-2019 14:14
Sodium	**270**		**0.0700**	**1.00**	**mg/L**	5	08-Feb-2019 16:21

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190123-FD-PV15mid-35D
Collection Date: 23-Jan-2019 17:30

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-37
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	08-Feb-2019 22:16
Arsenic	U		0.000400	0.00200	mg/L	1	08-Feb-2019 22:16
Cadmium	U		0.000200	0.00200	mg/L	1	08-Feb-2019 22:16
Calcium	**193**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 16:23
Iron	U		0.0120	0.200	mg/L	1	08-Feb-2019 22:16
Lead	U		0.000600	0.00200	mg/L	1	08-Feb-2019 22:16
Magnesium	**0.978**		**0.0100**	**0.200**	**mg/L**	1	08-Feb-2019 22:16
Potassium	**12.8**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 16:23
Selenium	U		0.00110	0.00200	mg/L	1	11-Feb-2019 14:16
Sodium	**263**		**0.0700**	**1.00**	**mg/L**	5	08-Feb-2019 16:23

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190123-FD-PV15mid-40D
Collection Date: 23-Jan-2019 17:30

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-38
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 11-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	12-Feb-2019 15:20
Arsenic	U		0.000400	0.00200	mg/L	1	12-Feb-2019 15:20
Cadmium	U		0.000200	0.00200	mg/L	1	12-Feb-2019 15:20
Calcium	**199**		**0.170**	**2.50**	**mg/L**	5	12-Feb-2019 15:04
Iron	U		0.0120	0.200	mg/L	1	12-Feb-2019 15:20
Lead	U		0.000600	0.00200	mg/L	1	12-Feb-2019 15:20
Magnesium	**0.973**		**0.0100**	**0.200**	**mg/L**	1	12-Feb-2019 15:20
Potassium	**12.6**		**0.0180**	**0.200**	**mg/L**	1	12-Feb-2019 15:20
Selenium	U		0.00110	0.00200	mg/L	1	12-Feb-2019 15:20
Sodium	**266**		**0.0700**	**1.00**	**mg/L**	5	12-Feb-2019 15:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190122-FD-PV15out-controlT
Collection Date: 22-Jan-2019 11:50

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-39
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**487**		**2.00**	**2.00**	**mg/L**	1	13-Feb-2019 17:13
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	**0.0337**		**0.000400**	**0.00200**	**mg/L**	1	11-Feb-2019 13:15
Arsenic	**0.00186**	J	**0.000400**	**0.00200**	**mg/L**	1	11-Feb-2019 13:15
Cadmium	U		0.000200	0.00200	mg/L	1	11-Feb-2019 13:15
Calcium	**193**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 21:17
Iron	U		0.0120	0.200	mg/L	1	11-Feb-2019 13:15
Lead	U		0.000600	0.00200	mg/L	1	11-Feb-2019 13:15
Magnesium	**1.18**		**0.0100**	**0.200**	**mg/L**	1	11-Feb-2019 13:15
Potassium	**12.0**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 21:17
Selenium	**0.00587**		**0.00110**	**0.00200**	**mg/L**	1	11-Feb-2019 13:15
Sodium	**263**		**0.0700**	**1.00**	**mg/L**	5	08-Feb-2019 21:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190122-FD-PV15out-30T
Collection Date: 22-Jan-2019 11:50

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-40
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**458**		**2.00**	**2.00**	**mg/L**	1	13-Feb-2019 17:13
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	11-Feb-2019 13:18
Arsenic	U		0.000400	0.00200	mg/L	1	11-Feb-2019 13:18
Cadmium	U		0.000200	0.00200	mg/L	1	11-Feb-2019 13:18
Calcium	**182**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 21:23
Iron	**0.0542**	J	**0.0120**	**0.200**	**mg/L**	1	11-Feb-2019 13:18
Lead	U		0.000600	0.00200	mg/L	1	11-Feb-2019 13:18
Magnesium	**0.845**		**0.0100**	**0.200**	**mg/L**	1	11-Feb-2019 13:18
Potassium	**12.2**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 21:23
Selenium	U		0.00110	0.00200	mg/L	1	11-Feb-2019 13:18
Sodium	**264**		**0.0700**	**1.00**	**mg/L**	5	08-Feb-2019 21:23

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190122-FD-PV15out-35T
Collection Date: 22-Jan-2019 11:50

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-41
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**471**		**2.00**	**2.00**	**mg/L**	1	13-Feb-2019 17:13
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	11-Feb-2019 13:20
Arsenic	U		0.000400	0.00200	mg/L	1	11-Feb-2019 13:20
Cadmium	U		0.000200	0.00200	mg/L	1	11-Feb-2019 13:20
Calcium	**187**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 21:26
Iron	**0.145**	J	**0.0120**	**0.200**	**mg/L**	1	11-Feb-2019 13:20
Lead	U		0.000600	0.00200	mg/L	1	11-Feb-2019 13:20
Magnesium	**0.994**		**0.0100**	**0.200**	**mg/L**	1	11-Feb-2019 13:20
Potassium	**12.3**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 21:26
Selenium	U		0.00110	0.00200	mg/L	1	11-Feb-2019 13:20
Sodium	**263**		**0.0700**	**1.00**	**mg/L**	5	08-Feb-2019 21:26

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190122-FD-PV15out-40T
Collection Date: 22-Jan-2019 11:50

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-42
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**451**		**2.00**	**2.00**	**mg/L**	1	13-Feb-2019 17:13
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	11-Feb-2019 13:22
Arsenic	U		0.000400	0.00200	mg/L	1	11-Feb-2019 13:22
Cadmium	U		0.000200	0.00200	mg/L	1	11-Feb-2019 13:22
Calcium	**179**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 21:28
Iron	**0.0180**	J	**0.0120**	**0.200**	**mg/L**	1	11-Feb-2019 13:22
Lead	U		0.000600	0.00200	mg/L	1	11-Feb-2019 13:22
Magnesium	**0.946**		**0.0100**	**0.200**	**mg/L**	1	11-Feb-2019 13:22
Potassium	**11.6**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 21:28
Selenium	U		0.00110	0.00200	mg/L	1	11-Feb-2019 13:22
Sodium	**256**		**0.0700**	**1.00**	**mg/L**	5	08-Feb-2019 21:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190122-FD-PV15inlet-controlT
Collection Date: 22-Jan-2019 12:00

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-43
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**467**		**2.00**	**2.00**	**mg/L**	1	13-Feb-2019 17:13
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	**0.0354**		**0.000400**	**0.00200**	**mg/L**	1	11-Feb-2019 13:24
Arsenic	**0.00107**	J	**0.000400**	**0.00200**	**mg/L**	1	11-Feb-2019 13:24
Cadmium	U		0.000200	0.00200	mg/L	1	11-Feb-2019 13:24
Calcium	**185**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 21:30
Iron	U		0.0120	0.200	mg/L	1	11-Feb-2019 13:24
Lead	U		0.000600	0.00200	mg/L	1	11-Feb-2019 13:24
Magnesium	**1.20**		**0.0100**	**0.200**	**mg/L**	1	11-Feb-2019 13:24
Potassium	**11.9**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 21:30
Selenium	**0.00606**		**0.00110**	**0.00200**	**mg/L**	1	11-Feb-2019 13:24
Sodium	**254**		**0.0700**	**1.00**	**mg/L**	5	08-Feb-2019 21:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190122-FD-PV15inlet-30-35-40T
Collection Date: 22-Jan-2019 12:00

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-44
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**474**		**2.00**	**2.00**	**mg/L**	1	13-Feb-2019 17:13
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	**0.0366**		**0.000400**	**0.00200**	**mg/L**	1	11-Feb-2019 13:27
Arsenic	**0.00108**	J	**0.000400**	**0.00200**	**mg/L**	1	11-Feb-2019 13:27
Cadmium	U		0.000200	0.00200	mg/L	1	11-Feb-2019 13:27
Calcium	**188**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 21:32
Iron	U		0.0120	0.200	mg/L	1	11-Feb-2019 13:27
Lead	U		0.000600	0.00200	mg/L	1	11-Feb-2019 13:27
Magnesium	**1.17**		**0.0100**	**0.200**	**mg/L**	1	11-Feb-2019 13:27
Potassium	**11.8**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 21:32
Selenium	**0.00685**		**0.00110**	**0.00200**	**mg/L**	1	11-Feb-2019 13:27
Sodium	**257**		**0.0700**	**1.00**	**mg/L**	5	08-Feb-2019 21:32

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190123-FD-PV15mid-controlT
Collection Date: 23-Jan-2019 17:30

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-45
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**480**		**2.00**	**2.00**	**mg/L**	1	13-Feb-2019 17:13
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	**0.0372**		**0.000400**	**0.00200**	**mg/L**	1	11-Feb-2019 13:29
Arsenic	**0.00142**	J	**0.000400**	**0.00200**	**mg/L**	1	11-Feb-2019 13:29
Cadmium	U		0.000200	0.00200	mg/L	1	11-Feb-2019 13:29
Calcium	**190**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 21:35
Iron	**0.0121**	J	**0.0120**	**0.200**	**mg/L**	1	11-Feb-2019 13:29
Lead	U		0.000600	0.00200	mg/L	1	11-Feb-2019 13:29
Magnesium	**1.28**		**0.0100**	**0.200**	**mg/L**	1	11-Feb-2019 13:29
Potassium	**11.7**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 21:35
Selenium	**0.00574**		**0.00110**	**0.00200**	**mg/L**	1	11-Feb-2019 13:29
Sodium	**255**		**0.0700**	**1.00**	**mg/L**	5	08-Feb-2019 21:35

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190123-FD-PV15mid-30T
Collection Date: 23-Jan-2019 17:30

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-46
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**438**		**2.00**	**2.00**	**mg/L**	1	13-Feb-2019 17:13
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	11-Feb-2019 13:41
Arsenic	U		0.000400	0.00200	mg/L	1	11-Feb-2019 13:41
Cadmium	U		0.000200	0.00200	mg/L	1	11-Feb-2019 13:41
Calcium	**174**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 21:37
Iron	**0.711**		**0.0120**	**0.200**	**mg/L**	1	11-Feb-2019 13:41
Lead	U		0.000600	0.00200	mg/L	1	11-Feb-2019 13:41
Magnesium	**0.802**		**0.0100**	**0.200**	**mg/L**	1	11-Feb-2019 13:41
Potassium	**10.5**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 21:37
Selenium	**0.00165**	J	**0.00110**	**0.00200**	**mg/L**	1	11-Feb-2019 13:41
Sodium	**248**		**0.0700**	**1.00**	**mg/L**	5	08-Feb-2019 21:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190123-FD-PV15mid-35T
Collection Date: 23-Jan-2019 17:30

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-47
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**466**		**2.00**	**2.00**	**mg/L**	1	13-Feb-2019 17:13
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	11-Feb-2019 13:44
Arsenic	U		0.000400	0.00200	mg/L	1	11-Feb-2019 13:44
Cadmium	U		0.000200	0.00200	mg/L	1	11-Feb-2019 13:44
Calcium	**185**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 21:39
Iron	**0.716**		**0.0120**	**0.200**	**mg/L**	1	11-Feb-2019 13:44
Lead	U		0.000600	0.00200	mg/L	1	11-Feb-2019 13:44
Magnesium	**0.973**		**0.0100**	**0.200**	**mg/L**	1	11-Feb-2019 13:44
Potassium	**12.2**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 21:39
Selenium	U		0.00110	0.00200	mg/L	1	11-Feb-2019 13:44
Sodium	**264**		**0.0700**	**1.00**	**mg/L**	5	08-Feb-2019 21:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190123-FD-PV15mid-40T
Collection Date: 23-Jan-2019 17:30

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-48
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**459**		**2.00**	**2.00**	**mg/L**	1	13-Feb-2019 17:13
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	11-Feb-2019 13:46
Arsenic	U		0.000400	0.00200	mg/L	1	11-Feb-2019 13:46
Cadmium	U		0.000200	0.00200	mg/L	1	11-Feb-2019 13:46
Calcium	**182**		**0.170**	**2.50**	**mg/L**	5	08-Feb-2019 21:42
Iron	**0.304**		**0.0120**	**0.200**	**mg/L**	1	11-Feb-2019 13:46
Lead	U		0.000600	0.00200	mg/L	1	11-Feb-2019 13:46
Magnesium	**1.00**		**0.0100**	**0.200**	**mg/L**	1	11-Feb-2019 13:46
Potassium	**11.8**		**0.0900**	**1.00**	**mg/L**	5	08-Feb-2019 21:42
Selenium	U		0.00110	0.00200	mg/L	1	11-Feb-2019 13:46
Sodium	**257**		**0.0700**	**1.00**	**mg/L**	5	08-Feb-2019 21:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190129-DGW-MW3-PV25out-controlD
Collection Date: 29-Jan-2019 12:05

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-49
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 11-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	12-Feb-2019 15:22
Arsenic	**0.00149**	J	**0.000400**	**0.00200**	**mg/L**	1	12-Feb-2019 15:22
Cadmium	U		0.000200	0.00200	mg/L	1	12-Feb-2019 15:22
Calcium	**109**		**0.170**	**2.50**	**mg/L**	5	12-Feb-2019 15:06
Iron	U		0.0120	0.200	mg/L	1	12-Feb-2019 15:22
Lead	U		0.000600	0.00200	mg/L	1	12-Feb-2019 15:22
Magnesium	**22.1**		**0.0100**	**0.200**	**mg/L**	1	12-Feb-2019 15:22
Potassium	**2.15**		**0.0180**	**0.200**	**mg/L**	1	12-Feb-2019 15:22
Selenium	U		0.00110	0.00200	mg/L	1	12-Feb-2019 15:22
Sodium	**194**		**0.0700**	**1.00**	**mg/L**	5	12-Feb-2019 15:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190129-DGW-MW3-PV25out-30D
Collection Date: 29-Jan-2019 12:05

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-50
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 11-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	12-Feb-2019 15:24
Arsenic	U		0.000400	0.00200	mg/L	1	12-Feb-2019 15:24
Cadmium	U		0.000200	0.00200	mg/L	1	12-Feb-2019 15:24
Calcium	**7.25**		**0.0340**	**0.500**	**mg/L**	1	12-Feb-2019 15:24
Iron	U		0.0120	0.200	mg/L	1	12-Feb-2019 15:24
Lead	U		0.000600	0.00200	mg/L	1	12-Feb-2019 15:24
Magnesium	**15.5**		**0.0100**	**0.200**	**mg/L**	1	12-Feb-2019 15:24
Potassium	**2.25**		**0.0180**	**0.200**	**mg/L**	1	12-Feb-2019 15:24
Selenium	U		0.00110	0.00200	mg/L	1	12-Feb-2019 15:24
Sodium	**199**		**0.0700**	**1.00**	**mg/L**	5	12-Feb-2019 15:08

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190129-DGW-MW3-PV25out-35D
Collection Date: 29-Jan-2019 12:05

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-51
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 11-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	12-Feb-2019 15:27
Arsenic	U		0.000400	0.00200	mg/L	1	12-Feb-2019 15:27
Cadmium	U		0.000200	0.00200	mg/L	1	12-Feb-2019 15:27
Calcium	**6.37**		**0.0340**	**0.500**	**mg/L**	1	12-Feb-2019 15:27
Iron	U		0.0120	0.200	mg/L	1	12-Feb-2019 15:27
Lead	U		0.000600	0.00200	mg/L	1	12-Feb-2019 15:27
Magnesium	**12.2**		**0.0100**	**0.200**	**mg/L**	1	12-Feb-2019 15:27
Potassium	**2.26**		**0.0180**	**0.200**	**mg/L**	1	12-Feb-2019 15:27
Selenium	U		0.00110	0.00200	mg/L	1	12-Feb-2019 15:27
Sodium	**180**		**0.280**	**4.00**	**mg/L**	20	12-Feb-2019 16:58

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190129-DGW-MW3-PV25out-40D
Collection Date: 29-Jan-2019 12:05

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-52
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 11-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	12-Feb-2019 15:35
Arsenic	U		0.000400	0.00200	mg/L	1	12-Feb-2019 15:35
Cadmium	U		0.000200	0.00200	mg/L	1	12-Feb-2019 15:35
Calcium	**5.99**		**0.0340**	**0.500**	**mg/L**	1	12-Feb-2019 15:35
Iron	U		0.0120	0.200	mg/L	1	12-Feb-2019 15:35
Lead	U		0.000600	0.00200	mg/L	1	12-Feb-2019 15:35
Magnesium	**11.8**		**0.0100**	**0.200**	**mg/L**	1	12-Feb-2019 15:35
Potassium	**2.20**		**0.0180**	**0.200**	**mg/L**	1	12-Feb-2019 15:35
Selenium	U		0.00110	0.00200	mg/L	1	12-Feb-2019 15:35
Sodium	**184**		**0.280**	**4.00**	**mg/L**	20	12-Feb-2019 17:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190129-DGW-MW3-PV25inlet-controlD
Collection Date: 29-Jan-2019 12:20

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-53
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 11-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	12-Feb-2019 15:39
Arsenic	**0.00908**		**0.000400**	**0.00200**	**mg/L**	1	12-Feb-2019 15:39
Cadmium	U		0.000200	0.00200	mg/L	1	12-Feb-2019 15:39
Calcium	**115**		**0.0340**	**0.500**	**mg/L**	1	12-Feb-2019 15:39
Iron	**0.0188**	J	**0.0120**	**0.200**	**mg/L**	1	12-Feb-2019 15:39
Lead	U		0.000600	0.00200	mg/L	1	12-Feb-2019 15:39
Magnesium	**21.4**		**0.0100**	**0.200**	**mg/L**	1	12-Feb-2019 15:39
Potassium	**2.04**		**0.0180**	**0.200**	**mg/L**	1	12-Feb-2019 15:39
Selenium	U		0.00110	0.00200	mg/L	1	12-Feb-2019 15:39
Sodium	**191**		**0.280**	**4.00**	**mg/L**	20	12-Feb-2019 17:02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190129-DGW-MW3-PV25inlet-30-35-40D
Collection Date: 29-Jan-2019 12:20

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-54
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 11-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	12-Feb-2019 15:41
Arsenic	**0.0125**		**0.000400**	**0.00200**	**mg/L**	1	12-Feb-2019 15:41
Cadmium	U		0.000200	0.00200	mg/L	1	12-Feb-2019 15:41
Calcium	**120**		**0.0340**	**0.500**	**mg/L**	1	12-Feb-2019 15:41
Iron	**0.0215**	J	**0.0120**	**0.200**	**mg/L**	1	12-Feb-2019 15:41
Lead	U		0.000600	0.00200	mg/L	1	12-Feb-2019 15:41
Magnesium	**22.0**		**0.0100**	**0.200**	**mg/L**	1	12-Feb-2019 15:41
Potassium	**2.13**		**0.0180**	**0.200**	**mg/L**	1	12-Feb-2019 15:41
Selenium	U		0.00110	0.00200	mg/L	1	12-Feb-2019 15:41
Sodium	**189**		**0.280**	**4.00**	**mg/L**	20	12-Feb-2019 17:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190130-DGW-MW3-PV25mid-controlD
Collection Date: 30-Jan-2019 16:25

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-55
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 11-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	12-Feb-2019 15:43
Arsenic	**0.00462**		**0.000400**	**0.00200**	**mg/L**	1	12-Feb-2019 15:43
Cadmium	U		0.000200	0.00200	mg/L	1	12-Feb-2019 15:43
Calcium	**121**		**0.0340**	**0.500**	**mg/L**	1	12-Feb-2019 15:43
Iron	U		0.0120	0.200	mg/L	1	12-Feb-2019 15:43
Lead	U		0.000600	0.00200	mg/L	1	12-Feb-2019 15:43
Magnesium	**22.1**		**0.0100**	**0.200**	**mg/L**	1	12-Feb-2019 15:43
Potassium	**2.12**		**0.0180**	**0.200**	**mg/L**	1	12-Feb-2019 15:43
Selenium	U		0.00110	0.00200	mg/L	1	12-Feb-2019 15:43
Sodium	**190**		**0.280**	**4.00**	**mg/L**	20	12-Feb-2019 17:07

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190130-DGW-MW3-PV25mid-30D
Collection Date: 30-Jan-2019 16:25

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-56
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 11-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	12-Feb-2019 15:46
Arsenic	U		0.000400	0.00200	mg/L	1	12-Feb-2019 15:46
Cadmium	U		0.000200	0.00200	mg/L	1	12-Feb-2019 15:46
Calcium	**9.60**		**0.0340**	**0.500**	**mg/L**	1	12-Feb-2019 15:46
Iron	U		0.0120	0.200	mg/L	1	12-Feb-2019 15:46
Lead	U		0.000600	0.00200	mg/L	1	12-Feb-2019 15:46
Magnesium	**17.6**		**0.0100**	**0.200**	**mg/L**	1	12-Feb-2019 15:46
Potassium	**2.34**		**0.0180**	**0.200**	**mg/L**	1	12-Feb-2019 15:46
Selenium	U		0.00110	0.00200	mg/L	1	12-Feb-2019 15:46
Sodium	**199**		**0.280**	**4.00**	**mg/L**	20	12-Feb-2019 17:09

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190130-DGW-MW3-PV25mid-35D
Collection Date: 30-Jan-2019 16:25

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-57
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 11-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	12-Feb-2019 15:59
Arsenic	U		0.000400	0.00200	mg/L	1	12-Feb-2019 15:59
Cadmium	U		0.000200	0.00200	mg/L	1	12-Feb-2019 15:59
Calcium	**9.14**		**0.0340**	**0.500**	**mg/L**	1	12-Feb-2019 15:59
Iron	U		0.0120	0.200	mg/L	1	12-Feb-2019 15:59
Lead	U		0.000600	0.00200	mg/L	1	12-Feb-2019 15:59
Magnesium	**15.9**		**0.0100**	**0.200**	**mg/L**	1	12-Feb-2019 15:59
Potassium	**2.09**		**0.0180**	**0.200**	**mg/L**	1	12-Feb-2019 15:59
Selenium	U		0.00110	0.00200	mg/L	1	12-Feb-2019 15:59
Sodium	**196**		**0.280**	**4.00**	**mg/L**	20	12-Feb-2019 17:11

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190130-DGW-MW3-PV25mid-40D
Collection Date: 30-Jan-2019 16:25

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-58
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 11-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	12-Feb-2019 16:01
Arsenic	U		0.000400	0.00200	mg/L	1	12-Feb-2019 16:01
Cadmium	U		0.000200	0.00200	mg/L	1	12-Feb-2019 16:01
Calcium	**7.90**		**0.0340**	**0.500**	**mg/L**	1	12-Feb-2019 16:01
Iron	U		0.0120	0.200	mg/L	1	12-Feb-2019 16:01
Lead	U		0.000600	0.00200	mg/L	1	12-Feb-2019 16:01
Magnesium	**14.8**		**0.0100**	**0.200**	**mg/L**	1	12-Feb-2019 16:01
Potassium	**2.09**		**0.0180**	**0.200**	**mg/L**	1	12-Feb-2019 16:01
Selenium	U		0.00110	0.00200	mg/L	1	12-Feb-2019 16:01
Sodium	**205**		**0.280**	**4.00**	**mg/L**	20	12-Feb-2019 17:14

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190129-DGW-MW3-PV25out-controlT
Collection Date: 29-Jan-2019 12:05

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-59
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**390**		**2.00**	**2.00**	**mg/L**	1	13-Feb-2019 17:13
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	07-Feb-2019 21:56
Arsenic	**0.00210**		**0.000400**	**0.00200**	**mg/L**	1	07-Feb-2019 21:56
Cadmium	U		0.000200	0.00200	mg/L	1	07-Feb-2019 21:56
Calcium	**122**		**0.0340**	**0.500**	**mg/L**	1	07-Feb-2019 21:56
Iron	**0.0843**	J	**0.0120**	**0.200**	**mg/L**	1	07-Feb-2019 21:56
Lead	U		0.000600	0.00200	mg/L	1	07-Feb-2019 21:56
Magnesium	**20.8**		**0.0100**	**0.200**	**mg/L**	1	07-Feb-2019 21:56
Potassium	**2.16**		**0.0180**	**0.200**	**mg/L**	1	07-Feb-2019 21:56
Selenium	**0.00118**	J	**0.00110**	**0.00200**	**mg/L**	1	07-Feb-2019 21:56
Sodium	**201**		**0.140**	**2.00**	**mg/L**	10	08-Feb-2019 13:48

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190129-DGW-MW3-PV25out-30T
Collection Date: 29-Jan-2019 12:05

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-60
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**80.3**		**2.00**	**2.00**	**mg/L**	1	13-Feb-2019 17:13
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	07-Feb-2019 22:18
Arsenic	U		0.000400	0.00200	mg/L	1	07-Feb-2019 22:18
Cadmium	U		0.000200	0.00200	mg/L	1	07-Feb-2019 22:18
Calcium	**7.25**		**0.0340**	**0.500**	**mg/L**	1	07-Feb-2019 22:18
Iron	**0.0797**	J	**0.0120**	**0.200**	**mg/L**	1	07-Feb-2019 22:18
Lead	U		0.000600	0.00200	mg/L	1	07-Feb-2019 22:18
Magnesium	**15.1**		**0.0100**	**0.200**	**mg/L**	1	07-Feb-2019 22:18
Potassium	**2.12**		**0.0180**	**0.200**	**mg/L**	1	07-Feb-2019 22:18
Selenium	**0.00113**	J	**0.00110**	**0.00200**	**mg/L**	1	07-Feb-2019 22:18
Sodium	**204**		**0.280**	**4.00**	**mg/L**	20	08-Feb-2019 13:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190129-DGW-MW3-PV25out-35T
Collection Date: 29-Jan-2019 12:05

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-61
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**63.3**		**2.00**	**2.00**	**mg/L**	1	13-Feb-2019 17:13
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	07-Feb-2019 22:20
Arsenic	U		0.000400	0.00200	mg/L	1	07-Feb-2019 22:20
Cadmium	U		0.000200	0.00200	mg/L	1	07-Feb-2019 22:20
Calcium	**6.39**		**0.0340**	**0.500**	**mg/L**	1	07-Feb-2019 22:20
Iron	U		0.0120	0.200	mg/L	1	07-Feb-2019 22:20
Lead	U		0.000600	0.00200	mg/L	1	07-Feb-2019 22:20
Magnesium	**11.5**		**0.0100**	**0.200**	**mg/L**	1	07-Feb-2019 22:20
Potassium	**2.09**		**0.0180**	**0.200**	**mg/L**	1	07-Feb-2019 22:20
Selenium	**0.00154**	J	**0.00110**	**0.00200**	**mg/L**	1	07-Feb-2019 22:20
Sodium	**198**		**0.280**	**4.00**	**mg/L**	20	08-Feb-2019 13:57

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190129-DGW-MW3-PV25out-40T
Collection Date: 29-Jan-2019 12:05

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-62
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**62.6**		**2.00**	**2.00**	**mg/L**	1	13-Feb-2019 17:13
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	07-Feb-2019 22:23
Arsenic	U		0.000400	0.00200	mg/L	1	07-Feb-2019 22:23
Cadmium	U		0.000200	0.00200	mg/L	1	07-Feb-2019 22:23
Calcium	**6.10**		**0.0340**	**0.500**	**mg/L**	1	07-Feb-2019 22:23
Iron	U		0.0120	0.200	mg/L	1	07-Feb-2019 22:23
Lead	U		0.000600	0.00200	mg/L	1	07-Feb-2019 22:23
Magnesium	**11.5**		**0.0100**	**0.200**	**mg/L**	1	07-Feb-2019 22:23
Potassium	**2.11**		**0.0180**	**0.200**	**mg/L**	1	07-Feb-2019 22:23
Selenium	U		0.00110	0.00200	mg/L	1	07-Feb-2019 22:23
Sodium	**191**		**0.280**	**4.00**	**mg/L**	20	08-Feb-2019 13:59

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190129-DGW-MW3-PV25inlet-controlT
Collection Date: 29-Jan-2019 12:20

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-63
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**380**		**2.00**	**2.00**	**mg/L**	1	13-Feb-2019 17:13
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	07-Feb-2019 22:25
Arsenic	**0.0153**		**0.000400**	**0.00200**	**mg/L**	1	07-Feb-2019 22:25
Cadmium	U		0.000200	0.00200	mg/L	1	07-Feb-2019 22:25
Calcium	**119**		**0.0340**	**0.500**	**mg/L**	1	07-Feb-2019 22:25
Iron	**0.588**		**0.0120**	**0.200**	**mg/L**	1	07-Feb-2019 22:25
Lead	U		0.000600	0.00200	mg/L	1	07-Feb-2019 22:25
Magnesium	**20.0**		**0.0100**	**0.200**	**mg/L**	1	07-Feb-2019 22:25
Potassium	**1.99**		**0.0180**	**0.200**	**mg/L**	1	07-Feb-2019 22:25
Selenium	**0.00115**	J	**0.00110**	**0.00200**	**mg/L**	1	07-Feb-2019 22:25
Sodium	**193**		**0.280**	**4.00**	**mg/L**	20	08-Feb-2019 14:01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190129-DGW-MW3-PV25inlet-30-35-40T
Collection Date: 29-Jan-2019 12:20

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-64
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**378**		**2.00**	**2.00**	**mg/L**	1	13-Feb-2019 17:13
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	07-Feb-2019 22:27
Arsenic	**0.0159**		**0.000400**	**0.00200**	**mg/L**	1	07-Feb-2019 22:27
Cadmium	U		0.000200	0.00200	mg/L	1	07-Feb-2019 22:27
Calcium	**118**		**0.0340**	**0.500**	**mg/L**	1	07-Feb-2019 22:27
Iron	**0.373**		**0.0120**	**0.200**	**mg/L**	1	07-Feb-2019 22:27
Lead	U		0.000600	0.00200	mg/L	1	07-Feb-2019 22:27
Magnesium	**20.3**		**0.0100**	**0.200**	**mg/L**	1	07-Feb-2019 22:27
Potassium	**2.05**		**0.0180**	**0.200**	**mg/L**	1	07-Feb-2019 22:27
Selenium	**0.00143**	J	**0.00110**	**0.00200**	**mg/L**	1	07-Feb-2019 22:27
Sodium	**193**		**0.280**	**4.00**	**mg/L**	20	08-Feb-2019 14:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190130-DGW-MW3-PV25mid-controlT
Collection Date: 30-Jan-2019 16:25

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-65
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**385**		**2.00**	**2.00**	**mg/L**	1	13-Feb-2019 17:13
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	07-Feb-2019 22:29
Arsenic	**0.00539**		**0.000400**	**0.00200**	**mg/L**	1	07-Feb-2019 22:29
Cadmium	U		0.000200	0.00200	mg/L	1	07-Feb-2019 22:29
Calcium	**120**		**0.0340**	**0.500**	**mg/L**	1	07-Feb-2019 22:29
Iron	**0.141**	J	**0.0120**	**0.200**	**mg/L**	1	07-Feb-2019 22:29
Lead	U		0.000600	0.00200	mg/L	1	07-Feb-2019 22:29
Magnesium	**20.7**		**0.0100**	**0.200**	**mg/L**	1	07-Feb-2019 22:29
Potassium	**2.05**		**0.0180**	**0.200**	**mg/L**	1	07-Feb-2019 22:29
Selenium	**0.00184**	J	**0.00110**	**0.00200**	**mg/L**	1	07-Feb-2019 22:29
Sodium	**188**		**0.280**	**4.00**	**mg/L**	20	08-Feb-2019 14:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190130-DGW-MW3-PV25mid-30T
Collection Date: 30-Jan-2019 16:25

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-66
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**91.4**		**2.00**	**2.00**	**mg/L**	1	13-Feb-2019 17:13
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	07-Feb-2019 22:32
Arsenic	U		0.000400	0.00200	mg/L	1	07-Feb-2019 22:32
Cadmium	U		0.000200	0.00200	mg/L	1	07-Feb-2019 22:32
Calcium	**9.55**		**0.0340**	**0.500**	**mg/L**	1	07-Feb-2019 22:32
Iron	**0.0411**	J	**0.0120**	**0.200**	**mg/L**	1	07-Feb-2019 22:32
Lead	U		0.000600	0.00200	mg/L	1	07-Feb-2019 22:32
Magnesium	**16.4**		**0.0100**	**0.200**	**mg/L**	1	07-Feb-2019 22:32
Potassium	**2.09**		**0.0180**	**0.200**	**mg/L**	1	07-Feb-2019 22:32
Selenium	**0.00223**		**0.00110**	**0.00200**	**mg/L**	1	07-Feb-2019 22:32
Sodium	**205**		**0.280**	**4.00**	**mg/L**	20	08-Feb-2019 14:08

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190130-DGW-MW3-PV25mid-35T
Collection Date: 30-Jan-2019 16:25

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-67
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**90.7**		**2.00**	**2.00**	**mg/L**	1	13-Feb-2019 17:13
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	07-Feb-2019 22:34
Arsenic	U		0.000400	0.00200	mg/L	1	07-Feb-2019 22:34
Cadmium	U		0.000200	0.00200	mg/L	1	07-Feb-2019 22:34
Calcium	**9.93**		**0.0340**	**0.500**	**mg/L**	1	07-Feb-2019 22:34
Iron	**0.365**		**0.0120**	**0.200**	**mg/L**	1	07-Feb-2019 22:34
Lead	U		0.000600	0.00200	mg/L	1	07-Feb-2019 22:34
Magnesium	**16.0**		**0.0100**	**0.200**	**mg/L**	1	07-Feb-2019 22:34
Potassium	**2.14**		**0.0180**	**0.200**	**mg/L**	1	07-Feb-2019 22:34
Selenium	U		0.00110	0.00200	mg/L	1	07-Feb-2019 22:34
Sodium	**209**		**0.280**	**4.00**	**mg/L**	20	08-Feb-2019 14:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190130-DGW-MW3-PV25mid-40T
Collection Date: 30-Jan-2019 16:25

ANALYTICAL REPORT
WorkOrder:HS19020256
Lab ID:HS19020256-68
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**84.8**		**2.00**	**2.00**	**mg/L**	1	13-Feb-2019 17:13
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 07-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	07-Feb-2019 22:36
Arsenic	U		0.000400	0.00200	mg/L	1	07-Feb-2019 22:36
Cadmium	U		0.000200	0.00200	mg/L	1	07-Feb-2019 22:36
Calcium	**8.73**		**0.0340**	**0.500**	**mg/L**	1	07-Feb-2019 22:36
Iron	**0.542**		**0.0120**	**0.200**	**mg/L**	1	07-Feb-2019 22:36
Lead	U		0.000600	0.00200	mg/L	1	07-Feb-2019 22:36
Magnesium	**15.3**		**0.0100**	**0.200**	**mg/L**	1	07-Feb-2019 22:36
Potassium	**2.18**		**0.0180**	**0.200**	**mg/L**	1	07-Feb-2019 22:36
Selenium	U		0.00110	0.00200	mg/L	1	07-Feb-2019 22:36
Sodium	**194**		**0.280**	**4.00**	**mg/L**	20	08-Feb-2019 14:18

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

Batch ID: 137506 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19020256-19	1	10	10 (mL)	1
HS19020256-20	1	10	10 (mL)	1
HS19020256-21	1	10	10 (mL)	1
HS19020256-22	1	10	10 (mL)	1
HS19020256-23	1	10	10 (mL)	1
HS19020256-24	1	10	10 (mL)	1
HS19020256-25	1	10	10 (mL)	1
HS19020256-26	1	10	10 (mL)	1
HS19020256-27	1	10	10 (mL)	1
HS19020256-28	1	10	10 (mL)	1
HS19020256-39	1	10	10 (mL)	1
HS19020256-40	1	10	10 (mL)	1
HS19020256-41	1	10	10 (mL)	1
HS19020256-42	1	10	10 (mL)	1
HS19020256-43	1	10	10 (mL)	1
HS19020256-44	1	10	10 (mL)	1
HS19020256-45	1	10	10 (mL)	1
HS19020256-46	1	10	10 (mL)	1
HS19020256-47	1	10	10 (mL)	1
HS19020256-48	1	10	10 (mL)	1

Batch ID: 137507 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19020256-59	1	10	10 (mL)	1
HS19020256-60	1	10	10 (mL)	1
HS19020256-61	1	10	10 (mL)	1
HS19020256-62	1	10	10 (mL)	1
HS19020256-63	1	10	10 (mL)	1
HS19020256-64	1	10	10 (mL)	1
HS19020256-65	1	10	10 (mL)	1
HS19020256-66	1	10	10 (mL)	1
HS19020256-67	1	10	10 (mL)	1
HS19020256-68	1	10	10 (mL)	1

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

Batch ID: 137509 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19020256-09	1	10	10 (mL)	1
HS19020256-10	1	10	10 (mL)	1
HS19020256-11	1	10	10 (mL)	1
HS19020256-12	1	10	10 (mL)	1
HS19020256-13	1	10	10 (mL)	1
HS19020256-14	1	10	10 (mL)	1
HS19020256-15	1	10	10 (mL)	1
HS19020256-16	1	10	10 (mL)	1
HS19020256-17	1	10	10 (mL)	1
HS19020256-18	1	10	10 (mL)	1
HS19020256-29	1	10	10 (mL)	1
HS19020256-30	1	10	10 (mL)	1
HS19020256-31	1	10	10 (mL)	1
HS19020256-32	1	10	10 (mL)	1
HS19020256-33	1	10	10 (mL)	1
HS19020256-34	1	10	10 (mL)	1
HS19020256-35	1	10	10 (mL)	1
HS19020256-36	1	10	10 (mL)	1
HS19020256-37	1	10	10 (mL)	1

Batch ID: 137611 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19020256-38	1	10	10 (mL)	1
HS19020256-49	1	10	10 (mL)	1
HS19020256-50	1	10	10 (mL)	1
HS19020256-51	1	10	10 (mL)	1
HS19020256-52	1	10	10 (mL)	1
HS19020256-53	1	10	10 (mL)	1
HS19020256-54	1	10	10 (mL)	1
HS19020256-55	1	10	10 (mL)	1
HS19020256-56	1	10	10 (mL)	1
HS19020256-57	1	10	10 (mL)	1
HS19020256-58	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 137506	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19020256-19	20190122-DGW-MW11-PV15out-controlT	22 Jan 2019 11:50		07 Feb 2019 10:30	11 Feb 2019 12:37	100
HS19020256-19	20190122-DGW-MW11-PV15out-controlT	22 Jan 2019 11:50		07 Feb 2019 10:30	08 Feb 2019 20:40	5
HS19020256-20	20190122-DGW-MW11-PV15out-30T	22 Jan 2019 11:50		07 Feb 2019 10:30	11 Feb 2019 12:44	100
HS19020256-20	20190122-DGW-MW11-PV15out-30T	22 Jan 2019 11:50		07 Feb 2019 10:30	08 Feb 2019 20:56	5
HS19020256-21	20190122-DGW-MW11-PV15out-35T	22 Jan 2019 11:50		07 Feb 2019 10:30	11 Feb 2019 12:46	100
HS19020256-21	20190122-DGW-MW11-PV15out-35T	22 Jan 2019 11:50		07 Feb 2019 10:30	08 Feb 2019 20:58	5
HS19020256-22	20190122-DGW-MW11-PV15out-40T	22 Jan 2019 11:50		07 Feb 2019 10:30	11 Feb 2019 12:48	100
HS19020256-22	20190122-DGW-MW11-PV15out-40T	22 Jan 2019 11:50		07 Feb 2019 10:30	08 Feb 2019 21:01	5
HS19020256-23	20190122-DGW-MW11-PV15inlet-controlT	22 Jan 2019 12:00		07 Feb 2019 10:30	11 Feb 2019 12:51	100
HS19020256-23	20190122-DGW-MW11-PV15inlet-controlT	22 Jan 2019 12:00		07 Feb 2019 10:30	08 Feb 2019 21:03	5
HS19020256-24	20190122-DGW-MW11-PV15inlet-30-35-40T	22 Jan 2019 12:00		07 Feb 2019 10:30	11 Feb 2019 12:53	100
HS19020256-24	20190122-DGW-MW11-PV15inlet-30-35-40T	22 Jan 2019 12:00		07 Feb 2019 10:30	08 Feb 2019 21:05	5
HS19020256-25	20190123-DGW-MW11-PV15mid-controlT	23 Jan 2019 17:15		07 Feb 2019 10:30	11 Feb 2019 12:55	100
HS19020256-25	20190123-DGW-MW11-PV15mid-controlT	23 Jan 2019 17:15		07 Feb 2019 10:30	08 Feb 2019 21:08	5
HS19020256-26	20190123-DGW-MW11-PV15mid-30T	23 Jan 2019 17:15		07 Feb 2019 10:30	11 Feb 2019 12:57	100
HS19020256-26	20190123-DGW-MW11-PV15mid-30T	23 Jan 2019 17:15		07 Feb 2019 10:30	08 Feb 2019 21:10	5
HS19020256-27	20190123-DGW-MW11-PV15mid-35T	23 Jan 2019 17:15		07 Feb 2019 10:30	11 Feb 2019 13:11	100
HS19020256-27	20190123-DGW-MW11-PV15mid-35T	23 Jan 2019 17:15		07 Feb 2019 10:30	08 Feb 2019 21:12	5
HS19020256-28	20190123-DGW-MW11-PV15mid-40T	23 Jan 2019 17:15		07 Feb 2019 10:30	11 Feb 2019 13:13	100
HS19020256-28	20190123-DGW-MW11-PV15mid-40T	23 Jan 2019 17:15		07 Feb 2019 10:30	08 Feb 2019 21:14	5
HS19020256-39	20190122-FD-PV15out-controlT	22 Jan 2019 11:50		07 Feb 2019 10:30	11 Feb 2019 13:15	1
HS19020256-39	20190122-FD-PV15out-controlT	22 Jan 2019 11:50		07 Feb 2019 10:30	08 Feb 2019 21:17	5
HS19020256-40	20190122-FD-PV15out-30T	22 Jan 2019 11:50		07 Feb 2019 10:30	11 Feb 2019 13:18	1
HS19020256-40	20190122-FD-PV15out-30T	22 Jan 2019 11:50		07 Feb 2019 10:30	08 Feb 2019 21:23	5
HS19020256-41	20190122-FD-PV15out-35T	22 Jan 2019 11:50		07 Feb 2019 10:30	11 Feb 2019 13:20	1
HS19020256-41	20190122-FD-PV15out-35T	22 Jan 2019 11:50		07 Feb 2019 10:30	08 Feb 2019 21:26	5
HS19020256-42	20190122-FD-PV15out-40T	22 Jan 2019 11:50		07 Feb 2019 10:30	11 Feb 2019 13:22	1
HS19020256-42	20190122-FD-PV15out-40T	22 Jan 2019 11:50		07 Feb 2019 10:30	08 Feb 2019 21:28	5
HS19020256-43	20190122-FD-PV15inlet-controlT	22 Jan 2019 12:00		07 Feb 2019 10:30	11 Feb 2019 13:24	1
HS19020256-43	20190122-FD-PV15inlet-controlT	22 Jan 2019 12:00		07 Feb 2019 10:30	08 Feb 2019 21:30	5
HS19020256-44	20190122-FD-PV15inlet-30-35-40T	22 Jan 2019 12:00		07 Feb 2019 10:30	11 Feb 2019 13:27	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

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Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
HS19020256-44	20190122-FD-PV15inlet-30-35-40T	22 Jan 2019 12:00		07 Feb 2019 10:30	08 Feb 2019 21:32	5
HS19020256-45	20190123-FD-PV15mid-controlT	23 Jan 2019 17:30		07 Feb 2019 10:30	11 Feb 2019 13:29	1
HS19020256-45	20190123-FD-PV15mid-controlT	23 Jan 2019 17:30		07 Feb 2019 10:30	08 Feb 2019 21:35	5
HS19020256-46	20190123-FD-PV15mid-30T	23 Jan 2019 17:30		07 Feb 2019 10:30	11 Feb 2019 13:41	1
HS19020256-46	20190123-FD-PV15mid-30T	23 Jan 2019 17:30		07 Feb 2019 10:30	08 Feb 2019 21:37	5
HS19020256-47	20190123-FD-PV15mid-35T	23 Jan 2019 17:30		07 Feb 2019 10:30	11 Feb 2019 13:44	1
HS19020256-47	20190123-FD-PV15mid-35T	23 Jan 2019 17:30		07 Feb 2019 10:30	08 Feb 2019 21:39	5
HS19020256-48	20190123-FD-PV15mid-40T	23 Jan 2019 17:30		07 Feb 2019 10:30	11 Feb 2019 13:46	1
HS19020256-48	20190123-FD-PV15mid-40T	23 Jan 2019 17:30		07 Feb 2019 10:30	08 Feb 2019 21:42	5
Batch ID 137507	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19020256-59	20190129-DGW-MW3-PV25out-controlT	29 Jan 2019 12:05		07 Feb 2019 10:30	08 Feb 2019 13:48	10
HS19020256-59	20190129-DGW-MW3-PV25out-controlT	29 Jan 2019 12:05		07 Feb 2019 10:30	07 Feb 2019 21:56	1
HS19020256-60	20190129-DGW-MW3-PV25out-30T	29 Jan 2019 12:05		07 Feb 2019 10:30	08 Feb 2019 13:54	20
HS19020256-60	20190129-DGW-MW3-PV25out-30T	29 Jan 2019 12:05		07 Feb 2019 10:30	07 Feb 2019 22:18	1
HS19020256-61	20190129-DGW-MW3-PV25out-35T	29 Jan 2019 12:05		07 Feb 2019 10:30	08 Feb 2019 13:57	20
HS19020256-61	20190129-DGW-MW3-PV25out-35T	29 Jan 2019 12:05		07 Feb 2019 10:30	07 Feb 2019 22:20	1
HS19020256-62	20190129-DGW-MW3-PV25out-40T	29 Jan 2019 12:05		07 Feb 2019 10:30	08 Feb 2019 13:59	20
HS19020256-62	20190129-DGW-MW3-PV25out-40T	29 Jan 2019 12:05		07 Feb 2019 10:30	07 Feb 2019 22:23	1
HS19020256-63	20190129-DGW-MW3-PV25inlet-controlT	29 Jan 2019 12:20		07 Feb 2019 10:30	08 Feb 2019 14:01	20
HS19020256-63	20190129-DGW-MW3-PV25inlet-controlT	29 Jan 2019 12:20		07 Feb 2019 10:30	07 Feb 2019 22:25	1
HS19020256-64	20190129-DGW-MW3-PV25inlet-30-35-40T	29 Jan 2019 12:20		07 Feb 2019 10:30	08 Feb 2019 14:04	20
HS19020256-64	20190129-DGW-MW3-PV25inlet-30-35-40T	29 Jan 2019 12:20		07 Feb 2019 10:30	07 Feb 2019 22:27	1
HS19020256-65	20190130-DGW-MW3-PV25mid-controlT	30 Jan 2019 16:25		07 Feb 2019 10:30	08 Feb 2019 14:06	20
HS19020256-65	20190130-DGW-MW3-PV25mid-controlT	30 Jan 2019 16:25		07 Feb 2019 10:30	07 Feb 2019 22:29	1
HS19020256-66	20190130-DGW-MW3-PV25mid-30T	30 Jan 2019 16:25		07 Feb 2019 10:30	08 Feb 2019 14:08	20
HS19020256-66	20190130-DGW-MW3-PV25mid-30T	30 Jan 2019 16:25		07 Feb 2019 10:30	07 Feb 2019 22:32	1
HS19020256-67	20190130-DGW-MW3-PV25mid-35T	30 Jan 2019 16:25		07 Feb 2019 10:30	08 Feb 2019 14:15	20
HS19020256-67	20190130-DGW-MW3-PV25mid-35T	30 Jan 2019 16:25		07 Feb 2019 10:30	07 Feb 2019 22:34	1
HS19020256-68	20190130-DGW-MW3-PV25mid-40T	30 Jan 2019 16:25		07 Feb 2019 10:30	08 Feb 2019 14:18	20
HS19020256-68	20190130-DGW-MW3-PV25mid-40T	30 Jan 2019 16:25		07 Feb 2019 10:30	07 Feb 2019 22:36	1

Client: Golder Associates
Project: Exide Column Studies
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Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 137509	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS19020256-09	20190122-DGW-MW11-PV15out-controlD	22 Jan 2019 11:50		07 Feb 2019 10:30	08 Feb 2019 19:58	100
HS19020256-09	20190122-DGW-MW11-PV15out-controlD	22 Jan 2019 11:50		07 Feb 2019 10:30	08 Feb 2019 15:09	5
HS19020256-10	20190122-DGW-MW11-PV15out-30D	22 Jan 2019 11:50		07 Feb 2019 10:30	08 Feb 2019 20:04	100
HS19020256-10	20190122-DGW-MW11-PV15out-30D	22 Jan 2019 11:50		07 Feb 2019 10:30	08 Feb 2019 15:32	5
HS19020256-11	20190122-DGW-MW11-PV15out-35D	22 Jan 2019 11:50		07 Feb 2019 10:30	08 Feb 2019 20:07	100
HS19020256-11	20190122-DGW-MW11-PV15out-35D	22 Jan 2019 11:50		07 Feb 2019 10:30	08 Feb 2019 15:35	5
HS19020256-12	20190122-DGW-MW11-PV15out-40D	22 Jan 2019 11:50		07 Feb 2019 10:30	08 Feb 2019 20:09	100
HS19020256-12	20190122-DGW-MW11-PV15out-40D	22 Jan 2019 11:50		07 Feb 2019 10:30	08 Feb 2019 15:37	5
HS19020256-13	20190122-DGW-MW11-PV15inlet-controlD	22 Jan 2019 12:00		07 Feb 2019 10:30	08 Feb 2019 20:11	100
HS19020256-13	20190122-DGW-MW11-PV15inlet-controlD	22 Jan 2019 12:00		07 Feb 2019 10:30	08 Feb 2019 15:39	5
HS19020256-14	20190122-DGW-MW11-PV15inlet-30-35-40D	22 Jan 2019 12:00		07 Feb 2019 10:30	08 Feb 2019 20:13	100
HS19020256-14	20190122-DGW-MW11-PV15inlet-30-35-40D	22 Jan 2019 12:00		07 Feb 2019 10:30	08 Feb 2019 15:41	5
HS19020256-15	20190123-DGW-MW11-PV15mid-controlD	23 Jan 2019 17:15		07 Feb 2019 10:30	08 Feb 2019 20:16	100
HS19020256-15	20190123-DGW-MW11-PV15mid-controlD	23 Jan 2019 17:15		07 Feb 2019 10:30	08 Feb 2019 15:44	5
HS19020256-16	20190123-DGW-MW11-PV15mid-30D	23 Jan 2019 17:15		07 Feb 2019 10:30	08 Feb 2019 20:22	100
HS19020256-16	20190123-DGW-MW11-PV15mid-30D	23 Jan 2019 17:15		07 Feb 2019 10:30	08 Feb 2019 15:46	5
HS19020256-17	20190123-DGW-MW11-PV15mid-35D	23 Jan 2019 17:15		07 Feb 2019 10:30	08 Feb 2019 20:25	100
HS19020256-17	20190123-DGW-MW11-PV15mid-35D	23 Jan 2019 17:15		07 Feb 2019 10:30	08 Feb 2019 15:48	5
HS19020256-18	20190123-DGW-MW11-PV15mid-40D	23 Jan 2019 17:15		07 Feb 2019 10:30	08 Feb 2019 20:27	100
HS19020256-18	20190123-DGW-MW11-PV15mid-40D	23 Jan 2019 17:15		07 Feb 2019 10:30	08 Feb 2019 15:51	5
HS19020256-29	20190122-FD-PV15out-controlD	22 Jan 2019 11:50		07 Feb 2019 10:30	11 Feb 2019 13:48	1
HS19020256-29	20190122-FD-PV15out-controlD	22 Jan 2019 11:50		07 Feb 2019 10:30	08 Feb 2019 21:51	1
HS19020256-29	20190122-FD-PV15out-controlD	22 Jan 2019 11:50		07 Feb 2019 10:30	08 Feb 2019 16:05	5
HS19020256-30	20190122-FD-PV15out-30D	22 Jan 2019 11:50		07 Feb 2019 10:30	11 Feb 2019 13:50	1
HS19020256-30	20190122-FD-PV15out-30D	22 Jan 2019 11:50		07 Feb 2019 10:30	08 Feb 2019 21:53	1
HS19020256-30	20190122-FD-PV15out-30D	22 Jan 2019 11:50		07 Feb 2019 10:30	08 Feb 2019 16:07	5
HS19020256-31	20190122-FD-PV15out-35D	22 Jan 2019 11:50		07 Feb 2019 10:30	11 Feb 2019 13:53	1
HS19020256-31	20190122-FD-PV15out-35D	22 Jan 2019 11:50		07 Feb 2019 10:30	08 Feb 2019 21:55	1
HS19020256-31	20190122-FD-PV15out-35D	22 Jan 2019 11:50		07 Feb 2019 10:30	08 Feb 2019 16:10	5
HS19020256-32	20190122-FD-PV15out-40D	22 Jan 2019 11:50		07 Feb 2019 10:30	11 Feb 2019 13:55	1
HS19020256-32	20190122-FD-PV15out-40D	22 Jan 2019 11:50		07 Feb 2019 10:30	08 Feb 2019 21:57	1
HS19020256-32	20190122-FD-PV15out-40D	22 Jan 2019 11:50		07 Feb 2019 10:30	08 Feb 2019 16:12	5

Client: Golder Associates
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Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
HS19020256-33	20190122-FD-PV15inlet-controlD	22 Jan 2019 12:00		07 Feb 2019 10:30	11 Feb 2019 13:57	1
HS19020256-33	20190122-FD-PV15inlet-controlD	22 Jan 2019 12:00		07 Feb 2019 10:30	08 Feb 2019 22:07	1
HS19020256-33	20190122-FD-PV15inlet-controlD	22 Jan 2019 12:00		07 Feb 2019 10:30	08 Feb 2019 16:14	5
HS19020256-34	20190122-FD-PV15inlet-30-35-40D	22 Jan 2019 12:00		07 Feb 2019 10:30	11 Feb 2019 13:59	1
HS19020256-34	20190122-FD-PV15inlet-30-35-40D	22 Jan 2019 12:00		07 Feb 2019 10:30	08 Feb 2019 22:09	1
HS19020256-34	20190122-FD-PV15inlet-30-35-40D	22 Jan 2019 12:00		07 Feb 2019 10:30	08 Feb 2019 16:16	5
HS19020256-35	20190123-FD-PV15mid-controlD	23 Jan 2019 17:30		07 Feb 2019 10:30	11 Feb 2019 14:12	1
HS19020256-35	20190123-FD-PV15mid-controlD	23 Jan 2019 17:30		07 Feb 2019 10:30	08 Feb 2019 22:11	1
HS19020256-35	20190123-FD-PV15mid-controlD	23 Jan 2019 17:30		07 Feb 2019 10:30	08 Feb 2019 16:19	5
HS19020256-36	20190123-FD-PV15mid-30D	23 Jan 2019 17:30		07 Feb 2019 10:30	11 Feb 2019 14:14	1
HS19020256-36	20190123-FD-PV15mid-30D	23 Jan 2019 17:30		07 Feb 2019 10:30	08 Feb 2019 22:13	1
HS19020256-36	20190123-FD-PV15mid-30D	23 Jan 2019 17:30		07 Feb 2019 10:30	08 Feb 2019 16:21	5
HS19020256-37	20190123-FD-PV15mid-35D	23 Jan 2019 17:30		07 Feb 2019 10:30	11 Feb 2019 14:16	1
HS19020256-37	20190123-FD-PV15mid-35D	23 Jan 2019 17:30		07 Feb 2019 10:30	08 Feb 2019 22:16	1
HS19020256-37	20190123-FD-PV15mid-35D	23 Jan 2019 17:30		07 Feb 2019 10:30	08 Feb 2019 16:23	5

Client: Golder Associates
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Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 137611	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS19020256-38	20190123-FD-PV15mid-40D	23 Jan 2019 17:30		11 Feb 2019 14:00	12 Feb 2019 15:20	1
HS19020256-38	20190123-FD-PV15mid-40D	23 Jan 2019 17:30		11 Feb 2019 14:00	12 Feb 2019 15:04	5
HS19020256-49	20190129-DGW-MW3-PV25out-controlD	29 Jan 2019 12:05		11 Feb 2019 14:00	12 Feb 2019 15:22	1
HS19020256-49	20190129-DGW-MW3-PV25out-controlD	29 Jan 2019 12:05		11 Feb 2019 14:00	12 Feb 2019 15:06	5
HS19020256-50	20190129-DGW-MW3-PV25out-30D	29 Jan 2019 12:05		11 Feb 2019 14:00	12 Feb 2019 15:24	1
HS19020256-50	20190129-DGW-MW3-PV25out-30D	29 Jan 2019 12:05		11 Feb 2019 14:00	12 Feb 2019 15:08	5
HS19020256-51	20190129-DGW-MW3-PV25out-35D	29 Jan 2019 12:05		11 Feb 2019 14:00	12 Feb 2019 16:58	20
HS19020256-51	20190129-DGW-MW3-PV25out-35D	29 Jan 2019 12:05		11 Feb 2019 14:00	12 Feb 2019 15:27	1
HS19020256-52	20190129-DGW-MW3-PV25out-40D	29 Jan 2019 12:05		11 Feb 2019 14:00	12 Feb 2019 17:00	20
HS19020256-52	20190129-DGW-MW3-PV25out-40D	29 Jan 2019 12:05		11 Feb 2019 14:00	12 Feb 2019 15:35	1
HS19020256-53	20190129-DGW-MW3-PV25inlet-controlD	29 Jan 2019 12:20		11 Feb 2019 14:00	12 Feb 2019 17:02	20
HS19020256-53	20190129-DGW-MW3-PV25inlet-controlD	29 Jan 2019 12:20		11 Feb 2019 14:00	12 Feb 2019 15:39	1
HS19020256-54	20190129-DGW-MW3-PV25inlet-30-35-40D	29 Jan 2019 12:20		11 Feb 2019 14:00	12 Feb 2019 17:05	20
HS19020256-54	20190129-DGW-MW3-PV25inlet-30-35-40D	29 Jan 2019 12:20		11 Feb 2019 14:00	12 Feb 2019 15:41	1
HS19020256-55	20190130-DGW-MW3-PV25mid-controlD	30 Jan 2019 16:25		11 Feb 2019 14:00	12 Feb 2019 17:07	20
HS19020256-55	20190130-DGW-MW3-PV25mid-controlD	30 Jan 2019 16:25		11 Feb 2019 14:00	12 Feb 2019 15:43	1
HS19020256-56	20190130-DGW-MW3-PV25mid-30D	30 Jan 2019 16:25		11 Feb 2019 14:00	12 Feb 2019 17:09	20
HS19020256-56	20190130-DGW-MW3-PV25mid-30D	30 Jan 2019 16:25		11 Feb 2019 14:00	12 Feb 2019 15:46	1
HS19020256-57	20190130-DGW-MW3-PV25mid-35D	30 Jan 2019 16:25		11 Feb 2019 14:00	12 Feb 2019 17:11	20
HS19020256-57	20190130-DGW-MW3-PV25mid-35D	30 Jan 2019 16:25		11 Feb 2019 14:00	12 Feb 2019 15:59	1
HS19020256-58	20190130-DGW-MW3-PV25mid-40D	30 Jan 2019 16:25		11 Feb 2019 14:00	12 Feb 2019 17:14	20
HS19020256-58	20190130-DGW-MW3-PV25mid-40D	30 Jan 2019 16:25		11 Feb 2019 14:00	12 Feb 2019 16:01	1
Batch ID R332664	**Test Name :** ALKALINITY BY SM2320B				**Matrix:** Groundwater	
HS19020256-01	20190204-FD-PV20Out-Control	04 Feb 2019 11:40			09 Feb 2019 14:12	1
HS19020256-02	20190204-FD-PV20Out-30	04 Feb 2019 11:40			09 Feb 2019 14:19	1
HS19020256-03	20190204-FD-PV20Out-35	04 Feb 2019 11:40			09 Feb 2019 14:27	1
HS19020256-04	20190204-FD-PV20Out-40	04 Feb 2019 11:40			09 Feb 2019 14:34	1
HS19020256-05	20190204-DGW-MW11-PV20out-control	04 Feb 2019 11:50			09 Feb 2019 14:41	1
HS19020256-06	20190204-DGW-MW11-PV20out-30	04 Feb 2019 11:50			09 Feb 2019 15:04	1
HS19020256-07	20190204-DGW-MW11-PV20out-35	04 Feb 2019 11:50			09 Feb 2019 15:11	1
HS19020256-08	20190204-DGW-MW11-PV20out-40	04 Feb 2019 11:50			09 Feb 2019 15:18	1

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Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R332744	**Test Name :** TOTAL DISSOLVED SOLIDS BY SM2540C				**Matrix:** Groundwater	
HS19020256-01	20190204-FD-PV20Out-Control	04 Feb 2019 11:40			11 Feb 2019 11:00	1
HS19020256-02	20190204-FD-PV20Out-30	04 Feb 2019 11:40			11 Feb 2019 11:00	1
HS19020256-03	20190204-FD-PV20Out-35	04 Feb 2019 11:40			11 Feb 2019 11:00	1
HS19020256-04	20190204-FD-PV20Out-40	04 Feb 2019 11:40			11 Feb 2019 11:00	1
HS19020256-05	20190204-DGW-MW11-PV20out-control	04 Feb 2019 11:50			11 Feb 2019 11:00	1
HS19020256-06	20190204-DGW-MW11-PV20out-30	04 Feb 2019 11:50			11 Feb 2019 11:00	1
HS19020256-07	20190204-DGW-MW11-PV20out-35	04 Feb 2019 11:50			11 Feb 2019 11:00	1
HS19020256-08	20190204-DGW-MW11-PV20out-40	04 Feb 2019 11:50			11 Feb 2019 11:00	1
Batch ID R332779	**Test Name :** ANIONS BY E300.0				**Matrix:** Groundwater	
HS19020256-01	20190204-FD-PV20Out-Control	04 Feb 2019 11:40			13 Feb 2019 04:12	20
HS19020256-06	20190204-DGW-MW11-PV20out-30	04 Feb 2019 11:50			13 Feb 2019 04:27	200
HS19020256-07	20190204-DGW-MW11-PV20out-35	04 Feb 2019 11:50			13 Feb 2019 04:41	200
HS19020256-08	20190204-DGW-MW11-PV20out-40	04 Feb 2019 11:50			13 Feb 2019 04:56	200
Batch ID R332817	**Test Name :** ANIONS BY E300.0				**Matrix:** Groundwater	
HS19020256-06	20190204-DGW-MW11-PV20out-30	04 Feb 2019 11:50			07 Feb 2019 00:22	10
HS19020256-06	20190204-DGW-MW11-PV20out-30	04 Feb 2019 11:50			07 Feb 2019 00:07	1
HS19020256-07	20190204-DGW-MW11-PV20out-35	04 Feb 2019 11:50			07 Feb 2019 00:51	10
HS19020256-07	20190204-DGW-MW11-PV20out-35	04 Feb 2019 11:50			07 Feb 2019 00:36	1
HS19020256-08	20190204-DGW-MW11-PV20out-40	04 Feb 2019 11:50			07 Feb 2019 01:20	10
HS19020256-08	20190204-DGW-MW11-PV20out-40	04 Feb 2019 11:50			07 Feb 2019 01:05	1
Batch ID R332818	**Test Name :** ANIONS BY E300.0				**Matrix:** Groundwater	
HS19020256-01	20190204-FD-PV20Out-Control	04 Feb 2019 11:40			07 Feb 2019 02:04	1
HS19020256-02	20190204-FD-PV20Out-30	04 Feb 2019 11:40			07 Feb 2019 02:47	10
HS19020256-02	20190204-FD-PV20Out-30	04 Feb 2019 11:40			07 Feb 2019 02:33	1
HS19020256-03	20190204-FD-PV20Out-35	04 Feb 2019 11:40			07 Feb 2019 03:45	10
HS19020256-03	20190204-FD-PV20Out-35	04 Feb 2019 11:40			07 Feb 2019 03:02	1
HS19020256-04	20190204-FD-PV20Out-40	04 Feb 2019 11:40			07 Feb 2019 04:14	10
HS19020256-04	20190204-FD-PV20Out-40	04 Feb 2019 11:40			07 Feb 2019 04:00	1
HS19020256-05	20190204-DGW-MW11-PV20out-control	04 Feb 2019 11:50			07 Feb 2019 05:56	10
HS19020256-05	20190204-DGW-MW11-PV20out-control	04 Feb 2019 11:50			07 Feb 2019 05:42	1

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Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R332827	**Test Name :** HARDNESS, TOTAL AS CACO3 BY SM2340B			**Matrix:** Groundwater		
HS19020256-19	20190122-DGW-MW11-PV15out-controlT	22 Jan 2019 11:50			13 Feb 2019 17:13	1
HS19020256-20	20190122-DGW-MW11-PV15out-30T	22 Jan 2019 11:50			13 Feb 2019 17:13	1
HS19020256-21	20190122-DGW-MW11-PV15out-35T	22 Jan 2019 11:50			13 Feb 2019 17:13	1
HS19020256-22	20190122-DGW-MW11-PV15out-40T	22 Jan 2019 11:50			13 Feb 2019 17:13	1
HS19020256-23	20190122-DGW-MW11-PV15inlet-controlT	22 Jan 2019 12:00			13 Feb 2019 17:13	1
HS19020256-24	20190122-DGW-MW11-PV15inlet-30-35-40T	22 Jan 2019 12:00			13 Feb 2019 17:13	1
HS19020256-25	20190123-DGW-MW11-PV15mid-controlT	23 Jan 2019 17:15			13 Feb 2019 17:13	1
HS19020256-26	20190123-DGW-MW11-PV15mid-30T	23 Jan 2019 17:15			13 Feb 2019 17:13	1
HS19020256-27	20190123-DGW-MW11-PV15mid-35T	23 Jan 2019 17:15			13 Feb 2019 17:13	1
HS19020256-28	20190123-DGW-MW11-PV15mid-40T	23 Jan 2019 17:15			13 Feb 2019 17:13	1
HS19020256-39	20190122-FD-PV15out-controlT	22 Jan 2019 11:50			13 Feb 2019 17:13	1
HS19020256-40	20190122-FD-PV15out-30T	22 Jan 2019 11:50			13 Feb 2019 17:13	1
HS19020256-41	20190122-FD-PV15out-35T	22 Jan 2019 11:50			13 Feb 2019 17:13	1
HS19020256-42	20190122-FD-PV15out-40T	22 Jan 2019 11:50			13 Feb 2019 17:13	1
HS19020256-43	20190122-FD-PV15inlet-controlT	22 Jan 2019 12:00			13 Feb 2019 17:13	1
HS19020256-44	20190122-FD-PV15inlet-30-35-40T	22 Jan 2019 12:00			13 Feb 2019 17:13	1
HS19020256-45	20190123-FD-PV15mid-controlT	23 Jan 2019 17:30			13 Feb 2019 17:13	1
HS19020256-46	20190123-FD-PV15mid-30T	23 Jan 2019 17:30			13 Feb 2019 17:13	1
HS19020256-47	20190123-FD-PV15mid-35T	23 Jan 2019 17:30			13 Feb 2019 17:13	1
HS19020256-48	20190123-FD-PV15mid-40T	23 Jan 2019 17:30			13 Feb 2019 17:13	1
HS19020256-59	20190129-DGW-MW3-PV25out-controlT	29 Jan 2019 12:05			13 Feb 2019 17:13	1
HS19020256-60	20190129-DGW-MW3-PV25out-30T	29 Jan 2019 12:05			13 Feb 2019 17:13	1
HS19020256-61	20190129-DGW-MW3-PV25out-35T	29 Jan 2019 12:05			13 Feb 2019 17:13	1
HS19020256-62	20190129-DGW-MW3-PV25out-40T	29 Jan 2019 12:05			13 Feb 2019 17:13	1
HS19020256-63	20190129-DGW-MW3-PV25inlet-controlT	29 Jan 2019 12:20			13 Feb 2019 17:13	1
HS19020256-64	20190129-DGW-MW3-PV25inlet-30-35-40T	29 Jan 2019 12:20			13 Feb 2019 17:13	1
HS19020256-65	20190130-DGW-MW3-PV25mid-controlT	30 Jan 2019 16:25			13 Feb 2019 17:13	1
HS19020256-66	20190130-DGW-MW3-PV25mid-30T	30 Jan 2019 16:25			13 Feb 2019 17:13	1
HS19020256-67	20190130-DGW-MW3-PV25mid-35T	30 Jan 2019 16:25			13 Feb 2019 17:13	1
HS19020256-68	20190130-DGW-MW3-PV25mid-40T	30 Jan 2019 16:25			13 Feb 2019 17:13	1

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DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R332873	**Test Name :** ANIONS BY E300.0			**Matrix:** Groundwater		
HS19020256-05	20190204-DGW-MW11-PV20out-control	04 Feb 2019 11:50			13 Feb 2019 18:08	100

WorkOrder: HS19020256
InstrumentID: MISC-Metals
Test Code: HARD
Test Number: M2340 B
Test Name: Hardness, Total as CaCO3 by

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Hardness (As CaCO3)	HARD	0	0	2.00	2.00

WorkOrder: HS19020256
InstrumentID: ICPMS05
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000555	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000460	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000554	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0537	0.0340	0.500
A	Iron	7439-89-6	0.0500	0.0549	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.00100	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0680	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0542	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00280	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0459	0.0140	0.200

WorkOrder: HS19020256
InstrumentID: ICPMS05
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000555	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000460	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000554	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0537	0.0340	0.500
A	Iron	7439-89-6	0.0500	0.0549	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.00100	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0680	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0542	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00280	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0459	0.0140	0.200

WorkOrder: HS19020256
InstrumentID: ICS2100
Test Code: 300_W
Test Number: E300
Test Name: Anions by E300.0

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Chloride	16887-00-6	0.500	0.581	0.200	0.500
A	Nitrogen, Nitrate (As N)	14797-55-8	0.100	0.107	0.0300	0.100
A	Sulfate	14808-79-8	0.500	0.626	0.200	0.500

WorkOrder: HS19020256
InstrumentID: ManTech01
Test Code: ALK_W 2320B
Test Number: SM2320B
Test Name: Alkalinity by SM2320B

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Alkalinity, Bicarbonate (As CaCO3)	ALK-Bicarb	5.00	5.06	5.00	5.00
A	Alkalinity, Carbonate (As CaCO3)	ALK-Carb	5.00	5.06	5.00	5.00
A	Alkalinity, Total (As CaCO3)	ALK	5.00	5.06	5.00	5.00

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

QC BATCH REPORT

Batch ID: 137506 **Instrument: ICPMS05** **Method: SW6020**

MBLK Sample ID: **MBLK-137506** Units: **mg/L** Analysis Date: **08-Feb-2019 20:36**
Client ID: Run ID: **ICPMS05_332566** SeqNo: **4943978** PrepDate: **07-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.000482	0.00200								J
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.0104	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	U	0.200								

LCS Sample ID: **LCS-137506** Units: **mg/L** Analysis Date: **08-Feb-2019 20:38**
Client ID: Run ID: **ICPMS05_332566** SeqNo: **4943979** PrepDate: **07-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05593	0.00200	0.05	0	112	80 - 120				
Arsenic	0.05334	0.00200	0.05	0	107	80 - 120				
Cadmium	0.05324	0.00200	0.05	0	106	80 - 120				
Calcium	5.196	0.500	5	0	104	80 - 120				
Iron	5.414	0.200	5	0	108	80 - 120				
Lead	0.05446	0.00200	0.05	0	109	80 - 120				
Magnesium	5.441	0.200	5	0	109	80 - 120				
Potassium	5.302	0.200	5	0	106	80 - 120				
Selenium	0.05377	0.00200	0.05	0	108	80 - 120				
Sodium	5.461	0.200	5	0	109	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

QC BATCH REPORT

Batch ID: 137506 **Instrument: ICPMS05** **Method: SW6020**

MS Sample ID: **HS19020256-19MS** Units: **mg/L** Analysis Date: **08-Feb-2019 20:45**
Client ID: **20190122-DGW-MW11-PV15out-controlT** Run ID: **ICPMS05_332566** SeqNo: **4943982** PrepDate: **07-Feb-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05353	0.0100	0.05	0.001817	103	80 - 120				
Arsenic	0.05069	0.0100	0.05	0.000191	101	80 - 120				
Cadmium	0.06448	0.0100	0.05	0.01177	105	80 - 120				
Calcium	502.8	2.50	5	512.8	-200	80 - 120				SO
Iron	5.11	1.00	5	0.01437	102	80 - 120				
Lead	0.05245	0.0100	0.05	0.000291	104	80 - 120				
Magnesium	314.8	1.00	5	311.8	60.6	80 - 120				SO
Potassium	25.77	1.00	5	21.59	83.7	80 - 120				O
Selenium	0.05119	0.0100	0.05	-0.001003	104	80 - 120				
Sodium	1612	1.00	5	1611	3.15	80 - 120				SEO

MSD Sample ID: **HS19020256-19MSD** Units: **mg/L** Analysis Date: **08-Feb-2019 20:47**
Client ID: **20190122-DGW-MW11-PV15out-controlT** Run ID: **ICPMS05_332566** SeqNo: **4943983** PrepDate: **07-Feb-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05271	0.0100	0.05	0.001817	102	80 - 120	0.05353	1.55	20	
Arsenic	0.04973	0.0100	0.05	0.000191	99.1	80 - 120	0.05069	1.91	20	
Cadmium	0.06511	0.0100	0.05	0.01177	107	80 - 120	0.06448	0.972	20	
Calcium	498.3	2.50	5	512.8	-290	80 - 120	502.8	0.898	20	SO
Iron	4.959	1.00	5	0.01437	98.9	80 - 120	5.11	3.01	20	
Lead	0.05133	0.0100	0.05	0.000291	102	80 - 120	0.05245	2.15	20	
Magnesium	310.3	1.00	5	311.8	-29.5	80 - 120	314.8	1.44	20	SO
Potassium	25.37	1.00	5	21.59	75.7	80 - 120	25.77	1.57	20	SO
Selenium	0.05007	0.0100	0.05	-0.001003	102	80 - 120	0.05119	2.21	20	
Sodium	1600	1.00	5	1611	-228	80 - 120	1612	0.72	20	SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

QC BATCH REPORT

Batch ID: 137506 **Instrument: ICPMS05** **Method: SW6020**

PDS Sample ID: **HS19020256-19PDS** Units: **mg/L** Analysis Date: **08-Feb-2019 20:49**
Client ID: **20190122-DGW-MW11-PV15out-controlT** Run ID: **ICPMS05_332566** SeqNo: **4943984** PrepDate: **07-Feb-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	1.088	0.0100	1	0	109	75 - 125				
Arsenic	1.082	0.0100	1	0	108	75 - 125				
Cadmium	1.105	0.0100	1	0.01177	109	75 - 125				
Calcium	591.1	2.50	100	512.8	78.4	75 - 125				O
Iron	105.1	1.00	100	0	105	75 - 125				
Lead	1.075	0.0100	1	0	108	75 - 125				
Magnesium	400.7	1.00	100	311.8	89.0	75 - 125				
Potassium	122.8	1.00	100	21.59	101	75 - 125				
Selenium	1.061	0.0100	1	0	106	75 - 125				

PDS Sample ID: **HS19020256-19PDS** Units: **mg/L** Analysis Date: **11-Feb-2019 12:42**
Client ID: **20190122-DGW-MW11-PV15out-controlT** Run ID: **ICPMS05_332637** SeqNo: **4944912** PrepDate: **07-Feb-2019** DF: **100**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	2685	20.0	1000	1641	104	75 - 125				

SD Sample ID: **HS19020256-19SD** Units: **mg/L** Analysis Date: **08-Feb-2019 20:43**
Client ID: **20190122-DGW-MW11-PV15out-controlT** Run ID: **ICPMS05_332566** SeqNo: **4943981** PrepDate: **07-Feb-2019** DF: **25**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0500					0.001817	0	10	
Arsenic	U	0.0500					0.000191	0	10	
Cadmium	0.01272	0.0500					0.01177	0	10	J
Calcium	478.1	12.5					512.8	6.76	10	
Iron	U	5.00					0.01437	0	10	
Lead	U	0.0500					0.000291	0	10	
Magnesium	319.8	5.00					311.8	2.57	10	
Potassium	20.31	5.00					21.59	5.93	10	
Selenium	U	0.0500					-0.001003	0	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

QC BATCH REPORT

Batch ID: 137506 **Instrument:** ICPMS05 **Method:** SW6020

SD Sample ID: **HS19020256-19SD** Units: **mg/L** Analysis Date: **11-Feb-2019 12:39**
Client ID: **20190122-DGW-MW11-PV15out-controlT** Run ID: **ICPMS05_332637** SeqNo: **4944911** PrepDate: **07-Feb-2019** DF: **500**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Sodium	1619	100					1641	1.33	10	

The following samples were analyzed in this batch:

HS19020256-19	HS19020256-20	HS19020256-21	HS19020256-22
HS19020256-23	HS19020256-24	HS19020256-25	HS19020256-26
HS19020256-27	HS19020256-28	HS19020256-39	HS19020256-40
HS19020256-41	HS19020256-42	HS19020256-43	HS19020256-44
HS19020256-45	HS19020256-46	HS19020256-47	HS19020256-48

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

QC BATCH REPORT

Batch ID: 137507 **Instrument: ICPMS05** **Method: SW6020**

MBLK Sample ID: **MBLK-137507** Units: **mg/L** Analysis Date: **07-Feb-2019 21:47**
Client ID: Run ID: **ICPMS05_332483** SeqNo: **4942564** PrepDate: **07-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01108	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	0.09196	0.200								J

LCS Sample ID: **LCS-137507** Units: **mg/L** Analysis Date: **07-Feb-2019 21:49**
Client ID: Run ID: **ICPMS05_332483** SeqNo: **4942565** PrepDate: **07-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05332	0.00200	0.05	0	107	80 - 120				
Arsenic	0.05259	0.00200	0.05	0	105	80 - 120				
Cadmium	0.05244	0.00200	0.05	0	105	80 - 120				
Calcium	5.464	0.500	5	0	109	80 - 120				
Iron	5.355	0.200	5	0	107	80 - 120				
Lead	0.05249	0.00200	0.05	0	105	80 - 120				
Magnesium	5.42	0.200	5	0	108	80 - 120				
Potassium	5.454	0.200	5	0	109	80 - 120				
Selenium	0.05421	0.00200	0.05	0	108	80 - 120				
Sodium	5.432	0.200	5	0	109	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

QC BATCH REPORT

Batch ID: 137507 **Instrument: ICPMS05** **Method: SW6020**

MS Sample ID: **HS19020256-59MS** Units: **mg/L** Analysis Date: **07-Feb-2019 22:00**
Client ID: **20190129-DGW-MW3-PV25out-controlT** Run ID: **ICPMS05_332483** SeqNo: **4942604** PrepDate: **07-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05362	0.00200	0.05	0.000302	107	80 - 120				
Arsenic	0.05367	0.00200	0.05	0.002097	103	80 - 120				
Cadmium	0.0507	0.00200	0.05	0.000016	101	80 - 120				
Calcium	123.7	0.500	5	122.4	25.6	80 - 120				SO
Iron	5.312	0.200	5	0.08431	105	80 - 120				
Lead	0.05083	0.00200	0.05	0.000078	102	80 - 120				
Magnesium	25.66	0.200	5	20.83	96.6	80 - 120				O
Potassium	7.303	0.200	5	2.163	103	80 - 120				
Selenium	0.05147	0.00200	0.05	0.001175	101	80 - 120				
Sodium	195.8	0.200	5	194.3	30.7	80 - 120				SEO

MSD Sample ID: **HS19020256-59MSD** Units: **mg/L** Analysis Date: **07-Feb-2019 22:02**
Client ID: **20190129-DGW-MW3-PV25out-controlT** Run ID: **ICPMS05_332483** SeqNo: **4942605** PrepDate: **07-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05545	0.00200	0.05	0.000302	110	80 - 120	0.05362	3.35	20	
Arsenic	0.05488	0.00200	0.05	0.002097	106	80 - 120	0.05367	2.24	20	
Cadmium	0.05299	0.00200	0.05	0.000016	106	80 - 120	0.0507	4.42	20	
Calcium	134.2	0.500	5	122.4	236	80 - 120	123.7	8.16	20	SO
Iron	5.488	0.200	5	0.08431	108	80 - 120	5.312	3.26	20	
Lead	0.05162	0.00200	0.05	0.000078	103	80 - 120	0.05083	1.55	20	
Magnesium	26.55	0.200	5	20.83	114	80 - 120	25.66	3.41	20	O
Potassium	7.428	0.200	5	2.163	105	80 - 120	7.303	1.7	20	
Selenium	0.05445	0.00200	0.05	0.001175	107	80 - 120	0.05147	5.63	20	
Sodium	206.5	0.200	5	194.3	244	80 - 120	195.8	5.3	20	SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

QC BATCH REPORT

Batch ID: 137507 **Instrument: ICPMS05** **Method: SW6020**

PDS Sample ID: **HS19020256-59PDS** Units: **mg/L** Analysis Date: **07-Feb-2019 22:05**
Client ID: **20190129-DGW-MW3-PV25out-controlT** Run ID: **ICPMS05_332483** SeqNo: **4942606** PrepDate: **07-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09855	0.00200	0.1	0.000302	98.2	75 - 125				
Arsenic	0.1043	0.00200	0.1	0.002097	102	75 - 125				
Cadmium	0.1039	0.00200	0.1	0.000016	104	75 - 125				
Calcium	127.4	0.500	10	122.4	50.1	75 - 125				SO
Iron	10.47	0.200	10	0.08431	104	75 - 125				
Lead	0.1016	0.00200	0.1	0.000078	102	75 - 125				
Magnesium	30.55	0.200	10	20.83	97.2	75 - 125				
Potassium	11.68	0.200	10	2.163	95.1	75 - 125				
Selenium	0.1038	0.00200	0.1	0.001175	103	75 - 125				

PDS Sample ID: **HS19020256-59PDS** Units: **mg/L** Analysis Date: **08-Feb-2019 13:52**
Client ID: **20190129-DGW-MW3-PV25out-controlT** Run ID: **ICPMS05_332566** SeqNo: **4943424** PrepDate: **07-Feb-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	303.3	2.00	100	201	102	75 - 125				

SD Sample ID: **HS19020256-59SD** Units: **mg/L** Analysis Date: **07-Feb-2019 21:58**
Client ID: **20190129-DGW-MW3-PV25out-controlT** Run ID: **ICPMS05_332483** SeqNo: **4942603** PrepDate: **07-Feb-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000302	0	10	
Arsenic	U	0.0100					0.002097	0	10	
Cadmium	U	0.0100					0.000016	0	10	
Calcium	116.2	2.50					122.4	5.08	10	
Iron	0.08216	1.00					0.08431	0	10	J
Lead	U	0.0100					0.000078	0	10	
Magnesium	21.95	1.00					20.83	5.39	10	
Potassium	2.21	1.00					2.163	2.18	10	
Selenium	U	0.0100					0.001175	0	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

QC BATCH REPORT

Batch ID: 137507 **Instrument:** ICPMS05 **Method:** SW6020

SD Sample ID: **HS19020256-59SD** Units: **mg/L** Analysis Date: **08-Feb-2019 13:50**
Client ID: **20190129-DGW-MW3-PV25out-controlT** Run ID: **ICPMS05_332566** SeqNo: **4943423** PrepDate: **07-Feb-2019** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Sodium	206.6	10.0					201	2.8	10	

The following samples were analyzed in this batch:

HS19020256-59	HS19020256-60	HS19020256-61	HS19020256-62
HS19020256-63	HS19020256-64	HS19020256-65	HS19020256-66
HS19020256-67	HS19020256-68		

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

QC BATCH REPORT

Batch ID: 137509 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLK-137509** Units: **mg/L** Analysis Date: **08-Feb-2019 14:39**
Client ID: Run ID: **ICPMS05_332566** SeqNo: **4943797** PrepDate: **07-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.0121	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	U	0.200								

LCS Sample ID: **LCS-137509** Units: **mg/L** Analysis Date: **08-Feb-2019 14:41**
Client ID: Run ID: **ICPMS05_332566** SeqNo: **4943798** PrepDate: **07-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.0543	0.00200	0.05	0	109	80 - 120				
Arsenic	0.05361	0.00200	0.05	0	107	80 - 120				
Cadmium	0.053	0.00200	0.05	0	106	80 - 120				
Calcium	5.524	0.500	5	0	110	80 - 120				
Iron	5.45	0.200	5	0	109	80 - 120				
Lead	0.05534	0.00200	0.05	0	111	80 - 120				
Magnesium	5.547	0.200	5	0	111	80 - 120				
Potassium	5.619	0.200	5	0	112	80 - 120				
Selenium	0.05439	0.00200	0.05	0	109	80 - 120				
Sodium	5.5	0.200	5	0	110	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

QC BATCH REPORT

Batch ID: 137509 **Instrument:** ICPMS05 **Method:** SW6020 (dissolved) (DISSOLVED)

MS Sample ID: **HS19020256-09MS** Units: **mg/L** Analysis Date: **08-Feb-2019 15:14**
Client ID: **20190122-DGW-MW11-PV15out-controlD** Run ID: **ICPMS05_332566** SeqNo: **4943811** PrepDate: **07-Feb-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05121	0.0100	0.05	0.000614	101	75 - 125				
Arsenic	0.05077	0.0100	0.05	0.000909	99.7	75 - 125				
Cadmium	0.06111	0.0100	0.05	0.01012	102	75 - 125				
Calcium	527.3	2.50	5	497.4	599	75 - 125				SO
Iron	5.29	1.00	5	0.005301	106	75 - 125				
Lead	0.05192	0.0100	0.05	0.000103	104	75 - 125				
Magnesium	310.6	1.00	5	299.2	229	75 - 125				SO
Potassium	26.89	1.00	5	20.69	124	75 - 125				O
Selenium	0.05743	0.0100	0.05	-0.000901	117	75 - 125				
Sodium	1618	1.00	5	1561	1140	75 - 125				SEO

MSD Sample ID: **HS19020256-09MSD** Units: **mg/L** Analysis Date: **08-Feb-2019 15:16**
Client ID: **20190122-DGW-MW11-PV15out-controlD** Run ID: **ICPMS05_332566** SeqNo: **4943812** PrepDate: **07-Feb-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05182	0.0100	0.05	0.000614	102	75 - 125	0.05121	1.17	20	
Arsenic	0.05278	0.0100	0.05	0.000909	104	75 - 125	0.05077	3.9	20	
Cadmium	0.06252	0.0100	0.05	0.01012	105	75 - 125	0.06111	2.27	20	
Calcium	524.8	2.50	5	497.4	548	75 - 125	527.3	0.485	20	SO
Iron	5.136	1.00	5	0.005301	103	75 - 125	5.29	2.95	20	
Lead	0.0521	0.0100	0.05	0.000103	104	75 - 125	0.05192	0.342	20	
Magnesium	321.6	1.00	5	299.2	449	75 - 125	310.6	3.48	20	SO
Potassium	27	1.00	5	20.69	126	75 - 125	26.89	0.411	20	SO
Selenium	0.06823	0.0100	0.05	-0.000901	138	75 - 125	0.05743	17.2	20	S
Sodium	1611	1.00	5	1561	1000	75 - 125	1618	0.417	20	SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

QC BATCH REPORT

Batch ID: 137509 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

PDS Sample ID: **HS19020256-09PDS** Units: **mg/L** Analysis Date: **08-Feb-2019 15:19**
Client ID: **20190122-DGW-MW11-PV15out-controlD** Run ID: **ICPMS05_332566** SeqNo: **4943813** PrepDate: **07-Feb-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.4929	0.0100	0.5	0.000614	98.5	75 - 125				
Arsenic	0.5344	0.0100	0.5	0.000909	107	75 - 125				
Cadmium	0.5274	0.0100	0.5	0.01012	103	75 - 125				
Calcium	543.4	2.50	50	497.4	92.1	75 - 125				O
Iron	52.82	1.00	50	0.005301	106	75 - 125				
Lead	0.5187	0.0100	0.5	0.000103	104	75 - 125				
Magnesium	348.7	1.00	50	299.2	99.0	75 - 125				O
Potassium	71.9	1.00	50	20.69	102	75 - 125				
Selenium	0.508	0.0100	0.5	-0.000901	102	75 - 125				

PDS Sample ID: **HS19020256-09PDS** Units: **mg/L** Analysis Date: **08-Feb-2019 20:02**
Client ID: **20190122-DGW-MW11-PV15out-controlD** Run ID: **ICPMS05_332566** SeqNo: **4943963** PrepDate: **07-Feb-2019** DF: **100**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	2635	20.0	1000	1672	96.3	75 - 125				

SD Sample ID: **HS19020256-09SD** Units: **mg/L** Analysis Date: **08-Feb-2019 15:12**
Client ID: **20190122-DGW-MW11-PV15out-controlD** Run ID: **ICPMS05_332566** SeqNo: **4943803** PrepDate: **07-Feb-2019** DF: **25**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0500					0.000614	0	10	
Arsenic	U	0.0500					0.000909	0	10	
Cadmium	0.009746	0.0500					0.01012	0	10	J
Calcium	448.5	12.5					497.4	9.82	10	
Iron	U	5.00					0.005301	0	10	
Lead	U	0.0500					0.000103	0	10	
Magnesium	290.5	5.00					299.2	2.91	10	
Potassium	19.53	5.00					20.69	5.58	10	
Selenium	U	0.0500					-0.000901	0	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

QC BATCH REPORT

Batch ID: 137509 **Instrument:** ICPMS05 **Method:** SW6020 (dissolved) (DISSOLVED)

SD Sample ID: **HS19020256-09SD** Units: **mg/L** Analysis Date: **08-Feb-2019 20:00**
Client ID: **20190122-DGW-MW11-PV15out-controlD** Run ID: **ICPMS05_332566** SeqNo: **4943962** PrepDate: **07-Feb-2019** DF: **500**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Sodium	1712	100					1672	2.41	10	

The following samples were analyzed in this batch:

HS19020256-09	HS19020256-10	HS19020256-11	HS19020256-12
HS19020256-13	HS19020256-14	HS19020256-15	HS19020256-16
HS19020256-17	HS19020256-18	HS19020256-29	HS19020256-30
HS19020256-31	HS19020256-32	HS19020256-33	HS19020256-34
HS19020256-35	HS19020256-36	HS19020256-37	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

QC BATCH REPORT

Batch ID: 137611 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLKF1-137611** Units: **mg/L** Analysis Date: **12-Feb-2019 14:18**
Client ID: Run ID: **ICPMS05_332704** SeqNo: **4947187** PrepDate: **11-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	0.08649	0.500								J
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.02186	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	0.0951	0.200								J

MBLK Sample ID: **MBLK-137611** Units: **mg/L** Analysis Date: **12-Feb-2019 14:20**
Client ID: Run ID: **ICPMS05_332704** SeqNo: **4947188** PrepDate: **11-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01334	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	U	0.200								

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

QC BATCH REPORT

Batch ID: 137611 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

LCS Sample ID: **LCS-137611** Units: **mg/L** Analysis Date: **12-Feb-2019 14:23**
Client ID: Run ID: **ICPMS05_332704** SeqNo: **4947189** PrepDate: **11-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05128	0.00200	0.05	0	103	80 - 120				
Arsenic	0.05098	0.00200	0.05	0	102	80 - 120				
Cadmium	0.05017	0.00200	0.05	0	100	80 - 120				
Calcium	5.335	0.500	5	0	107	80 - 120				
Iron	5.357	0.200	5	0	107	80 - 120				
Lead	0.04919	0.00200	0.05	0	98.4	80 - 120				
Magnesium	5.501	0.200	5	0	110	80 - 120				
Potassium	5.444	0.200	5	0	109	80 - 120				
Selenium	0.05202	0.00200	0.05	0	104	80 - 120				
Sodium	5.452	0.200	5	0	109	80 - 120				

MS Sample ID: **HS19020255-04MS** Units: **mg/L** Analysis Date: **12-Feb-2019 14:29**
Client ID: Run ID: **ICPMS05_332704** SeqNo: **4947193** PrepDate: **11-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05239	0.00200	0.05	0.000248	104	75 - 125				
Arsenic	0.0522	0.00200	0.05	0.000469	103	75 - 125				
Cadmium	0.05049	0.00200	0.05	0.000026	101	75 - 125				
Calcium	48.13	0.500	5	40.23	158	75 - 125				SO
Iron	5.307	0.200	5	0.02804	106	75 - 125				
Lead	0.05019	0.00200	0.05	0.000064	100	75 - 125				
Magnesium	23.16	0.200	5	17.35	116	75 - 125				
Potassium	6.335	0.200	5	0.9694	107	75 - 125				
Selenium	0.05242	0.00200	0.05	0.00019	104	75 - 125				
Sodium	78.9	0.200	5	69.61	186	75 - 125				SO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

QC BATCH REPORT

Batch ID: 137611 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MSD Sample ID: **HS19020255-04MSD** Units: **mg/L** Analysis Date: **12-Feb-2019 14:32**
Client ID: Run ID: **ICPMS05_332704** SeqNo: **4947194** PrepDate: **11-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05408	0.00200	0.05	0.000248	108	75 - 125	0.05239	3.18	20	
Arsenic	0.05255	0.00200	0.05	0.000469	104	75 - 125	0.0522	0.661	20	
Cadmium	0.0516	0.00200	0.05	0.000026	103	75 - 125	0.05049	2.17	20	
Calcium	48	0.500	5	40.23	155	75 - 125	48.13	0.273	20	SO
Iron	5.466	0.200	5	0.02804	109	75 - 125	5.307	2.96	20	
Lead	0.05062	0.00200	0.05	0.000064	101	75 - 125	0.05019	0.843	20	
Magnesium	23.55	0.200	5	17.35	124	75 - 125	23.16	1.66	20	
Potassium	6.482	0.200	5	0.9694	110	75 - 125	6.335	2.3	20	
Selenium	0.05062	0.00200	0.05	0.00019	101	75 - 125	0.05242	3.48	20	
Sodium	78.92	0.200	5	69.61	186	75 - 125	78.9	0.0264	20	SO

PDS Sample ID: **HS19020255-04PDS** Units: **mg/L** Analysis Date: **12-Feb-2019 14:34**
Client ID: Run ID: **ICPMS05_332704** SeqNo: **4947195** PrepDate: **11-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.0986	0.00200	0.1	0.000248	98.3	75 - 125				
Arsenic	0.1068	0.00200	0.1	0.000469	106	75 - 125				
Cadmium	0.1076	0.00200	0.1	0.000026	108	75 - 125				
Calcium	53.16	0.500	10	40.23	129	75 - 125				SO
Iron	10.88	0.200	10	0.02804	108	75 - 125				
Lead	0.09893	0.00200	0.1	0.000064	98.9	75 - 125				
Magnesium	28.85	0.200	10	17.35	115	75 - 125				
Potassium	11.95	0.200	10	0.9694	110	75 - 125				
Selenium	0.1084	0.00200	0.1	0.00019	108	75 - 125				
Sodium	84.32	0.200	10	69.61	147	75 - 125				SO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

QC BATCH REPORT

Batch ID: 137611 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

SD Sample ID: **HS19020255-04SD** Units: **mg/L** Analysis Date: **12-Feb-2019 14:27**
Client ID: Run ID: **ICPMS05_332704** SeqNo: **4947191** PrepDate: **11-Feb-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000248	0	10	
Arsenic	U	0.0100					0.000469	0	10	
Cadmium	U	0.0100					0.000026	0	10	
Calcium	42.59	2.50					40.23	5.87	10	
Iron	U	1.00					0.02804	0	10	
Lead	U	0.0100					0.000064	0	10	
Magnesium	18.99	1.00					17.35	9.41	10	
Potassium	1.032	1.00					0.9694	0	10	
Selenium	U	0.0100					0.00019	0	10	
Sodium	76.18	1.00					69.61	9.43	10	

The following samples were analyzed in this batch:

HS19020256-38	HS19020256-49	HS19020256-50	HS19020256-51
HS19020256-52	HS19020256-53	HS19020256-54	HS19020256-55
HS19020256-56	HS19020256-57	HS19020256-58	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

QC BATCH REPORT

Batch ID: R332664 **Instrument: ManTech01** **Method: SM2320B**

MBLK Sample ID: **WBLKW1-190209** Units: **mg/L** Analysis Date: **09-Feb-2019 13:38**
Client ID: Run ID: **ManTech01_332664** SeqNo: **4945184** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	U	5.00								
Alkalinity, Carbonate (As CaCO3)	U	5.00								
Alkalinity, Total (As CaCO3)	U	5.00								

LCS Sample ID: **WLCS1-190209** Units: **mg/L** Analysis Date: **09-Feb-2019 13:47**
Client ID: Run ID: **ManTech01_332664** SeqNo: **4945185** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1024	5.00	1000	0	102	85 - 115				
Alkalinity, Total (As CaCO3)	1058	5.00	1000	0	106	85 - 115				

LCSD Sample ID: **WLCSD1-190209** Units: **mg/L** Analysis Date: **09-Feb-2019 13:56**
Client ID: Run ID: **ManTech01_332664** SeqNo: **4945186** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1031	5.00	1000	0	103	85 - 115	1024	0.638	20	
Alkalinity, Total (As CaCO3)	1064	5.00	1000	0	106	85 - 115	1058	0.607	20	

DUP Sample ID: **HS19011505-01DUP** Units: **mg/L** Analysis Date: **09-Feb-2019 15:32**
Client ID: Run ID: **ManTech01_332664** SeqNo: **4945199** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	518.8	5.00					518.3	0.0964	20	
Alkalinity, Carbonate (As CaCO3)	U	5.00					0	0	20	
Alkalinity, Total (As CaCO3)	518.8	5.00					518.3	0.0964	20	

The following samples were analyzed in this batch:

HS19020256-01	HS19020256-02	HS19020256-03	HS19020256-04
HS19020256-05	HS19020256-06	HS19020256-07	HS19020256-08

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

QC BATCH REPORT

Batch ID: R332744 **Instrument: Balance1** **Method: M2540C**

MBLK Sample ID: **WBLK-021119** Units: **mg/L** Analysis Date: **11-Feb-2019 11:00**
Client ID: Run ID: **Balance1_332744** SeqNo: **4947252** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	U	10.0								

LCS Sample ID: **WLCS-021119** Units: **mg/L** Analysis Date: **11-Feb-2019 11:00**
Client ID: Run ID: **Balance1_332744** SeqNo: **4947253** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	954	10.0	1000	0	95.4	85 - 115				

DUP Sample ID: **HS19020358-01DUP** Units: **mg/L** Analysis Date: **11-Feb-2019 11:00**
Client ID: Run ID: **Balance1_332744** SeqNo: **4947251** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	852	10.0					878	3.01	5	

The following samples were analyzed in this batch:

HS19020256-01	HS19020256-02	HS19020256-03	HS19020256-04
HS19020256-05	HS19020256-06	HS19020256-07	HS19020256-08

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

QC BATCH REPORT

Batch ID: R332779 **Instrument: ICS2100** **Method: E300**

MBLK Sample ID: **WBLKW1-021219** Units: **mg/L** Analysis Date: **12-Feb-2019 11:53**
Client ID: Run ID: **ICS2100_332779** SeqNo: **4948063** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	U	0.500								

LCS Sample ID: **WLCSW1-021219** Units: **mg/L** Analysis Date: **12-Feb-2019 12:08**
Client ID: Run ID: **ICS2100_332779** SeqNo: **4948064** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	19.93	0.500	20	0	99.7	90 - 110				

LCSD Sample ID: **WLCSDW1-021219** Units: **mg/L** Analysis Date: **12-Feb-2019 12:23**
Client ID: Run ID: **ICS2100_332779** SeqNo: **4948065** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	20.43	0.500	20	0	102	90 - 110	19.93	2.47	20	

MS Sample ID: **HS19020311-01MS** Units: **mg/L** Analysis Date: **13-Feb-2019 02:59**
Client ID: Run ID: **ICS2100_332779** SeqNo: **4948098** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	44.2	0.500	10	32.65	116	80 - 120				

MS Sample ID: **HS19011432-01MS** Units: **mg/L** Analysis Date: **12-Feb-2019 13:52**
Client ID: Run ID: **ICS2100_332779** SeqNo: **4948067** PrepDate: DF: **500**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	5023	250	5000	388.6	92.7	80 - 120				

MSD Sample ID: **HS19020311-01MSD** Units: **mg/L** Analysis Date: **13-Feb-2019 03:14**
Client ID: Run ID: **ICS2100_332779** SeqNo: **4948099** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	44.91	0.500	10	32.65	123	80 - 120	44.2	1.59	20	S

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

QC BATCH REPORT

Batch ID: R332779 **Instrument: ICS2100** **Method: E300**

MSD Sample ID: **HS19011432-01MSD** Units: **mg/L** Analysis Date: **12-Feb-2019 14:07**
Client ID: Run ID: **ICS2100_332779** SeqNo: **4948068** PrepDate: DF: **500**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	5151	250	5000	388.6	95.2	80 - 120	5023	2.5	20	

The following samples were analyzed in this batch: HS19020256-01 HS19020256-06 HS19020256-07 HS19020256-08

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

QC BATCH REPORT

Batch ID: R332817 **Instrument: ICS2100** **Method: E300**

MBLK Sample ID: **WBLKW1-020619** Units: **mg/L** Analysis Date: **06-Feb-2019 16:57**
Client ID: Run ID: **ICS2100_332817** SeqNo: **4948673** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	0.500								
Nitrogen, Nitrate (As N)	U	0.100								

LCS Sample ID: **WLCSW1-020619** Units: **mg/L** Analysis Date: **06-Feb-2019 17:31**
Client ID: Run ID: **ICS2100_332817** SeqNo: **4948674** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.28	0.500	20	0	96.4	90 - 110				
Nitrogen, Nitrate (As N)	3.764	0.100	4	0	94.1	90 - 110				

LCSD Sample ID: **WLCSDW1-020619** Units: **mg/L** Analysis Date: **06-Feb-2019 17:46**
Client ID: Run ID: **ICS2100_332817** SeqNo: **4948675** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.75	0.500	20	0	98.7	90 - 110	19.28	2.41	20	
Nitrogen, Nitrate (As N)	3.855	0.100	4	0	96.4	90 - 110	3.764	2.39	20	

MS Sample ID: **HS19020263-01MS** Units: **mg/L** Analysis Date: **06-Feb-2019 18:18**
Client ID: Run ID: **ICS2100_332817** SeqNo: **4948677** PrepDate: DF: **2**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	533.3	1.00	20	521.9	57.2	80 - 120				SEO
Nitrogen, Nitrate (As N)	11.76	0.200	4	7.66	102	80 - 120				

MS Sample ID: **HS19020255-04MS** Units: **mg/L** Analysis Date: **06-Feb-2019 23:24**
Client ID: Run ID: **ICS2100_332817** SeqNo: **4948695** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	27.67	0.500	10	18.62	90.4	80 - 120				
Nitrogen, Nitrate (As N)	2.185	0.100	2	0	109	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

QC BATCH REPORT

Batch ID: R332817 **Instrument: ICS2100** **Method: E300**

MSD Sample ID: **HS19020263-01MSD** Units: **mg/L** Analysis Date: **06-Feb-2019 18:33**
Client ID: Run ID: **ICS2100_332817** SeqNo: **4948678** PrepDate: DF: **2**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	548.1	1.00	20	521.9	131	80 - 120	533.3	2.74	20	SEO
Nitrogen, Nitrate (As N)	11.81	0.200	4	7.66	104	80 - 120	11.76	0.419	20	

MSD Sample ID: **HS19020255-04MSD** Units: **mg/L** Analysis Date: **06-Feb-2019 23:38**
Client ID: Run ID: **ICS2100_332817** SeqNo: **4948696** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	28.06	0.500	10	18.62	94.4	80 - 120	27.67	1.4	20	
Nitrogen, Nitrate (As N)	2.228	0.100	2	0	111	80 - 120	2.185	1.95	20	

The following samples were analyzed in this batch: HS19020256-06 HS19020256-07 HS19020256-08

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

QC BATCH REPORT

Batch ID: R332818 **Instrument: ICS2100** **Method: E300**

MBLK Sample ID: **WBLKW2-020619** Units: **mg/L** Analysis Date: **07-Feb-2019 15:29**
Client ID: Run ID: **ICS2100_332818** SeqNo: **4948754** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	0.500								
Nitrogen, Nitrate (As N)	U	0.100								
Sulfate	U	0.500								

LCS Sample ID: **WLCSW2-020619** Units: **mg/L** Analysis Date: **07-Feb-2019 05:13**
Client ID: Run ID: **ICS2100_332818** SeqNo: **4948773** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.54	0.500	20	0	97.7	90 - 110				
Nitrogen, Nitrate (As N)	3.824	0.100	4	0	95.6	90 - 110				
Sulfate	19.48	0.500	20	0	97.4	90 - 110				

LCSD Sample ID: **WLCSDW2-020619** Units: **mg/L** Analysis Date: **07-Feb-2019 05:27**
Client ID: Run ID: **ICS2100_332818** SeqNo: **4948774** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.52	0.500	20	0	97.6	90 - 110	19.54	0.0768	20	
Nitrogen, Nitrate (As N)	3.804	0.100	4	0	95.1	90 - 110	3.824	0.524	20	
Sulfate	19.48	0.500	20	0	97.4	90 - 110	19.48	0.00513	20	

MS Sample ID: **HS19020256-03MS** Units: **mg/L** Analysis Date: **07-Feb-2019 03:16**
Client ID: **20190204-FD-PV20Out-35** Run ID: **ICS2100_332818** SeqNo: **4948765** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	37.73	0.500	10	27.85	98.8	80 - 120				
Nitrogen, Nitrate (As N)	2.81	0.100	2	0	140	80 - 120				S
Sulfate	968.3	0.500	10	972.7	-44.6	80 - 120				SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

QC BATCH REPORT

Batch ID: R332818 **Instrument: ICS2100** **Method: E300**

MSD Sample ID: **HS19020256-03MSD** Units: **mg/L** Analysis Date: **07-Feb-2019 03:31**
Client ID: **20190204-FD-PV20Out-35** Run ID: **ICS2100_332818** SeqNo: **4948766** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	37.82	0.500	10	27.85	99.7	80 - 120	37.73	0.249	20	
Nitrogen, Nitrate (As N)	2.821	0.100	2	0	141	80 - 120	2.81	0.391	20	S
Sulfate	964.3	0.500	10	972.7	-84.6	80 - 120	968.3	0.414	20	SEO

The following samples were analyzed in this batch: HS19020256-01 HS19020256-02 HS19020256-03 HS19020256-04 HS19020256-05

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

QC BATCH REPORT

Batch ID: R332873 **Instrument: ICS2100** **Method: E300**

MBLK Sample ID: **WBLKW1-021319** Units: **mg/L** Analysis Date: **13-Feb-2019 13:42**
Client ID: Run ID: **ICS2100_332873** SeqNo: **4950026** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	U	0.500								

LCS Sample ID: **WLCSW1-021319** Units: **mg/L** Analysis Date: **13-Feb-2019 14:11**
Client ID: Run ID: **ICS2100_332873** SeqNo: **4950028** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	20.03	0.500	20	0	100	90 - 110				

LCSD Sample ID: **WLCSDW1-021319** Units: **mg/L** Analysis Date: **13-Feb-2019 14:25**
Client ID: Run ID: **ICS2100_332873** SeqNo: **4950029** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	19.9	0.500	20	0	99.5	90 - 110	20.03	0.636	20	

MS Sample ID: **HS19020648-01MS** Units: **mg/L** Analysis Date: **13-Feb-2019 19:36**
Client ID: Run ID: **ICS2100_332873** SeqNo: **4950045** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	114	0.500	10	104.6	93.5	80 - 120				EO

MS Sample ID: **HS19020459-03MS** Units: **mg/L** Analysis Date: **13-Feb-2019 18:37**
Client ID: Run ID: **ICS2100_332873** SeqNo: **4950042** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	22.28	0.500	10	12.68	95.9	80 - 120				

MSD Sample ID: **HS19020648-01MSD** Units: **mg/L** Analysis Date: **13-Feb-2019 19:51**
Client ID: Run ID: **ICS2100_332873** SeqNo: **4950046** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	110.9	0.500	10	104.6	62.8	80 - 120	114	2.73	20	SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020256

QC BATCH REPORT

Batch ID: R332873 **Instrument: ICS2100** **Method: E300**

MSD Sample ID: **HS19020459-03MSD** Units: **mg/L** Analysis Date: **13-Feb-2019 18:52**
Client ID: Run ID: **ICS2100_332873** SeqNo: **4950043** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	22.13	0.500	10	12.68	94.4	80 - 120	22.28	0.671	20	

The following samples were analyzed in this batch: HS19020256-05

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19020256**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
California	2919, 2018-2019	30-Apr-2019
Maryland	343, 2018-2019	30-Jun-2019

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19020256

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19020256-01	20190204-FD-PV20Out-Control	Login	2/6/2019 10:42:32 AM	NDR	MET011

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19020256

Date/Time Received: **06-Feb-2019 09:35**
Received by: **RPG**

Checklist completed by: *Nilesh D. Ranchod* eSignature — 6-Feb-2019 Date

Reviewed by: *Dane J. Wacasey* eSignature — 13-Feb-2019 Date

Matrices: **Water**

Carrier name: **FedEx International Priority**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	7 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Samplers name present on COC?	Yes ☐	No ☑	
Chain of custody agrees with sample labels?	Yes ☐	No ☑	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	4.4C/4.8C UC/C	IR # 11
Cooler(s)/Kit(s):	44485	
Date/Time sample(s) sent to storage:	02/06/2019 13:30PM	

Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:
COC# 1 IDs differ: COC=20190402 Labels= 20190204.
COCs # 2, 3, 4, 5, 6, 7 all sample no time on COC or labels.
COC # 7 IDs differ: COC= 20190130-DGW-MW3-PV25Inlet, Labels = PV25 mid. Logged in per COC.

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

ALS Environmental

Chain of Custody Form

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HS19020256

Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information		Analysis Requested
PO Number	130-2086	Project Name	Exide Column Studies	A 300_W (300 Cl, SO4, [*NO3* *48hr HT*])
Work Order		Project Number	130-2086	B TDS_W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C ALK_W 2320B (2320B Alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D HARD (2340B Hardness (calc))
Address	13515 Barrett Parkway Drive Suite 260	Address	13515 Barrett Parkway Drive Suite 260	E ICP_TW (6020A Total Metals (6)+Cations)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	F ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
Phone		Phone		G
Fax		Fax		H
e-Mail Address	Emily_White@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com	I
				J

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190402-FD-PW2out-control		11:40	GW	2,8	3 1	X	X	X	X	X	X					
2	20190402-FD-PW2out-30		11:40	GW	8	1	X	X	X								
3	20190402-FD-PW2out-35		11:40	GW	8	1	X	X	X								
4	20190402-FD-PW2out-40		11:40	GW	8	1	X	X	X								
5																	
6	20190402-DGW-MW11-PW2out-control		11:50		8	1	X	X	X								
7	20190402-DGW-MW11-PW2out-30		11:50		8	1	X	X	X								
8	20190402-DGW-MW11-PW2out-35		11:50		8	1	X	X	X								
9	20190402-DGW-MW11-PW2out-40		11:50		8	1	X	X	X								
10																	

Sampler(s): Please Print & Sign: [signature]

Shipment Method: FedEx

Required Turnaround Time: ☐STD 10 Wk Days ☑5 Wk Days ☐2 Wk Days ☐24 Hour ☐Other _____

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
[signature]	2019/04/02	15:30	
Relinquished by:	Date: 2/6/19	Time: 0935	Received by (Laboratory): RG
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes:

Cooler Temp.

QC Package: (Check Box Below)

	Level II: Standard QC	X	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other: _____		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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Golder Associates

Exide Column Studies

ALS Project Manager:

Customer Information		Project Information			
PO Number	130-2086	Project Name	Exide Column Studies	A	300_W (300 Cl, SO4, [*NO3* *48hr HT*])
Work Order		Project Number	130-2086	B	TDS_W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK_W 2320B (2320B Alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B Hardness (calc))
Address	13515 Barrett Parkway Drive Suite 260	Address	13515 Barrett Parkway Drive Suite 260	E	ICP_TW (6020A Total Metals (6)+Cations)
				F	ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	G	
Phone		Phone		H	
Fax		Fax		I	
e-Mail Address	Emily_White@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190122-DGW-MW11-PU15out-controlD	2019/01/22		GW	2	1	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	X					
2	20190122-DGW-MW11-PU15out-30D	"		"	2	1						X					
3	20190122-DGW-MW11-PU15out-35D	"		"	2	1						X					
4	20190122-DGW-MW11-PU15out-40D	"		"	2	1						X					
5	20190122-DGW-MW11-PU15inlet-controlD	"		"	2	1						X					
6	20190122-DGW-MW11-PU15inlet-30-35-40D	"		"	2	1						X					
7	20190123-DGW-MW11-PU15mid-control	2019/01/23		"	2	1						X					
8	20190123-DGW-MW11-PU15mid-30D	"		"	2	1						X					
9	20190123-DGW-MW11-PU15mid-35D	"		"	2	1						X					
10	20190123-DGW-MW11-PU15mid-40D	"		"	2	1						X					

Sampler(s): Please Print & Sign: [signature]

Shipment Method: FedEx

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other ____

Results Due Date:

Relinquished by:	Date:	Time:	Received by:	Notes:
[signature]	2019/02/02	15:30		
Relinquished by:	Date: 2/6/19	Time: 0935	Received by (Laboratory): RG	Cooler Temp.
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	

QC Package: (Check Box Below)

	Level II: Standard QC	X	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other: ____		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information	
PO Number	130-2086	Project Name	Exide Column Studies
Work Order		Project Number	130-2086
Company Name	Golder Associates	Bill To Company	Golder Associates
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P
Address	13515 Barrett Parkway Drive Suite 260	Address	13515 Barrett Parkway Drive Suite 260
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021
Phone		Phone	
Fax		Fax	
e-Mail Address	Emily_White@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com

A	300_W (300 Cl, SO4, [*NO3* *48hr HT*])
B	TDS_W 2540C (2540C TDS)
C	ALK_W 2320B (2320B Alkalinity)
D	HARD (2340B Hardness (calc))
E	ICP_TW (6020A Total Metals (6)+Cations)
F	ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
G	
H	
I	
J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190122-DGW-MW11-PW1Sout-control	2019/01/22		GW	2,B	3,1	X	X	X	X	X	X					
2	20190122-DGW-MW11-PW1Sout-30T	"		"	2	1				X	X						
3	20190122-DGW-MW11-PW1Sout-35T	"		"	2	1				X	X						
4	20190122-DGW-MW11-PW1Sout-40T	"		"	2	1				X	X						
5	20190122-DGW-MW11-PW1Sinlet-control	"		"	2	1				X	X						
6	20190122-DGW-MW11-PW1Sinlet-30-35-40T	"		"	2	1				X	X						
7	20190123-DGW-MW11-PW1Smid-control	2019/01/23		"	2	1				X	X						
8	20190123-DGW-MW11-PW1Smid-30T	"		"	2	1				X	X						
9	20190123-DGW-MW11-PW1Smid-35T	"		"	2	1				X	X						
10	20190123-DGW-MW11-PW1Smid-40T	"		"	2	1				X	X						

Sampler(s): Please Print & Sign

Shipment Method: FedEx

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

	Date:	Time:		
Relinquished by:	2019/01/22	15:30	Received by:	Notes:
Relinquished by:	2/6/19	0935	Received by (Laboratory): RG	Cooler Temp.
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	

QC Package: (Check Box Below)

	Level II: Standard QC	X	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other: _____		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

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Chain of Custody Form

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Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086	Project Name	Exide Column Studies	A	300_W (300 Cl, SO4, [*NO3* *48hr HT*])
Work Order		Project Number	130-2086	B	TDS_W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK_W 2320B (2320B Alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B Hardness (calc))
Address	13515 Barrett Parkway Drive Suite 260	Address	13515 Barrett Parkway Drive Suite 260	E	ICP_TW (6020A Total Metals (6)+Cations)
				F	ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	G	
Phone		Phone		H	
Fax		Fax		I	
e-Mail Address	Emily_White@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190122-FD-PW15out-control D	2019/01/22		GW	2,8	3,1	X	X	X	X	X	X					
2	20190122-FD-PW15out-30D	"			2	1						X					
3	20190122-FD-PW15out-35D	"			2	1						X					
4	20190122-FD-PW15out-40D	"			2	1						X					
5	20190122-FD-PW15inlet-control D	"			2	1						X					
6	20190122-FD-PW15inlet-30-35-40D	"			2	1						X					
7	20190123-FD-PW15mid-control D	2019/01/23			2	1						X					
8	20190123-FD-PW15mid-30D	"			2	1						X					
9	20190123-FD-PW15mid-35D	"			2	1						X					
10	20190123-FD-PW15mid-40D	"			2	1						X					

Sampler(s): Please Print & Sign

Shipment Method: FedEx

Required Turnaround Time: ☐STD 10 Wk Days ☑5 Wk Days ☐2 Wk Days ☐24 Hour ☐Other ____

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
	2/9/2019	15:30	
Relinquished by:	Date:	Time:	Received by (Laboratory):
	2/6/19	0935	RG
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes:

Cooler Temp.

QC Package: (Check Box Below)

	Level II: Standard QC	X	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other: ____		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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Chain of Custody Form

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HS19020256

Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086	Project Name	Exide Column Studies	A	300_W (300 Cl, SO4, [*NO3* *48hr HT*])
Work Order		Project Number	130-2086	B	TDS_W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK_W 2320B (2320B Alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B Hardness (calc))
Address	13515 Barrett Parkway Drive Suite 260	Address	13515 Barrett Parkway Drive Suite 260	E	ICP_TW (6020A Total Metals (6)+Cations)
				F	ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	G	
Phone		Phone		H	
Fax		Fax		I	
e-Mail Address	Emily_White@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190122-FD-PV15out-control T	2019/01/22		GW	2,8	1 3	X	X	X	X	X	X					
2	20190122-FD-PV15out-30T	1		1	2	1				X	X						
3	20190122-FD-PV15out-35T	1		1	2	1				X	X						
4	20190122-FD-PV15out-40T	1		1	2	1				X	X						
5	20190122-FD-PV15inlet-control T	1		1	2	1				X	X						
6	20190122-FD-PV15inlet-30-35-40T	1		1	2	1				X	X						
7	20190123-FD-PV15~~inlet~~ MID-control T	2019/01/23		1	2	1				X	X						
8	20190123-FD-PV15mid-30T	1		1	2	1				X	X						
9	20190123-FD-PV15mid-35T	1		1	2	1				X	X						
10	20190123-FD-PV15mid-40T	11		1	2	1				X	X						

Sampler(s): Please Print & Sign: Grant Edmonson

Shipment Method: FedEx

Required Turnaround Time: ☐STD 10 Wk Days ☑5 Wk Days ☐2 Wk Days ☐24 Hour ☐Other _____

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
Grant Edmonson	2019/02/04	15:30	
Relinquished by:	Date: 2/6/19	Time: 0935	Received by (Laboratory): RG
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes:

Cooler Temp.

QC Package: (Check Box Below)

- ☐ Level II: Standard QC
- ☐ Level III: Std QC + Raw Data
- ☐ Level IV: SW846 CLP-Like
- ☐ Other: _____
- X TRRP-Checklist
- ☐ TRRP Level IV

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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HS19020256

Golder Associates
Exide Column Studies

ALS Environmental

ALS Project Manager:

Customer Information		Project Information			
PO Number	130-2086	Project Name	Exide Column Studies	A	300_W (300 Cl, SO4, [*NO3* *48hr HT*])
Work Order		Project Number	130-2086	B	TDS_W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK_W 2320B (2320B Alkalinity)
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P	D	HARD (2340B Hardness (calc))
Address	13515 Barrett Parkway Drive Suite 260	Address	13515 Barrett Parkway Drive Suite 260	E	ICP_TW (6020A Total Metals (6)+Cations)
				F	ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	G	
Phone		Phone		H	
Fax		Fax		I	
e-Mail Address	Emily_White@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190129-DGW-MW3-PW2Smid-control	2019/01/29		GW	2,8	3,1	X	X	X	X	X	X					
2	20190129-" " " -30D	"		"	2	1						X					
3	20190129-" " " -35D	"		"	2	1						X					
4	20190129-" " " -40D	"		"	2	1						X					
5	20190129-DGW-MW3-PW2Smid-control	"		"	2	1						X					
6	20190129-DGW-MW3-PW2Smid-30-35-40D	"		"	2	1						X					
7	20190130-DGW-MW3-PW2Smid-control	2019/01/30		"	2	1						X					
8	20190130-" " " -30D	"		"	2	1						X					
9	20190130-" " " -35D	"		"	2	1						X					
10	20190130-" " " -40D	"		"	2	1						X					

Sampler(s): Please Print & Sign: Emily White

Shipment Method: FedEx

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other ____

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
Emily White	2019/02/01	15.30	
Relinquished by:	Date: 2/6/19	Time: 0935	Received by (Laboratory): RG
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes:

Cooler Temp.

QC Package: (Check Box Below)

- ☐ Level II: Standard QC
- ☐ Level III: Std QC + Raw Data
- ☐ Level IV: SW846 CLP-Like
- ☐ Other: ____
- X TRRP-Checklist
- ☐ TRRP Level IV

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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HS19020256

Golder Associates
Exide Column Studies

ALS Environmental

ALS Project Manager:

Customer Information		Project Information	
PO Number	130-2086	Project Name	Exide Column Studies
Work Order		Project Number	130-2086
Company Name	Golder Associates	Bill To Company	Golder Associates
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P
Address	13515 Barrett Parkway Drive Suite 260	Address	13515 Barrett Parkway Drive Suite 260
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021
Phone		Phone	
Fax		Fax	
e-Mail Address	Emily_White@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com

A	300_W (300 Cl, SO4, [*NO3* *48hr HT*])
B	TDS_W 2540C (2540C TDS)
C	ALK_W 2320B (2320B Alkalinity)
D	HARD (2340B Hardness (calc))
E	ICP_TW (6020A Total Metals (6)+Cations)
F	ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
G	
H	
I	
J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190129-DGW-MW3-PW2Sout-contact	2019/01/29		GW	2,8	3,1	X	X	X	X	X	X					
2	" " " " -30T	"		"	2	1				X	X						
3	" " " " -85T	"		"	2	1				X	X						
4	" " " " -40T	"		"	2	1				X	X						
5	20190129-DGW-MW3-PW2Sinlet-contact	"		"	2	1				X	X						
6	20190129-DGW-MW3-PW2Sinlet-30-35-40T	"		"	2	1				X	X						
7	20190130-DGW-MW3-PW2Sinlet-contact	2019/01/30		"	2	1				X	X						
8	" " " " -30T	"		"	2	1				X	X						
9	" " " " -35T	"		"	2	1				X	X						
10	" " " " -40T	"		"	2	1				X	X						

Sampler(s): Please Print & Sign: [signature]

Shipment Method: FedEx

Required Turnaround Time: ☐STD 10 Wk Days ☑5 Wk Days ☐2 Wk Days ☐24 Hour ☐Other _____

Results Due Date:

Relinquished by: [signature]	Date: 2019/02/04	Time: 15:30	Received by:	Notes:
Relinquished by:	Date: 2/6/19	Time: 0935	Received by (Laboratory): RG	Cooler Temp.
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	

QC Package: (Check Box Below)

- ☐ Level II: Standard QC
- ☐ Level III: Std QC + Raw Data
- ☐ Level IV: SW846 CLP-Like
- ☐ Other: _____
- X TRRP-Checklist
- ☐ TRRP Level IV

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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ORIGIN ID:YUXA (514) 383-0990
Audrey Etheves
Golder Associates Ltd
7250 rue du Mile End
3e etage
MONTREAL, PQ H2R3A4
CANADA, CA

SHIP DATE: 04FEB19
ACTWGT: 35.25 LB
CAD: 108680724/INET4102

BILL RECIPIENT
EINVAT:

TO Dane Wacasey
(281) 530-5656
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

(US)

FedEx Express

AWB

J19019010720uv

NH SGRA

PKG:YOUR PKG

TRK# 7743 8484 5043

Form 0430

10:30A
INTL PRIORITY

REF:
DESC1:Échantillons d'eau
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: Audrey Etheves
T/C: R 967554812
D/T: R 967554812

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ORIGIN ID:YUXA (514) 383-0990
AUDREY ETHEVES
GOLDER ASSOCIATES LTD
7250 RUE DU MILE END
3E ETAGE
MONTREAL, PQ H2R3A4
CANADA CA

SHIP DATE: 04FEB19
ACTWGT: 35.25 LB
CAD: 108680724/INET4102

BILL RECIPIENT

TO **DANE WACASEY**
ALS HOUSTON LABORATORY
10450 STANCLIFF RD
STE 210
HOUSTON TX 77099 **(US)**
(281) 530-5656 REF:
INV:
PO: DEPT:

FedEx Express

E

TRK# 0430 **7743 8484 5043**

10:30A
INTL PRIORITY

NH SGRA

77099
TX-US IAH

Après l'impression de cette étiquette :
COPIE DU DESTINATAIRE - VEUILLEZ LA PLACER DEVANT LA POCHETTE
1. Pliez la page imprimée le long de la ligne horizontale.
2. Placez l'étiquette dans la pochette d'expédition et fixez-la à votre paquet.

CUSTODY SEAL
Time:
Seal Broken By:
Date:
ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
Date:
Name:
Company:
ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CUSTODY SEAL
Time:
Seal Broken By:
Date:
Name:
Company:

Chain of Custody Form

Page 1 of 7

ALS Environmental
North America Corporate Office
10450 Stancliff Road, Suite 210
Houston, TX 77099
+1 800 695 7222

ALS Project Manager:		Work Order #:	

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086-01	Project Name	Exide column studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrette Parkway Drive, Suit	E	ICP DISS (6020A diss metals (6)+cations-FldFltr)
				F	ICP TW (6020A total metals (6)+cations)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin Mo 63021	G	
Phone	314 984-8800	Phone	314 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190204-FD-PV20out-control	02-04-19	11:40 AM	GW	8	1	x	x	x								
2	20190204-FD-PV20out-30	02-04-19	11:40 AM	GW	8	1	x	x	x								
3	20190204-FD-PV20out-35	02-04-19	11:40 AM	GW	8	1	x	x	x								
4	20190204-FD-PV20out-40	02-04-19	11:40 AM	GW	8	1	x	x	x								
5																	
6	20190204-DGW-MW11-PV20out-control	02-04-19	11:50 AM	GW	8	1	x	x	x								
7	20190204-DGW-MW11-PV20out-30	02-04-19	11:50 AM	GW	8	1	x	x	x								
8	20190204-DGW-MW11-PV20out-35	02-04-19	11:50 AM	GW	8	1	x	x	x								
9	20190204-DGW-MW11-PV20out-40	02-04-19	11:50 AM	GW	8	1	x	x	x								
10																	

Sampler(s): Please Print & Sign	Shipment Method:	Required Turnaround Time:	Results Due Date:
Giovanna Llamosas		☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____	

Relinquished by:	Date:	Time:	Received by:	Notes:
Giovanna Llamosas	2019/04/02	15:30		
Relinquished by:	Date:	Time:	Received by (Laboratory):	Cooler Temp.
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	

QC Package: (Check Box Below)			
	Level II: Standard QC	x	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other: _____		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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ALS Environmental
North America Corporate Office
10450 Stancliff Road, Suite 210
Houston, TX 77099
+1 800 695 7222

ALS Project Manager:		Work Order #:	

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086-01	Project Name	Exide column studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrette Parkway Drive, Suit	E	ICP TW (6020A total metals (6)+cations)
				F	ICP DISS (6020A diss metals (6)+cations-FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin Mo 63021	G	
Phone	314 984-8800	Phone	314 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190122-DGW-MW11-PV15out-controlD	01-22-19	11:50 AM	GW	2	1						x					
2	20190122-DGW-MW11-PV15out-30D	01-22-19	11:50 AM	GW	2	1						x					
3	20190122-DGW-MW11-PV15out-35D	01-22-19	11:50 AM	GW	2	1						x					
4	20190122-DGW-MW11-PV15out-40D	01-22-19	11:50 AM	GW	2	1						x					
5	20190122-DGW-MW11-PV15inlet-controlD	01-22-19	12:00 PM	GW	2	1						x					
6	20190122-DGW-MW11-PV15inlet-30-35-40D	01-22-19	12:00 PM	GW	2	1						x					
7	20190123-DGW-MW11-PV15mid-controlD	01-23-19	5:15 PM	GW	2	1						x					
8	20190123-DGW-MW11-PV15mid-30D	01-23-19	5:15 PM	GW	2	1						x					
9	20190123-DGW-MW11-PV15mid-35D	01-23-19	5:15 PM	GW	2	1						x					
10	20190123-DGW-MW11-PV15mid-40D	01-23-19	5:15 PM	GW	2	1						x					

Sampler(s): Please Print & Sign	Shipment Method:	Required Turnaround Time:	Results Due Date:
Giovanna Llamosas		☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____	

Relinquished by:	Date:	Time:	Received by:	Notes:
Giovanna Llamosas	2019/04/02	15:30		
Relinquished by:	Date:	Time:	Received by (Laboratory):	Cooler Temp.
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	

QC Package: (Check Box Below)

	Level II: Standard QC	x	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other: _____		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

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North America Corporate Office
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Houston, TX 77099
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ALS Project Manager:		Work Order #:	

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086-01	Project Name	Exide column studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrette Parkway Drive, Suit	E	ICP TW (6020A total metals (6)+cations)
				F	ICP DISS (6020A diss metals (6)+cations-FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin Mo 63021	G	
Phone	314 984-8800	Phone	314 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190122-DGW-MW11-PV15out-controlT	01-22-19	11:50 AM	GW	2	1				x	x						
2	20190122-DGW-MW11-PV15out-30T	01-22-19	11:50 AM	GW	2	1				x	x						
3	20190122-DGW-MW11-PV15out-35T	01-22-19	11:50 AM	GW	2	1				x	x						
4	20190122-DGW-MW11-PV15out-40T	01-22-19	11:50 AM	GW	2	1				x	x						
5	20190122-DGW-MW11-PV15inlet-controlT	01-22-19	12:00 PM	GW	2	1				x	x						
6	20190122-DGW-MW11-PV15inlet-30-35-40T	01-22-19	12:00 PM	GW	2	1				x	x						
7	20190123-DGW-MW11-PV15mid-controlT	01-23-19	5:15 PM	GW	2	1				x	x						
8	20190123-DGW-MW11-PV15mid-30T	01-23-19	5:15 PM	GW	2	1				x	x						
9	20190123-DGW-MW11-PV15mid-35T	01-23-19	5:15 PM	GW	2	1				x	x						
10	20190123-DGW-MW11-PV15mid-40T	01-23-19	5:15 PM	GW	2	1				x	x						

Sampler(s): Please Print & Sign	Shipment Method:	Required Turnaround Time:	Results Due Date:
Giovanna Llamosas		☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____	

Relinquished by:	Date:	Time:	Received by:	Notes:
Giovanna Llamosas	2019/04/02	15:30		
Relinquished by:	Date:	Time:	Received by (Laboratory):	Cooler Temp.
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	

QC Package: (Check Box Below)

	Level II: Standard QC	x	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other: _____		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

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North America Corporate Office
10450 Stancliff Road, Suite 210
Houston, TX 77099
+1 800 695 7222

ALS Project Manager:			Work Order #:	
Customer Information		**Project Information**		**Parameter/Method Request for Analysis**
PO Number	130-2086-01	Project Name	Exide column studies	A 300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086	B TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrotte Parkway Drive, Suit	E ICP TW (6020A total metals (6)+cations)
				F ICP DISS (6020A diss metals (6)+cations-FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin Mo 63021	G
Phone	314 984-8800	Phone	314 984-8800	H
Fax		Fax		I
e-Mail Address	ewhite@golder.com	e-Mail Address		J

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190122-FD-PV15out-controlD	01-22-19	11:50 AM	GW	2	1						x					
2	20190122-FD-PV15out-30D	01-22-19	11:50 AM	GW	2	1						x					
3	20190122-FD-PV15out-35D	01-22-19	11:50 AM	GW	2	1						x					
4	20190122-FD-PV15out-40D	01-22-19	11:50 AM	GW	2	1						x					
5	20190122-FD-PV15inlet-controlD	01-22-19	12:00 PM	GW	2	1						x					
6	20190122-FD-PV15inlet-30-35-40D	01-22-19	12:00 PM	GW	2	1						x					
7	20190123-FD-PV15mid-controlD	01-23-19	5:30 PM	GW	2	1						x					
8	20190123-FD-PV15mid-30D	01-23-19	5:30 PM	GW	2	1						x					
9	20190123-FD-PV15mid-35D	01-23-19	5:30 PM	GW	2	1						x					
10	20190123-FD-PV15mid-40D	01-23-19	5:30 PM	GW	2	1						x					

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method:

Required Turnaround Time: ☐ Other _____
☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour

Results Due Date:

Relinquished by:	Date:	Time:	Received by:	Notes:
Giovanna Llamosas	2019/04/02	15:30		
Relinquished by:	Date:	Time:	Received by (Laboratory):	Cooler Temp.
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	

QC Package: (Check Box Below)

	Level II: Standard QC	x	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other: _____		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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Houston, TX 77099
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ALS Environmental

ALS Project Manager: | Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086-01	Project Name	Exide column studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrette Parkway Drive, Suit	E	ICP TW (6020A total metals (6)+cations)
				F	ICP DISS (6020A diss metals (6)+cations-FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin Mo 63021	G	
Phone	314 984-8800	Phone	314 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190122-FD-PV15out-controlT	01-22-19	11:50 AM	GW	2	1				x	x						
2	20190122-FD-PV15out-30T	01-22-19	11:50 AM	GW	2	1				x	x						
3	20190122-FD-PV15out-35T	01-22-19	11:50 AM	GW	2	1				x	x						
4	20190122-FD-PV15out-40T	01-22-19	11:50 AM	GW	2	1				x	x						
5	20190122-FD-PV15inlet-controlT	01-22-19	12:00 PM	GW	2	1				x	x						
6	20190122-FD-PV15inlet-30-35-40T	01-22-19	12:00 PM	GW	2	1				x	x						
7	20190123-FD-PV15mid-controlT	01-23-19	5:30 PM	GW	2	1				x	x						
8	20190123-FD-PV15mid-30T	01-23-19	5:30 PM	GW	2	1				x	x						
9	20190123-FD-PV15mid-35T	01-23-19	5:30 PM	GW	2	1				x	x						
10	20190123-FD-PV15mid-40T	01-23-19	5:30 PM	GW	2	1				x	x						

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method:

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by:	Date:	Time:	Received by:	Notes:
Giovanna Llamosas	2019/04/02	15:30		
Relinquished by:	Date:	Time:	Received by (Laboratory):	Cooler Temp.
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	

QC Package: (Check Box Below)

	Level II: Standard QC	x	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other: _____		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

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ALS Project Manager: | Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086-01	Project Name	Exide column studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrette Parkway Drive, Suit	E	ICP TW (6020A total metals (6)+cations)
				F	ICP DISS (6020A diss metals (6)+cations-FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin Mo 63021	G	
Phone	314 984-8800	Phone	314 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190129-DGW-MW3-PV25out-controlD	01-29-19	12:05 PM	GW	2	1						X					
2	20190129-DGW-MW3-PV25out-30D	01-29-19	12:05 PM	GW	2	1						X					
3	20190129-DGW-MW3-PV25out-35D	01-29-19	12:05 PM	GW	2	1						X					
4	20190129-DGW-MW3-PV25out-40D	01-29-19	12:05 PM	GW	2	1						X					
5	20190129-DGW-MW3-PV25inlet-controlD	01-29-19	12:20 PM	GW	2	1						X					
6	20190129-DGW-MW3-PV25inlet-30-35-40D	01-29-19	12:20 PM	GW	2	1						X					
7	20190130-DGW-MW3-PV25mid-controlD	01-30-19	4:25 PM	GW	2	1						X					
8	20190130-DGW-MW3-PV25mid-30D	01-30-19	4:25 PM	GW	2	1						X					
9	20190130-DGW-MW3-PV25mid-35D	01-30-19	4:25 PM	GW	2	1						X					
10	20190130-DGW-MW3-PV25mid-40D	01-30-19	4:25 PM	GW	2	1						X					

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method:

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
Giovanna Llamosas	2019/02/18	15:30	
Relinquished by:	Date:	Time:	Received by (Laboratory):
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes:

Cooler Temp.

QC Package: (Check Box Below)

	Level II: Standard QC	x	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other: _____		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

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ALS Project Manager:		Work Order #:	

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086-01	Project Name	Exide column studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrette Parkway Drive, Suit	E	ICP TW (6020A total metals (6)+cations)
				F	ICP DISS (6020A diss metals (6)+cations-FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin Mo 63021	G	
Phone	314 984-8800	Phone	314 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190129-DGW-MW3-PV25out-controlT	01-29-19	12:05 PM	GW	2	1				X	X						
2	20190129-DGW-MW3-PV25out-30T	01-29-19	12:05 PM	GW	2	1				X	X						
3	20190129-DGW-MW3-PV25out-35T	01-29-19	12:05 PM	GW	2	1				X	X						
4	20190129-DGW-MW3-PV25out-40T	01-29-19	12:05 PM	GW	2	1				X	X						
5	20190129-DGW-MW3-PV25inlet-controlT	01-29-19	12:20 PM	GW	2	1				X	X						
6	20190129-DGW-MW3-PV25inlet-30-35-40T	01-29-19	12:20 PM	GW	2	1				X	X						
7	20190130-DGW-MW3-PV25mid-controlT	01-30-19	4:25 PM	GW	2	1				X	X						
8	20190130-DGW-MW3-PV25mid-30T	01-30-19	4:25 PM	GW	2	1				X	X						
9	20190130-DGW-MW3-PV25mid-35T	01-30-19	4:25 PM	GW	2	1				X	X						
10	20190130-DGW-MW3-PV25mid-40T	01-30-19	4:25 PM	GW	2	1				X	X						

Sampler(s): Please Print & Sign	Shipment Method:	Required Turnaround Time:	Results Due Date:
Giovanna Llamosas		☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other	

Relinquished by:	Date:	Time:	Received by:	Notes:
Giovanna Llamosas	2019/02/18	15:30		
Relinquished by:	Date:	Time:	Received by (Laboratory):	Cooler Temp.
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	

QC Package: (Check Box Below)

	Level II: Standard QC	x	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other: _____		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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February 22, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19020798**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 20 sample(s) on Feb 15, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19020798**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS19020798**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 02/22/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19020798				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 137831,137924,R333360				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			2
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		X			3
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports	
Laboratory Name: ALS Laboratory Group	LRC Date: 02/22/2019
Project Name: Exide Column Studies	Laboratory Job Number: HS19020798
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 137831,137924,R333360

ER#[5]	Description
1	Batch 137831, Dissolved Metals Method SW6020, sample HS19020423-06, MS and MSD were performed on unrelated sample. Batch 137924, Metals Method SW6020, sample HS19020576-01, MS and MSD were performed on unrelated sample.
2	See Run Log and CCB Exceptions Report.
3	Batch 137831, Dissolved Metals Method SW6020, sample HS19020423-06, PDS was performed on unrelated sample.

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020798
Start Date: 19-Feb-2019 End Date: 20-Feb-2019

Run ID:ICPMS04_333119
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	19-Feb-2019 14:04	019_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	19-Feb-2019 14:06	020SMPL.d	CA NA
LLICV5	1	19-Feb-2019 14:08	021LICV.d	CA NA
ICB	1	19-Feb-2019 14:10	022_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	19-Feb-2019 14:46	024ICSA.d	CA NA
ICSAB	1	19-Feb-2019 14:49	025ICSB.d	CA NA
CCV 1	1	19-Feb-2019 15:19	035_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	19-Feb-2019 15:22	036_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	19-Feb-2019 15:45	045_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	19-Feb-2019 15:47	046_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLKF1-137831	1	19-Feb-2019 16:02	047SMPL.d	AS CA CD FE K MG NA PB SB SE
MBLKF2-137831	1	19-Feb-2019 16:05	048SMPL.d	AS CA CD FE K MG NA PB SB SE
MBLKF3-137831	1	19-Feb-2019 16:07	049SMPL.d	AS CA CD FE K MG NA PB SB SE
MBLK-137831	1	19-Feb-2019 16:09	050SMPL.d	AS CA CD FE K MG NA PB SB SE
LCS-137831	1	19-Feb-2019 16:11	051SMPL.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	19-Feb-2019 16:25	057_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	19-Feb-2019 16:27	058_CCB.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZSD	5	19-Feb-2019 16:35	060SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZMS	1	19-Feb-2019 16:38	061SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZMSD	1	19-Feb-2019 16:40	062SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZPDS	1	19-Feb-2019 16:42	063SMPL.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	19-Feb-2019 16:56	069_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	19-Feb-2019 16:58	070_CCB.d	AS CA CD FE K MG NA PB SB SE
20190206-FD-PV20Out-controlD	10	19-Feb-2019 17:14	073SMPL.d	CA NA
20190206-FD-PV20Out-30D	10	19-Feb-2019 17:16	074SMPL.d	CA NA
20190206-FD-PV20Out-35D	10	19-Feb-2019 17:18	075SMPL.d	CA NA
20190206-FD-PV20Out-40D	10	19-Feb-2019 17:21	076SMPL.d	CA NA
20190206-FD-PV20inlet-controlD	10	19-Feb-2019 17:23	077SMPL.d	CA NA
20190206-FD-PV20inlet-30-35-40D	10	19-Feb-2019 17:25	078SMPL.d	CA NA
CCV 5	1	19-Feb-2019 17:32	081_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	19-Feb-2019 17:34	082_CCB.d	AS CA CD FE K MG NA PB SB SE
20190207-FD-PV20mid-controlD	10	19-Feb-2019 17:36	083SMPL.d	CA NA
20190207-FD-PV20mid-30D	10	19-Feb-2019 17:39	084SMPL.d	CA NA
20190207-FD-PV20mid-35D	10	19-Feb-2019 17:41	085SMPL.d	CA NA
20190207-FD-PV20mid-40D	10	19-Feb-2019 17:43	086SMPL.d	CA NA
CCV 6	1	19-Feb-2019 17:48	088_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	19-Feb-2019 17:50	089_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 7	1	19-Feb-2019 20:38	107_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	19-Feb-2019 20:40	108SMPL.d	CA NA
LLCCV5	1	19-Feb-2019 20:42	109LICV.d	CA NA
ICCB 7	1	19-Feb-2019 20:44	110_ICB.d	AS CA CD FE K MG NA PB SB SE
CCV 8	1	19-Feb-2019 21:49	120_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	19-Feb-2019 21:52	121_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	19-Feb-2019 22:16	132_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	19-Feb-2019 22:19	133_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 10	1	19-Feb-2019 22:41	143_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	19-Feb-2019 22:43	144_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 11	1	19-Feb-2019 23:03	153_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	19-Feb-2019 23:06	154_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 12	1	19-Feb-2019 23:33	165_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 12	1	19-Feb-2019 23:36	166_CCB.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020798

Run ID:ICPMS04_333119
Instrument:ICPMS04
Method:SW6020

ICB	Date: 19-Feb-2019 14:10	Seq: 4955312		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Potassium	23.01	18	200	
CCB 1	Date: 19-Feb-2019 15:22	Seq: 4955575		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.08	0.4	2	
	Potassium	41.67	18	200	
	Sodium	33.72	14	200	
CCB 2	Date: 19-Feb-2019 15:47	Seq: 4955584		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.142	0.4	2	
	Potassium	49.79	18	200	
	Sodium	45.69	14	200	
CCB 3	Date: 19-Feb-2019 16:27	Seq: 4955778		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.922	0.4	2	
	Potassium	49.29	18	200	
	Sodium	44.44	14	200	
CCB 4	Date: 19-Feb-2019 16:58	Seq: 4955856		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.982	0.4	2	
	Iron	20.68	12	200	
	Potassium	62.61	18	200	
	Sodium	59.44	14	200	
CCB 5	Date: 19-Feb-2019 17:34	Seq: 4956174		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.788	0.4	2	
	Potassium	65.97	18	200	
	Sodium	45.62	14	200	
CCB 6	Date: 19-Feb-2019 17:50	Seq: 4956181		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.889	0.4	2	
	Potassium	63.64	18	200	
	Sodium	38.66	14	200	
ICCB 7	Date: 19-Feb-2019 20:44	Seq: 4956192		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Iron	-12.4	12	200	
CCB 8	Date: 19-Feb-2019 21:52	Seq: 4956203		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.444	0.4	2	
	Sodium	34.83	14	200	
CCB 9	Date: 19-Feb-2019 22:19	Seq: 4956215		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.437	0.4	2	
	Iron	15.93	12	200	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020798
Start Date: 20-Feb-2019 End Date: 21-Feb-2019

Run ID:ICPMS04_333185
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	20-Feb-2019 13:07	022_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	20-Feb-2019 13:09	023SMPL.d	AS CD FE K MG PB SB SE
LLICV5	1	20-Feb-2019 13:12	024LICV.d	AS CD FE K MG PB SB SE
ICB	1	20-Feb-2019 13:14	025_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	20-Feb-2019 13:33	027ICSA.d	AS CD FE K MG PB SB SE
ICSAB	1	20-Feb-2019 13:35	028ICSB.d	AS CD FE K MG PB SB SE
CCB 1	1	20-Feb-2019 14:09	041_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 1	1	20-Feb-2019 14:16	043_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	20-Feb-2019 14:42	053_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	20-Feb-2019 14:45	054_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	20-Feb-2019 14:57	059_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	20-Feb-2019 14:59	060_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	20-Feb-2019 15:38	070_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	20-Feb-2019 15:44	072_CCV.d	AS CA CD FE K MG NA PB SB SE
20190206-FD-PV20Out-controlD	1	20-Feb-2019 15:54	073SMPL.d	AS CD FE K MG PB SB SE
20190206-FD-PV20Out-30D	1	20-Feb-2019 15:56	074SMPL.d	AS CD FE K MG PB SB SE
20190206-FD-PV20Out-35D	1	20-Feb-2019 15:59	075SMPL.d	AS CD FE K MG PB SB SE
20190206-FD-PV20Out-40D	1	20-Feb-2019 16:01	076SMPL.d	AS CD FE K MG PB SB SE
20190206-FD-PV20inlet-controlD	1	20-Feb-2019 16:03	077SMPL.d	AS CD FE K MG PB SB SE
20190206-FD-PV20inlet-30-35-40D	1	20-Feb-2019 16:06	078SMPL.d	AS CD FE K MG PB SB SE
20190207-FD-PV20mid-controlD	1	20-Feb-2019 16:08	079SMPL.d	AS CD FE K MG PB SB SE
20190207-FD-PV20mid-30D	1	20-Feb-2019 16:10	080SMPL.d	AS CD FE K MG PB SB SE
CCV 5	1	20-Feb-2019 16:15	082_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	20-Feb-2019 16:17	083_CCB.d	AS CA CD FE K MG NA PB SB SE
20190207-FD-PV20mid-35D	1	20-Feb-2019 16:38	091SMPL.d	AS CD FE K MG PB SB SE
20190207-FD-PV20mid-40D	1	20-Feb-2019 16:40	092SMPL.d	AS CD FE K MG PB SB SE
CCV 6	1	20-Feb-2019 16:45	094_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	20-Feb-2019 16:47	095_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	20-Feb-2019 16:58	097_CCV.d	AS CA CD FE K MG NA PB SB SE
ICCV 8	1	20-Feb-2019 17:32	110_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	20-Feb-2019 17:34	111SMPL.d	AS CD FE K MG PB SB SE
LLCCV5	1	20-Feb-2019 17:36	112LICV.d	AS CD FE K MG PB SB SE
ICCB 7	1	20-Feb-2019 17:38	113_ICB.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	20-Feb-2019 18:11	125_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	20-Feb-2019 18:14	126_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 10	1	20-Feb-2019 18:38	137_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	20-Feb-2019 18:40	138_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 11	1	20-Feb-2019 19:06	149_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	20-Feb-2019 19:08	150_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 12	1	20-Feb-2019 21:03	154_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	20-Feb-2019 21:06	155_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 13	1	20-Feb-2019 21:29	164_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 12	1	20-Feb-2019 21:31	165_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 14	1	20-Feb-2019 21:55	176_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 13	1	20-Feb-2019 21:57	177_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 15	1	20-Feb-2019 22:22	188_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 14	1	20-Feb-2019 22:24	189_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 16	1	20-Feb-2019 22:49	200_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 15	1	20-Feb-2019 22:51	201_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 17	1	20-Feb-2019 23:19	212_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 16	1	20-Feb-2019 23:21	213_CCB.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020798

Run ID:ICPMS04_333185
Instrument:ICPMS04
Method:SW6020

ICB	Date: 20-Feb-2019 13:14	Seq: 4956822		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Iron	-16.46	12	200	
CCB 1	Date: 20-Feb-2019 14:09	Seq: 4957000		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Iron	81.85	12	200	
	Potassium	22.19	18	200	
CCB 2	Date: 20-Feb-2019 14:45	Seq: 4957086		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Iron	-29.43	12	200	
CCB 3	Date: 20-Feb-2019 14:59	Seq: 4957183		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Iron	-34.49	12	200	
CCB 4	Date: 20-Feb-2019 15:38	Seq: 4957294		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Iron	44.87	12	200	
CCB 5	Date: 20-Feb-2019 16:17	Seq: 4957475		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Iron	-13.01	12	200	
CCB 6	Date: 20-Feb-2019 16:47	Seq: 4957567		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Iron	-15.76	12	200	
ICCB 7	Date: 20-Feb-2019 17:38	Seq: 4957630		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Iron	-25.88	12	200	
CCB 8	Date: 20-Feb-2019 18:14	Seq: 4957852		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Iron	-30.63	12	200	
	Potassium	-23.24	18	200	
CCB 9	Date: 20-Feb-2019 18:40	Seq: 4957864		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Iron	-33.24	12	200	
	Potassium	-48.05	18	200	
CCB 10	Date: 20-Feb-2019 19:08	Seq: 4957876		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Iron	-28.66	12	200	
	Potassium	-55.56	18	200	
CCB 11	Date: 20-Feb-2019 21:06	Seq: 4958019		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Iron	-27.84	12	200	
	Potassium	-22.75	18	200	
CCB 12	Date: 20-Feb-2019 21:31	Seq: 4958029		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020798
Start Date: 21-Feb-2019 End Date: 22-Feb-2019

Run ID:ICPMS05_333276
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	21-Feb-2019 12:08	020_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	21-Feb-2019 12:11	021SMPL.d	AS CA CD FE K MG NA PB SB SE
LLICV5	1	21-Feb-2019 12:13	022LICV.d	AS CA CD FE K MG NA PB SB SE
ICB	1	21-Feb-2019 12:15	023_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	21-Feb-2019 12:26	025ICSA.d	AS CA CD FE K MG NA PB SB SE
ICSAB	1	21-Feb-2019 12:28	026ICSB.d	AS CA CD FE K MG NA PB SB SE
CCV 1	1	21-Feb-2019 13:03	037_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	21-Feb-2019 13:05	038_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	21-Feb-2019 13:32	049_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	21-Feb-2019 13:34	050_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	21-Feb-2019 14:01	061_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	21-Feb-2019 14:03	062_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-137924	1	21-Feb-2019 15:06	064SMPL.d	AS CA CD FE K MG NA PB SB SE
LCS-137924	1	21-Feb-2019 15:09	065SMPL.d	AS CA CD FE K MG PB SB SE
ZZZZZZSD	5	21-Feb-2019 15:13	067SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZMS	1	21-Feb-2019 15:15	068SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZMSD	1	21-Feb-2019 15:18	069SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZPDS	1	21-Feb-2019 15:20	070SMPL.d	AS CA CD FE K MG NA PB SB SE
20190206-FD-PV20Out-controlT	10	21-Feb-2019 15:24	072SMPL.d	CA NA
CCV 4	1	21-Feb-2019 15:29	074_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	21-Feb-2019 15:31	075_CCB.d	AS CA CD FE K MG NA PB SB SE
20190206-FD-PV20Out-30T	10	21-Feb-2019 15:37	076SMPL.d	CA NA
20190206-FD-PV20Out-35T	10	21-Feb-2019 15:39	077SMPL.d	CA NA
20190206-FD-PV20Out-40T	10	21-Feb-2019 15:41	078SMPL.d	CA NA
20190206-FD-PV20inlet-controlT	10	21-Feb-2019 15:43	079SMPL.d	CA NA
20190206-FD-PV20inlet-30-35-40T	10	21-Feb-2019 15:46	080SMPL.d	CA NA
20190207-FD-PV20mid-controlT	10	21-Feb-2019 15:48	081SMPL.d	CA NA
20190207-FD-PV20mid-30T	10	21-Feb-2019 15:50	082SMPL.d	CA NA
20190207-FD-PV20mid-35T	10	21-Feb-2019 15:53	083SMPL.d	CA NA
20190207-FD-PV20mid-40T	10	21-Feb-2019 15:55	084SMPL.d	CA NA
CCV 5	1	21-Feb-2019 15:59	086_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	21-Feb-2019 16:02	087_CCB.d	AS CA CD FE K MG NA PB SB SE
20190206-FD-PV20Out-controlT	1	21-Feb-2019 16:14	091SMPL.d	AS CD FE K MG PB SB SE
20190206-FD-PV20Out-30T	1	21-Feb-2019 16:17	092SMPL.d	AS CD FE K MG PB SB SE
20190206-FD-PV20Out-35T	1	21-Feb-2019 16:19	093SMPL.d	AS CD FE K MG PB SB SE
20190206-FD-PV20Out-40T	1	21-Feb-2019 16:21	094SMPL.d	AS CD FE K MG PB SB SE
20190206-FD-PV20inlet-controlT	1	21-Feb-2019 16:23	095SMPL.d	AS CD FE K MG PB SB SE
CCV 6	1	21-Feb-2019 16:45	097_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	21-Feb-2019 16:48	098_CCB.d	AS CA CD FE K MG NA PB SB SE
20190206-FD-PV20inlet-30-35-40T	1	21-Feb-2019 16:57	099SMPL.d	AS CD FE K MG PB SB SE
20190207-FD-PV20mid-controlT	1	21-Feb-2019 17:00	100SMPL.d	AS CD FE K MG PB SB SE
20190207-FD-PV20mid-30T	1	21-Feb-2019 17:02	101SMPL.d	AS CD FE K MG PB SB SE
20190207-FD-PV20mid-35T	1	21-Feb-2019 17:04	102SMPL.d	AS CD FE K MG PB SB SE
20190207-FD-PV20mid-40T	1	21-Feb-2019 17:06	103SMPL.d	AS CD FE K MG PB SB SE
CCV 7	1	21-Feb-2019 17:16	105_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	21-Feb-2019 17:18	106_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 8	1	21-Feb-2019 18:04	120_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	21-Feb-2019 18:06	121_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	21-Feb-2019 18:31	132_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	21-Feb-2019 18:33	133_CCB.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020798

Run ID:ICPMS05_333276
Instrument:ICPMS05
Method:SW6020

CCB 1	Date: 21-Feb-2019 13:05	Seq: 4958923	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Magnesium	10.27	10	200	
Sodium	26	14	200	

CCB 2	Date: 21-Feb-2019 13:34	Seq: 4959003	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	34.67	14	200	

CCB 3	Date: 21-Feb-2019 14:03	Seq: 4959015	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	114.6	14	200	

CCB 4	Date: 21-Feb-2019 15:31	Seq: 4959312	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.426	0.4	2	
Sodium	52.05	14	200	

CCB 5	Date: 21-Feb-2019 16:02	Seq: 4959324	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	58.17	14	200	

CCB 6	Date: 21-Feb-2019 16:48	Seq: 4959335	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	76.22	14	200	

CCB 7	Date: 21-Feb-2019 17:18	Seq: 4959343	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	97.39	14	200	

CCB 8	Date: 21-Feb-2019 18:06	Seq: 4959357	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.572	0.4	2	
Sodium	50.78	14	200	

CCB 9	Date: 21-Feb-2019 18:33	Seq: 4959369	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.493	0.4	2	
Potassium	-25.06	18	200	
Sodium	95.45	14	200	

CCB 10	Date: 21-Feb-2019 19:01	Seq: 4959381	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.381	0.4	2	
Potassium	-18.04	18	200	
Sodium	90.59	14	200	

CCB 12	Date: 21-Feb-2019 22:31	Seq: 4959455	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.823	0.4	2	
Potassium	22.73	18	200	
Sodium	15.15	14	200	

CCB 13	Date: 21-Feb-2019 22:47	Seq: 4959474	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19020798

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19020798-01	20190206-FD-PV20Out-controlD	Groundwater		06-Feb-2019 15:10	15-Feb-2019 08:37	☐
HS19020798-02	20190206-FD-PV20Out-30D	Groundwater		06-Feb-2019 15:10	15-Feb-2019 08:37	☐
HS19020798-03	20190206-FD-PV20Out-35D	Groundwater		06-Feb-2019 15:10	15-Feb-2019 08:37	☐
HS19020798-04	20190206-FD-PV20Out-40D	Groundwater		06-Feb-2019 15:10	15-Feb-2019 08:37	☐
HS19020798-05	20190206-FD-PV20inlet-controlD	Groundwater		06-Feb-2019 15:20	15-Feb-2019 08:37	☐
HS19020798-06	20190206-FD-PV20inlet-30-35-40D	Groundwater		06-Feb-2019 15:20	15-Feb-2019 08:37	☐
HS19020798-07	20190207-FD-PV20mid-controlD	Groundwater		07-Feb-2019 18:10	15-Feb-2019 08:37	☐
HS19020798-08	20190207-FD-PV20mid-30D	Groundwater		07-Feb-2019 18:10	15-Feb-2019 08:37	☐
HS19020798-09	20190207-FD-PV20mid-35D	Groundwater		07-Feb-2019 18:10	15-Feb-2019 08:37	☐
HS19020798-10	20190207-FD-PV20mid-40D	Groundwater		07-Feb-2019 18:10	15-Feb-2019 08:37	☐
HS19020798-11	20190206-FD-PV20Out-controlT	Groundwater		06-Feb-2019 15:10	15-Feb-2019 08:37	☐
HS19020798-12	20190206-FD-PV20Out-30T	Groundwater		06-Feb-2019 15:10	15-Feb-2019 08:37	☐
HS19020798-13	20190206-FD-PV20Out-35T	Groundwater		06-Feb-2019 15:10	15-Feb-2019 08:37	☐
HS19020798-14	20190206-FD-PV20Out-40T	Groundwater		06-Feb-2019 15:10	15-Feb-2019 08:37	☐
HS19020798-15	20190206-FD-PV20inlet-controlT	Groundwater		06-Feb-2019 15:20	15-Feb-2019 08:37	☐
HS19020798-16	20190206-FD-PV20inlet-30-35-40T	Groundwater		06-Feb-2019 15:20	15-Feb-2019 08:37	☐
HS19020798-17	20190207-FD-PV20mid-controlT	Groundwater		07-Feb-2019 18:10	15-Feb-2019 08:37	☐
HS19020798-18	20190207-FD-PV20mid-30T	Groundwater		07-Feb-2019 18:10	15-Feb-2019 08:37	☐
HS19020798-19	20190207-FD-PV20mid-35T	Groundwater		06-Feb-2019 18:10	15-Feb-2019 08:37	☐
HS19020798-20	20190207-FD-PV20mid-40T	Groundwater		07-Feb-2019 18:10	15-Feb-2019 08:37	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190206-FD-PV20Out-controlD
Collection Date: 06-Feb-2019 15:10

ANALYTICAL REPORT
WorkOrder:HS19020798
Lab ID:HS19020798-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 18-Feb-2019		Analyst: JCJ
Antimony	**0.0362**		**0.000400**	**0.00200**	**mg/L**	1	20-Feb-2019 15:54
Arsenic	**0.00130**	J	**0.000400**	**0.00200**	**mg/L**	1	20-Feb-2019 15:54
Cadmium	U		0.000200	0.00200	mg/L	1	20-Feb-2019 15:54
Calcium	**204**		**0.340**	**5.00**	**mg/L**	10	19-Feb-2019 17:14
Iron	**0.0132**	J	**0.0120**	**0.200**	**mg/L**	1	20-Feb-2019 15:54
Lead	U		0.000600	0.00200	mg/L	1	20-Feb-2019 15:54
Magnesium	**1.18**		**0.0100**	**0.200**	**mg/L**	1	20-Feb-2019 15:54
Potassium	**13.0**		**0.0180**	**0.200**	**mg/L**	1	20-Feb-2019 15:54
Selenium	**0.00480**		**0.00110**	**0.00200**	**mg/L**	1	20-Feb-2019 15:54
Sodium	**271**		**0.140**	**2.00**	**mg/L**	10	19-Feb-2019 17:14

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190206-FD-PV20Out-30D
Collection Date: 06-Feb-2019 15:10

ANALYTICAL REPORT
WorkOrder:HS19020798
Lab ID:HS19020798-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 18-Feb-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	20-Feb-2019 15:56
Arsenic	U		0.000400	0.00200	mg/L	1	20-Feb-2019 15:56
Cadmium	U		0.000200	0.00200	mg/L	1	20-Feb-2019 15:56
Calcium	**197**		**0.340**	**5.00**	**mg/L**	10	19-Feb-2019 17:16
Iron	**0.0496**	J	**0.0120**	**0.200**	**mg/L**	1	20-Feb-2019 15:56
Lead	U		0.000600	0.00200	mg/L	1	20-Feb-2019 15:56
Magnesium	**0.814**		**0.0100**	**0.200**	**mg/L**	1	20-Feb-2019 15:56
Potassium	**13.0**		**0.0180**	**0.200**	**mg/L**	1	20-Feb-2019 15:56
Selenium	U		0.00110	0.00200	mg/L	1	20-Feb-2019 15:56
Sodium	**278**		**0.140**	**2.00**	**mg/L**	10	19-Feb-2019 17:16

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190206-FD-PV20Out-35D
Collection Date: 06-Feb-2019 15:10

ANALYTICAL REPORT
WorkOrder:HS19020798
Lab ID:HS19020798-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 18-Feb-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	20-Feb-2019 15:59
Arsenic	U		0.000400	0.00200	mg/L	1	20-Feb-2019 15:59
Cadmium	U		0.000200	0.00200	mg/L	1	20-Feb-2019 15:59
Calcium	**194**		**0.340**	**5.00**	**mg/L**	10	19-Feb-2019 17:18
Iron	**0.0450**	J	**0.0120**	**0.200**	**mg/L**	1	20-Feb-2019 15:59
Lead	U		0.000600	0.00200	mg/L	1	20-Feb-2019 15:59
Magnesium	**0.980**		**0.0100**	**0.200**	**mg/L**	1	20-Feb-2019 15:59
Potassium	**12.8**		**0.0180**	**0.200**	**mg/L**	1	20-Feb-2019 15:59
Selenium	U		0.00110	0.00200	mg/L	1	20-Feb-2019 15:59
Sodium	**264**		**0.140**	**2.00**	**mg/L**	10	19-Feb-2019 17:18

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190206-FD-PV20Out-40D
Collection Date: 06-Feb-2019 15:10

ANALYTICAL REPORT
WorkOrder:HS19020798
Lab ID:HS19020798-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 18-Feb-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	20-Feb-2019 16:01
Arsenic	U		0.000400	0.00200	mg/L	1	20-Feb-2019 16:01
Cadmium	U		0.000200	0.00200	mg/L	1	20-Feb-2019 16:01
Calcium	**201**		**0.340**	**5.00**	**mg/L**	10	19-Feb-2019 17:21
Iron	**0.0181**	J	**0.0120**	**0.200**	**mg/L**	1	20-Feb-2019 16:01
Lead	U		0.000600	0.00200	mg/L	1	20-Feb-2019 16:01
Magnesium	**1.04**		**0.0100**	**0.200**	**mg/L**	1	20-Feb-2019 16:01
Potassium	**13.0**		**0.0180**	**0.200**	**mg/L**	1	20-Feb-2019 16:01
Selenium	U		0.00110	0.00200	mg/L	1	20-Feb-2019 16:01
Sodium	**277**		**0.140**	**2.00**	**mg/L**	10	19-Feb-2019 17:21

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190206-FD-PV20inlet-controlD
Collection Date: 06-Feb-2019 15:20

ANALYTICAL REPORT
WorkOrder:HS19020798
Lab ID:HS19020798-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 18-Feb-2019		Analyst: JCJ
Antimony	**0.0353**		**0.000400**	**0.00200**	**mg/L**	1	20-Feb-2019 16:03
Arsenic	**0.00115**	J	**0.000400**	**0.00200**	**mg/L**	1	20-Feb-2019 16:03
Cadmium	U		0.000200	0.00200	mg/L	1	20-Feb-2019 16:03
Calcium	**199**		**0.340**	**5.00**	**mg/L**	10	19-Feb-2019 17:23
Iron	U		0.0120	0.200	mg/L	1	20-Feb-2019 16:03
Lead	U		0.000600	0.00200	mg/L	1	20-Feb-2019 16:03
Magnesium	**1.20**		**0.0100**	**0.200**	**mg/L**	1	20-Feb-2019 16:03
Potassium	**12.2**		**0.0180**	**0.200**	**mg/L**	1	20-Feb-2019 16:03
Selenium	**0.00594**		**0.00110**	**0.00200**	**mg/L**	1	20-Feb-2019 16:03
Sodium	**267**		**0.140**	**2.00**	**mg/L**	10	19-Feb-2019 17:23

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190206-FD-PV20inlet-30-35-40D
Collection Date: 06-Feb-2019 15:20

ANALYTICAL REPORT
WorkOrder:HS19020798
Lab ID:HS19020798-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 18-Feb-2019		Analyst: JCJ
Antimony	**0.0342**		**0.000400**	**0.00200**	**mg/L**	1	20-Feb-2019 16:06
Arsenic	**0.00120**	J	**0.000400**	**0.00200**	**mg/L**	1	20-Feb-2019 16:06
Cadmium	U		0.000200	0.00200	mg/L	1	20-Feb-2019 16:06
Calcium	**212**		**0.340**	**5.00**	**mg/L**	10	19-Feb-2019 17:25
Iron	U		0.0120	0.200	mg/L	1	20-Feb-2019 16:06
Lead	U		0.000600	0.00200	mg/L	1	20-Feb-2019 16:06
Magnesium	**1.19**		**0.0100**	**0.200**	**mg/L**	1	20-Feb-2019 16:06
Potassium	**12.5**		**0.0180**	**0.200**	**mg/L**	1	20-Feb-2019 16:06
Selenium	**0.00538**		**0.00110**	**0.00200**	**mg/L**	1	20-Feb-2019 16:06
Sodium	**270**		**0.140**	**2.00**	**mg/L**	10	19-Feb-2019 17:25

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190207-FD-PV20mid-controlD
Collection Date: 07-Feb-2019 18:10

ANALYTICAL REPORT
WorkOrder:HS19020798
Lab ID:HS19020798-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 18-Feb-2019		Analyst: JCJ
Antimony	**0.0340**		**0.000400**	**0.00200**	**mg/L**	1	20-Feb-2019 16:08
Arsenic	**0.00115**	J	**0.000400**	**0.00200**	**mg/L**	1	20-Feb-2019 16:08
Cadmium	U		0.000200	0.00200	mg/L	1	20-Feb-2019 16:08
Calcium	**207**		**0.340**	**5.00**	**mg/L**	10	19-Feb-2019 17:36
Iron	U		0.0120	0.200	mg/L	1	20-Feb-2019 16:08
Lead	U		0.000600	0.00200	mg/L	1	20-Feb-2019 16:08
Magnesium	**1.25**		**0.0100**	**0.200**	**mg/L**	1	20-Feb-2019 16:08
Potassium	**12.2**		**0.0180**	**0.200**	**mg/L**	1	20-Feb-2019 16:08
Selenium	**0.00524**		**0.00110**	**0.00200**	**mg/L**	1	20-Feb-2019 16:08
Sodium	**264**		**0.140**	**2.00**	**mg/L**	10	19-Feb-2019 17:36

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190207-FD-PV20mid-30D
Collection Date: 07-Feb-2019 18:10

ANALYTICAL REPORT
WorkOrder:HS19020798
Lab ID:HS19020798-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 18-Feb-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	20-Feb-2019 16:10
Arsenic	U		0.000400	0.00200	mg/L	1	20-Feb-2019 16:10
Cadmium	U		0.000200	0.00200	mg/L	1	20-Feb-2019 16:10
Calcium	**188**		**0.340**	**5.00**	**mg/L**	10	19-Feb-2019 17:39
Iron	U		0.0120	0.200	mg/L	1	20-Feb-2019 16:10
Lead	U		0.000600	0.00200	mg/L	1	20-Feb-2019 16:10
Magnesium	**0.807**		**0.0100**	**0.200**	**mg/L**	1	20-Feb-2019 16:10
Potassium	**13.0**		**0.0180**	**0.200**	**mg/L**	1	20-Feb-2019 16:10
Selenium	U		0.00110	0.00200	mg/L	1	20-Feb-2019 16:10
Sodium	**246**		**0.140**	**2.00**	**mg/L**	10	19-Feb-2019 17:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190207-FD-PV20mid-35D
Collection Date: 07-Feb-2019 18:10

ANALYTICAL REPORT
WorkOrder:HS19020798
Lab ID:HS19020798-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 18-Feb-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	20-Feb-2019 16:38
Arsenic	U		0.000400	0.00200	mg/L	1	20-Feb-2019 16:38
Cadmium	U		0.000200	0.00200	mg/L	1	20-Feb-2019 16:38
Calcium	**202**		**0.340**	**5.00**	**mg/L**	10	19-Feb-2019 17:41
Iron	**0.0844**	J	**0.0120**	**0.200**	**mg/L**	1	20-Feb-2019 16:38
Lead	U		0.000600	0.00200	mg/L	1	20-Feb-2019 16:38
Magnesium	**0.989**		**0.0100**	**0.200**	**mg/L**	1	20-Feb-2019 16:38
Potassium	**12.6**		**0.0180**	**0.200**	**mg/L**	1	20-Feb-2019 16:38
Selenium	U		0.00110	0.00200	mg/L	1	20-Feb-2019 16:38
Sodium	**273**		**0.140**	**2.00**	**mg/L**	10	19-Feb-2019 17:41

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190207-FD-PV20mid-40D
Collection Date: 07-Feb-2019 18:10

ANALYTICAL REPORT
WorkOrder:HS19020798
Lab ID:HS19020798-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 18-Feb-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	20-Feb-2019 16:40
Arsenic	U		0.000400	0.00200	mg/L	1	20-Feb-2019 16:40
Cadmium	U		0.000200	0.00200	mg/L	1	20-Feb-2019 16:40
Calcium	**198**		**0.340**	**5.00**	**mg/L**	10	19-Feb-2019 17:43
Iron	U		0.0120	0.200	mg/L	1	20-Feb-2019 16:40
Lead	U		0.000600	0.00200	mg/L	1	20-Feb-2019 16:40
Magnesium	**1.08**		**0.0100**	**0.200**	**mg/L**	1	20-Feb-2019 16:40
Potassium	**13.0**		**0.0180**	**0.200**	**mg/L**	1	20-Feb-2019 16:40
Selenium	U		0.00110	0.00200	mg/L	1	20-Feb-2019 16:40
Sodium	**261**		**0.140**	**2.00**	**mg/L**	10	19-Feb-2019 17:43

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190206-FD-PV20Out-controlT
Collection Date: 06-Feb-2019 15:10

ANALYTICAL REPORT
WorkOrder:HS19020798
Lab ID:HS19020798-11
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**540**		**2.00**	**2.00**	**mg/L**	1	22-Feb-2019 17:14
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Feb-2019		Analyst: JHD
Antimony	**0.0367**		**0.000400**	**0.00200**	**mg/L**	1	21-Feb-2019 16:14
Arsenic	**0.00130**	J	**0.000400**	**0.00200**	**mg/L**	1	21-Feb-2019 16:14
Cadmium	U		0.000200	0.00200	mg/L	1	21-Feb-2019 16:14
Calcium	**214**		**0.340**	**5.00**	**mg/L**	10	21-Feb-2019 15:24
Iron	U		0.0120	0.200	mg/L	1	21-Feb-2019 16:14
Lead	U		0.000600	0.00200	mg/L	1	21-Feb-2019 16:14
Magnesium	**1.32**		**0.0100**	**0.200**	**mg/L**	1	21-Feb-2019 16:14
Potassium	**13.6**		**0.0180**	**0.200**	**mg/L**	1	21-Feb-2019 16:14
Selenium	**0.00631**		**0.00110**	**0.00200**	**mg/L**	1	21-Feb-2019 16:14
Sodium	**290**		**0.140**	**2.00**	**mg/L**	10	21-Feb-2019 15:24

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190206-FD-PV20Out-30T
Collection Date: 06-Feb-2019 15:10

ANALYTICAL REPORT
WorkOrder:HS19020798
Lab ID:HS19020798-12
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**508**		**2.00**	**2.00**	**mg/L**	1	22-Feb-2019 17:14
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	21-Feb-2019 16:17
Arsenic	U		0.000400	0.00200	mg/L	1	21-Feb-2019 16:17
Cadmium	U		0.000200	0.00200	mg/L	1	21-Feb-2019 16:17
Calcium	**202**		**0.340**	**5.00**	**mg/L**	10	21-Feb-2019 15:37
Iron	**0.0975**	J	**0.0120**	**0.200**	**mg/L**	1	21-Feb-2019 16:17
Lead	U		0.000600	0.00200	mg/L	1	21-Feb-2019 16:17
Magnesium	**0.826**		**0.0100**	**0.200**	**mg/L**	1	21-Feb-2019 16:17
Potassium	**13.5**		**0.0180**	**0.200**	**mg/L**	1	21-Feb-2019 16:17
Selenium	U		0.00110	0.00200	mg/L	1	21-Feb-2019 16:17
Sodium	**289**		**0.140**	**2.00**	**mg/L**	10	21-Feb-2019 15:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190206-FD-PV20Out-35T
Collection Date: 06-Feb-2019 15:10

ANALYTICAL REPORT
WorkOrder:HS19020798
Lab ID:HS19020798-13
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**516**		**2.00**	**2.00**	**mg/L**	1	22-Feb-2019 17:14
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	21-Feb-2019 16:19
Arsenic	U		0.000400	0.00200	mg/L	1	21-Feb-2019 16:19
Cadmium	U		0.000200	0.00200	mg/L	1	21-Feb-2019 16:19
Calcium	**205**		**0.340**	**5.00**	**mg/L**	10	21-Feb-2019 15:39
Iron	**0.192**	J	**0.0120**	**0.200**	**mg/L**	1	21-Feb-2019 16:19
Lead	U		0.000600	0.00200	mg/L	1	21-Feb-2019 16:19
Magnesium	**1.07**		**0.0100**	**0.200**	**mg/L**	1	21-Feb-2019 16:19
Potassium	**13.9**		**0.0180**	**0.200**	**mg/L**	1	21-Feb-2019 16:19
Selenium	U		0.00110	0.00200	mg/L	1	21-Feb-2019 16:19
Sodium	**291**		**0.140**	**2.00**	**mg/L**	10	21-Feb-2019 15:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190206-FD-PV20Out-40T
Collection Date: 06-Feb-2019 15:10

ANALYTICAL REPORT
WorkOrder:HS19020798
Lab ID:HS19020798-14
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**509**		**2.00**	**2.00**	**mg/L**	1	22-Feb-2019 17:14
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	21-Feb-2019 16:21
Arsenic	U		0.000400	0.00200	mg/L	1	21-Feb-2019 16:21
Cadmium	U		0.000200	0.00200	mg/L	1	21-Feb-2019 16:21
Calcium	**202**		**0.340**	**5.00**	**mg/L**	10	21-Feb-2019 15:41
Iron	**0.0378**	J	**0.0120**	**0.200**	**mg/L**	1	21-Feb-2019 16:21
Lead	U		0.000600	0.00200	mg/L	1	21-Feb-2019 16:21
Magnesium	**1.11**		**0.0100**	**0.200**	**mg/L**	1	21-Feb-2019 16:21
Potassium	**14.5**		**0.0180**	**0.200**	**mg/L**	1	21-Feb-2019 16:21
Selenium	U		0.00110	0.00200	mg/L	1	21-Feb-2019 16:21
Sodium	**288**		**0.140**	**2.00**	**mg/L**	10	21-Feb-2019 15:41

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190206-FD-PV20inlet-controlT
Collection Date: 06-Feb-2019 15:20

ANALYTICAL REPORT
WorkOrder:HS19020798
Lab ID:HS19020798-15
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**565**		**2.00**	**2.00**	**mg/L**	1	22-Feb-2019 17:14
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Feb-2019		Analyst: JHD
Antimony	**0.0372**		**0.000400**	**0.00200**	**mg/L**	1	21-Feb-2019 16:23
Arsenic	**0.00126**	J	**0.000400**	**0.00200**	**mg/L**	1	21-Feb-2019 16:23
Cadmium	U		0.000200	0.00200	mg/L	1	21-Feb-2019 16:23
Calcium	**224**		**0.340**	**5.00**	**mg/L**	10	21-Feb-2019 15:43
Iron	U		0.0120	0.200	mg/L	1	21-Feb-2019 16:23
Lead	U		0.000600	0.00200	mg/L	1	21-Feb-2019 16:23
Magnesium	**1.31**		**0.0100**	**0.200**	**mg/L**	1	21-Feb-2019 16:23
Potassium	**13.6**		**0.0180**	**0.200**	**mg/L**	1	21-Feb-2019 16:23
Selenium	**0.00753**		**0.00110**	**0.00200**	**mg/L**	1	21-Feb-2019 16:23
Sodium	**305**		**0.140**	**2.00**	**mg/L**	10	21-Feb-2019 15:43

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190206-FD-PV20inlet-30-35-40T
Collection Date: 06-Feb-2019 15:20

ANALYTICAL REPORT
WorkOrder:HS19020798
Lab ID:HS19020798-16
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**519**		**2.00**	**2.00**	**mg/L**	1	22-Feb-2019 17:14
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Feb-2019		Analyst: JHD
Antimony	**0.0356**		**0.000400**	**0.00200**	**mg/L**	1	21-Feb-2019 16:57
Arsenic	**0.00128**	J	**0.000400**	**0.00200**	**mg/L**	1	21-Feb-2019 16:57
Cadmium	U		0.000200	0.00200	mg/L	1	21-Feb-2019 16:57
Calcium	**206**		**0.340**	**5.00**	**mg/L**	10	21-Feb-2019 15:46
Iron	U		0.0120	0.200	mg/L	1	21-Feb-2019 16:57
Lead	U		0.000600	0.00200	mg/L	1	21-Feb-2019 16:57
Magnesium	**1.24**		**0.0100**	**0.200**	**mg/L**	1	21-Feb-2019 16:57
Potassium	**13.5**		**0.0180**	**0.200**	**mg/L**	1	21-Feb-2019 16:57
Selenium	**0.00714**		**0.00110**	**0.00200**	**mg/L**	1	21-Feb-2019 16:57
Sodium	**285**		**0.140**	**2.00**	**mg/L**	10	21-Feb-2019 15:46

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190207-FD-PV20mid-controlT
Collection Date: 07-Feb-2019 18:10

ANALYTICAL REPORT
WorkOrder:HS19020798
Lab ID:HS19020798-17
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**505**		**2.00**	**2.00**	**mg/L**	1	22-Feb-2019 17:14
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Feb-2019		Analyst: JHD
Antimony	**0.0361**		**0.000400**	**0.00200**	**mg/L**	1	21-Feb-2019 17:00
Arsenic	**0.00129**	J	**0.000400**	**0.00200**	**mg/L**	1	21-Feb-2019 17:00
Cadmium	U		0.000200	0.00200	mg/L	1	21-Feb-2019 17:00
Calcium	**200**		**0.340**	**5.00**	**mg/L**	10	21-Feb-2019 15:48
Iron	**0.0143**	J	**0.0120**	**0.200**	**mg/L**	1	21-Feb-2019 17:00
Lead	U		0.000600	0.00200	mg/L	1	21-Feb-2019 17:00
Magnesium	**1.28**		**0.0100**	**0.200**	**mg/L**	1	21-Feb-2019 17:00
Potassium	**13.1**		**0.0180**	**0.200**	**mg/L**	1	21-Feb-2019 17:00
Selenium	**0.00640**		**0.00110**	**0.00200**	**mg/L**	1	21-Feb-2019 17:00
Sodium	**276**		**0.140**	**2.00**	**mg/L**	10	21-Feb-2019 15:48

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190207-FD-PV20mid-30T
Collection Date: 07-Feb-2019 18:10

ANALYTICAL REPORT
WorkOrder:HS19020798
Lab ID:HS19020798-18
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**518**		**2.00**	**2.00**	**mg/L**	1	22-Feb-2019 17:14
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	21-Feb-2019 17:02
Arsenic	U		0.000400	0.00200	mg/L	1	21-Feb-2019 17:02
Cadmium	U		0.000200	0.00200	mg/L	1	21-Feb-2019 17:02
Calcium	**206**		**0.340**	**5.00**	**mg/L**	10	21-Feb-2019 15:50
Iron	**0.781**		**0.0120**	**0.200**	**mg/L**	1	21-Feb-2019 17:02
Lead	U		0.000600	0.00200	mg/L	1	21-Feb-2019 17:02
Magnesium	**0.850**		**0.0100**	**0.200**	**mg/L**	1	21-Feb-2019 17:02
Potassium	**13.9**		**0.0180**	**0.200**	**mg/L**	1	21-Feb-2019 17:02
Selenium	U		0.00110	0.00200	mg/L	1	21-Feb-2019 17:02
Sodium	**286**		**0.140**	**2.00**	**mg/L**	10	21-Feb-2019 15:50

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190207-FD-PV20mid-35T
Collection Date: 06-Feb-2019 18:10

ANALYTICAL REPORT
WorkOrder:HS19020798
Lab ID:HS19020798-19
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**516**		**2.00**	**2.00**	**mg/L**	1	22-Feb-2019 17:14
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	21-Feb-2019 17:04
Arsenic	U		0.000400	0.00200	mg/L	1	21-Feb-2019 17:04
Cadmium	U		0.000200	0.00200	mg/L	1	21-Feb-2019 17:04
Calcium	**205**		**0.340**	**5.00**	**mg/L**	10	21-Feb-2019 15:53
Iron	**0.572**		**0.0120**	**0.200**	**mg/L**	1	21-Feb-2019 17:04
Lead	U		0.000600	0.00200	mg/L	1	21-Feb-2019 17:04
Magnesium	**1.04**		**0.0100**	**0.200**	**mg/L**	1	21-Feb-2019 17:04
Potassium	**13.8**		**0.0180**	**0.200**	**mg/L**	1	21-Feb-2019 17:04
Selenium	U		0.00110	0.00200	mg/L	1	21-Feb-2019 17:04
Sodium	**295**		**0.140**	**2.00**	**mg/L**	10	21-Feb-2019 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190207-FD-PV20mid-40T
Collection Date: 07-Feb-2019 18:10

ANALYTICAL REPORT
WorkOrder:HS19020798
Lab ID:HS19020798-20
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**499**		**2.00**	**2.00**	**mg/L**	1	22-Feb-2019 17:14
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	21-Feb-2019 17:06
Arsenic	U		0.000400	0.00200	mg/L	1	21-Feb-2019 17:06
Cadmium	U		0.000200	0.00200	mg/L	1	21-Feb-2019 17:06
Calcium	**198**		**0.340**	**5.00**	**mg/L**	10	21-Feb-2019 15:55
Iron	**0.530**		**0.0120**	**0.200**	**mg/L**	1	21-Feb-2019 17:06
Lead	U		0.000600	0.00200	mg/L	1	21-Feb-2019 17:06
Magnesium	**1.12**		**0.0100**	**0.200**	**mg/L**	1	21-Feb-2019 17:06
Potassium	**13.6**		**0.0180**	**0.200**	**mg/L**	1	21-Feb-2019 17:06
Selenium	U		0.00110	0.00200	mg/L	1	21-Feb-2019 17:06
Sodium	**287**		**0.140**	**2.00**	**mg/L**	10	21-Feb-2019 15:55

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020798

Batch ID: 137831 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19020798-01	1	10	10 (mL)	1
HS19020798-02	1	10	10 (mL)	1
HS19020798-03	1	10	10 (mL)	1
HS19020798-04	1	10	10 (mL)	1
HS19020798-05	1	10	10 (mL)	1
HS19020798-06	1	10	10 (mL)	1
HS19020798-07	1	10	10 (mL)	1
HS19020798-08	1	10	10 (mL)	1
HS19020798-09	1	10	10 (mL)	1
HS19020798-10	1	10	10 (mL)	1

Batch ID: 137924 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19020798-11	1	10	10 (mL)	1
HS19020798-12	1	10	10 (mL)	1
HS19020798-13	1	10	10 (mL)	1
HS19020798-14	1	10	10 (mL)	1
HS19020798-15	1	10	10 (mL)	1
HS19020798-16	1	10	10 (mL)	1
HS19020798-17	1	10	10 (mL)	1
HS19020798-18	1	10	10 (mL)	1
HS19020798-19	1	10	10 (mL)	1
HS19020798-20	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020798

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 137831	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS19020798-01	20190206-FD-PV20Out-controlID	06 Feb 2019 15:10		18 Feb 2019 14:00	20 Feb 2019 15:54	1
HS19020798-01	20190206-FD-PV20Out-controlID	06 Feb 2019 15:10		18 Feb 2019 14:00	19 Feb 2019 17:14	10
HS19020798-02	20190206-FD-PV20Out-30D	06 Feb 2019 15:10		18 Feb 2019 14:00	20 Feb 2019 15:56	1
HS19020798-02	20190206-FD-PV20Out-30D	06 Feb 2019 15:10		18 Feb 2019 14:00	19 Feb 2019 17:16	10
HS19020798-03	20190206-FD-PV20Out-35D	06 Feb 2019 15:10		18 Feb 2019 14:00	20 Feb 2019 15:59	1
HS19020798-03	20190206-FD-PV20Out-35D	06 Feb 2019 15:10		18 Feb 2019 14:00	19 Feb 2019 17:18	10
HS19020798-04	20190206-FD-PV20Out-40D	06 Feb 2019 15:10		18 Feb 2019 14:00	20 Feb 2019 16:01	1
HS19020798-04	20190206-FD-PV20Out-40D	06 Feb 2019 15:10		18 Feb 2019 14:00	19 Feb 2019 17:21	10
HS19020798-05	20190206-FD-PV20inlet-controlID	06 Feb 2019 15:20		18 Feb 2019 14:00	20 Feb 2019 16:03	1
HS19020798-05	20190206-FD-PV20inlet-controlID	06 Feb 2019 15:20		18 Feb 2019 14:00	19 Feb 2019 17:23	10
HS19020798-06	20190206-FD-PV20inlet-30-35-40D	06 Feb 2019 15:20		18 Feb 2019 14:00	20 Feb 2019 16:06	1
HS19020798-06	20190206-FD-PV20inlet-30-35-40D	06 Feb 2019 15:20		18 Feb 2019 14:00	19 Feb 2019 17:25	10
HS19020798-07	20190207-FD-PV20mid-controlID	07 Feb 2019 18:10		18 Feb 2019 14:00	20 Feb 2019 16:08	1
HS19020798-07	20190207-FD-PV20mid-controlID	07 Feb 2019 18:10		18 Feb 2019 14:00	19 Feb 2019 17:36	10
HS19020798-08	20190207-FD-PV20mid-30D	07 Feb 2019 18:10		18 Feb 2019 14:00	20 Feb 2019 16:10	1
HS19020798-08	20190207-FD-PV20mid-30D	07 Feb 2019 18:10		18 Feb 2019 14:00	19 Feb 2019 17:39	10
HS19020798-09	20190207-FD-PV20mid-35D	07 Feb 2019 18:10		18 Feb 2019 14:00	20 Feb 2019 16:38	1
HS19020798-09	20190207-FD-PV20mid-35D	07 Feb 2019 18:10		18 Feb 2019 14:00	19 Feb 2019 17:41	10
HS19020798-10	20190207-FD-PV20mid-40D	07 Feb 2019 18:10		18 Feb 2019 14:00	20 Feb 2019 16:40	1
HS19020798-10	20190207-FD-PV20mid-40D	07 Feb 2019 18:10		18 Feb 2019 14:00	19 Feb 2019 17:43	10

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020798

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 137924	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19020798-11	20190206-FD-PV20Out-controlT	06 Feb 2019 15:10		20 Feb 2019 15:00	21 Feb 2019 16:14	1
HS19020798-11	20190206-FD-PV20Out-controlT	06 Feb 2019 15:10		20 Feb 2019 15:00	21 Feb 2019 15:24	10
HS19020798-12	20190206-FD-PV20Out-30T	06 Feb 2019 15:10		20 Feb 2019 15:00	21 Feb 2019 16:17	1
HS19020798-12	20190206-FD-PV20Out-30T	06 Feb 2019 15:10		20 Feb 2019 15:00	21 Feb 2019 15:37	10
HS19020798-13	20190206-FD-PV20Out-35T	06 Feb 2019 15:10		20 Feb 2019 15:00	21 Feb 2019 16:19	1
HS19020798-13	20190206-FD-PV20Out-35T	06 Feb 2019 15:10		20 Feb 2019 15:00	21 Feb 2019 15:39	10
HS19020798-14	20190206-FD-PV20Out-40T	06 Feb 2019 15:10		20 Feb 2019 15:00	21 Feb 2019 16:21	1
HS19020798-14	20190206-FD-PV20Out-40T	06 Feb 2019 15:10		20 Feb 2019 15:00	21 Feb 2019 15:41	10
HS19020798-15	20190206-FD-PV20inlet-controlT	06 Feb 2019 15:20		20 Feb 2019 15:00	21 Feb 2019 16:23	1
HS19020798-15	20190206-FD-PV20inlet-controlT	06 Feb 2019 15:20		20 Feb 2019 15:00	21 Feb 2019 15:43	10
HS19020798-16	20190206-FD-PV20inlet-30-35-40T	06 Feb 2019 15:20		20 Feb 2019 15:00	21 Feb 2019 16:57	1
HS19020798-16	20190206-FD-PV20inlet-30-35-40T	06 Feb 2019 15:20		20 Feb 2019 15:00	21 Feb 2019 15:46	10
HS19020798-17	20190207-FD-PV20mid-controlT	07 Feb 2019 18:10		20 Feb 2019 15:00	21 Feb 2019 17:00	1
HS19020798-17	20190207-FD-PV20mid-controlT	07 Feb 2019 18:10		20 Feb 2019 15:00	21 Feb 2019 15:48	10
HS19020798-18	20190207-FD-PV20mid-30T	07 Feb 2019 18:10		20 Feb 2019 15:00	21 Feb 2019 17:02	1
HS19020798-18	20190207-FD-PV20mid-30T	07 Feb 2019 18:10		20 Feb 2019 15:00	21 Feb 2019 15:50	10
HS19020798-19	20190207-FD-PV20mid-35T	06 Feb 2019 18:10		20 Feb 2019 15:00	21 Feb 2019 17:04	1
HS19020798-19	20190207-FD-PV20mid-35T	06 Feb 2019 18:10		20 Feb 2019 15:00	21 Feb 2019 15:53	10
HS19020798-20	20190207-FD-PV20mid-40T	07 Feb 2019 18:10		20 Feb 2019 15:00	21 Feb 2019 17:06	1
HS19020798-20	20190207-FD-PV20mid-40T	07 Feb 2019 18:10		20 Feb 2019 15:00	21 Feb 2019 15:55	10
Batch ID R333360	**Test Name :** HARDNESS, TOTAL AS CACO3 BY SM2340B			**Matrix:** Groundwater		
HS19020798-11	20190206-FD-PV20Out-controlT	06 Feb 2019 15:10			22 Feb 2019 17:14	1
HS19020798-12	20190206-FD-PV20Out-30T	06 Feb 2019 15:10			22 Feb 2019 17:14	1
HS19020798-13	20190206-FD-PV20Out-35T	06 Feb 2019 15:10			22 Feb 2019 17:14	1
HS19020798-14	20190206-FD-PV20Out-40T	06 Feb 2019 15:10			22 Feb 2019 17:14	1
HS19020798-15	20190206-FD-PV20inlet-controlT	06 Feb 2019 15:20			22 Feb 2019 17:14	1
HS19020798-16	20190206-FD-PV20inlet-30-35-40T	06 Feb 2019 15:20			22 Feb 2019 17:14	1
HS19020798-17	20190207-FD-PV20mid-controlT	07 Feb 2019 18:10			22 Feb 2019 17:14	1
HS19020798-18	20190207-FD-PV20mid-30T	07 Feb 2019 18:10			22 Feb 2019 17:14	1
HS19020798-19	20190207-FD-PV20mid-35T	06 Feb 2019 18:10			22 Feb 2019 17:14	1
HS19020798-20	20190207-FD-PV20mid-40T	07 Feb 2019 18:10			22 Feb 2019 17:14	1

WorkOrder: HS19020798
InstrumentID: ICPMS04
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000521	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000340	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000553	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0523	0.0340	0.500
A	Iron	7439-89-6	0.0250	0.0205	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000916	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0700	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0418	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00274	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0556	0.0140	0.200

WorkOrder: HS19020798
InstrumentID: ICPMS05
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000555	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000460	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000554	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0537	0.0340	0.500
A	Iron	7439-89-6	0.0500	0.0549	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.00100	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0680	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0542	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00280	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0459	0.0140	0.200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020798

QC BATCH REPORT

Batch ID: 137831 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLKF2-137831** Units: **mg/L** Analysis Date: **19-Feb-2019 16:05**
Client ID: Run ID: **ICPMS04_333119** SeqNo: **4955757** PrepDate: **18-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01323	0.200								J
Potassium	0.0544	0.200								J
Selenium	U	0.00200								
Sodium	0.05359	0.200								J

MBLK Sample ID: **MBLKF3-137831** Units: **mg/L** Analysis Date: **19-Feb-2019 16:07**
Client ID: Run ID: **ICPMS04_333119** SeqNo: **4955758** PrepDate: **18-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.0108	0.200								J
Potassium	0.02676	0.200								J
Selenium	U	0.00200								
Sodium	0.04212	0.200								J

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020798

QC BATCH REPORT

Batch ID: 137831 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLKF1-137831** Units: **mg/L** Analysis Date: **19-Feb-2019 16:02**
Client ID: Run ID: **ICPMS04_333119** SeqNo: **4955756** PrepDate: **18-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01276	0.200								J
Potassium	0.05281	0.200								J
Selenium	U	0.00200								
Sodium	0.04459	0.200								J

MBLK Sample ID: **MBLK-137831** Units: **mg/L** Analysis Date: **19-Feb-2019 16:09**
Client ID: Run ID: **ICPMS04_333119** SeqNo: **4955759** PrepDate: **18-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01023	0.200								J
Potassium	0.04355	0.200								J
Selenium	U	0.00200								
Sodium	0.03374	0.200								J

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020798

QC BATCH REPORT

Batch ID: 137831 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

LCS Sample ID: **LCS-137831** Units: **mg/L** Analysis Date: **19-Feb-2019 16:11**
Client ID: Run ID: **ICPMS04_333119** SeqNo: **4955760** PrepDate: **18-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05222	0.00200	0.05	0	104	80 - 120				
Arsenic	0.05123	0.00200	0.05	0	102	80 - 120				
Cadmium	0.0508	0.00200	0.05	0	102	80 - 120				
Calcium	5.277	0.500	5	0	106	80 - 120				
Iron	4.918	0.200	5	0	98.4	80 - 120				
Lead	0.0516	0.00200	0.05	0	103	80 - 120				
Magnesium	5.109	0.200	5	0	102	80 - 120				
Potassium	5.166	0.200	5	0	103	80 - 120				
Selenium	0.05098	0.00200	0.05	0	102	80 - 120				
Sodium	5.202	0.200	5	0	104	80 - 120				

MS Sample ID: **HS19020423-06MS** Units: **mg/L** Analysis Date: **19-Feb-2019 16:38**
Client ID: Run ID: **ICPMS04_333119** SeqNo: **4955847** PrepDate: **18-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05422	0.00200	0.05	0.000415	108	75 - 125				
Arsenic	0.2497	0.00200	0.05	0.2193	60.8	75 - 125				SO
Cadmium	0.05314	0.00200	0.05	-0.000006	106	75 - 125				
Calcium	94.01	0.500	5	97.55	-70.7	75 - 125				SO
Iron	5.111	0.200	5	0.1288	99.6	75 - 125				
Lead	0.05247	0.00200	0.05	0.000079	105	75 - 125				
Magnesium	51.82	0.200	5	50.21	32.2	75 - 125				SO
Potassium	6.19	0.200	5	1.063	103	75 - 125				
Selenium	0.05291	0.00200	0.05	0.00036	105	75 - 125				
Sodium	137.6	0.200	5	139	-28.4	75 - 125				SO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020798

QC BATCH REPORT

Batch ID: 137831 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

MSD Sample ID: **HS19020423-06MSD** Units: **mg/L** Analysis Date: **19-Feb-2019 16:40**
Client ID: Run ID: **ICPMS04_333119** SeqNo: **4955848** PrepDate: **18-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05261	0.00200	0.05	0.000415	104	75 - 125	0.05422	3.02	20	
Arsenic	0.2552	0.00200	0.05	0.2193	71.8	75 - 125	0.2497	2.18	20	SO
Cadmium	0.0541	0.00200	0.05	-0.000006	108	75 - 125	0.05314	1.8	20	
Calcium	95	0.500	5	97.55	-50.9	75 - 125	94.01	1.05	20	SO
Iron	5.11	0.200	5	0.1288	99.6	75 - 125	5.111	0.0233	20	
Lead	0.05355	0.00200	0.05	0.000079	107	75 - 125	0.05247	2.03	20	
Magnesium	52.41	0.200	5	50.21	44.0	75 - 125	51.82	1.14	20	SO
Potassium	6.293	0.200	5	1.063	105	75 - 125	6.19	1.65	20	
Selenium	0.05137	0.00200	0.05	0.00036	102	75 - 125	0.05291	2.97	20	
Sodium	136.8	0.200	5	139	-43.5	75 - 125	137.6	0.551	20	SO

PDS Sample ID: **HS19020423-06PDS** Units: **mg/L** Analysis Date: **19-Feb-2019 16:42**
Client ID: Run ID: **ICPMS04_333119** SeqNo: **4955849** PrepDate: **18-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1081	0.00200	0.1	0.000415	108	75 - 125				
Arsenic	0.3085	0.00200	0.1	0.2193	89.2	75 - 125				
Cadmium	0.1176	0.00200	0.1	-0.000006	118	75 - 125				
Calcium	98.31	0.500	10	97.55	7.61	75 - 125				SO
Iron	11.04	0.200	10	0.1288	109	75 - 125				
Lead	0.1148	0.00200	0.1	0.000079	115	75 - 125				
Magnesium	55.65	0.200	10	50.21	54.5	75 - 125				SO
Potassium	12.07	0.200	10	1.063	110	75 - 125				
Selenium	0.1113	0.00200	0.1	0.00036	111	75 - 125				
Sodium	136.2	0.200	10	139	-28.7	75 - 125				SO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020798

QC BATCH REPORT

Batch ID: 137831 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

SD Sample ID: **HS19020423-06SD** Units: **mg/L** Analysis Date: **19-Feb-2019 16:35**
Client ID: Run ID: **ICPMS04_333119** SeqNo: **4955846** PrepDate: **18-Feb-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000415	0	10	
Arsenic	0.2007	0.0100					0.2193	8.49	10	
Cadmium	U	0.0100					-0.000006	0	10	
Calcium	89.08	2.50					97.55	8.67	10	
Iron	0.3453	1.00					0.1288	0	10	J
Lead	U	0.0100					0.000079	0	10	
Magnesium	49.35	1.00					50.21	1.71	10	
Potassium	1.098	1.00					1.063	3.25	10	
Selenium	U	0.0100					0.00036	0	10	
Sodium	134.2	1.00					139	3.43	10	

The following samples were analyzed in this batch:

HS19020798-01	HS19020798-02	HS19020798-03	HS19020798-04
HS19020798-05	HS19020798-06	HS19020798-07	HS19020798-08
HS19020798-09	HS19020798-10		

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020798

QC BATCH REPORT

Batch ID: 137924 **Instrument: ICPMS05** **Method: SW6020**

MBLK Sample ID: **MBLK-137924** Units: **mg/L** Analysis Date: **21-Feb-2019 15:06**
Client ID: Run ID: **ICPMS05_333276** SeqNo: **4959301** PrepDate: **20-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.0103	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	0.04548	0.200								J

LCS Sample ID: **LCS-137924** Units: **mg/L** Analysis Date: **21-Feb-2019 15:09**
Client ID: Run ID: **ICPMS05_333276** SeqNo: **4959302** PrepDate: **20-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05318	0.00200	0.05	0	106	80 - 120				
Arsenic	0.05426	0.00200	0.05	0	109	80 - 120				
Cadmium	0.05428	0.00200	0.05	0	109	80 - 120				
Calcium	5.586	0.500	5	0	112	80 - 120				
Iron	5.781	0.200	5	0	116	80 - 120				
Lead	0.05355	0.00200	0.05	0	107	80 - 120				
Magnesium	5.874	0.200	5	0	117	80 - 120				
Potassium	5.761	0.200	5	0	115	80 - 120				
Selenium	0.05239	0.00200	0.05	0	105	80 - 120				

LCS Sample ID: **LCS-137924** Units: **mg/L** Analysis Date: **21-Feb-2019 22:08**
Client ID: Run ID: **ICPMS05_333276** SeqNo: **4959445** PrepDate: **20-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	5.488	0.200	5	0	110	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020798

QC BATCH REPORT

Batch ID: 137924 **Instrument: ICPMS05** **Method: SW6020**

MS Sample ID: **HS19020570-01MS** Units: **mg/L** Analysis Date: **21-Feb-2019 15:15**
Client ID: Run ID: **ICPMS05_333276** SeqNo: **4959305** PrepDate: **20-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04866	0.00200	0.05	0	97.3	80 - 120				
Arsenic	0.05156	0.00200	0.05	0.000844	101	80 - 120				
Cadmium	0.05225	0.00200	0.05	0	104	80 - 120				
Calcium	98.98	0.500	5	92.68	126	80 - 120				SO
Iron	8.138	0.200	5	2.086	121	80 - 120				S
Lead	0.05234	0.00200	0.05	0	105	80 - 120				
Magnesium	32.95	0.200	5	26.59	127	80 - 120				SO
Potassium	6.076	0.200	5	0.9194	103	80 - 120				
Selenium	0.05191	0.00200	0.05	0	104	80 - 120				
Sodium	66	0.200	5	59.42	132	80 - 120				SO

MSD Sample ID: **HS19020570-01MSD** Units: **mg/L** Analysis Date: **21-Feb-2019 15:18**
Client ID: Run ID: **ICPMS05_333276** SeqNo: **4959306** PrepDate: **20-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04897	0.00200	0.05	0	97.9	80 - 120	0.04866	0.649	20	
Arsenic	0.05296	0.00200	0.05	0.000844	104	80 - 120	0.05156	2.67	20	
Cadmium	0.05511	0.00200	0.05	0	110	80 - 120	0.05225	5.34	20	
Calcium	99.2	0.500	5	92.68	130	80 - 120	98.98	0.216	20	SO
Iron	8.589	0.200	5	2.086	130	80 - 120	8.138	5.39	20	S
Lead	0.05337	0.00200	0.05	0	107	80 - 120	0.05234	1.95	20	
Magnesium	32.44	0.200	5	26.59	117	80 - 120	32.95	1.56	20	O
Potassium	6.374	0.200	5	0.9194	109	80 - 120	6.076	4.79	20	
Selenium	0.04997	0.00200	0.05	0	99.9	80 - 120	0.05191	3.81	20	
Sodium	65	0.200	5	59.42	112	80 - 120	66	1.52	20	O

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020798

QC BATCH REPORT

Batch ID: 137924 **Instrument: ICPMS05** **Method: SW6020**

PDS Sample ID: **HS19020570-01PDS** Units: **mg/L** Analysis Date: **21-Feb-2019 15:20**
Client ID: Run ID: **ICPMS05_333276** SeqNo: **4959307** PrepDate: **20-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.0921	0.00200	0.1	0	92.1	75 - 125				
Arsenic	0.1057	0.00200	0.1	0.000844	105	75 - 125				
Cadmium	0.1066	0.00200	0.1	0	107	75 - 125				
Calcium	102.5	0.500	10	92.68	98.3	75 - 125				O
Iron	13.18	0.200	10	2.086	111	75 - 125				
Lead	0.1029	0.00200	0.1	0	103	75 - 125				
Magnesium	37.4	0.200	10	26.59	108	75 - 125				
Potassium	11.34	0.200	10	0.9194	104	75 - 125				
Selenium	0.1021	0.00200	0.1	0	102	75 - 125				
Sodium	69.54	0.200	10	59.42	101	75 - 125				O

SD Sample ID: **HS19020570-01SD** Units: **mg/L** Analysis Date: **21-Feb-2019 15:13**
Client ID: Run ID: **ICPMS05_333276** SeqNo: **4959304** PrepDate: **20-Feb-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000267	0	10	
Arsenic	U	0.0100					0.000844	0	10	
Cadmium	U	0.0100					0.000068	0	10	
Calcium	86.7	2.50					92.68	6.45	10	
Iron	2.003	1.00					2.086	3.97	10	
Lead	U	0.0100					0.000279	0	10	
Magnesium	27.56	1.00					26.59	3.65	10	
Potassium	0.8843	1.00					0.9194	0	10	J
Selenium	U	0.0100					0.000855	0	10	
Sodium	60.51	1.00					59.42	1.84	10	

The following samples were analyzed in this batch:

HS19020798-11	HS19020798-12	HS19020798-13	HS19020798-14
HS19020798-15	HS19020798-16	HS19020798-17	HS19020798-18
HS19020798-19	HS19020798-20		

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19020798**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
California	2919, 2018-2019	30-Apr-2019
Maryland	343, 2018-2019	30-Jun-2019

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19020798

Date/Time Received: **15-Feb-2019 08:37**
Received by: **NDR**

Checklist completed by: *Nilesh D. Ranchod* eSignature — 15-Feb-2019 Date

Reviewed by: *Dane J. Wacasey* eSignature — 22-Feb-2019 Date

Matrices: **Water**

Carrier name: **FedEx International Priority**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	2 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:194586/194585
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☐	No ☑	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	16.0C/16.4C UC/C	IR # 11
Cooler(s)/Kit(s):	RED	
Date/Time sample(s) sent to storage:	02/15/2019 12:45pm	

Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes: No times on sample containers. Sample IDs differ: FD-Mid samples
COC= 20190206 Date 2019/02/07
Labels = 20190207 Date 2019/02/07 Logged in per sample labels.

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070

Chain of Custody Form

Page ____ of ____

COC ID: 194586

HS19020798

Golder Associates
Exide Column Studies

Customer Information		Project Information		ALS Project Manager:
Purchase Order	130-2086-06	Project Name	Exide Column Studies	
Work Order		Project Number	130-2086	
Company Name	Golder Associates	Bill To Company	Golder Associates	
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P	
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit	
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021	
Phone	(314) 984-8800	Phone	(314) 984-8800	
Fax		Fax		
e-Mail Address	Emily_White@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com	

A	300_W (300 Cl, SO4, [*NO3* *48hr HT*])
B	TDS_W 2540C (2540C TDS)
C	ALK_W 2320B (2320B Alkalinity)
D	HARD (2340B Hardness (calc))
E	ICP_TW (6020A Total Metals (6)+Cations)
F	ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
G	
H	
I	
J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190206-FD-PW20wet-control D	2019/02/06	15:10	Groundwa	2	8						X					
2	" -30D	"		"	2	1						X					
3	" -35D	"		"	2	1						X					
4	" -40D	"		"	2	1						X					
5	20190206-FD-PW20inlet-control D	2019/02/06	15:20	"	2	1						X					
6	" -30-35-40D	"		"	2	1						X					
7	20190206-FD-PW20mid-control D	2019/02/07	15:10	"	2	1						X					
8	" -30D	"		"	2	1						X					
9	" -35D	"		"	2	1						X					
10	" -40D	"		"	2	1						X					

Sampler(s) Please Print & Sign: Marie Edmonds

Shipment Method:

Required Turnaround Time: (Check Box) ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other ____

Results Due Date:

Relinquished by: Marie Edmonds — Date: 2019/02/13 — Time: 15:30

Relinquished by: — Date: 2/15/19 — Time: 08:37

Received by:

Received by (Laboratory): NR

Logged by (Laboratory): — Date: — Time:

Checked by (Laboratory):

Notes: Exide Column Studies

Cooler ID	Cooler Temp.
RED	16.0

QC Package: (Check One Box Below)

☐ Level II Std QC
☐ Level III Std QC/Raw Data
☐ Level IV SW846/CLP
☐ Other
☒ TRRP CheckList
☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

IR # 11

Note:
1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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+1 970 490 1511
Holland, MI
+1 616 399 6070

Chain of Custody Form

COC ID: 194585

HS19020798

Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information	
Purchase Order	130-2086-06	Project Name	Exide Column Studies
Work Order		Project Number	130-2086
Company Name	Golder Associates	Bill To Company	Golder Associates
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021
Phone	(314) 984-8800	Phone	(314) 984-8800
Fax		Fax	
e-Mail Address	Emily_White@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com

A	300_W (300 Cl, SO4, [*NO3* *48hr HT*])
B	TDS_W 2540C (2540C TDS)
C	ALK_W 2320B (2320B Alkalinity)
D	HARD (2340B Hardness (calc))
E	ICP_TW (6020A Total Metals (6)+Cations)
F	ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
G	
H	
I	
J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190206-FD-PV20out-control T	2019/02/06	15:10	Groundwa	2	1				X	X						
2	" -30T	"		GW	2	1				X	X						
3	" -35T	"		GW	2	1				X	X						
4	" -40T	"		GW	2	1				X	X						
5	20190206-FD-PV30inlet-control T	2019/02/06	15:20	GW	2	1				X	X						
6	" -30-35-40-T	"		GW	2	1				X	X						
7	20190207-FD-PV20mid-control T	2019/02/07	13:10	GW	2	1				X	X						
8	" -30T	"		GW	2	1				X	X						
9	" -35T	"		GW	2	1				X	X						
10	" -40T	"		GW	2	1				X	X						

Sampler(s) Please Print & Sign: [signature]

Shipment Method:

Required Turnaround Time: (Check Box) ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other

Results Due Date:

Relinquished by: [signature] Date: 2019/02/13 Time: 15:30

Received by:

Relinquished by: Date: 2.15.19 Time: 08:37

Received by (Laboratory): NA

Logged by (Laboratory): Date: Time:

Checked by (Laboratory):

Notes: Exide Column Studies

Cooler ID	Cooler Temp.
Red	4°C 16.0

QC Package: (Check One Box Below)

- ☐ Level II Std QC
- ☐ Level III Std QC/Raw Data
- ☐ Level IV SW846/CLP
- ☒ TRRP Checklist
- ☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note:
1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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ORIGIN ID:YUXA (514) 383-0990
AUDREY ETHEVES
GOLDER ASSOCIATES LTD
7250 RUE DU MILE END
3E ETAGE
MONTREAL, PQ H2R3A4
CANADA CA

SHIP DATE: 13FEB19
ACTWGT: 14.90 LB
CAD: 108680724/INET4102

BILL RECIPIENT

TO **DANE WACASEY**
ALS HOUSTON LABORATORY
10450 STANCLIFF RD
STE 210
HOUSTON TX 77099 **(US)**
(281) 530-5656 REF:
INV:
PO: DEPT:

565J2/0E3D/23AD

FedEx Express

E

J191019010702uv

TRK# 0430 **7744 6149 1238**

10:30A
INTL PRIORITY

NH SGRA

77099
TX-US IAH

Après l'impression de cette étiquette :
COPIE DU DESTINATAIRE - VEUILLEZ LA PLACER DEVANT LA POCHETTE
1. Pliez la page imprimée le long de la ligne horizontale.
2. Placez l'étiquette dans la pochette d'expédition et fixez-la à votre paquet.

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

February 22, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19020802**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 20 sample(s) on Feb 15, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19020802**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19020802**	

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 02/22/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19020802				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 137876,137955,R333360				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?	X				
		Were analytical duplicates analyzed at the appropriate frequency?	X				
		Were RPDs or relative standard deviations within the laboratory QC limits?	X				
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				2
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 02/22/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19020802				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 137876,137955,R333360				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			3
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		X			4
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports		
Laboratory Name: ALS Laboratory Group		LRC Date: 02/22/2019
Project Name: Exide Column Studies		Laboratory Job Number: HS19020802
Reviewer Name: Dane Wacasey		Prep Batch Number(s): 137876,137955,R333360
ER#[5]	**Description**	
1	Batch 137876, Metals Method SW6020, sample HS19020532-04, MS was performed on unrelated sample. Batch 137955, Metals Method SW6020, sample HS19020608-02, MS and MSD were performed on unrelated sample.	
2	Batch 137876, Metals Method SW6020, some samples were analyzed at 5x dilution due to high Sodium content.	
3	See Run Log and CCB Exceptions Report.	
4	Batch 137955, Metals Method SW6020, sample HS19020608-02, PDS was performed on unrelated sample. Batch 137955, Metals Method SW6020, sample HS19020608-02, Serial Dilution was performed on unrelated sample.	

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020802
Start Date: 20-Feb-2019 End Date: 21-Feb-2019

Run ID:ICPMS05_333248
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	20-Feb-2019 21:44	042_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	20-Feb-2019 21:46	043SMPL.d	AS CA CD FE K MG PB SB SE
LLICV5	1	20-Feb-2019 21:48	044LICV.d	AS CA CD FE K MG PB SB SE
ICB	1	20-Feb-2019 21:51	045_ICB.d	AS CA CD FE K MG NA PB SB SE
LLICV5	1	20-Feb-2019 21:53	046LICV.d	AS CA CD FE K MG PB SB SE
ICSA	1	20-Feb-2019 21:55	047ICSA.d	AS CA CD FE K MG PB SB SE
ICSAB	1	20-Feb-2019 21:57	048ICSB.d	AS CA CD FE K MG PB SB SE
CCV 1	1	20-Feb-2019 22:16	053_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	20-Feb-2019 22:18	054_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	20-Feb-2019 22:32	060_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	20-Feb-2019 22:34	061_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	20-Feb-2019 22:59	072_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	20-Feb-2019 23:01	073_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLKF1-137876	1	20-Feb-2019 23:03	074SMPL.d	AS CA CD FE K MG NA PB SB SE
MBLK-137876	1	20-Feb-2019 23:06	075SMPL.d	AS CA CD FE K MG NA PB SB SE
LCS-137876	1	20-Feb-2019 23:08	076SMPL.d	AS CA CD FE K MG PB SB SE
ZZZZZZSD	5	20-Feb-2019 23:12	078SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZMS	1	20-Feb-2019 23:15	079SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZMSD	1	20-Feb-2019 23:17	080SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZPDS	1	20-Feb-2019 23:19	081SMPL.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	20-Feb-2019 23:21	082_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	20-Feb-2019 23:23	083_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	20-Feb-2019 23:50	095_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	21-Feb-2019 00:02	097_CCV.d	AS CA CD FE K MG NA PB SB SE
20190206-DGW-MW11-PV20inlet-controlD	5	21-Feb-2019 00:04	098SMPL.d	AS CA CD FE K MG PB SB SE
20190206-DGW-MW11-PV20inlet-30-35-40D	5	21-Feb-2019 00:06	099SMPL.d	AS CA CD FE K MG PB SB SE
20190207-DGW-MW11-PV20mid-controlD	5	21-Feb-2019 00:08	100SMPL.d	AS CA CD FE K MG PB SB SE
20190207-DGW-MW11-PV20mid-30D	5	21-Feb-2019 00:11	101SMPL.d	AS CA CD FE K MG PB SB SE
20190207-DGW-MW11-PV20mid-35D	5	21-Feb-2019 00:13	102SMPL.d	AS CA CD FE K MG PB SB SE
20190207-DGW-MW11-PV20mid-40D	5	21-Feb-2019 00:15	103SMPL.d	AS CA CD FE K MG PB SB SE
CCV 6	1	21-Feb-2019 00:22	106_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	21-Feb-2019 00:24	107_CCB.d	AS CA CD FE K MG NA PB SB SE
ICV	1	21-Feb-2019 00:53	120_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	21-Feb-2019 00:55	121SMPL.d	AS CA CD FE K MG PB SB SE
LLICV5	1	21-Feb-2019 00:58	122LICV.d	AS CA CD FE K MG PB SB SE
ICB	1	21-Feb-2019 01:00	123_ICB.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	21-Feb-2019 01:18	131_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	21-Feb-2019 01:20	132_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 8	1	21-Feb-2019 01:45	143_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	21-Feb-2019 01:47	144_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	21-Feb-2019 02:12	155_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	21-Feb-2019 02:14	156_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 10	1	21-Feb-2019 02:34	165_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	21-Feb-2019 02:36	166SMPL.d	AS CA CD FE K MG PB SB SE
LLCCV5	1	21-Feb-2019 02:39	167LICV.d	AS CA CD FE K MG PB SB SE
ICCB 10	1	21-Feb-2019 02:41	168_ICB.d	AS CA CD FE K MG NA PB SB SE
CCV 11	1	21-Feb-2019 02:48	171_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	21-Feb-2019 02:50	172_CCB.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020802

Run ID:ICPMS05_333248
Instrument:ICPMS05
Method:SW6020

CCB 1	Date: 20-Feb-2019 22:18	Seq: 4957898	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.92	0.4	2	

CCB 2	Date: 20-Feb-2019 22:34	Seq: 4957905	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.339	0.4	2	
Sodium	42.78	14	200	

CCB 3	Date: 20-Feb-2019 23:01	Seq: 4957917	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.875	0.4	2	
Potassium	29.24	18	200	
Sodium	82.74	14	200	

CCB 4	Date: 20-Feb-2019 23:23	Seq: 4957933	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.993	0.4	2	
Sodium	43.26	14	200	

CCB 5	Date: 20-Feb-2019 23:50	Seq: 4957945	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.777	0.4	2	
Calcium	54.48	34	500	
Magnesium	44.09	10	200	
Potassium	48.63	18	200	
Selenium	1.174	1.1	2	
Sodium	844.8	14	200	

CCB 6	Date: 21-Feb-2019 00:24	Seq: 4957957	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.684	0.4	2	
Potassium	26.08	18	200	
Sodium	257.5	14	200	

ICB	Date: 21-Feb-2019 01:00	Seq: 4957968	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	-61.9	14	200	

CCB 7	Date: 21-Feb-2019 01:20	Seq: 4957977	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.671	0.4	2	
Sodium	36.47	14	200	

CCB 8	Date: 21-Feb-2019 01:47	Seq: 4957989	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.657	0.4	2	
Magnesium	12.11	10	200	
Potassium	-27.38	18	200	
Sodium	-45	14	200	

CCB 9	Date: 21-Feb-2019 02:14	Seq: 4958001	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.753	0.4	2	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020802
Start Date: 21-Feb-2019 End Date: 22-Feb-2019

Run ID:ICPMS05_333276
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	21-Feb-2019 12:08	020_ICV.d	AS CA CD FE K MG NA P PB SB SE
LLICV2	1	21-Feb-2019 12:11	021SMPL.d	AS CA CD FE K MG NA P PB SB SE
LLICV5	1	21-Feb-2019 12:13	022LICV.d	AS CA CD FE K MG NA P PB SB SE
ICB	1	21-Feb-2019 12:15	023_ICB.d	AS CA CD FE K MG NA P PB SB SE
ICSA	1	21-Feb-2019 12:26	025ICSA.d	AS CA CD FE K MG NA P PB SB SE
ICSAB	1	21-Feb-2019 12:28	026ICSB.d	AS CA CD FE K MG NA P PB SB SE
CCV 1	1	21-Feb-2019 13:03	037_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 1	1	21-Feb-2019 13:05	038_CCB.d	AS CA CD FE K MG NA P PB SB SE
LCS-137876	1	21-Feb-2019 13:21	044SMPL.d	NA
20190206-DGW-MW11-PV20out-controlD	50	21-Feb-2019 13:23	045SMPL.d	CA MG NA
20190206-DGW-MW11-PV20out-30D	50	21-Feb-2019 13:26	046SMPL.d	CA MG NA
20190206-DGW-MW11-PV20out-35D	50	21-Feb-2019 13:28	047SMPL.d	CA MG NA
20190206-DGW-MW11-PV20out-40D	50	21-Feb-2019 13:30	048SMPL.d	CA MG NA
CCV 2	1	21-Feb-2019 13:32	049_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 2	1	21-Feb-2019 13:34	050_CCB.d	AS CA CD FE K MG NA P PB SB SE
20190206-DGW-MW11-PV20inlet-controlD	50	21-Feb-2019 13:38	051SMPL.d	NA
20190206-DGW-MW11-PV20inlet-30-35-40D	50	21-Feb-2019 13:40	052SMPL.d	NA
20190207-DGW-MW11-PV20mid-controlD	50	21-Feb-2019 13:43	053SMPL.d	NA
20190207-DGW-MW11-PV20mid-30D	50	21-Feb-2019 13:45	054SMPL.d	NA
20190207-DGW-MW11-PV20mid-35D	50	21-Feb-2019 13:47	055SMPL.d	NA
20190207-DGW-MW11-PV20mid-40D	50	21-Feb-2019 13:49	056SMPL.d	NA
20190206-DGW-MW11-PV20out-controlD	5	21-Feb-2019 13:52	057SMPL.d	AS CD FE K P PB SB SE
20190206-DGW-MW11-PV20out-30D	5	21-Feb-2019 13:54	058SMPL.d	AS CD FE K P PB SB SE
20190206-DGW-MW11-PV20out-35D	5	21-Feb-2019 13:56	059SMPL.d	AS CD FE K P PB SB SE
20190206-DGW-MW11-PV20out-40D	5	21-Feb-2019 13:58	060SMPL.d	AS CD FE K P PB SB SE
CCV 3	1	21-Feb-2019 14:01	061_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 3	1	21-Feb-2019 14:03	062_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 4	1	21-Feb-2019 15:29	074_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 4	1	21-Feb-2019 15:31	075_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 5	1	21-Feb-2019 15:59	086_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 5	1	21-Feb-2019 16:02	087_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 6	1	21-Feb-2019 16:45	097_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 6	1	21-Feb-2019 16:48	098_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 7	1	21-Feb-2019 17:16	105_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 7	1	21-Feb-2019 17:18	106_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 8	1	21-Feb-2019 18:04	120_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 8	1	21-Feb-2019 18:06	121_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 9	1	21-Feb-2019 18:31	132_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 9	1	21-Feb-2019 18:33	133_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 10	1	21-Feb-2019 18:58	144_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 10	1	21-Feb-2019 19:01	145_CCB.d	AS CA CD FE K MG NA P PB SB SE
ICCV 11	1	21-Feb-2019 21:59	159_ICV.d	AS CA CD FE K MG NA P PB SB SE
LLCCV2	1	21-Feb-2019 22:01	160SMPL.d	AS CA CD FE K MG NA P PB SB SE

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020802
Start Date: 21-Feb-2019 End Date: 22-Feb-2019

Run ID:ICPMS05_333276
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
LLCCV5	1	21-Feb-2019 22:03	161LICV.d	AS CA CD FE K MG NA P PB SB SE
ICCB 11	1	21-Feb-2019 22:06	162_ICB.d	AS CA CD FE K MG NA P PB SB SE
CCV 12	1	21-Feb-2019 22:29	172_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 12	1	21-Feb-2019 22:31	173_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 13	1	21-Feb-2019 22:44	179_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 13	1	21-Feb-2019 22:47	180_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 14	1	21-Feb-2019 23:12	191_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 14	1	21-Feb-2019 23:14	192_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 15	1	21-Feb-2019 23:34	201_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 15	1	21-Feb-2019 23:37	202_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 16	1	22-Feb-2019 00:02	213_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 16	1	22-Feb-2019 00:04	214_CCB.d	AS CA CD FE K MG NA P PB SB SE
LCS-137955	1	22-Feb-2019 00:11	217SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZSD	5	22-Feb-2019 00:15	219SMPL.d	AS CD FE K MG PB SB SE
ZZZZZZMS	1	22-Feb-2019 00:17	220SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZMSD	1	22-Feb-2019 00:20	221SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZPDS	1	22-Feb-2019 00:22	222SMPL.d	AS CD FE K MG PB SB SE
CCV 17	1	22-Feb-2019 00:24	223_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 17	1	22-Feb-2019 00:26	224_CCB.d	AS CA CD FE K MG NA P PB SB SE
20190206-DGW-MW11-PV20out-controlT	1	22-Feb-2019 00:42	231SMPL.d	AS CD FE K PB SB SE
20190206-DGW-MW11-PV20out-30T	1	22-Feb-2019 00:44	232SMPL.d	AS CD FE K PB SB SE
20190206-DGW-MW11-PV20out-35T	1	22-Feb-2019 00:47	233SMPL.d	AS CD FE K PB SB SE
20190206-DGW-MW11-PV20out-40T	1	22-Feb-2019 00:49	234SMPL.d	AS CD FE K PB SB SE
CCV 18	1	22-Feb-2019 00:51	235_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 18	1	22-Feb-2019 00:53	236_CCB.d	AS CA CD FE K MG NA P PB SB SE
20190206-DGW-MW11-PV20inlet-controlT	1	22-Feb-2019 00:56	237SMPL.d	AS CD FE K PB SB SE
20190206-DGW-MW11-PV20inlet-30-35-40T	1	22-Feb-2019 00:58	238SMPL.d	AS CD FE K PB SB SE
20190207-DGW-MW11-PV20mid-controlT	1	22-Feb-2019 01:00	239SMPL.d	AS CD FE K PB SB SE
20190207-DGW-MW11-PV20mid-30T	1	22-Feb-2019 01:02	240SMPL.d	AS CD FE K PB SB SE
20190207-DGW-MW11-PV20mid-35T	1	22-Feb-2019 01:05	241SMPL.d	AS CD FE K PB SB SE
20190207-DGW-MW11-PV20mid-40T	1	22-Feb-2019 01:07	242SMPL.d	AS CD FE K PB SB SE
CCB 19	1	22-Feb-2019 01:20	248_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 19	1	22-Feb-2019 01:25	250_CCV.d	AS CA CD FE K MG NA P PB SB SE
LLICV2	1	22-Feb-2019 01:29	252SMPL.d	AS CA CD FE K MG NA P PB SB SE
LLICV5	1	22-Feb-2019 01:32	253LICV.d	AS CA CD FE K MG NA P PB SB SE
ICSA	1	22-Feb-2019 01:34	254ICSA.d	AS CA CD FE K MG NA P PB SB SE
ICSAB	1	22-Feb-2019 01:36	255ICSB.d	AS CA CD FE K MG NA P PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020802

Run ID:ICPMS05_333276
Instrument:ICPMS05
Method:SW6020

CCB 1	Date: 21-Feb-2019 13:05	Seq: 4958923	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Magnesium	10.27	10	200	
Sodium	26	14	200	

CCB 2	Date: 21-Feb-2019 13:34	Seq: 4959003	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	34.67	14	200	

CCB 3	Date: 21-Feb-2019 14:03	Seq: 4959015	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	114.6	14	200	

CCB 4	Date: 21-Feb-2019 15:31	Seq: 4959312	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.426	0.4	2	
Sodium	52.05	14	200	

CCB 5	Date: 21-Feb-2019 16:02	Seq: 4959324	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	58.17	14	200	

CCB 6	Date: 21-Feb-2019 16:48	Seq: 4959335	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	76.22	14	200	

CCB 7	Date: 21-Feb-2019 17:18	Seq: 4959343	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	97.39	14	200	

CCB 8	Date: 21-Feb-2019 18:06	Seq: 4959357	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.572	0.4	2	
Sodium	50.78	14	200	

CCB 9	Date: 21-Feb-2019 18:33	Seq: 4959369	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.493	0.4	2	
Potassium	-25.06	18	200	
Sodium	95.45	14	200	

CCB 10	Date: 21-Feb-2019 19:01	Seq: 4959381	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.381	0.4	2	
Potassium	-18.04	18	200	
Sodium	90.59	14	200	

CCB 12	Date: 21-Feb-2019 22:31	Seq: 4959455	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.823	0.4	2	
Potassium	22.73	18	200	
Sodium	15.15	14	200	

CCB 13	Date: 21-Feb-2019 22:47	Seq: 4959474	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020802

Run ID:ICPMS05_333276
Instrument:ICPMS05
Method:SW6020

Antimony	1.304	0.4	2	
Potassium	30.49	18	200	
Sodium	111.2	14	200	

CCB 14 Date: 21-Feb-2019 23:14 Seq: 4959486 D/F: 1 Units: ug/L

Analyte	Result	MDL	Report Limit
Antimony	0.946	0.4	2
Potassium	33.28	18	200
Sodium	234.3	14	200

CCB 15 Date: 21-Feb-2019 23:37 Seq: 4959496 D/F: 1 Units: ug/L

Analyte	Result	MDL	Report Limit
Antimony	1.185	0.4	2
Potassium	32.94	18	200
Sodium	214.3	14	200

CCB 16 Date: 22-Feb-2019 00:04 Seq: 4959657 D/F: 1 Units: ug/L

Analyte	Result	MDL	Report Limit
Antimony	0.779	0.4	2
Potassium	20.53	18	200
Sodium	122.8	14	200

CCB 17 Date: 22-Feb-2019 00:26 Seq: 4959671 D/F: 1 Units: ug/L

Analyte	Result	MDL	Report Limit
Antimony	1.142	0.4	2
Magnesium	12.06	10	200
Potassium	27.28	18	200
Sodium	415.4	14	200

CCB 18 Date: 22-Feb-2019 00:53 Seq: 4959683 D/F: 1 Units: ug/L

Analyte	Result	MDL	Report Limit
Antimony	0.761	0.4	2
Calcium	44.16	34	500
Magnesium	25.2	10	200
Potassium	42.61	18	200
Sodium	1045	14	200

CCB 19 Date: 22-Feb-2019 01:20 Seq: 4959695 D/F: 1 Units: ug/L

Analyte	Result	MDL	Report Limit
Antimony	0.739	0.4	2
Magnesium	13.2	10	200
Potassium	23.21	18	200
Sodium	634.9	14	200

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020802
Start Date: 22-Feb-2019 End Date: 22-Feb-2019

Run ID:ICPMS05_333328
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
LLICV2	1	22-Feb-2019 12:41	037SMPL.d	CA MG NA
LLICV5	1	22-Feb-2019 12:44	038LICV.d	CA MG NA
ICB	1	22-Feb-2019 12:46	039_ICB.d	AS CA CD FE K MG NA PB SB SE
ICV	1	22-Feb-2019 12:58	041_ICV.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	22-Feb-2019 13:02	042ICSA.d	CA MG NA
ICSAB	1	22-Feb-2019 13:05	043ICSB.d	CA MG NA
CCV 1	1	22-Feb-2019 14:29	052_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	22-Feb-2019 14:31	053_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-137955	1	22-Feb-2019 14:34	054SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZSD	250	22-Feb-2019 14:39	056SMPL.d	CA NA
ZZZZZZPDS	50	22-Feb-2019 14:41	057SMPL.d	CA NA
20190206-DGW-MW11-PV20out-controlT	50	22-Feb-2019 14:43	058SMPL.d	CA MG NA
20190206-DGW-MW11-PV20out-30T	50	22-Feb-2019 14:46	059SMPL.d	CA MG NA
20190206-DGW-MW11-PV20out-35T	50	22-Feb-2019 14:48	060SMPL.d	CA MG NA
20190206-DGW-MW11-PV20out-40T	50	22-Feb-2019 14:50	061SMPL.d	CA MG NA
20190206-DGW-MW11-PV20inlet-controlT	50	22-Feb-2019 14:52	062SMPL.d	CA MG NA
20190206-DGW-MW11-PV20inlet-30-35-40T	50	22-Feb-2019 14:55	063SMPL.d	CA MG NA
CCV 2	1	22-Feb-2019 14:57	064_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	22-Feb-2019 14:59	065_CCB.d	AS CA CD FE K MG NA PB SB SE
20190207-DGW-MW11-PV20mid-controlT	50	22-Feb-2019 15:33	067SMPL.d	CA MG NA
20190207-DGW-MW11-PV20mid-30T	50	22-Feb-2019 15:35	068SMPL.d	CA MG NA
20190207-DGW-MW11-PV20mid-35T	50	22-Feb-2019 15:37	069SMPL.d	CA MG NA
20190207-DGW-MW11-PV20mid-40T	50	22-Feb-2019 15:39	070SMPL.d	CA MG NA
ZZZZZZSD	25	22-Feb-2019 15:44	072SMPL.d	
ZZZZZZPDS	5	22-Feb-2019 15:46	073SMPL.d	
CCV 3	1	22-Feb-2019 15:56	075_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	22-Feb-2019 15:58	076_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	22-Feb-2019 16:33	087_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	22-Feb-2019 16:35	088_CCV.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020802

Run ID:ICPMS05_333328
Instrument:ICPMS05
Method:SW6020

CCB 1	Date: 22-Feb-2019 14:31	Seq: 4960521	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.456	0.4	2	
Sodium	23.81	14	200	

CCB 2	Date: 22-Feb-2019 14:59	Seq: 4960533	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.413	0.4	2	
Sodium	16.61	14	200	

CCB 4	Date: 22-Feb-2019 16:33	Seq: 4960607	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.615	0.4	2	
Potassium	25.7	18	200	
Sodium	32.93	14	200	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19020802

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19020802-01	20190206-DGW-MW11-PV20out-controlD	Groundwater		06-Feb-2019 15:10	15-Feb-2019 08:37	☐
HS19020802-02	20190206-DGW-MW11-PV20out-30D	Groundwater		06-Feb-2019 15:10	15-Feb-2019 08:37	☐
HS19020802-03	20190206-DGW-MW11-PV20out-35D	Groundwater		06-Feb-2019 15:10	15-Feb-2019 08:37	☐
HS19020802-04	20190206-DGW-MW11-PV20out-40D	Groundwater		06-Feb-2019 15:10	15-Feb-2019 08:37	☐
HS19020802-05	20190206-DGW-MW11-PV20inlet-controlD	Groundwater		06-Feb-2019 15:20	15-Feb-2019 08:37	☐
HS19020802-06	20190206-DGW-MW11-PV20inlet-30-35-40D	Groundwater		06-Feb-2019 15:20	15-Feb-2019 08:37	☐
HS19020802-07	20190207-DGW-MW11-PV20mid-controlD	Groundwater		07-Feb-2019 18:05	15-Feb-2019 08:37	☐
HS19020802-08	20190207-DGW-MW11-PV20mid-30D	Groundwater		07-Feb-2019 18:05	15-Feb-2019 08:37	☐
HS19020802-09	20190207-DGW-MW11-PV20mid-35D	Groundwater		07-Feb-2019 18:05	15-Feb-2019 08:37	☐
HS19020802-10	20190207-DGW-MW11-PV20mid-40D	Groundwater		07-Feb-2019 18:05	15-Feb-2019 08:37	☐
HS19020802-11	20190206-DGW-MW11-PV20out-controlT	Groundwater		06-Feb-2019 15:10	15-Feb-2019 08:37	☐
HS19020802-12	20190206-DGW-MW11-PV20out-30T	Groundwater		06-Feb-2019 15:10	15-Feb-2019 08:37	☐
HS19020802-13	20190206-DGW-MW11-PV20out-35T	Groundwater		06-Feb-2019 15:10	15-Feb-2019 08:37	☐
HS19020802-14	20190206-DGW-MW11-PV20out-40T	Groundwater		06-Feb-2019 15:10	15-Feb-2019 08:37	☐
HS19020802-15	20190206-DGW-MW11-PV20inlet-controlT	Groundwater		06-Feb-2019 15:20	15-Feb-2019 08:37	☐
HS19020802-16	20190206-DGW-MW11-PV20inlet-30-35-40T	Groundwater		06-Feb-2019 15:20	15-Feb-2019 08:37	☐
HS19020802-17	20190207-DGW-MW11-PV20mid-controlT	Groundwater		07-Feb-2019 18:05	15-Feb-2019 08:37	☐
HS19020802-18	20190207-DGW-MW11-PV20mid-30T	Groundwater		07-Feb-2019 18:05	15-Feb-2019 08:37	☐
HS19020802-19	20190207-DGW-MW11-PV20mid-35T	Groundwater		07-Feb-2019 18:05	15-Feb-2019 08:37	☐
HS19020802-20	20190207-DGW-MW11-PV20mid-40T	Groundwater		07-Feb-2019 18:05	15-Feb-2019 08:37	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190206-DGW-MW11-PV20out-controlD
Collection Date: 06-Feb-2019 15:10

ANALYTICAL REPORT
WorkOrder:HS19020802
Lab ID:HS19020802-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 19-Feb-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	21-Feb-2019 13:52
Arsenic	U		0.00200	0.0100	mg/L	5	21-Feb-2019 13:52
Cadmium	**0.00619**	J	**0.00100**	**0.0100**	**mg/L**	5	21-Feb-2019 13:52
Calcium	**521**		**1.70**	**25.0**	**mg/L**	50	21-Feb-2019 13:23
Iron	U		0.0600	1.00	mg/L	5	21-Feb-2019 13:52
Lead	U		0.00300	0.0100	mg/L	5	21-Feb-2019 13:52
Magnesium	**308**		**0.500**	**10.0**	**mg/L**	50	21-Feb-2019 13:23
Potassium	**20.1**		**0.0900**	**1.00**	**mg/L**	5	21-Feb-2019 13:52
Selenium	U		0.00550	0.0100	mg/L	5	21-Feb-2019 13:52
Sodium	**1,930**		**0.700**	**10.0**	**mg/L**	50	21-Feb-2019 13:23

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190206-DGW-MW11-PV20out-30D
Collection Date: 06-Feb-2019 15:10

ANALYTICAL REPORT
WorkOrder:HS19020802
Lab ID:HS19020802-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 19-Feb-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	21-Feb-2019 13:54
Arsenic	U		0.00200	0.0100	mg/L	5	21-Feb-2019 13:54
Cadmium	U		0.00100	0.0100	mg/L	5	21-Feb-2019 13:54
Calcium	**364**		**1.70**	**25.0**	**mg/L**	50	21-Feb-2019 13:26
Iron	U		0.0600	1.00	mg/L	5	21-Feb-2019 13:54
Lead	U		0.00300	0.0100	mg/L	5	21-Feb-2019 13:54
Magnesium	**316**		**0.500**	**10.0**	**mg/L**	50	21-Feb-2019 13:26
Potassium	**23.0**		**0.0900**	**1.00**	**mg/L**	5	21-Feb-2019 13:54
Selenium	U		0.00550	0.0100	mg/L	5	21-Feb-2019 13:54
Sodium	**1,780**		**0.700**	**10.0**	**mg/L**	50	21-Feb-2019 13:26

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190206-DGW-MW11-PV20out-35D
Collection Date: 06-Feb-2019 15:10

ANALYTICAL REPORT
WorkOrder:HS19020802
Lab ID:HS19020802-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 19-Feb-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	21-Feb-2019 13:56
Arsenic	U		0.00200	0.0100	mg/L	5	21-Feb-2019 13:56
Cadmium	U		0.00100	0.0100	mg/L	5	21-Feb-2019 13:56
Calcium	**380**		**1.70**	**25.0**	**mg/L**	50	21-Feb-2019 13:28
Iron	U		0.0600	1.00	mg/L	5	21-Feb-2019 13:56
Lead	U		0.00300	0.0100	mg/L	5	21-Feb-2019 13:56
Magnesium	**320**		**0.500**	**10.0**	**mg/L**	50	21-Feb-2019 13:28
Potassium	**23.7**		**0.0900**	**1.00**	**mg/L**	5	21-Feb-2019 13:56
Selenium	U		0.00550	0.0100	mg/L	5	21-Feb-2019 13:56
Sodium	**1,870**		**0.700**	**10.0**	**mg/L**	50	21-Feb-2019 13:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190206-DGW-MW11-PV20out-40D
Collection Date: 06-Feb-2019 15:10

ANALYTICAL REPORT
WorkOrder:HS19020802
Lab ID:HS19020802-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 19-Feb-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	21-Feb-2019 13:58
Arsenic	U		0.00200	0.0100	mg/L	5	21-Feb-2019 13:58
Cadmium	U		0.00100	0.0100	mg/L	5	21-Feb-2019 13:58
Calcium	**365**		**1.70**	**25.0**	**mg/L**	50	21-Feb-2019 13:30
Iron	U		0.0600	1.00	mg/L	5	21-Feb-2019 13:58
Lead	U		0.00300	0.0100	mg/L	5	21-Feb-2019 13:58
Magnesium	**315**		**0.500**	**10.0**	**mg/L**	50	21-Feb-2019 13:30
Potassium	**23.3**		**0.0900**	**1.00**	**mg/L**	5	21-Feb-2019 13:58
Selenium	U		0.00550	0.0100	mg/L	5	21-Feb-2019 13:58
Sodium	**1,790**		**0.700**	**10.0**	**mg/L**	50	21-Feb-2019 13:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190206-DGW-MW11-PV20inlet-controlD
Collection Date: 06-Feb-2019 15:20

ANALYTICAL REPORT
WorkOrder:HS19020802
Lab ID:HS19020802-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 19-Feb-2019		Analyst: ALR
Antimony	**0.00423**	J	**0.00200**	**0.0100**	**mg/L**	5	21-Feb-2019 00:04
Arsenic	U		0.00200	0.0100	mg/L	5	21-Feb-2019 00:04
Cadmium	**0.00552**	J	**0.00100**	**0.0100**	**mg/L**	5	21-Feb-2019 00:04
Calcium	**504**		**0.170**	**2.50**	**mg/L**	5	21-Feb-2019 00:04
Iron	**1.31**		**0.0600**	**1.00**	**mg/L**	5	21-Feb-2019 00:04
Lead	U		0.00300	0.0100	mg/L	5	21-Feb-2019 00:04
Magnesium	**287**		**0.0500**	**1.00**	**mg/L**	5	21-Feb-2019 00:04
Potassium	**19.2**		**0.0900**	**1.00**	**mg/L**	5	21-Feb-2019 00:04
Selenium	U		0.00550	0.0100	mg/L	5	21-Feb-2019 00:04
Sodium	**2,010**		**0.700**	**10.0**	**mg/L**	50	21-Feb-2019 13:38

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190206-DGW-MW11-PV20inlet-30-35-40D
Collection Date: 06-Feb-2019 15:20

ANALYTICAL REPORT
WorkOrder:HS19020802
Lab ID:HS19020802-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 19-Feb-2019		Analyst: ALR
Antimony	U		0.00200	0.0100	mg/L	5	21-Feb-2019 00:06
Arsenic	U		0.00200	0.0100	mg/L	5	21-Feb-2019 00:06
Cadmium	**0.00621**	J	**0.00100**	**0.0100**	**mg/L**	5	21-Feb-2019 00:06
Calcium	**486**		**0.170**	**2.50**	**mg/L**	5	21-Feb-2019 00:06
Iron	**2.52**		**0.0600**	**1.00**	**mg/L**	5	21-Feb-2019 00:06
Lead	U		0.00300	0.0100	mg/L	5	21-Feb-2019 00:06
Magnesium	**286**		**0.0500**	**1.00**	**mg/L**	5	21-Feb-2019 00:06
Potassium	**20.7**		**0.0900**	**1.00**	**mg/L**	5	21-Feb-2019 00:06
Selenium	U		0.00550	0.0100	mg/L	5	21-Feb-2019 00:06
Sodium	**1,870**		**0.700**	**10.0**	**mg/L**	50	21-Feb-2019 13:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190207-DGW-MW11-PV20mid-controlD
Collection Date: 07-Feb-2019 18:05

ANALYTICAL REPORT
WorkOrder:HS19020802
Lab ID:HS19020802-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 19-Feb-2019		Analyst: ALR
Antimony	U		0.00200	0.0100	mg/L	5	21-Feb-2019 00:08
Arsenic	U		0.00200	0.0100	mg/L	5	21-Feb-2019 00:08
Cadmium	**0.00512**	J	**0.00100**	**0.0100**	**mg/L**	5	21-Feb-2019 00:08
Calcium	**476**		**0.170**	**2.50**	**mg/L**	5	21-Feb-2019 00:08
Iron	U		0.0600	1.00	mg/L	5	21-Feb-2019 00:08
Lead	U		0.00300	0.0100	mg/L	5	21-Feb-2019 00:08
Magnesium	**269**		**0.0500**	**1.00**	**mg/L**	5	21-Feb-2019 00:08
Potassium	**17.3**		**0.0900**	**1.00**	**mg/L**	5	21-Feb-2019 00:08
Selenium	U		0.00550	0.0100	mg/L	5	21-Feb-2019 00:08
Sodium	**2,040**		**0.700**	**10.0**	**mg/L**	50	21-Feb-2019 13:43

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190207-DGW-MW11-PV20mid-30D
Collection Date: 07-Feb-2019 18:05

ANALYTICAL REPORT
WorkOrder:HS19020802
Lab ID:HS19020802-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 19-Feb-2019		Analyst: ALR
Antimony	U		0.00200	0.0100	mg/L	5	21-Feb-2019 00:11
Arsenic	U		0.00200	0.0100	mg/L	5	21-Feb-2019 00:11
Cadmium	U		0.00100	0.0100	mg/L	5	21-Feb-2019 00:11
Calcium	**368**		**0.170**	**2.50**	**mg/L**	5	21-Feb-2019 00:11
Iron	**0.212**	J	**0.0600**	**1.00**	**mg/L**	5	21-Feb-2019 00:11
Lead	U		0.00300	0.0100	mg/L	5	21-Feb-2019 00:11
Magnesium	**280**		**0.0500**	**1.00**	**mg/L**	5	21-Feb-2019 00:11
Potassium	**20.3**		**0.0900**	**1.00**	**mg/L**	5	21-Feb-2019 00:11
Selenium	U		0.00550	0.0100	mg/L	5	21-Feb-2019 00:11
Sodium	**1,810**		**0.700**	**10.0**	**mg/L**	50	21-Feb-2019 13:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190207-DGW-MW11-PV20mid-35D
Collection Date: 07-Feb-2019 18:05

ANALYTICAL REPORT
WorkOrder:HS19020802
Lab ID:HS19020802-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 19-Feb-2019		Analyst: ALR
Antimony	U		0.00200	0.0100	mg/L	5	21-Feb-2019 00:13
Arsenic	U		0.00200	0.0100	mg/L	5	21-Feb-2019 00:13
Cadmium	U		0.00100	0.0100	mg/L	5	21-Feb-2019 00:13
Calcium	**367**		**0.170**	**2.50**	**mg/L**	5	21-Feb-2019 00:13
Iron	**0.0959**	J	**0.0600**	**1.00**	**mg/L**	5	21-Feb-2019 00:13
Lead	U		0.00300	0.0100	mg/L	5	21-Feb-2019 00:13
Magnesium	**284**		**0.0500**	**1.00**	**mg/L**	5	21-Feb-2019 00:13
Potassium	**21.6**		**0.0900**	**1.00**	**mg/L**	5	21-Feb-2019 00:13
Selenium	U		0.00550	0.0100	mg/L	5	21-Feb-2019 00:13
Sodium	**1,830**		**0.700**	**10.0**	**mg/L**	50	21-Feb-2019 13:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190207-DGW-MW11-PV20mid-40D
Collection Date: 07-Feb-2019 18:05

ANALYTICAL REPORT
WorkOrder:HS19020802
Lab ID:HS19020802-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 19-Feb-2019		Analyst: ALR
Antimony	U		0.00200	0.0100	mg/L	5	21-Feb-2019 00:15
Arsenic	U		0.00200	0.0100	mg/L	5	21-Feb-2019 00:15
Cadmium	U		0.00100	0.0100	mg/L	5	21-Feb-2019 00:15
Calcium	**369**		**0.170**	**2.50**	**mg/L**	5	21-Feb-2019 00:15
Iron	U		0.0600	1.00	mg/L	5	21-Feb-2019 00:15
Lead	U		0.00300	0.0100	mg/L	5	21-Feb-2019 00:15
Magnesium	**285**		**0.0500**	**1.00**	**mg/L**	5	21-Feb-2019 00:15
Potassium	**21.7**		**0.0900**	**1.00**	**mg/L**	5	21-Feb-2019 00:15
Selenium	U		0.00550	0.0100	mg/L	5	21-Feb-2019 00:15
Sodium	**1,820**		**0.700**	**10.0**	**mg/L**	50	21-Feb-2019 13:49

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190206-DGW-MW11-PV20out-controlT
Collection Date: 06-Feb-2019 15:10

ANALYTICAL REPORT
WorkOrder:HS19020802
Lab ID:HS19020802-11
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,670**		**2.00**	**2.00**	**mg/L**	1	22-Feb-2019 17:14
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 21-Feb-2019		Analyst: JHD
Antimony	**0.000460**	J	**0.000400**	**0.00200**	**mg/L**	1	22-Feb-2019 00:42
Arsenic	**0.00119**	J	**0.000400**	**0.00200**	**mg/L**	1	22-Feb-2019 00:42
Cadmium	**0.00590**		**0.000200**	**0.00200**	**mg/L**	1	22-Feb-2019 00:42
Calcium	**529**		**1.70**	**25.0**	**mg/L**	50	22-Feb-2019 14:43
Iron	U		0.0120	0.200	mg/L	1	22-Feb-2019 00:42
Lead	U		0.000600	0.00200	mg/L	1	22-Feb-2019 00:42
Magnesium	**327**		**0.500**	**10.0**	**mg/L**	50	22-Feb-2019 14:43
Potassium	**21.5**		**0.0180**	**0.200**	**mg/L**	1	22-Feb-2019 00:42
Selenium	U		0.00110	0.00200	mg/L	1	22-Feb-2019 00:42
Sodium	**1,990**		**0.700**	**10.0**	**mg/L**	50	22-Feb-2019 14:43

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190206-DGW-MW11-PV20out-30T
Collection Date: 06-Feb-2019 15:10

ANALYTICAL REPORT
WorkOrder:HS19020802
Lab ID:HS19020802-12
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,270**		**2.00**	**2.00**	**mg/L**	1	22-Feb-2019 17:14
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 21-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	22-Feb-2019 00:44
Arsenic	U		0.000400	0.00200	mg/L	1	22-Feb-2019 00:44
Cadmium	U		0.000200	0.00200	mg/L	1	22-Feb-2019 00:44
Calcium	**369**		**1.70**	**25.0**	**mg/L**	50	22-Feb-2019 14:46
Iron	**3.72**		**0.0120**	**0.200**	**mg/L**	1	22-Feb-2019 00:44
Lead	U		0.000600	0.00200	mg/L	1	22-Feb-2019 00:44
Magnesium	**328**		**0.500**	**10.0**	**mg/L**	50	22-Feb-2019 14:46
Potassium	**24.2**		**0.0180**	**0.200**	**mg/L**	1	22-Feb-2019 00:44
Selenium	U		0.00110	0.00200	mg/L	1	22-Feb-2019 00:44
Sodium	**1,860**		**0.700**	**10.0**	**mg/L**	50	22-Feb-2019 14:46

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190206-DGW-MW11-PV20out-35T
Collection Date: 06-Feb-2019 15:10

ANALYTICAL REPORT
WorkOrder:HS19020802
Lab ID:HS19020802-13
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,250**		**2.00**	**2.00**	**mg/L**	1	22-Feb-2019 17:14
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 21-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	22-Feb-2019 00:47
Arsenic	U		0.000400	0.00200	mg/L	1	22-Feb-2019 00:47
Cadmium	U		0.000200	0.00200	mg/L	1	22-Feb-2019 00:47
Calcium	**370**		**1.70**	**25.0**	**mg/L**	50	22-Feb-2019 14:48
Iron	**2.20**		**0.0120**	**0.200**	**mg/L**	1	22-Feb-2019 00:47
Lead	U		0.000600	0.00200	mg/L	1	22-Feb-2019 00:47
Magnesium	**321**		**0.500**	**10.0**	**mg/L**	50	22-Feb-2019 14:48
Potassium	**24.5**		**0.0180**	**0.200**	**mg/L**	1	22-Feb-2019 00:47
Selenium	U		0.00110	0.00200	mg/L	1	22-Feb-2019 00:47
Sodium	**1,870**		**0.700**	**10.0**	**mg/L**	50	22-Feb-2019 14:48

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190206-DGW-MW11-PV20out-40T
Collection Date: 06-Feb-2019 15:10

ANALYTICAL REPORT
WorkOrder:HS19020802
Lab ID:HS19020802-14
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,160**		**2.00**	**2.00**	**mg/L**	1	22-Feb-2019 17:14
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 21-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	22-Feb-2019 00:49
Arsenic	U		0.000400	0.00200	mg/L	1	22-Feb-2019 00:49
Cadmium	U		0.000200	0.00200	mg/L	1	22-Feb-2019 00:49
Calcium	**348**		**1.70**	**25.0**	**mg/L**	50	22-Feb-2019 14:50
Iron	**1.39**		**0.0120**	**0.200**	**mg/L**	1	22-Feb-2019 00:49
Lead	U		0.000600	0.00200	mg/L	1	22-Feb-2019 00:49
Magnesium	**314**		**0.500**	**10.0**	**mg/L**	50	22-Feb-2019 14:50
Potassium	**24.7**		**0.0180**	**0.200**	**mg/L**	1	22-Feb-2019 00:49
Selenium	U		0.00110	0.00200	mg/L	1	22-Feb-2019 00:49
Sodium	**1,800**		**0.700**	**10.0**	**mg/L**	50	22-Feb-2019 14:50

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190206-DGW-MW11-PV20inlet-controlT
Collection Date: 06-Feb-2019 15:20

ANALYTICAL REPORT
WorkOrder:HS19020802
Lab ID:HS19020802-15
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,640**		**2.00**	**2.00**	**mg/L**	1	22-Feb-2019 17:14
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 21-Feb-2019		Analyst: JHD
Antimony	**0.000668**	J	**0.000400**	**0.00200**	**mg/L**	1	22-Feb-2019 00:56
Arsenic	**0.000442**	J	**0.000400**	**0.00200**	**mg/L**	1	22-Feb-2019 00:56
Cadmium	**0.00562**		**0.000200**	**0.00200**	**mg/L**	1	22-Feb-2019 00:56
Calcium	**528**		**1.70**	**25.0**	**mg/L**	50	22-Feb-2019 14:52
Iron	**8.48**		**0.0120**	**0.200**	**mg/L**	1	22-Feb-2019 00:56
Lead	**0.00252**		**0.000600**	**0.00200**	**mg/L**	1	22-Feb-2019 00:56
Magnesium	**321**		**0.500**	**10.0**	**mg/L**	50	22-Feb-2019 14:52
Potassium	**20.6**		**0.0180**	**0.200**	**mg/L**	1	22-Feb-2019 00:56
Selenium	U		0.00110	0.00200	mg/L	1	22-Feb-2019 00:56
Sodium	**1,970**		**0.700**	**10.0**	**mg/L**	50	22-Feb-2019 14:52

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190206-DGW-MW11-PV20inlet-30-35-40T
Collection Date: 06-Feb-2019 15:20

ANALYTICAL REPORT
WorkOrder:HS19020802
Lab ID:HS19020802-16
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,740**		**2.00**	**2.00**	**mg/L**	1	22-Feb-2019 17:14
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 21-Feb-2019		Analyst: JHD
Antimony	**0.000510**	J	**0.000400**	**0.00200**	**mg/L**	1	22-Feb-2019 00:58
Arsenic	**0.000405**	J	**0.000400**	**0.00200**	**mg/L**	1	22-Feb-2019 00:58
Cadmium	**0.00672**		**0.000200**	**0.00200**	**mg/L**	1	22-Feb-2019 00:58
Calcium	**540**		**1.70**	**25.0**	**mg/L**	50	22-Feb-2019 14:55
Iron	**8.17**		**0.0120**	**0.200**	**mg/L**	1	22-Feb-2019 00:58
Lead	**0.00326**		**0.000600**	**0.00200**	**mg/L**	1	22-Feb-2019 00:58
Magnesium	**338**		**0.500**	**10.0**	**mg/L**	50	22-Feb-2019 14:55
Potassium	**24.6**		**0.0180**	**0.200**	**mg/L**	1	22-Feb-2019 00:58
Selenium	**0.00114**	J	**0.00110**	**0.00200**	**mg/L**	1	22-Feb-2019 00:58
Sodium	**1,860**		**0.700**	**10.0**	**mg/L**	50	22-Feb-2019 14:55

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190207-DGW-MW11-PV20mid-controlT
Collection Date: 07-Feb-2019 18:05

ANALYTICAL REPORT
WorkOrder:HS19020802
Lab ID:HS19020802-17
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,530**		**2.00**	**2.00**	**mg/L**	1	22-Feb-2019 17:14
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 21-Feb-2019		Analyst: JHD
Antimony	**0.000524**	J	**0.000400**	**0.00200**	**mg/L**	1	22-Feb-2019 01:00
Arsenic	U		0.000400	0.00200	mg/L	1	22-Feb-2019 01:00
Cadmium	**0.00556**		**0.000200**	**0.00200**	**mg/L**	1	22-Feb-2019 01:00
Calcium	**495**		**1.70**	**25.0**	**mg/L**	50	22-Feb-2019 15:33
Iron	U		0.0120	0.200	mg/L	1	22-Feb-2019 01:00
Lead	U		0.000600	0.00200	mg/L	1	22-Feb-2019 01:00
Magnesium	**315**		**0.500**	**10.0**	**mg/L**	50	22-Feb-2019 15:33
Potassium	**21.6**		**0.0180**	**0.200**	**mg/L**	1	22-Feb-2019 01:00
Selenium	**0.00130**	J	**0.00110**	**0.00200**	**mg/L**	1	22-Feb-2019 01:00
Sodium	**1,930**		**0.700**	**10.0**	**mg/L**	50	22-Feb-2019 15:33

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190207-DGW-MW11-PV20mid-30T
Collection Date: 07-Feb-2019 18:05

ANALYTICAL REPORT
WorkOrder:HS19020802
Lab ID:HS19020802-18
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,380**		**2.00**	**2.00**	**mg/L**	1	22-Feb-2019 17:14
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 21-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	22-Feb-2019 01:02
Arsenic	U		0.000400	0.00200	mg/L	1	22-Feb-2019 01:02
Cadmium	U		0.000200	0.00200	mg/L	1	22-Feb-2019 01:02
Calcium	**405**		**1.70**	**25.0**	**mg/L**	50	22-Feb-2019 15:35
Iron	**6.38**		**0.0120**	**0.200**	**mg/L**	1	22-Feb-2019 01:02
Lead	U		0.000600	0.00200	mg/L	1	22-Feb-2019 01:02
Magnesium	**333**		**0.500**	**10.0**	**mg/L**	50	22-Feb-2019 15:35
Potassium	**26.1**		**0.0180**	**0.200**	**mg/L**	1	22-Feb-2019 01:02
Selenium	U		0.00110	0.00200	mg/L	1	22-Feb-2019 01:02
Sodium	**1,900**		**0.700**	**10.0**	**mg/L**	50	22-Feb-2019 15:35

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190207-DGW-MW11-PV20mid-35T
Collection Date: 07-Feb-2019 18:05

ANALYTICAL REPORT
WorkOrder:HS19020802
Lab ID:HS19020802-19
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,510**		**2.00**	**2.00**	**mg/L**	1	22-Feb-2019 17:14
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 21-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	22-Feb-2019 01:05
Arsenic	U		0.000400	0.00200	mg/L	1	22-Feb-2019 01:05
Cadmium	U		0.000200	0.00200	mg/L	1	22-Feb-2019 01:05
Calcium	**418**		**1.70**	**25.0**	**mg/L**	50	22-Feb-2019 15:37
Iron	**3.49**		**0.0120**	**0.200**	**mg/L**	1	22-Feb-2019 01:05
Lead	U		0.000600	0.00200	mg/L	1	22-Feb-2019 01:05
Magnesium	**355**		**0.500**	**10.0**	**mg/L**	50	22-Feb-2019 15:37
Potassium	**26.7**		**0.0180**	**0.200**	**mg/L**	1	22-Feb-2019 01:05
Selenium	U		0.00110	0.00200	mg/L	1	22-Feb-2019 01:05
Sodium	**1,990**		**0.700**	**10.0**	**mg/L**	50	22-Feb-2019 15:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190207-DGW-MW11-PV20mid-40T
Collection Date: 07-Feb-2019 18:05

ANALYTICAL REPORT
WorkOrder:HS19020802
Lab ID:HS19020802-20
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,300**		**2.00**	**2.00**	**mg/L**	1	22-Feb-2019 17:14
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 21-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	22-Feb-2019 01:07
Arsenic	U		0.000400	0.00200	mg/L	1	22-Feb-2019 01:07
Cadmium	U		0.000200	0.00200	mg/L	1	22-Feb-2019 01:07
Calcium	**377**		**1.70**	**25.0**	**mg/L**	50	22-Feb-2019 15:39
Iron	**0.906**		**0.0120**	**0.200**	**mg/L**	1	22-Feb-2019 01:07
Lead	U		0.000600	0.00200	mg/L	1	22-Feb-2019 01:07
Magnesium	**330**		**0.500**	**10.0**	**mg/L**	50	22-Feb-2019 15:39
Potassium	**26.1**		**0.0180**	**0.200**	**mg/L**	1	22-Feb-2019 01:07
Selenium	U		0.00110	0.00200	mg/L	1	22-Feb-2019 01:07
Sodium	**1,870**		**0.700**	**10.0**	**mg/L**	50	22-Feb-2019 15:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020802

Batch ID: 137876 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19020802-01	1	10	10 (mL)	1
HS19020802-02	1	10	10 (mL)	1
HS19020802-03	1	10	10 (mL)	1
HS19020802-04	1	10	10 (mL)	1
HS19020802-05	1	10	10 (mL)	1
HS19020802-06	1	10	10 (mL)	1
HS19020802-07	1	10	10 (mL)	1
HS19020802-08	1	10	10 (mL)	1
HS19020802-09	1	10	10 (mL)	1
HS19020802-10	1	10	10 (mL)	1

Batch ID: 137955 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19020802-11	1	10	10 (mL)	1
HS19020802-12	1	10	10 (mL)	1
HS19020802-13	1	10	10 (mL)	1
HS19020802-14	1	10	10 (mL)	1
HS19020802-15	1	10	10 (mL)	1
HS19020802-16	1	10	10 (mL)	1
HS19020802-17	1	10	10 (mL)	1
HS19020802-18	1	10	10 (mL)	1
HS19020802-19	1	10	10 (mL)	1
HS19020802-20	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020802

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 137876	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS19020802-01	20190206-DGW-MW11-PV20out-controlD	06 Feb 2019 15:10		19 Feb 2019 13:30	21 Feb 2019 13:52	5
HS19020802-01	20190206-DGW-MW11-PV20out-controlD	06 Feb 2019 15:10		19 Feb 2019 13:30	21 Feb 2019 13:23	50
HS19020802-02	20190206-DGW-MW11-PV20out-30D	06 Feb 2019 15:10		19 Feb 2019 13:30	21 Feb 2019 13:54	5
HS19020802-02	20190206-DGW-MW11-PV20out-30D	06 Feb 2019 15:10		19 Feb 2019 13:30	21 Feb 2019 13:26	50
HS19020802-03	20190206-DGW-MW11-PV20out-35D	06 Feb 2019 15:10		19 Feb 2019 13:30	21 Feb 2019 13:56	5
HS19020802-03	20190206-DGW-MW11-PV20out-35D	06 Feb 2019 15:10		19 Feb 2019 13:30	21 Feb 2019 13:28	50
HS19020802-04	20190206-DGW-MW11-PV20out-40D	06 Feb 2019 15:10		19 Feb 2019 13:30	21 Feb 2019 13:58	5
HS19020802-04	20190206-DGW-MW11-PV20out-40D	06 Feb 2019 15:10		19 Feb 2019 13:30	21 Feb 2019 13:30	50
HS19020802-05	20190206-DGW-MW11-PV20inlet-controlD	06 Feb 2019 15:20		19 Feb 2019 13:30	21 Feb 2019 13:38	50
HS19020802-05	20190206-DGW-MW11-PV20inlet-controlD	06 Feb 2019 15:20		19 Feb 2019 13:30	21 Feb 2019 00:04	5
HS19020802-06	20190206-DGW-MW11-PV20inlet-30-35-40D	06 Feb 2019 15:20		19 Feb 2019 13:30	21 Feb 2019 13:40	50
HS19020802-06	20190206-DGW-MW11-PV20inlet-30-35-40D	06 Feb 2019 15:20		19 Feb 2019 13:30	21 Feb 2019 00:06	5
HS19020802-07	20190207-DGW-MW11-PV20mid-controlD	07 Feb 2019 18:05		19 Feb 2019 13:30	21 Feb 2019 13:43	50
HS19020802-07	20190207-DGW-MW11-PV20mid-controlD	07 Feb 2019 18:05		19 Feb 2019 13:30	21 Feb 2019 00:08	5
HS19020802-08	20190207-DGW-MW11-PV20mid-30D	07 Feb 2019 18:05		19 Feb 2019 13:30	21 Feb 2019 13:45	50
HS19020802-08	20190207-DGW-MW11-PV20mid-30D	07 Feb 2019 18:05		19 Feb 2019 13:30	21 Feb 2019 00:11	5
HS19020802-09	20190207-DGW-MW11-PV20mid-35D	07 Feb 2019 18:05		19 Feb 2019 13:30	21 Feb 2019 13:47	50
HS19020802-09	20190207-DGW-MW11-PV20mid-35D	07 Feb 2019 18:05		19 Feb 2019 13:30	21 Feb 2019 00:13	5
HS19020802-10	20190207-DGW-MW11-PV20mid-40D	07 Feb 2019 18:05		19 Feb 2019 13:30	21 Feb 2019 13:49	50
HS19020802-10	20190207-DGW-MW11-PV20mid-40D	07 Feb 2019 18:05		19 Feb 2019 13:30	21 Feb 2019 00:15	5

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020802

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 137955	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19020802-11	20190206-DGW-MW11-PV20out-controlT	06 Feb 2019 15:10		21 Feb 2019 10:00	22 Feb 2019 14:43	50
HS19020802-11	20190206-DGW-MW11-PV20out-controlT	06 Feb 2019 15:10		21 Feb 2019 10:00	22 Feb 2019 00:42	1
HS19020802-12	20190206-DGW-MW11-PV20out-30T	06 Feb 2019 15:10		21 Feb 2019 10:00	22 Feb 2019 14:46	50
HS19020802-12	20190206-DGW-MW11-PV20out-30T	06 Feb 2019 15:10		21 Feb 2019 10:00	22 Feb 2019 00:44	1
HS19020802-13	20190206-DGW-MW11-PV20out-35T	06 Feb 2019 15:10		21 Feb 2019 10:00	22 Feb 2019 14:48	50
HS19020802-13	20190206-DGW-MW11-PV20out-35T	06 Feb 2019 15:10		21 Feb 2019 10:00	22 Feb 2019 00:47	1
HS19020802-14	20190206-DGW-MW11-PV20out-40T	06 Feb 2019 15:10		21 Feb 2019 10:00	22 Feb 2019 14:50	50
HS19020802-14	20190206-DGW-MW11-PV20out-40T	06 Feb 2019 15:10		21 Feb 2019 10:00	22 Feb 2019 00:49	1
HS19020802-15	20190206-DGW-MW11-PV20inlet-controlT	06 Feb 2019 15:20		21 Feb 2019 10:00	22 Feb 2019 14:52	50
HS19020802-15	20190206-DGW-MW11-PV20inlet-controlT	06 Feb 2019 15:20		21 Feb 2019 10:00	22 Feb 2019 00:56	1
HS19020802-16	20190206-DGW-MW11-PV20inlet-30-35-40T	06 Feb 2019 15:20		21 Feb 2019 10:00	22 Feb 2019 14:55	50
HS19020802-16	20190206-DGW-MW11-PV20inlet-30-35-40T	06 Feb 2019 15:20		21 Feb 2019 10:00	22 Feb 2019 00:58	1
HS19020802-17	20190207-DGW-MW11-PV20mid-controlT	07 Feb 2019 18:05		21 Feb 2019 10:00	22 Feb 2019 15:33	50
HS19020802-17	20190207-DGW-MW11-PV20mid-controlT	07 Feb 2019 18:05		21 Feb 2019 10:00	22 Feb 2019 01:00	1
HS19020802-18	20190207-DGW-MW11-PV20mid-30T	07 Feb 2019 18:05		21 Feb 2019 10:00	22 Feb 2019 15:35	50
HS19020802-18	20190207-DGW-MW11-PV20mid-30T	07 Feb 2019 18:05		21 Feb 2019 10:00	22 Feb 2019 01:02	1
HS19020802-19	20190207-DGW-MW11-PV20mid-35T	07 Feb 2019 18:05		21 Feb 2019 10:00	22 Feb 2019 15:37	50
HS19020802-19	20190207-DGW-MW11-PV20mid-35T	07 Feb 2019 18:05		21 Feb 2019 10:00	22 Feb 2019 01:05	1
HS19020802-20	20190207-DGW-MW11-PV20mid-40T	07 Feb 2019 18:05		21 Feb 2019 10:00	22 Feb 2019 15:39	50
HS19020802-20	20190207-DGW-MW11-PV20mid-40T	07 Feb 2019 18:05		21 Feb 2019 10:00	22 Feb 2019 01:07	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020802

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R333360	**Test Name :** HARDNESS, TOTAL AS CACO3 BY SM2340B			**Matrix:** Groundwater		
HS19020802-11	20190206-DGW-MW11-PV20out-controlT	06 Feb 2019 15:10			22 Feb 2019 17:14	1
HS19020802-12	20190206-DGW-MW11-PV20out-30T	06 Feb 2019 15:10			22 Feb 2019 17:14	1
HS19020802-13	20190206-DGW-MW11-PV20out-35T	06 Feb 2019 15:10			22 Feb 2019 17:14	1
HS19020802-14	20190206-DGW-MW11-PV20out-40T	06 Feb 2019 15:10			22 Feb 2019 17:14	1
HS19020802-15	20190206-DGW-MW11-PV20inlet-controlT	06 Feb 2019 15:20			22 Feb 2019 17:14	1
HS19020802-16	20190206-DGW-MW11-PV20inlet-30-35-40T	06 Feb 2019 15:20			22 Feb 2019 17:14	1
HS19020802-17	20190207-DGW-MW11-PV20mid-controlT	07 Feb 2019 18:05			22 Feb 2019 17:14	1
HS19020802-18	20190207-DGW-MW11-PV20mid-30T	07 Feb 2019 18:05			22 Feb 2019 17:14	1
HS19020802-19	20190207-DGW-MW11-PV20mid-35T	07 Feb 2019 18:05			22 Feb 2019 17:14	1
HS19020802-20	20190207-DGW-MW11-PV20mid-40T	07 Feb 2019 18:05			22 Feb 2019 17:14	1

WorkOrder: HS19020802
InstrumentID: ICPMS05
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000555	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000460	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000554	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0537	0.0340	0.500
A	Iron	7439-89-6	0.0500	0.0549	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.00100	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0680	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0542	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00280	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0459	0.0140	0.200

WorkOrder: HS19020802
InstrumentID: ICPMS05
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000555	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000460	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000554	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0537	0.0340	0.500
A	Iron	7439-89-6	0.0500	0.0549	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.00100	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0680	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0542	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00280	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0459	0.0140	0.200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020802

QC BATCH REPORT

Batch ID: 137876 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLKF1-137876** Units: **mg/L** Analysis Date: **20-Feb-2019 23:03**
Client ID: Run ID: **ICPMS05_333248** SeqNo: **4957924** PrepDate: **19-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.0143	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	0.05188	0.200								J

MBLK Sample ID: **MBLK-137876** Units: **mg/L** Analysis Date: **20-Feb-2019 23:06**
Client ID: Run ID: **ICPMS05_333248** SeqNo: **4957925** PrepDate: **19-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01325	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	0.04071	0.200								J

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020802

QC BATCH REPORT

Batch ID: 137876 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

LCS Sample ID: **LCS-137876** Units: **mg/L** Analysis Date: **20-Feb-2019 23:08**
Client ID: Run ID: **ICPMS05_333248** SeqNo: **4957926** PrepDate: **19-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05529	0.00200	0.05	0	111	80 - 120				
Arsenic	0.05375	0.00200	0.05	0	108	80 - 120				
Cadmium	0.05588	0.00200	0.05	0	112	80 - 120				
Calcium	5.624	0.500	5	0	112	80 - 120				
Iron	5.591	0.200	5	0	112	80 - 120				
Lead	0.05568	0.00200	0.05	0	111	80 - 120				
Magnesium	5.665	0.200	5	0	113	80 - 120				
Potassium	5.521	0.200	5	0	110	80 - 120				
Selenium	0.05368	0.00200	0.05	0	107	80 - 120				

LCS Sample ID: **LCS-137876** Units: **mg/L** Analysis Date: **21-Feb-2019 13:21**
Client ID: Run ID: **ICPMS05_333276** SeqNo: **4958997** PrepDate: **19-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	5.508	0.200	5	0	110	80 - 120				

MS Sample ID: **HS19020532-04MS** Units: **mg/L** Analysis Date: **20-Feb-2019 23:15**
Client ID: Run ID: **ICPMS05_333248** SeqNo: **4957929** PrepDate: **19-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05441	0.00200	0.05	0.000485	108	75 - 125				
Arsenic	0.0558	0.00200	0.05	0.003111	105	75 - 125				
Cadmium	0.05359	0.00200	0.05	0.000028	107	75 - 125				
Calcium	24.95	0.500	5	20.71	84.9	75 - 125				O
Iron	5.35	0.200	5	0.009533	107	75 - 125				
Lead	0.05291	0.00200	0.05	0.000327	105	75 - 125				
Magnesium	9.379	0.200	5	4.289	102	75 - 125				
Potassium	5.728	0.200	5	0.4692	105	75 - 125				
Selenium	0.05017	0.00200	0.05	0.000722	98.9	75 - 125				
Sodium	49.22	0.200	5	46.9	46.3	75 - 125				SO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020802

QC BATCH REPORT

Batch ID: 137876 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MSD Sample ID: **HS19020532-04MSD** Units: **mg/L** Analysis Date: **20-Feb-2019 23:17**
Client ID: Run ID: **ICPMS05_333248** SeqNo: **4957930** PrepDate: **19-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05506	0.00200	0.05	0.000485	109	75 - 125	0.05441	1.19	20	
Arsenic	0.05669	0.00200	0.05	0.003111	107	75 - 125	0.0558	1.59	20	
Cadmium	0.05361	0.00200	0.05	0.000028	107	75 - 125	0.05359	0.0466	20	
Calcium	25.81	0.500	5	20.71	102	75 - 125	24.95	3.39	20	O
Iron	5.417	0.200	5	0.009533	108	75 - 125	5.35	1.26	20	
Lead	0.05364	0.00200	0.05	0.000327	107	75 - 125	0.05291	1.38	20	
Magnesium	9.461	0.200	5	4.289	103	75 - 125	9.379	0.866	20	
Potassium	5.697	0.200	5	0.4692	105	75 - 125	5.728	0.529	20	
Selenium	0.05285	0.00200	0.05	0.000722	104	75 - 125	0.05017	5.22	20	
Sodium	52.15	0.200	5	46.9	105	75 - 125	49.22	5.79	20	O

PDS Sample ID: **HS19020532-04PDS** Units: **mg/L** Analysis Date: **20-Feb-2019 23:19**
Client ID: Run ID: **ICPMS05_333248** SeqNo: **4957931** PrepDate: **19-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1074	0.00200	0.1	0.000485	107	75 - 125				
Arsenic	0.1108	0.00200	0.1	0.003111	108	75 - 125				
Cadmium	0.1104	0.00200	0.1	0.000028	110	75 - 125				
Calcium	30.58	0.500	10	20.71	98.8	75 - 125				
Iron	10.79	0.200	10	0.009533	108	75 - 125				
Lead	0.1046	0.00200	0.1	0.000327	104	75 - 125				
Magnesium	14.39	0.200	10	4.289	101	75 - 125				
Potassium	11	0.200	10	0.4692	105	75 - 125				
Selenium	0.1059	0.00200	0.1	0.000722	105	75 - 125				
Sodium	54.49	0.200	10	46.9	75.8	75 - 125				O

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020802

QC BATCH REPORT

Batch ID: 137876 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

SD Sample ID: **HS19020532-04SD** Units: **mg/L** Analysis Date: **20-Feb-2019 23:12**
Client ID: Run ID: **ICPMS05_333248** SeqNo: **4957928** PrepDate: **19-Feb-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000485	0	10	
Arsenic	0.002316	0.0100					0.003111	0	10	J
Cadmium	U	0.0100					0.000028	0	10	
Calcium	19.45	2.50					20.71	6.08	10	
Iron	U	1.00					0.009533	0	10	
Lead	U	0.0100					0.000327	0	10	
Magnesium	3.986	1.00					4.289	7.07	10	
Potassium	0.556	1.00					0.4692	0	10	J
Selenium	U	0.0100					0.000722	0	10	
Sodium	45.14	1.00					46.9	3.77	10	

The following samples were analyzed in this batch:

HS19020802-01	HS19020802-02	HS19020802-03	HS19020802-04
HS19020802-05	HS19020802-06	HS19020802-07	HS19020802-08
HS19020802-09	HS19020802-10		

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020802

QC BATCH REPORT

Batch ID: 137955 **Instrument: ICPMS05** **Method: SW6020**

MBLK Sample ID: **MBLK-137955** Units: **mg/L** Analysis Date: **22-Feb-2019 14:34**
Client ID: Run ID: **ICPMS05_333328** SeqNo: **4960522** PrepDate: **21-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	U	0.200								
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	0.02146	0.200								J

LCS Sample ID: **LCS-137955** Units: **mg/L** Analysis Date: **22-Feb-2019 00:11**
Client ID: Run ID: **ICPMS05_333276** SeqNo: **4959664** PrepDate: **21-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05423	0.00200	0.05	0	108	80 - 120				
Arsenic	0.05483	0.00200	0.05	0	110	80 - 120				
Cadmium	0.05289	0.00200	0.05	0	106	80 - 120				
Calcium	5.756	0.500	5	0	115	80 - 120				
Iron	5.736	0.200	5	0	115	80 - 120				
Lead	0.05314	0.00200	0.05	0	106	80 - 120				
Magnesium	5.774	0.200	5	0	115	80 - 120				
Potassium	5.868	0.200	5	0	117	80 - 120				
Selenium	0.0554	0.00200	0.05	0	111	80 - 120				
Sodium	5.693	0.200	5	0	114	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020802

QC BATCH REPORT

Batch ID: 137955 **Instrument: ICPMS05** **Method: SW6020**

MS Sample ID: **HS19020608-02MS** Units: **mg/L** Analysis Date: **22-Feb-2019 00:17**
Client ID: Run ID: **ICPMS05_333276** SeqNo: **4959667** PrepDate: **21-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.0532	0.00200	0.05	0	106	80 - 120				
Arsenic	0.06358	0.00200	0.05	0.005234	117	80 - 120				
Cadmium	0.05271	0.00200	0.05	0	105	80 - 120				
Calcium	473.4	0.500	5	461.3	242	80 - 120				SEO
Iron	5.823	0.200	5	0.165	113	80 - 120				
Lead	0.05398	0.00200	0.05	0	108	80 - 120				
Magnesium	175.9	0.200	5	166.2	194	80 - 120				SO
Potassium	69.1	0.200	5	62.67	129	80 - 120				SO
Selenium	0.00965	0.00200	0.05	0.001121	17.1	80 - 120				S
Sodium	1265	0.200	5	1223	831	80 - 120				SEO

MSD Sample ID: **HS19020608-02MSD** Units: **mg/L** Analysis Date: **22-Feb-2019 00:20**
Client ID: Run ID: **ICPMS05_333276** SeqNo: **4959668** PrepDate: **21-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05595	0.00200	0.05	0	112	80 - 120	0.0532	5.04	20	
Arsenic	0.06708	0.00200	0.05	0.005234	124	80 - 120	0.06358	5.36	20	S
Cadmium	0.05282	0.00200	0.05	0	106	80 - 120	0.05271	0.208	20	
Calcium	496.6	0.500	5	461.3	706	80 - 120	473.4	4.78	20	SEO
Iron	6.151	0.200	5	0.165	120	80 - 120	5.823	5.48	20	
Lead	0.0544	0.00200	0.05	0	109	80 - 120	0.05398	0.771	20	
Magnesium	180.7	0.200	5	166.2	289	80 - 120	175.9	2.67	20	SEO
Potassium	73.41	0.200	5	62.67	215	80 - 120	69.1	6.05	20	SO
Selenium	0.00827	0.00200	0.05	0.001121	14.3	80 - 120	0.00965	15.4	20	S
Sodium	1313	0.200	5	1223	1790	80 - 120	1265	3.73	20	SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020802

QC BATCH REPORT

Batch ID: 137955 **Instrument: ICPMS05** **Method: SW6020**

PDS Sample ID: **HS19020608-02PDS** Units: **mg/L** Analysis Date: **22-Feb-2019 00:22**
Client ID: Run ID: **ICPMS05_333276** SeqNo: **4959669** PrepDate: **21-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1011	0.00200	0.1	0	101	75 - 125				
Arsenic	0.1138	0.00200	0.1	0.005234	109	75 - 125				
Cadmium	0.1048	0.00200	0.1	0	105	75 - 125				
Iron	10.97	0.200	10	0.165	108	75 - 125				
Lead	0.1041	0.00200	0.1	0	104	75 - 125				
Magnesium	170	0.200	10	166.2	38.4	75 - 125				SO
Potassium	71.22	0.200	10	62.67	85.5	75 - 125				O
Selenium	0.1101	0.00200	0.1	0.001121	109	75 - 125				

PDS Sample ID: **HS19020608-02PDS** Units: **mg/L** Analysis Date: **22-Feb-2019 14:41**
Client ID: Run ID: **ICPMS05_333328** SeqNo: **4960525** PrepDate: **21-Feb-2019** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	960.2	25.0	500	448.3	102	75 - 125				
Sodium	1848	10.0	500	1376	94.4	75 - 125				

SD Sample ID: **HS19020608-02SD** Units: **mg/L** Analysis Date: **22-Feb-2019 00:15**
Client ID: Run ID: **ICPMS05_333276** SeqNo: **4959666** PrepDate: **21-Feb-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000113	0	10	
Arsenic	0.004523	0.0100					0.005234	0	10	J
Cadmium	U	0.0100					0.000034	0	10	
Iron	0.1664	1.00					0.165	0	10	J
Lead	U	0.0100					0.000256	0	10	
Magnesium	171.1	1.00					166.2	2.94	10	
Potassium	63.3	1.00					62.67	1.01	10	
Selenium	U	0.0100					0.001121	0	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19020802

QC BATCH REPORT

Batch ID: 137955 **Instrument: ICPMS05** **Method: SW6020**

SD Sample ID: **HS19020608-02SD** Units: **mg/L** Analysis Date: **22-Feb-2019 14:39**
Client ID: Run ID: **ICPMS05_333328** SeqNo: **4960524** PrepDate: **21-Feb-2019** DF: **250**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	453.6	125					460	1.39	10	
Sodium	1426	50.0					1247	14.4	10	R

The following samples were analyzed in this batch:

HS19020802-11	HS19020802-12	HS19020802-13	HS19020802-14
HS19020802-15	HS19020802-16	HS19020802-17	HS19020802-18
HS19020802-19	HS19020802-20		

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19020802**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
California	2919, 2018-2019	30-Apr-2019
Maryland	343, 2018-2019	30-Jun-2019

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19020802

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19020802-01	20190206-DGW-MW11-PV20out-controlD	Login	2/15/2019 12:41:14 PM	NDR	MET034
HS19020802-02	20190206-DGW-MW11-PV20out-30D	Login	2/15/2019 12:41:14 PM	NDR	MET034
HS19020802-03	20190206-DGW-MW11-PV20out-35D	Login	2/15/2019 12:41:14 PM	NDR	MET034
HS19020802-04	20190206-DGW-MW11-PV20out-40D	Login	2/15/2019 12:41:14 PM	NDR	MET034
HS19020802-05	20190206-DGW-MW11-PV20inlet-controlD	Login	2/15/2019 12:41:14 PM	NDR	MET034
HS19020802-06	20190206-DGW-MW11-PV20inlet-30-35-40D	Login	2/15/2019 12:41:14 PM	NDR	MET034
HS19020802-07	20190207-DGW-MW11-PV20mid-controlD	Login	2/15/2019 12:41:14 PM	NDR	MET034
HS19020802-08	20190207-DGW-MW11-PV20mid-30D	Login	2/15/2019 12:41:14 PM	NDR	MET034
HS19020802-09	20190207-DGW-MW11-PV20mid-35D	Login	2/15/2019 12:41:14 PM	NDR	MET034
HS19020802-10	20190207-DGW-MW11-PV20mid-40D	Login	2/15/2019 12:41:14 PM	NDR	MET034
HS19020802-11	20190206-DGW-MW11-PV20out-controlT	Login	2/15/2019 12:41:14 PM	NDR	MET034
HS19020802-12	20190206-DGW-MW11-PV20out-30T	Login	2/15/2019 12:41:14 PM	NDR	MET034
HS19020802-13	20190206-DGW-MW11-PV20out-35T	Login	2/15/2019 12:41:14 PM	NDR	MET034
HS19020802-14	20190206-DGW-MW11-PV20out-40T	Login	2/15/2019 12:41:14 PM	NDR	MET034
HS19020802-15	20190206-DGW-MW11-PV20inlet-controlT	Login	2/15/2019 12:41:14 PM	NDR	MET034
HS19020802-16	20190206-DGW-MW11-PV20inlet-30-35-40T	Login	2/15/2019 12:41:14 PM	NDR	MET034
HS19020802-17	20190207-DGW-MW11-PV20mid-controlT	Login	2/15/2019 12:41:14 PM	NDR	MET034
HS19020802-18	20190207-DGW-MW11-PV20mid-30T	Login	2/15/2019 12:41:14 PM	NDR	MET034
HS19020802-19	20190207-DGW-MW11-PV20mid-35T	Login	2/15/2019 12:41:14 PM	NDR	MET034
HS19020802-20	20190207-DGW-MW11-PV20mid-40T	Login	2/15/2019 12:41:14 PM	NDR	MET034

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19020802
Date/Time Received: **15-Feb-2019 08:37**
Received by: **NDR**

Checklist completed by: *Nilesh D. Ranchod* eSignature — 15-Feb-2019 Date
Reviewed by: *Dane J. Wacasey* eSignature — 22-Feb-2019 Date

Matrices: **Water**
Carrier name: **FedEx International Priority**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	2 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:194583/194584
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☐	No ☑	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	16.0C/16.4C UC/C	IR # 11
Cooler(s)/Kit(s):	RED	
Date/Time sample(s) sent to storage:	02/15/2019 12:45pm	

Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes: No times on sample containers. Sample IDs differ: MW11 Mid samples
COC= 20190206 Date 2019/02/07
Labels = 20190207 Date 2019/02/07 Logged in per sample labels.

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

ALS

Cincinnati, OH +1 513 733 5336
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Holland, MI +1 616 399 6070

Chain of Custody Form

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COC ID: 194583

HS19020802
Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information			
Purchase Order	130-2086-06	Project Name	Exide Column Studies	A	300_W (300 Cl, SO4, [*NO3* *48hr HT*])
Work Order		Project Number	130-2086	B	TDS_W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK_W 2320B (2320B Alkalinity)
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P	D	HARD (2340B Hardness (calc))
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit	E	ICP_TW (6020A Total Metals (6)+Cations)
				F	ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021	G	
Phone	(314) 984-8800	Phone	(314) 984-8800	H	
Fax		Fax		I	
e-Mail Address	Emily_White@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190206-DGW-MW11-PV20out-controlD	2019/02/06	15:10	Groundwa	2,8	~~8~~ 1	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	X					
2	" -30D	"	↓	"	2	1						X					
3	" -35D	"	↓	"	2	1						X					
4	" -40D	"	↓	"	2	1						X					
5	20190206-DGW-MW11-PV2inlet-controlD	2019/02/06	15:20	"	2	1						X					
6	" -30-35-40D	"	↓	"	2	1						X					
7	20190206-DGW-MW11-PV20mid-controlD	2019/02/07	13:05	"	2	1						X					
8	" -30D	"	↓	"	2	1						X					
9	" -35D	"	↓	"	2	1						X → just a few mL (ICP)					
10	" -40D	"	↓	"	2	1						X					

Sampler(s) Please Print & Sign: [signature]

Shipment Method:

Required Turnaround Time: (Check Box) ☐ Other ____ ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
[signature]	2019/02/13	15:30	
Relinquished by:	Date: 2/15/19	Time: 08:37	Received by (Laboratory): NR
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes: Exide Column Studies

Cooler ID	Cooler Temp.
Red	~~IR/C~~ 16.0
~~IR~~	11
	c/f +0.4

QC Package: (Check One Box Below)
☐ Level II Std QC
☐ Level III Std QC/Raw Data
☐ Level IV SW846/CLP
☐ Other
☒ TRRP Checklist
☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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Chain of Custody Form

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COC ID: 194584

HS19020802

WV

Golder Associates
Exide Column Studies

Customer Information		Project Information		ALS Project Manager:
Purchase Order	130-2086-06	Project Name	Exide Column Studies	
Work Order		Project Number	130-2086	
Company Name	Golder Associates	Bill To Company	Golder Associates	
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P	
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrett Parkway Drive, Suit	
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin MO 63021	
Phone	(314) 984-8800	Phone	(314) 984-8800	
Fax		Fax		
e-Mail Address	Emily_White@golder.com	e-Mail Address	Tammy_Kurzmack@golder.com	

A 300_W (300 Cl, SO4, [*NO3* *48hr HT*])
B TDS_W 2540C (2540C TDS)
C ALK_W 2320B (2320B Alkalinity)
D HARD (2340B Hardness (calc))
E ICP_TW (6020A Total Metals (6)+Cations)
F ICP_DISS (6020A Diss Metals (6)+Cations - FldFltr)
G
H
I
J

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190206-DGW-MW11-PV20out-contdT	2019/02/06	15:10	Groundwa	2,8	3				X	X						
2	" -30T	"		"	2	1				X	X						
3	" -35T	"		"	2	1				X	X						
4	" -40T	"		"	2	1				X	X						
5	20190206-DGW-MW11-PV20inlet-contdT	2019/02/06	15:20	"	2	1				X	X						
6	" -30-35-40T	"		"	2	1				X	X						
7	20190207-DGW-MW11-PV20mid-contdT	2019/02/07	13:05	"	2	1				X	X						
8	" -30T	"		"	2	1				X	X						
9	" -35T	"		"	2	1				X	X						
10	" -40T	"		"	2	1				X	X						

Sampler(s) Please Print & Sign

Shipment Method

Required Turnaround Time: (Check Box) ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other ____

Results Due Date:

Relinquished by: [signature] Date: 2019/02/13 Time: 15:30

Relinquished by: [signature] Date: 2.15.19 Time: 08:37

Received by:

Received by (Laboratory):

Logged by (Laboratory): Date: Time:

Checked by (Laboratory): NA

Notes: Exide Column Studies

Cooler ID	Cooler Temp.
R60	4.1°C 16.0

QC Package: (Check One Box Below)
☐ Level II Std QC
☐ Level III Std QC/Raw Data
☐ Level IV SW846/CLP
☐ Other
☒ TRRP Checklist
☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

IR # 11

CF +0.1

Note:
1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

Copyright 2011 by ALS Environmental.

ORIGIN ID:YUZA
AUDREY ETHIER (514) 393-0990
GOUDER ASSOCIATES LTD
7250 RUE DU MILE END
3E ETAGE
MONTREAL, PQ H2R3A4
CANADA CA

SHIP DATE: 13FEB19
ACTWGT: 14.80 LB
CAD: 10683072/INET4102

BILL RECIPIENT

TO DANE WACASEY
ALS HOUSTON LABORATORY
10450 STANCLIFF RD
STE 210
HOUSTON TX 77099 (US)
(281) 530-5656

REF:

INV:
PO:
DEPT:

965J2/CE3D/23AD

FedEx Express

J191810507d2xv

TRK# 7744 6149 1238
0430

10:30A
INTL PRIORITY

NH SGRA

77099
TX-US IAH

Après l'impression de cette étiquette :
COPIE DU DESTINATAIRE - VEUILLEZ LA PLACER DEVANT LA POCHETTE
1. Pliez la page imprimée le long de la ligne horizontale.
2. Placez l'étiquette dans la pochette d'expédition et fixez-la à votre paquet.

DÉFINITIONS Dans la présente lettre de transport aérien, « nous », « notre », « nos » et « FedEx » se rapportent à Federal Express Corporation, ses filiales, sous-traitants et tous leurs employés, mandataires et prépositions autorisés. « Vous », « votre » et « vos » se rapportent à l'expéditeur, ses employés, donneurs d'ordre et mandataires. Si l'envoi ne provient pas des États-Unis, votre contrat d'expédition est conclu avec la filiale, la succursale ou les prestataires locaux de FedEx ayant à l'origine accepté de procéder à l'expédition. « Colis » désigne de tout contenant ou de tous enveloppe dont nous acceptons d'effectuer la livraison, notamment les marchandises. Nos services de transport par voie aérienne par nos aéronefs et par ceux affrétés par le biais de nos systèmes automatisés, comptoirs, dépôts et autres installations de réception. « Envoi » désigne de tout colis pour lequel vous nous donnez des instructions au titre de la présente lettre de transport aérien. REMARQUE RELATIVE AU TRANSPORT AÉRIEN La Convention de Varsovie amendée régit et limite dans la plupart des cas la responsabilité de FedEx en cas de perte, retard ou dommage affectant votre envoi. La Convention de Varsovie amendée limite la responsabilité de FedEx. Par exemple, aux États-Unis, la responsabilité est limitée à 9,07 $ par livre (20 $ par kilogramme), à moins qu'une valeur d'expédition supérieure ne soit déclarée comme décrit ci-dessous, sous frais supplémentaire étant alors à votre charge. L'interprétation et la mise en application des dispositions relatives aux limites de responsabilité de la Convention de Varsovie peuvent varier d'un pays à l'autre. FedEx se réserve le droit d'organiser l'itinéraire emprunté et les escales à sa convenance. REMARQUE RELATIVE AU TRANSPORT ROUTIER. Les envois internationaux auxquels ne s'applique pas la Convention de Varsovie ou la Convention relative au contrat de transport international de marchandises par route (« CMR ») sont soumis aux tarifs et conditions de la CMR, sauf indication contraire dans la présente lettre de transport aérien. Conformément aux envois transportés exclusivement par voie terrestre, les causes de la CMR prévoient en cas de conflit entre les dispositions de la CMR et celles de la présente lettre de transport aérien. LIMITATION DE RESPONSABILITÉ. La responsabilité maximale de FedEx en cas de dommage, perte, retard, manque, erreur de livraison, défaut de livraison, informations incorrectes ou défaut d'informations relatives à l'envoi est limitée par le présent Contrat et correspond aux montants les considérés du coût de l'expédition, si telle n'est pas définie n'est pas régie par la Convention de Varsovie, la CMR ou autres traités internationaux, lois, dispositions réglementaires, décrets ou CMR, sauf indication de toute autre disposition contraire de la présente lettre de transport aérien. Concernant les envois transportés exclusivement par voie terrestre, les causes de la CMR prévoient en cas de conflit entre les dispositions de la CMR et celles de la présente lettre de transport aérien. LIMITATION DE RESPONSABILITÉ. La responsabilité maximale de FedEx en cas de dommage, perte, retard, manque, erreur de livraison, défaut de livraison, informations incorrectes ou défaut d'informations relatives à l'envoi est limitée par le présent Contrat et correspond aux montants les considérés du coût de l'expédition, si telle n'est pas définie n'est pas régie par la Convention de Varsovie, la CMR ou autres traités internationaux, lois, dispositions réglementaires, décrets ou diduent. Veuillez vous référer au coût de l'expédition déclaré dans le Guide des Services FedEx en vigueur au document des justifiant afin de déterminer les limites correspondantes. FedEx ne propose pas de responsabilité supplémentaires (« assurance ») au-delà de mais il vous est possible de payer des frais supplémentaires par tranche de 100 $US supplémentaires (ou équivalent en monnaie locale du pays d'origine) de valeur d'expédition déclarée. Si la valeur d'expédition déclarée est supérieure et des frais supplémentaires vous acquittez, la responsabilité de FedEx équivaut tenu à la valeur la plus faible entre la valeur déclarée et les dommages réels. EXCLUSION DE RESPONSABILITÉ. FEDEX NE SAURAIT EN AUCUN CAS ÊTRE TENU POUR RESPONSABLE DE TOUT DOMMAGE DIRECT, INDIRECT, ACCESSOIRE, SPÉCIAL OU CONSÉCUTIF SUPÉRIEUR À LA VALEUR D'EXPÉDITION DÉCLARÉE (Y COMPRIS, SANS QUE CELA SOIT À TITRE DE PERTES DE REVENUS OU BÉNÉFICES) OU À LA VALEUR RÉELLE DE L'ENVOI, SI CELLE-CI EST INFÉRIEURE, QUE FEDEX AIT PU OU NON SAVOIR QUE DE TELS DOMMAGES POURRAIENT SURVENIR). FedEx ne saurait en aucun cas être tenu pour responsable de vos dépendants ou employés, y compris, sans que cela soit limitatif, de déclarations incorrectes de marchandises, d'emballage, sécurisation, marquage ou adresses non adaptés ou insuffisants de transport, et des agissements ou omissions du destinataire ou de quiconque pourrait être concerné par cet envoi, si de la violation par l'une des parties des clauses du présent contrat. FedEx ne saurait en aucun cas être tenu pour responsable de tous dommages, pertes, retards, manques, erreurs de livraison, défauts de livraison, informations incorrectes ou défaut d'informations relatives à l'envoi de liquides, devises ou autres marchandises illicites ou d'autres marchandises hors de notre contrôle tels que les catastrophes naturelles, risques sanitaires, actes de terrorisme, guerre, grèves, désordre public, et des agissements ou omissions des autorités publiques (notamment des douanes ou responsables de la santé publique) ayant autorité. DÉFAUT DE CARACTÈRE. Sous réserve contraire, exprimée ou tacite, RECOURS EN CAS DE PERTE, DOMMAGE OU RETARD. TOUT RECOURS DOIT ÊTRE EXERCÉ PAR ÉCRIT ET DANS DES DÉLAIS STRICTS. VOIR NOS TARIFS, LE GUIDE DES SERVICES FEDEX EN VIGUEUR OU LES CONDITIONS STANDARD D'EXPÉDITION POUR PLUS D'INFORMATIONS. La Convention de Varsovie prévoit des procédures de recours écrites spécifiques en cas de dommages, retard ou défaut de livraison des envois. En outre, l'expropriation et le tarif en application des dispositions relatives aux voies de recours de la Convention de Varsovie peuvent varier d'un pays à l'autre. Veuillez vous référer à la Convention pour déterminer les délais de recours applicables à votre envoi. Le droit à dommages-intérêts s'éteint, sauf si un recours est formé dans un délai de deux ans, comme spécifié dans la Convention. FedEx n'est pas tenu de répondre à un recours avant que tous les règlements d'expédition aient été respectés. Le montant du dédommagement ne peut être déduit des frais d'expédition. Si la destinataire accepte formellement une livraison sans aucun dommage sur le bulletin de livraison, FedEx considérera alors que la marchandise a été livrée dans de bonnes conditions. Alors que nous puissions répondre aux demandes de dommages, nous vous demandons du mieux à notre disposition les emballages, cartons d'expédition et emballages d'origine à des fins d'expédition. DROIT IMPÉRATIF. Dès lors que l'une des dispositions contenues ou citées dans la présente lettre de transport aérien va à l'encontre des belles, lois, dispositions réglementaires, clauses ou décrets réglementaires, lesdites dispositions restent en vigueur dans le cadre du présent document dans la mesure où celui-ci n'est pas annulé. Le fait que l'une des dispositions soit invalide ou inapplicable n'affecte pas les autres parties de la présente lettre de transport aérien. Sauf indication contraire, FEDERAL EXPRESS CORPORATION, 2005 Corporate Avenue, Memphis, TN 38132, USA, est le premier transporteur du présent envoi.

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

March 01, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19021248**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 22 sample(s) on Feb 25, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19021248**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS19021248**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 03/01/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19021248				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 138128,138133,R333858				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?			X		
		Were analytical duplicates analyzed at the appropriate frequency?			X		
		Were RPDs or relative standard deviations within the laboratory QC limits?			X		
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 03/01/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19021248				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 138128,138133,R333858				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			2
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports		
Laboratory Name: ALS Laboratory Group		LRC Date: 03/01/2019
Project Name: Exide Column Studies		Laboratory Job Number: HS19021248
Reviewer Name: Dane Wacasey		Prep Batch Number(s): 138128,138133,R333858
ER#[5]	**Description**	
1	Batch 138128, Metals Method SW6020, sample HS19020902-03, MS and MSD were performed on unrelated sample. Batch 138133, Metals Method SW6020, sample HS19020902-03, MS and MSD were performed on unrelated sample.	
2	See Run Log and CCB Exceptions Report.	

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021248
Start Date: 27-Feb-2019 End Date: 28-Feb-2019

Run ID:ICPMS04_333622
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	27-Feb-2019 12:56	021_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	27-Feb-2019 12:58	022SMPL.d	CA MG NA
LLICV5	1	27-Feb-2019 13:00	023LICV.d	CA MG NA
ICB	1	27-Feb-2019 13:03	024_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	27-Feb-2019 13:13	026ICSA.d	CA MG NA
ICSAB	1	27-Feb-2019 13:15	027ICSB.d	CA MG NA
CCV 1	1	27-Feb-2019 13:57	037_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	27-Feb-2019 13:59	038_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	27-Feb-2019 14:15	040_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	27-Feb-2019 14:35	049_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	27-Feb-2019 14:47	052_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	27-Feb-2019 15:19	063_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	27-Feb-2019 15:21	064_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	27-Feb-2019 15:30	066_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	27-Feb-2019 16:05	080_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	27-Feb-2019 16:15	081_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 5	1	27-Feb-2019 16:44	094_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	27-Feb-2019 16:46	095SMPL.d	CA MG NA
LLCCV5	1	27-Feb-2019 16:49	096LICV.d	CA MG NA
ICCB 7	1	27-Feb-2019 16:51	097_ICB.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	27-Feb-2019 17:17	106_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	27-Feb-2019 17:19	107_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	27-Feb-2019 17:45	118_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	27-Feb-2019 18:00	121_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 8	1	27-Feb-2019 18:25	132_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	27-Feb-2019 18:27	133_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 9	1	27-Feb-2019 23:12	189_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	27-Feb-2019 23:14	190SMPL.d	CA MG NA
LLCCV5	1	27-Feb-2019 23:17	191LICV.d	CA MG NA
ICCB 11	1	27-Feb-2019 23:19	192_ICB.d	AS CA CD FE K MG NA PB SB SE
CCV 10	1	28-Feb-2019 00:50	210_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 12	1	28-Feb-2019 00:53	211_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-138133	1	28-Feb-2019 00:55	212SMPL.d	CA MG NA
LCS-138133	1	28-Feb-2019 00:57	213SMPL.d	CA MG NA
ZZZZZZSD	50	28-Feb-2019 01:01	215SMPL.d	CA MG
ZZZZZZMS	10	28-Feb-2019 01:04	216SMPL.d	CA MG NA
ZZZZZZMSD	10	28-Feb-2019 01:06	217SMPL.d	CA MG NA
ZZZZZZPDS	10	28-Feb-2019 01:08	218SMPL.d	CA MG
CCV 11	1	28-Feb-2019 01:15	221_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 13	1	28-Feb-2019 01:17	222_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-138128	1	28-Feb-2019 01:19	223SMPL.d	AS CA CD FE K MG NA PB SB SE
LCS-138128	1	28-Feb-2019 01:22	224SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZSD	50	28-Feb-2019 01:26	226SMPL.d	AS CA CD FE K MG PB SB SE
ZZZZZZMS	10	28-Feb-2019 01:28	227SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZMSD	10	28-Feb-2019 01:31	228SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZPDS	10	28-Feb-2019 01:33	229SMPL.d	AS CA CD FE K MG PB SB SE
CCV 12	1	28-Feb-2019 01:40	232_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 14	1	28-Feb-2019 01:42	233_CCB.d	AS CA CD FE K MG NA PB SB SE
20190208-DGW-MW3-PV30out-controlT	10	28-Feb-2019 01:44	234SMPL.d	CA NA
20190208-DGW-MW3-PV30out-30T	10	28-Feb-2019 01:46	235SMPL.d	NA

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021248
Start Date: 27-Feb-2019 End Date: 28-Feb-2019

Run ID:ICPMS04_333622
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
20190208-DGW-MW3-PV30out-35T	10	28-Feb-2019 01:49	236SMPL.d	NA
20190208-DGW-MW3-PV30out-40T	10	28-Feb-2019 01:51	237SMPL.d	NA
20190208-DGW-MW3-PV30inlet-controlT	10	28-Feb-2019 01:53	238SMPL.d	CA MG NA
20190208-DGW-MW3-PV30inlet-30-35-40T	10	28-Feb-2019 01:55	239SMPL.d	CA MG NA
20190210-DGW-MW3-PV30mid-controlT	10	28-Feb-2019 01:58	240SMPL.d	CA MG NA
20190210-DGW-MW3-PV30mid-30T	10	28-Feb-2019 02:00	241SMPL.d	NA
20190210-DGW-MW3-PV30mid-35T	10	28-Feb-2019 02:02	242SMPL.d	NA
20190210-DGW-MW3-PV30mid-40T	10	28-Feb-2019 02:04	243SMPL.d	NA
CCV 13	1	28-Feb-2019 02:07	244_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 15	1	28-Feb-2019 02:09	245_CCB.d	AS CA CD FE K MG NA PB SB SE
20190208-DGW-MW3-PV30inlet-controlT-DUP	10	28-Feb-2019 02:11	246SMPL.d	CA MG NA
CCV 14	1	28-Feb-2019 02:34	256_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 16	1	28-Feb-2019 02:36	257_CCB.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	28-Feb-2019 02:47	262SMPL.d	CA MG NA
LLICV5	1	28-Feb-2019 02:49	263LICV.d	CA MG NA
ICSA	1	28-Feb-2019 02:52	264ICSA.d	CA MG NA
ICSAB	1	28-Feb-2019 02:54	265ICSB.d	CA MG NA

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021248

Run ID:ICPMS04_333622
Instrument:ICPMS04
Method:SW6020

Iron	-41.62	12	200	
Sodium	25.11	14	200	

CCB 12 Date: 28-Feb-2019 00:53 Seq: 4968816 D/F: 1 Units: ug/L

Analyte	Result	MDL	Report Limit
Iron	19.71	12	200
Sodium	111.2	14	200

CCB 13 Date: 28-Feb-2019 01:17 Seq: 4968827 D/F: 1 Units: ug/L

Analyte	Result	MDL	Report Limit
Sodium	270.6	14	200

CCB 14 Date: 28-Feb-2019 01:42 Seq: 4968838 D/F: 1 Units: ug/L

Analyte	Result	MDL	Report Limit
Iron	12.4	12	200
Sodium	345.9	14	200

CCB 15 Date: 28-Feb-2019 02:09 Seq: 4968850 D/F: 1 Units: ug/L

Analyte	Result	MDL	Report Limit
Sodium	166.1	14	200

CCB 16 Date: 28-Feb-2019 02:36 Seq: 4968862 D/F: 1 Units: ug/L

Analyte	Result	MDL	Report Limit
Iron	12.59	12	200
Sodium	171.3	14	200

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021248
Start Date: 28-Feb-2019 End Date: 01-Mar-2019

Run ID:ICPMS04_333735
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	28-Feb-2019 12:18	018_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	28-Feb-2019 12:20	019SMPL.d	AS CA CD FE K MG PB SB SE
LLICV5	1	28-Feb-2019 12:23	020LICV.d	AS CA CD FE K MG PB SB SE
ICB	1	28-Feb-2019 12:25	021_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	28-Feb-2019 12:37	024ICSA.d	AS CA CD FE K MG PB SB SE
ICSAB	1	28-Feb-2019 12:48	027ICSB.d	AS CA CD FE K MG PB SB SE
ZZZZZZSD	2500	28-Feb-2019 12:57	030SMPL.d	
ZZZZZZPDS	500	28-Feb-2019 12:59	031SMPL.d	
ZZZZZZSD	2500	28-Feb-2019 13:06	034SMPL.d	NA
ZZZZZZPDS	500	28-Feb-2019 13:08	035SMPL.d	NA
CCB 1	1	28-Feb-2019 13:15	038_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 1	1	28-Feb-2019 13:40	040_CCV.d	AS CA CD FE K MG NA PB SB SE
20190208-DGW-MW3-PV30out-controlT	1	28-Feb-2019 13:42	041SMPL.d	AS CD FE K MG PB SB SE
20190208-DGW-MW3-PV30out-30T	1	28-Feb-2019 13:44	042SMPL.d	AS CA CD FE K MG PB SB SE
20190208-DGW-MW3-PV30out-35T	1	28-Feb-2019 13:47	043SMPL.d	AS CA CD FE K MG PB SB SE
20190208-DGW-MW3-PV30out-40T	1	28-Feb-2019 13:49	044SMPL.d	AS CA CD FE K MG PB SB SE
20190208-DGW-MW3-PV30inlet-controlT	1	28-Feb-2019 13:51	045SMPL.d	AS CD FE K PB SB SE
20190208-DGW-MW3-PV30inlet-30-35-40T	1	28-Feb-2019 13:53	046SMPL.d	AS CD FE K PB SB SE
20190210-DGW-MW3-PV30mid-controlT	1	28-Feb-2019 13:56	047SMPL.d	AS CD FE K PB SB SE
20190210-DGW-MW3-PV30mid-30T	1	28-Feb-2019 13:58	048SMPL.d	AS CA CD FE K MG PB SB SE
CCB 2	1	28-Feb-2019 14:05	051_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	28-Feb-2019 14:14	053_CCV.d	AS CA CD FE K MG NA PB SB SE
20190210-DGW-MW3-PV30mid-35T	1	28-Feb-2019 14:17	054SMPL.d	AS CA CD FE K MG PB SB SE
20190210-DGW-MW3-PV30mid-40T	1	28-Feb-2019 14:19	055SMPL.d	AS CA CD FE K MG PB SB SE
20190208-DGW-MW3-PV30inlet-controlT-DUP	1	28-Feb-2019 14:21	056SMPL.d	AS CD FE K PB SB SE
CCB 3	1	28-Feb-2019 14:39	064_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	28-Feb-2019 14:55	066_CCV.d	AS CA CD FE K MG NA PB SB SE
ICCV 4	1	28-Feb-2019 15:45	084_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	28-Feb-2019 15:47	085SMPL.d	AS CA CD FE K MG PB SB SE
LLCCV5	1	28-Feb-2019 15:49	086LICV.d	AS CA CD FE K MG PB SB SE
ICCB 4	1	28-Feb-2019 15:51	087_ICB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	28-Feb-2019 16:20	097_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	28-Feb-2019 16:22	098_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	28-Feb-2019 16:54	109_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	28-Feb-2019 16:56	110_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	28-Feb-2019 17:27	122_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	28-Feb-2019 17:34	124_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 8	1	28-Feb-2019 17:52	131_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	28-Feb-2019 17:54	132_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	28-Feb-2019 18:27	141_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	28-Feb-2019 18:29	142_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 10	1	28-Feb-2019 23:08	180_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	28-Feb-2019 23:11	181SMPL.d	AS CA CD FE K MG PB SB SE
LLCCV5	1	28-Feb-2019 23:13	182LICV.d	AS CA CD FE K MG PB SB SE
ICCB 10	1	28-Feb-2019 23:15	183_ICB.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021248

Run ID:ICPMS04_333735
Instrument:ICPMS04
Method:SW6020

CCB 1	Date: 28-Feb-2019 13:15	Seq: 4969850	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.532	0.4	2	
Sodium	15.82	14	200	

CCB 2	Date: 28-Feb-2019 14:05	Seq: 4970105	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	68.33	12	200	
Sodium	64.57	14	200	

CCB 3	Date: 28-Feb-2019 14:39	Seq: 4970121	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	64.2	12	200	
Potassium	-21.4	18	200	
Sodium	181.8	14	200	

ICCB 4	Date: 28-Feb-2019 15:51	Seq: 4970253	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	-46.19	12	200	
Sodium	-15.06	14	200	

CCB 5	Date: 28-Feb-2019 16:22	Seq: 4970298	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	-77.44	12	200	

CCB 6	Date: 28-Feb-2019 16:56	Seq: 4970452	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.697	0.4	2	
Iron	-67.43	12	200	

CCB 7	Date: 28-Feb-2019 17:27	Seq: 4970755	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	-35.4	12	200	
Potassium	-18.03	18	200	

CCB 8	Date: 28-Feb-2019 17:54	Seq: 4970765	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	-39.19	12	200	

CCB 9	Date: 28-Feb-2019 18:29	Seq: 4970830	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.407	0.4	2	
Iron	-70.33	12	200	
Potassium	-27.24	18	200	
Sodium	30.16	14	200	

CCB 11	Date: 28-Feb-2019 23:35	Seq: 4971069	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	-12.2	12	200	

CCB 12	Date: 28-Feb-2019 23:50	Seq: 4971076	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.832	0.4	2	
Sodium	70.58	14	200	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021248
Start Date: 28-Feb-2019 End Date: 01-Mar-2019

Run ID:ICPMS05_333724
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	28-Feb-2019 11:15	022_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	28-Feb-2019 11:17	023SMPL.d	AS CA CD FE K MG NA PB SB SE
LLICV5	1	28-Feb-2019 11:19	024LICV.d	AS CA CD FE K MG NA PB SB SE
ICB	1	28-Feb-2019 11:21	025_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	28-Feb-2019 11:24	026ICSA.d	AS CA CD FE K MG NA PB SB SE
ICSAB	1	28-Feb-2019 11:27	027ICSB.d	AS CA CD FE K MG NA PB SB SE
CCV 1	1	28-Feb-2019 11:59	038_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	28-Feb-2019 12:01	039_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	28-Feb-2019 12:26	050_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	28-Feb-2019 12:28	051_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-138128	1	28-Feb-2019 12:31	052SMPL.d	AS CA CD FE K MG NA PB SB SE
LCS-138128	1	28-Feb-2019 12:33	053SMPL.d	
ZZZZZZSD	50	28-Feb-2019 12:38	055SMPL.d	
ZZZZZZMS	10	28-Feb-2019 12:40	056SMPL.d	
ZZZZZZMSD	10	28-Feb-2019 12:42	057SMPL.d	
ZZZZZZPDS	10	28-Feb-2019 12:45	058SMPL.d	
CCV 3	1	28-Feb-2019 12:57	062_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	28-Feb-2019 12:59	063_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	28-Feb-2019 13:14	069_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	28-Feb-2019 13:17	070_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	28-Feb-2019 14:00	084_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	28-Feb-2019 14:02	085_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	28-Feb-2019 14:33	096_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	28-Feb-2019 14:35	097_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	28-Feb-2019 15:13	108_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	28-Feb-2019 15:15	109_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 8	1	28-Feb-2019 15:40	119_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	28-Feb-2019 15:42	120_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	28-Feb-2019 16:18	129_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	28-Feb-2019 16:21	130_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 10	1	28-Feb-2019 17:00	139_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	28-Feb-2019 17:02	140_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 11	1	28-Feb-2019 17:30	151_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	28-Feb-2019 17:32	152_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 12	1	28-Feb-2019 18:01	163_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 12	1	28-Feb-2019 18:03	164_CCB.d	AS CA CD FE K MG NA PB SB SE
20190208-DGW-MW3-PV30out-controlD	10	28-Feb-2019 18:33	167SMPL.d	CA NA
20190208-DGW-MW3-PV30out-30D	10	28-Feb-2019 18:36	168SMPL.d	NA
20190208-DGW-MW3-PV30out-35D	10	28-Feb-2019 18:38	169SMPL.d	NA
20190208-DGW-MW3-PV30out-40D	10	28-Feb-2019 18:40	170SMPL.d	NA
20190208-DGW-MW3-PV30inlet-controlD	10	28-Feb-2019 18:42	171SMPL.d	CA NA
20190208-DGW-MW3-PV30inlet-30-35-40D	10	28-Feb-2019 18:45	172SMPL.d	CA NA
20190210-DGW-MW3-PV30mid-controlD	10	28-Feb-2019 18:47	173SMPL.d	CA NA
20190210-DGW-MW3-PV30mid-30D	10	28-Feb-2019 18:49	174SMPL.d	NA
20190210-DGW-MW3-PV30mid-35D	10	28-Feb-2019 18:52	175SMPL.d	NA
CCV 13	1	28-Feb-2019 18:54	176_CCV.d	AS CA CD FE K MG NA PB SB SE

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021248
Start Date: 28-Feb-2019 End Date: 01-Mar-2019

Run ID:ICPMS05_333724
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
CCB 13	1	28-Feb-2019 18:56	177_CCB.d	AS CA CD FE K MG NA PB SB SE
20190210-DGW-MW3-PV30mid-40D	10	28-Feb-2019 18:59	178SMPL.d	NA
20190208-DGW-MW3-PV30inlet-controlD-DUP	10	28-Feb-2019 19:01	179SMPL.d	CA NA
CCV 14	1	28-Feb-2019 19:19	187_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 14	1	28-Feb-2019 19:22	188_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 15	1	28-Feb-2019 21:42	201_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	28-Feb-2019 21:44	202SMPL.d	AS CA CD FE K MG NA PB SB SE
LLCCV5	1	28-Feb-2019 21:46	203LICV.d	AS CA CD FE K MG NA PB SB SE
ICCB 15	1	28-Feb-2019 21:48	204_ICB.d	AS CA CD FE K MG NA PB SB SE
20190208-DGW-MW3-PV30out-controlD	1	28-Feb-2019 21:50	205SMPL.d	AS CD FE K MG PB SB SE
20190208-DGW-MW3-PV30out-30D	1	28-Feb-2019 21:53	206SMPL.d	AS CA CD FE K MG PB SB SE
20190208-DGW-MW3-PV30out-35D	1	28-Feb-2019 21:55	207SMPL.d	AS CA CD FE K MG PB SB SE
20190208-DGW-MW3-PV30out-40D	1	28-Feb-2019 21:57	208SMPL.d	AS CA CD FE K MG PB SB SE
20190208-DGW-MW3-PV30inlet-controlD	1	28-Feb-2019 21:59	209SMPL.d	AS CD FE K MG PB SB SE
CCV 16	1	28-Feb-2019 22:02	210_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 16	1	28-Feb-2019 22:04	211_CCB.d	AS CA CD FE K MG NA PB SB SE
20190208-DGW-MW3-PV30inlet-30-35-40D	1	28-Feb-2019 22:06	212SMPL.d	AS CD FE K MG PB SB SE
20190210-DGW-MW3-PV30mid-controlD	1	28-Feb-2019 22:08	213SMPL.d	AS CD FE K MG PB SB SE
20190210-DGW-MW3-PV30mid-30D	1	28-Feb-2019 22:11	214SMPL.d	AS CA CD FE K MG PB SB SE
20190210-DGW-MW3-PV30mid-35D	1	28-Feb-2019 22:13	215SMPL.d	AS CA CD FE K MG PB SB SE
20190210-DGW-MW3-PV30mid-40D	1	28-Feb-2019 22:15	216SMPL.d	AS CA CD FE K MG PB SB SE
20190208-DGW-MW3-PV30inlet-controlD-DUP	1	28-Feb-2019 22:17	217SMPL.d	AS CD FE K MG PB SB SE
CCV 17	1	28-Feb-2019 22:22	219_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 17	1	28-Feb-2019 22:24	220_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 18	1	28-Feb-2019 22:44	229_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 18	1	28-Feb-2019 22:47	230_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 19	1	28-Feb-2019 23:11	241_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 19	1	28-Feb-2019 23:14	242_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 20	1	28-Feb-2019 23:32	250_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 20	1	28-Feb-2019 23:34	251_CCB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	28-Feb-2019 23:36	252ICSA.d	AS CA CD FE K MG NA PB SB SE
ICSAB	1	28-Feb-2019 23:39	253ICSB.d	AS CA CD FE K MG NA PB SB SE
CCV 21	1	28-Feb-2019 23:52	259_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 21	1	28-Feb-2019 23:54	260_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 22	1	01-Mar-2019 00:13	268_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 22	1	01-Mar-2019 00:15	269_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 23	1	01-Mar-2019 00:33	277_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 23	1	01-Mar-2019 00:35	278_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 24	1	01-Mar-2019 01:00	289_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 24	1	01-Mar-2019 01:02	290_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 25	1	01-Mar-2019 01:09	293_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 25	1	01-Mar-2019 01:11	294_CCB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	01-Mar-2019 01:18	297ICSA.d	AS CA CD FE K MG NA PB SB SE
ICSAB	1	01-Mar-2019 01:20	298ICSB.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021248

Run ID:ICPMS05_333724
Instrument:ICPMS05
Method:SW6020

CCB 1	Date: 28-Feb-2019 12:01	Seq: 4969554		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Calcium	-44.08	34	500	
CCB 2	Date: 28-Feb-2019 12:28	Seq: 4969581		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Calcium	-36.89	34	500	
CCB 3	Date: 28-Feb-2019 12:59	Seq: 4969695		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Potassium	19.58	18	200	
	Selenium	1.289	1.1	2	
	Sodium	127.7	14	200	
CCB 4	Date: 28-Feb-2019 13:17	Seq: 4970166		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	33.28	14	200	
CCB 5	Date: 28-Feb-2019 14:02	Seq: 4970181		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	51.92	14	200	
CCB 6	Date: 28-Feb-2019 14:35	Seq: 4970256		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Potassium	28.24	18	200	
	Sodium	149.5	14	200	
CCB 7	Date: 28-Feb-2019 15:15	Seq: 4970268		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	139.7	14	200	
CCB 8	Date: 28-Feb-2019 15:42	Seq: 4970279		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Potassium	18.93	18	200	
	Sodium	144.5	14	200	
CCB 9	Date: 28-Feb-2019 16:21	Seq: 4970363		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Potassium	26.47	18	200	
	Sodium	149.5	14	200	
CCB 10	Date: 28-Feb-2019 17:02	Seq: 4970843		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Potassium	22.91	18	200	
	Sodium	86.09	14	200	
CCB 11	Date: 28-Feb-2019 17:32	Seq: 4970855		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Potassium	21.28	18	200	
	Sodium	103.6	14	200	
CCB 12	Date: 28-Feb-2019 18:03	Seq: 4970867		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.43	0.4	2	
	Potassium	27.96	18	200	

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021248

Run ID:ICPMS05_333724
Instrument:ICPMS05
Method:SW6020

CCB 12	Sodium	109.9	14	200	
CCB 13	Date: 28-Feb-2019 18:56	Seq: 4970975	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Potassium	25.45	18	200	
	Sodium	51.11	14	200	
CCB 14	Date: 28-Feb-2019 19:22	Seq: 4970986	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Potassium	20.08	18	200	
	Sodium	57.46	14	200	
CCB 16	Date: 28-Feb-2019 22:04	Seq: 4971006	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	54.48	14	200	
CCB 17	Date: 28-Feb-2019 22:24	Seq: 4971015	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	61.75	14	200	
CCB 18	Date: 28-Feb-2019 22:47	Seq: 4971025	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.41	0.4	2	
	Sodium	25.8	14	200	
CCB 19	Date: 28-Feb-2019 23:14	Seq: 4971166	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	50.51	14	200	
CCB 20	Date: 28-Feb-2019 23:34	Seq: 4971183	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.447	0.4	2	
	Calcium	-35.46	34	500	
	Sodium	171.2	14	200	
CCB 21	Date: 28-Feb-2019 23:54	Seq: 4971192	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	159.2	14	200	
CCB 22	Date: 01-Mar-2019 00:15	Seq: 4971201	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	155.1	14	200	
CCB 23	Date: 01-Mar-2019 00:35	Seq: 4971273	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	151.6	14	200	
CCB 24	Date: 01-Mar-2019 01:02	Seq: 4971286	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	200.9	14	200	
CCB 25	Date: 01-Mar-2019 01:11	Seq: 4971290	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Calcium	-36.66	34	500	
	Sodium	164	14	200	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19021248

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19021248-01	20190208-DGW-MW3-PV30out-controlD	Groundwater		08-Feb-2019 12:30	25-Feb-2019 08:08	☐
HS19021248-02	20190208-DGW-MW3-PV30out-30D	Groundwater		08-Feb-2019 12:30	25-Feb-2019 08:08	☐
HS19021248-03	20190208-DGW-MW3-PV30out-35D	Groundwater		08-Feb-2019 12:30	25-Feb-2019 08:08	☐
HS19021248-04	20190208-DGW-MW3-PV30out-40D	Groundwater		08-Feb-2019 12:30	25-Feb-2019 08:08	☐
HS19021248-05	20190208-DGW-MW3-PV30inlet-controlD	Groundwater		08-Feb-2019 12:35	25-Feb-2019 08:08	☐
HS19021248-06	20190208-DGW-MW3-PV30inlet-30-35-40D	Groundwater		08-Feb-2019 12:35	25-Feb-2019 08:08	☐
HS19021248-07	20190210-DGW-MW3-PV30mid-controlD	Groundwater		10-Feb-2019 20:45	25-Feb-2019 08:08	☐
HS19021248-08	20190210-DGW-MW3-PV30mid-30D	Groundwater		10-Feb-2019 20:45	25-Feb-2019 08:08	☐
HS19021248-09	20190210-DGW-MW3-PV30mid-35D	Groundwater		10-Feb-2019 20:45	25-Feb-2019 08:08	☐
HS19021248-10	20190210-DGW-MW3-PV30mid-40D	Groundwater		10-Feb-2019 20:45	25-Feb-2019 08:08	☐
HS19021248-11	20190208-DGW-MW3-PV30out-controlT	Groundwater		08-Feb-2019 12:30	25-Feb-2019 08:08	☐
HS19021248-12	20190208-DGW-MW3-PV30out-30T	Groundwater		08-Feb-2019 12:30	25-Feb-2019 08:08	☐
HS19021248-13	20190208-DGW-MW3-PV30out-35T	Groundwater		08-Feb-2019 12:30	25-Feb-2019 08:08	☐
HS19021248-14	20190208-DGW-MW3-PV30out-40T	Groundwater		08-Feb-2019 12:30	25-Feb-2019 08:08	☐
HS19021248-15	20190208-DGW-MW3-PV30inlet-controlT	Groundwater		08-Feb-2019 12:35	25-Feb-2019 08:08	☐
HS19021248-16	20190208-DGW-MW3-PV30inlet-30-35-40T	Groundwater		08-Feb-2019 12:35	25-Feb-2019 08:08	☐
HS19021248-17	20190210-DGW-MW3-PV30mid-controlT	Groundwater		10-Feb-2019 20:45	25-Feb-2019 08:08	☐
HS19021248-18	20190210-DGW-MW3-PV30mid-30T	Groundwater		10-Feb-2019 20:45	25-Feb-2019 08:08	☐
HS19021248-19	20190210-DGW-MW3-PV30mid-35T	Groundwater		10-Feb-2019 20:45	25-Feb-2019 08:08	☐
HS19021248-20	20190210-DGW-MW3-PV30mid-40T	Groundwater		10-Feb-2019 20:45	25-Feb-2019 08:08	☐
HS19021248-21	20190208-DGW-MW3-PV30inlet-controlD-DUP	Groundwater		08-Feb-2019 12:35	25-Feb-2019 08:08	☐
HS19021248-22	20190208-DGW-MW3-PV30inlet-controlT-DUP	Groundwater		08-Feb-2019 12:35	25-Feb-2019 08:08	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190208-DGW-MW3-PV30out-controlD
Collection Date: 08-Feb-2019 12:30

ANALYTICAL REPORT
WorkOrder:HS19021248
Lab ID:HS19021248-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	28-Feb-2019 21:50
Arsenic	**0.00196**	J	**0.000400**	**0.00200**	**mg/L**	1	28-Feb-2019 21:50
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 21:50
Calcium	**110**		**0.340**	**5.00**	**mg/L**	10	28-Feb-2019 18:33
Iron	U		0.0120	0.200	mg/L	1	28-Feb-2019 21:50
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 21:50
Magnesium	**21.4**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 21:50
Potassium	**2.16**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 21:50
Selenium	U		0.00110	0.00200	mg/L	1	28-Feb-2019 21:50
Sodium	**212**		**0.140**	**2.00**	**mg/L**	10	28-Feb-2019 18:33

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190208-DGW-MW3-PV30out-30D
Collection Date: 08-Feb-2019 12:30

ANALYTICAL REPORT
WorkOrder:HS19021248
Lab ID:HS19021248-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	28-Feb-2019 21:53
Arsenic	U		0.000400	0.00200	mg/L	1	28-Feb-2019 21:53
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 21:53
Calcium	**6.96**		**0.0340**	**0.500**	**mg/L**	1	28-Feb-2019 21:53
Iron	U		0.0120	0.200	mg/L	1	28-Feb-2019 21:53
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 21:53
Magnesium	**15.1**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 21:53
Potassium	**2.24**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 21:53
Selenium	U		0.00110	0.00200	mg/L	1	28-Feb-2019 21:53
Sodium	**218**		**0.140**	**2.00**	**mg/L**	10	28-Feb-2019 18:36

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190208-DGW-MW3-PV30out-35D
Collection Date: 08-Feb-2019 12:30

ANALYTICAL REPORT
WorkOrder:HS19021248
Lab ID:HS19021248-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	28-Feb-2019 21:55
Arsenic	U		0.000400	0.00200	mg/L	1	28-Feb-2019 21:55
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 21:55
Calcium	**6.19**		**0.0340**	**0.500**	**mg/L**	1	28-Feb-2019 21:55
Iron	U		0.0120	0.200	mg/L	1	28-Feb-2019 21:55
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 21:55
Magnesium	**11.5**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 21:55
Potassium	**2.25**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 21:55
Selenium	U		0.00110	0.00200	mg/L	1	28-Feb-2019 21:55
Sodium	**215**		**0.140**	**2.00**	**mg/L**	10	28-Feb-2019 18:38

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190208-DGW-MW3-PV30out-40D
Collection Date: 08-Feb-2019 12:30

ANALYTICAL REPORT
WorkOrder:HS19021248
Lab ID:HS19021248-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	28-Feb-2019 21:57
Arsenic	U		0.000400	0.00200	mg/L	1	28-Feb-2019 21:57
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 21:57
Calcium	**5.76**		**0.0340**	**0.500**	**mg/L**	1	28-Feb-2019 21:57
Iron	U		0.0120	0.200	mg/L	1	28-Feb-2019 21:57
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 21:57
Magnesium	**11.0**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 21:57
Potassium	**2.26**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 21:57
Selenium	U		0.00110	0.00200	mg/L	1	28-Feb-2019 21:57
Sodium	**207**		**0.140**	**2.00**	**mg/L**	10	28-Feb-2019 18:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190208-DGW-MW3-PV30inlet-controlD
Collection Date: 08-Feb-2019 12:35

ANALYTICAL REPORT
WorkOrder:HS19021248
Lab ID:HS19021248-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	28-Feb-2019 21:59
Arsenic	**0.0107**		**0.000400**	**0.00200**	**mg/L**	1	28-Feb-2019 21:59
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 21:59
Calcium	**105**		**0.340**	**5.00**	**mg/L**	10	28-Feb-2019 18:42
Iron	**0.0244**	J	**0.0120**	**0.200**	**mg/L**	1	28-Feb-2019 21:59
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 21:59
Magnesium	**21.9**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 21:59
Potassium	**2.13**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 21:59
Selenium	U		0.00110	0.00200	mg/L	1	28-Feb-2019 21:59
Sodium	**207**		**0.140**	**2.00**	**mg/L**	10	28-Feb-2019 18:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190208-DGW-MW3-PV30inlet-30-35-40D
Collection Date: 08-Feb-2019 12:35

ANALYTICAL REPORT
WorkOrder:HS19021248
Lab ID:HS19021248-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	28-Feb-2019 22:06
Arsenic	**0.0159**		**0.000400**	**0.00200**	**mg/L**	1	28-Feb-2019 22:06
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 22:06
Calcium	**106**		**0.340**	**5.00**	**mg/L**	10	28-Feb-2019 18:45
Iron	**0.0199**	J	**0.0120**	**0.200**	**mg/L**	1	28-Feb-2019 22:06
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 22:06
Magnesium	**21.3**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 22:06
Potassium	**2.05**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 22:06
Selenium	U		0.00110	0.00200	mg/L	1	28-Feb-2019 22:06
Sodium	**208**		**0.140**	**2.00**	**mg/L**	10	28-Feb-2019 18:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190210-DGW-MW3-PV30mid-controlD
Collection Date: 10-Feb-2019 20:45

ANALYTICAL REPORT
WorkOrder:HS19021248
Lab ID:HS19021248-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	28-Feb-2019 22:08
Arsenic	**0.00964**		**0.000400**	**0.00200**	**mg/L**	1	28-Feb-2019 22:08
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 22:08
Calcium	**102**		**0.340**	**5.00**	**mg/L**	10	28-Feb-2019 18:47
Iron	U		0.0120	0.200	mg/L	1	28-Feb-2019 22:08
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 22:08
Magnesium	**21.4**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 22:08
Potassium	**2.17**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 22:08
Selenium	U		0.00110	0.00200	mg/L	1	28-Feb-2019 22:08
Sodium	**212**		**0.140**	**2.00**	**mg/L**	10	28-Feb-2019 18:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190210-DGW-MW3-PV30mid-30D
Collection Date: 10-Feb-2019 20:45

ANALYTICAL REPORT
WorkOrder:HS19021248
Lab ID:HS19021248-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	28-Feb-2019 22:11
Arsenic	U		0.000400	0.00200	mg/L	1	28-Feb-2019 22:11
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 22:11
Calcium	**6.39**		**0.0340**	**0.500**	**mg/L**	1	28-Feb-2019 22:11
Iron	U		0.0120	0.200	mg/L	1	28-Feb-2019 22:11
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 22:11
Magnesium	**11.0**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 22:11
Potassium	**1.90**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 22:11
Selenium	U		0.00110	0.00200	mg/L	1	28-Feb-2019 22:11
Sodium	**208**		**0.140**	**2.00**	**mg/L**	10	28-Feb-2019 18:49

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190210-DGW-MW3-PV30mid-35D
Collection Date: 10-Feb-2019 20:45

ANALYTICAL REPORT
WorkOrder:HS19021248
Lab ID:HS19021248-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	28-Feb-2019 22:13
Arsenic	U		0.000400	0.00200	mg/L	1	28-Feb-2019 22:13
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 22:13
Calcium	**6.95**		**0.0340**	**0.500**	**mg/L**	1	28-Feb-2019 22:13
Iron	U		0.0120	0.200	mg/L	1	28-Feb-2019 22:13
Lead	**0.000776**	J	**0.000600**	**0.00200**	**mg/L**	1	28-Feb-2019 22:13
Magnesium	**10.1**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 22:13
Potassium	**1.91**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 22:13
Selenium	U		0.00110	0.00200	mg/L	1	28-Feb-2019 22:13
Sodium	**209**		**0.140**	**2.00**	**mg/L**	10	28-Feb-2019 18:52

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190210-DGW-MW3-PV30mid-40D
Collection Date: 10-Feb-2019 20:45

ANALYTICAL REPORT
WorkOrder:HS19021248
Lab ID:HS19021248-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	28-Feb-2019 22:15
Arsenic	U		0.000400	0.00200	mg/L	1	28-Feb-2019 22:15
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 22:15
Calcium	**6.34**		**0.0340**	**0.500**	**mg/L**	1	28-Feb-2019 22:15
Iron	U		0.0120	0.200	mg/L	1	28-Feb-2019 22:15
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 22:15
Magnesium	**10.5**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 22:15
Potassium	**1.97**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 22:15
Selenium	U		0.00110	0.00200	mg/L	1	28-Feb-2019 22:15
Sodium	**209**		**0.140**	**2.00**	**mg/L**	10	28-Feb-2019 18:59

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190208-DGW-MW3-PV30out-controlT
Collection Date: 08-Feb-2019 12:30

ANALYTICAL REPORT
WorkOrder:HS19021248
Lab ID:HS19021248-11
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**392**		**2.00**	**2.00**	**mg/L**	1	01-Mar-2019 16:24
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 26-Feb-2019		Analyst: JCJ
Antimony	**0.000476**	J	**0.000400**	**0.00200**	**mg/L**	1	28-Feb-2019 13:42
Arsenic	**0.00228**		**0.000400**	**0.00200**	**mg/L**	1	28-Feb-2019 13:42
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 13:42
Calcium	**119**		**0.340**	**5.00**	**mg/L**	10	28-Feb-2019 01:44
Iron	**0.130**	J	**0.0120**	**0.200**	**mg/L**	1	28-Feb-2019 13:42
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 13:42
Magnesium	**23.0**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 13:42
Potassium	**2.26**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 13:42
Selenium	**0.00110**	J	**0.00110**	**0.00200**	**mg/L**	1	28-Feb-2019 13:42
Sodium	**206**		**0.140**	**2.00**	**mg/L**	10	28-Feb-2019 01:44

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190208-DGW-MW3-PV30out-30T
Collection Date: 08-Feb-2019 12:30

ANALYTICAL REPORT
WorkOrder:HS19021248
Lab ID:HS19021248-12
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**79.3**		**2.00**	**2.00**	**mg/L**	1	01-Mar-2019 16:24
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 26-Feb-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	28-Feb-2019 13:44
Arsenic	U		0.000400	0.00200	mg/L	1	28-Feb-2019 13:44
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 13:44
Calcium	**7.18**		**0.0340**	**0.500**	**mg/L**	1	28-Feb-2019 13:44
Iron	**0.454**		**0.0120**	**0.200**	**mg/L**	1	28-Feb-2019 13:44
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 13:44
Magnesium	**14.9**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 13:44
Potassium	**2.32**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 13:44
Selenium	U		0.00110	0.00200	mg/L	1	28-Feb-2019 13:44
Sodium	**216**		**0.140**	**2.00**	**mg/L**	10	28-Feb-2019 01:46

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190208-DGW-MW3-PV30out-35T
Collection Date: 08-Feb-2019 12:30

ANALYTICAL REPORT
WorkOrder:HS19021248
Lab ID:HS19021248-13
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**65.2**		**2.00**	**2.00**	**mg/L**	1	01-Mar-2019 16:24
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 26-Feb-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	28-Feb-2019 13:47
Arsenic	U		0.000400	0.00200	mg/L	1	28-Feb-2019 13:47
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 13:47
Calcium	**6.65**		**0.0340**	**0.500**	**mg/L**	1	28-Feb-2019 13:47
Iron	**0.124**	J	**0.0120**	**0.200**	**mg/L**	1	28-Feb-2019 13:47
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 13:47
Magnesium	**11.8**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 13:47
Potassium	**2.32**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 13:47
Selenium	U		0.00110	0.00200	mg/L	1	28-Feb-2019 13:47
Sodium	**213**		**0.140**	**2.00**	**mg/L**	10	28-Feb-2019 01:49

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190208-DGW-MW3-PV30out-40T
Collection Date: 08-Feb-2019 12:30

ANALYTICAL REPORT
WorkOrder:HS19021248
Lab ID:HS19021248-14
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**60.5**		**2.00**	**2.00**	**mg/L**	1	01-Mar-2019 16:24
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 26-Feb-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	28-Feb-2019 13:49
Arsenic	U		0.000400	0.00200	mg/L	1	28-Feb-2019 13:49
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 13:49
Calcium	**6.09**		**0.0340**	**0.500**	**mg/L**	1	28-Feb-2019 13:49
Iron	**0.136**	J	**0.0120**	**0.200**	**mg/L**	1	28-Feb-2019 13:49
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 13:49
Magnesium	**11.0**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 13:49
Potassium	**2.39**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 13:49
Selenium	U		0.00110	0.00200	mg/L	1	28-Feb-2019 13:49
Sodium	**217**		**0.140**	**2.00**	**mg/L**	10	28-Feb-2019 01:51

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190208-DGW-MW3-PV30inlet-controlT
Collection Date: 08-Feb-2019 12:35

ANALYTICAL REPORT
WorkOrder:HS19021248
Lab ID:HS19021248-15
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**384**		**2.00**	**2.00**	**mg/L**	1	01-Mar-2019 16:24
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 26-Feb-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	28-Feb-2019 13:51
Arsenic	**0.0167**		**0.000400**	**0.00200**	**mg/L**	1	28-Feb-2019 13:51
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 13:51
Calcium	**117**		**0.340**	**5.00**	**mg/L**	10	28-Feb-2019 01:53
Iron	**0.763**		**0.0120**	**0.200**	**mg/L**	1	28-Feb-2019 13:51
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 13:51
Magnesium	**22.2**		**0.100**	**2.00**	**mg/L**	10	28-Feb-2019 01:53
Potassium	**2.18**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 13:51
Selenium	U		0.00110	0.00200	mg/L	1	28-Feb-2019 13:51
Sodium	**206**		**0.140**	**2.00**	**mg/L**	10	28-Feb-2019 01:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190208-DGW-MW3-PV30inlet-30-35-40T
Collection Date: 08-Feb-2019 12:35

ANALYTICAL REPORT
WorkOrder:HS19021248
Lab ID:HS19021248-16
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**394**		**2.00**	**2.00**	**mg/L**	1	01-Mar-2019 16:24
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 26-Feb-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	28-Feb-2019 13:53
Arsenic	**0.0250**		**0.000400**	**0.00200**	**mg/L**	1	28-Feb-2019 13:53
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 13:53
Calcium	**120**		**0.340**	**5.00**	**mg/L**	10	28-Feb-2019 01:55
Iron	**1.30**		**0.0120**	**0.200**	**mg/L**	1	28-Feb-2019 13:53
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 13:53
Magnesium	**22.8**		**0.100**	**2.00**	**mg/L**	10	28-Feb-2019 01:55
Potassium	**2.18**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 13:53
Selenium	U		0.00110	0.00200	mg/L	1	28-Feb-2019 13:53
Sodium	**213**		**0.140**	**2.00**	**mg/L**	10	28-Feb-2019 01:55

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190210-DGW-MW3-PV30mid-controlT
Collection Date: 10-Feb-2019 20:45

ANALYTICAL REPORT
WorkOrder:HS19021248
Lab ID:HS19021248-17
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**375**		**2.00**	**2.00**	**mg/L**	1	01-Mar-2019 16:24
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 26-Feb-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	28-Feb-2019 13:56
Arsenic	**0.0107**		**0.000400**	**0.00200**	**mg/L**	1	28-Feb-2019 13:56
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 13:56
Calcium	**113**		**0.340**	**5.00**	**mg/L**	10	28-Feb-2019 01:58
Iron	**0.238**		**0.0120**	**0.200**	**mg/L**	1	28-Feb-2019 13:56
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 13:56
Magnesium	**22.5**		**0.100**	**2.00**	**mg/L**	10	28-Feb-2019 01:58
Potassium	**2.22**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 13:56
Selenium	U		0.00110	0.00200	mg/L	1	28-Feb-2019 13:56
Sodium	**208**		**0.140**	**2.00**	**mg/L**	10	28-Feb-2019 01:58

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190210-DGW-MW3-PV30mid-30T
Collection Date: 10-Feb-2019 20:45

ANALYTICAL REPORT
WorkOrder:HS19021248
Lab ID:HS19021248-18
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**63.3**		**2.00**	**2.00**	**mg/L**	1	01-Mar-2019 16:24
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 26-Feb-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	28-Feb-2019 13:58
Arsenic	U		0.000400	0.00200	mg/L	1	28-Feb-2019 13:58
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 13:58
Calcium	**6.87**		**0.0340**	**0.500**	**mg/L**	1	28-Feb-2019 13:58
Iron	**0.114**	J	**0.0120**	**0.200**	**mg/L**	1	28-Feb-2019 13:58
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 13:58
Magnesium	**11.2**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 13:58
Potassium	**2.02**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 13:58
Selenium	U		0.00110	0.00200	mg/L	1	28-Feb-2019 13:58
Sodium	**204**		**0.140**	**2.00**	**mg/L**	10	28-Feb-2019 02:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190210-DGW-MW3-PV30mid-35T
Collection Date: 10-Feb-2019 20:45

ANALYTICAL REPORT
WorkOrder:HS19021248
Lab ID:HS19021248-19
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**60.1**		**2.00**	**2.00**	**mg/L**	1	01-Mar-2019 16:24
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 26-Feb-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	28-Feb-2019 14:17
Arsenic	U		0.000400	0.00200	mg/L	1	28-Feb-2019 14:17
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 14:17
Calcium	**7.25**		**0.0340**	**0.500**	**mg/L**	1	28-Feb-2019 14:17
Iron	**0.217**		**0.0120**	**0.200**	**mg/L**	1	28-Feb-2019 14:17
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 14:17
Magnesium	**10.2**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 14:17
Potassium	**1.95**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 14:17
Selenium	U		0.00110	0.00200	mg/L	1	28-Feb-2019 14:17
Sodium	**200**		**0.140**	**2.00**	**mg/L**	10	28-Feb-2019 02:02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190210-DGW-MW3-PV30mid-40T
Collection Date: 10-Feb-2019 20:45

ANALYTICAL REPORT
WorkOrder:HS19021248
Lab ID:HS19021248-20
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**61.3**		**2.00**	**2.00**	**mg/L**	1	01-Mar-2019 16:24
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 26-Feb-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	28-Feb-2019 14:19
Arsenic	U		0.000400	0.00200	mg/L	1	28-Feb-2019 14:19
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 14:19
Calcium	**6.89**		**0.0340**	**0.500**	**mg/L**	1	28-Feb-2019 14:19
Iron	**0.694**		**0.0120**	**0.200**	**mg/L**	1	28-Feb-2019 14:19
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 14:19
Magnesium	**10.7**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 14:19
Potassium	**2.04**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 14:19
Selenium	U		0.00110	0.00200	mg/L	1	28-Feb-2019 14:19
Sodium	**212**		**0.140**	**2.00**	**mg/L**	10	28-Feb-2019 02:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190208-DGW-MW3-PV30inlet-controlD-DUP
Collection Date: 08-Feb-2019 12:35

ANALYTICAL REPORT
WorkOrder:HS19021248
Lab ID:HS19021248-21
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	28-Feb-2019 22:17
Arsenic	**0.0107**		**0.000400**	**0.00200**	**mg/L**	1	28-Feb-2019 22:17
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 22:17
Calcium	**107**		**0.340**	**5.00**	**mg/L**	10	28-Feb-2019 19:01
Iron	**0.0225**	J	**0.0120**	**0.200**	**mg/L**	1	28-Feb-2019 22:17
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 22:17
Magnesium	**22.6**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 22:17
Potassium	**2.18**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 22:17
Selenium	U		0.00110	0.00200	mg/L	1	28-Feb-2019 22:17
Sodium	**211**		**0.140**	**2.00**	**mg/L**	10	28-Feb-2019 19:01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190208-DGW-MW3-PV30inlet-controlT-DUP
Collection Date: 08-Feb-2019 12:35

ANALYTICAL REPORT
WorkOrder:HS19021248
Lab ID:HS19021248-22
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**389**		**2.00**	**2.00**	**mg/L**	1	01-Mar-2019 16:24
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 26-Feb-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	28-Feb-2019 14:21
Arsenic	**0.0162**		**0.000400**	**0.00200**	**mg/L**	1	28-Feb-2019 14:21
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 14:21
Calcium	**119**		**0.340**	**5.00**	**mg/L**	10	28-Feb-2019 02:11
Iron	**0.795**		**0.0120**	**0.200**	**mg/L**	1	28-Feb-2019 14:21
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 14:21
Magnesium	**22.3**		**0.100**	**2.00**	**mg/L**	10	28-Feb-2019 02:11
Potassium	**2.13**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 14:21
Selenium	U		0.00110	0.00200	mg/L	1	28-Feb-2019 14:21
Sodium	**206**		**0.140**	**2.00**	**mg/L**	10	28-Feb-2019 02:11

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021248

Batch ID: 138128 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19021248-11	1	10	10 (mL)	1
HS19021248-12	1	10	10 (mL)	1
HS19021248-13	1	10	10 (mL)	1
HS19021248-14	1	10	10 (mL)	1
HS19021248-15	1	10	10 (mL)	1
HS19021248-16	1	10	10 (mL)	1
HS19021248-17	1	10	10 (mL)	1
HS19021248-18	1	10	10 (mL)	1
HS19021248-19	1	10	10 (mL)	1
HS19021248-20	1	10	10 (mL)	1
HS19021248-22	1	10	10 (mL)	1

Batch ID: 138133 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19021248-01	1	10	10 (mL)	1
HS19021248-02	1	10	10 (mL)	1
HS19021248-03	1	10	10 (mL)	1
HS19021248-04	1	10	10 (mL)	1
HS19021248-05	1	10	10 (mL)	1
HS19021248-06	1	10	10 (mL)	1
HS19021248-07	1	10	10 (mL)	1
HS19021248-08	1	10	10 (mL)	1
HS19021248-09	1	10	10 (mL)	1
HS19021248-10	1	10	10 (mL)	1
HS19021248-21	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021248

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 138128	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19021248-11	20190208-DGW-MW3-PV30out-controlT	08 Feb 2019 12:30		26 Feb 2019 11:00	28 Feb 2019 13:42	1
HS19021248-11	20190208-DGW-MW3-PV30out-controlT	08 Feb 2019 12:30		26 Feb 2019 11:00	28 Feb 2019 01:44	10
HS19021248-12	20190208-DGW-MW3-PV30out-30T	08 Feb 2019 12:30		26 Feb 2019 11:00	28 Feb 2019 13:44	1
HS19021248-12	20190208-DGW-MW3-PV30out-30T	08 Feb 2019 12:30		26 Feb 2019 11:00	28 Feb 2019 01:46	10
HS19021248-13	20190208-DGW-MW3-PV30out-35T	08 Feb 2019 12:30		26 Feb 2019 11:00	28 Feb 2019 13:47	1
HS19021248-13	20190208-DGW-MW3-PV30out-35T	08 Feb 2019 12:30		26 Feb 2019 11:00	28 Feb 2019 01:49	10
HS19021248-14	20190208-DGW-MW3-PV30out-40T	08 Feb 2019 12:30		26 Feb 2019 11:00	28 Feb 2019 13:49	1
HS19021248-14	20190208-DGW-MW3-PV30out-40T	08 Feb 2019 12:30		26 Feb 2019 11:00	28 Feb 2019 01:51	10
HS19021248-15	20190208-DGW-MW3-PV30inlet-controlT	08 Feb 2019 12:35		26 Feb 2019 11:00	28 Feb 2019 13:51	1
HS19021248-15	20190208-DGW-MW3-PV30inlet-controlT	08 Feb 2019 12:35		26 Feb 2019 11:00	28 Feb 2019 01:53	10
HS19021248-16	20190208-DGW-MW3-PV30inlet-30-35-40T	08 Feb 2019 12:35		26 Feb 2019 11:00	28 Feb 2019 13:53	1
HS19021248-16	20190208-DGW-MW3-PV30inlet-30-35-40T	08 Feb 2019 12:35		26 Feb 2019 11:00	28 Feb 2019 01:55	10
HS19021248-17	20190210-DGW-MW3-PV30mid-controlT	10 Feb 2019 20:45		26 Feb 2019 11:00	28 Feb 2019 13:56	1
HS19021248-17	20190210-DGW-MW3-PV30mid-controlT	10 Feb 2019 20:45		26 Feb 2019 11:00	28 Feb 2019 01:58	10
HS19021248-18	20190210-DGW-MW3-PV30mid-30T	10 Feb 2019 20:45		26 Feb 2019 11:00	28 Feb 2019 13:58	1
HS19021248-18	20190210-DGW-MW3-PV30mid-30T	10 Feb 2019 20:45		26 Feb 2019 11:00	28 Feb 2019 02:00	10
HS19021248-19	20190210-DGW-MW3-PV30mid-35T	10 Feb 2019 20:45		26 Feb 2019 11:00	28 Feb 2019 14:17	1
HS19021248-19	20190210-DGW-MW3-PV30mid-35T	10 Feb 2019 20:45		26 Feb 2019 11:00	28 Feb 2019 02:02	10
HS19021248-20	20190210-DGW-MW3-PV30mid-40T	10 Feb 2019 20:45		26 Feb 2019 11:00	28 Feb 2019 14:19	1
HS19021248-20	20190210-DGW-MW3-PV30mid-40T	10 Feb 2019 20:45		26 Feb 2019 11:00	28 Feb 2019 02:04	10
HS19021248-22	20190208-DGW-MW3-PV30inlet-controlT-DUP	08 Feb 2019 12:35		26 Feb 2019 11:00	28 Feb 2019 14:21	1
HS19021248-22	20190208-DGW-MW3-PV30inlet-controlT-DUP	08 Feb 2019 12:35		26 Feb 2019 11:00	28 Feb 2019 02:11	10

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021248

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 138133	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS19021248-01	20190208-DGW-MW3-PV30out-controlD	08 Feb 2019 12:30		26 Feb 2019 11:00	28 Feb 2019 21:50	1
HS19021248-01	20190208-DGW-MW3-PV30out-controlD	08 Feb 2019 12:30		26 Feb 2019 11:00	28 Feb 2019 18:33	10
HS19021248-02	20190208-DGW-MW3-PV30out-30D	08 Feb 2019 12:30		26 Feb 2019 11:00	28 Feb 2019 21:53	1
HS19021248-02	20190208-DGW-MW3-PV30out-30D	08 Feb 2019 12:30		26 Feb 2019 11:00	28 Feb 2019 18:36	10
HS19021248-03	20190208-DGW-MW3-PV30out-35D	08 Feb 2019 12:30		26 Feb 2019 11:00	28 Feb 2019 21:55	1
HS19021248-03	20190208-DGW-MW3-PV30out-35D	08 Feb 2019 12:30		26 Feb 2019 11:00	28 Feb 2019 18:38	10
HS19021248-04	20190208-DGW-MW3-PV30out-40D	08 Feb 2019 12:30		26 Feb 2019 11:00	28 Feb 2019 21:57	1
HS19021248-04	20190208-DGW-MW3-PV30out-40D	08 Feb 2019 12:30		26 Feb 2019 11:00	28 Feb 2019 18:40	10
HS19021248-05	20190208-DGW-MW3-PV30inlet-controlD	08 Feb 2019 12:35		26 Feb 2019 11:00	28 Feb 2019 21:59	1
HS19021248-05	20190208-DGW-MW3-PV30inlet-controlD	08 Feb 2019 12:35		26 Feb 2019 11:00	28 Feb 2019 18:42	10
HS19021248-06	20190208-DGW-MW3-PV30inlet-30-35-40D	08 Feb 2019 12:35		26 Feb 2019 11:00	28 Feb 2019 22:06	1
HS19021248-06	20190208-DGW-MW3-PV30inlet-30-35-40D	08 Feb 2019 12:35		26 Feb 2019 11:00	28 Feb 2019 18:45	10
HS19021248-07	20190210-DGW-MW3-PV30mid-controlD	10 Feb 2019 20:45		26 Feb 2019 11:00	28 Feb 2019 22:08	1
HS19021248-07	20190210-DGW-MW3-PV30mid-controlD	10 Feb 2019 20:45		26 Feb 2019 11:00	28 Feb 2019 18:47	10
HS19021248-08	20190210-DGW-MW3-PV30mid-30D	10 Feb 2019 20:45		26 Feb 2019 11:00	28 Feb 2019 22:11	1
HS19021248-08	20190210-DGW-MW3-PV30mid-30D	10 Feb 2019 20:45		26 Feb 2019 11:00	28 Feb 2019 18:49	10
HS19021248-09	20190210-DGW-MW3-PV30mid-35D	10 Feb 2019 20:45		26 Feb 2019 11:00	28 Feb 2019 22:13	1
HS19021248-09	20190210-DGW-MW3-PV30mid-35D	10 Feb 2019 20:45		26 Feb 2019 11:00	28 Feb 2019 18:52	10
HS19021248-10	20190210-DGW-MW3-PV30mid-40D	10 Feb 2019 20:45		26 Feb 2019 11:00	28 Feb 2019 22:15	1
HS19021248-10	20190210-DGW-MW3-PV30mid-40D	10 Feb 2019 20:45		26 Feb 2019 11:00	28 Feb 2019 18:59	10
HS19021248-21	20190208-DGW-MW3-PV30inlet-controlD-DUP	08 Feb 2019 12:35		26 Feb 2019 11:00	28 Feb 2019 22:17	1
HS19021248-21	20190208-DGW-MW3-PV30inlet-controlD-DUP	08 Feb 2019 12:35		26 Feb 2019 11:00	28 Feb 2019 19:01	10

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021248

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R333858	**Test Name :** HARDNESS, TOTAL AS CACO3 BY SM2340B				**Matrix:** Groundwater	
HS19021248-11	20190208-DGW-MW3-PV30out-controlT	08 Feb 2019 12:30			01 Mar 2019 16:24	1
HS19021248-12	20190208-DGW-MW3-PV30out-30T	08 Feb 2019 12:30			01 Mar 2019 16:24	1
HS19021248-13	20190208-DGW-MW3-PV30out-35T	08 Feb 2019 12:30			01 Mar 2019 16:24	1
HS19021248-14	20190208-DGW-MW3-PV30out-40T	08 Feb 2019 12:30			01 Mar 2019 16:24	1
HS19021248-15	20190208-DGW-MW3-PV30inlet-controlT	08 Feb 2019 12:35			01 Mar 2019 16:24	1
HS19021248-16	20190208-DGW-MW3-PV30inlet-30-35-40T	08 Feb 2019 12:35			01 Mar 2019 16:24	1
HS19021248-17	20190210-DGW-MW3-PV30mid-controlT	10 Feb 2019 20:45			01 Mar 2019 16:24	1
HS19021248-18	20190210-DGW-MW3-PV30mid-30T	10 Feb 2019 20:45			01 Mar 2019 16:24	1
HS19021248-19	20190210-DGW-MW3-PV30mid-35T	10 Feb 2019 20:45			01 Mar 2019 16:24	1
HS19021248-20	20190210-DGW-MW3-PV30mid-40T	10 Feb 2019 20:45			01 Mar 2019 16:24	1
HS19021248-22	20190208-DGW-MW3-PV30inlet-controlT-DUP	08 Feb 2019 12:35			01 Mar 2019 16:24	1

WorkOrder: HS19021248
InstrumentID: ICPMS05
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000555	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000460	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000554	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0537	0.0340	0.500
A	Iron	7439-89-6	0.0500	0.0549	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.00100	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0680	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0542	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00280	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0459	0.0140	0.200

WorkOrder: HS19021248
InstrumentID: ICPMS04
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000521	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000340	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000553	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0523	0.0340	0.500
A	Iron	7439-89-6	0.0250	0.0205	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000916	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0700	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0418	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00274	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0556	0.0140	0.200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021248

QC BATCH REPORT

Batch ID: 138128 **Instrument: ICPMS05** **Method: SW6020**

MBLK Sample ID: **MBLK-138128** Units: **mg/L** Analysis Date: **28-Feb-2019 01:19**
Client ID: Run ID: **ICPMS04_333622** SeqNo: **4968828** PrepDate: **26-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01211	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	0.2187	0.200								

MBLK Sample ID: **MBLK-138128** Units: **mg/L** Analysis Date: **28-Feb-2019 12:31**
Client ID: Run ID: **ICPMS05_333724** SeqNo: **4969684** PrepDate: **26-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	0.000743	0.00200								J
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	U	0.200								
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	0.03231	0.200								J

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021248

QC BATCH REPORT

Batch ID: 138128 **Instrument: ICPMS05** **Method: SW6020**

LCS Sample ID: **LCS-138128** Units: **mg/L** Analysis Date: **28-Feb-2019 01:22**
Client ID: Run ID: **ICPMS04_333622** SeqNo: **4968829** PrepDate: **26-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.0506	0.00200	0.05	0	101	80 - 120				
Arsenic	0.04994	0.00200	0.05	0	99.9	80 - 120				
Cadmium	0.05155	0.00200	0.05	0	103	80 - 120				
Calcium	5.478	0.500	5	0	110	80 - 120				
Iron	5.355	0.200	5	0	107	80 - 120				
Lead	0.04869	0.00200	0.05	0	97.4	80 - 120				
Magnesium	5.746	0.200	5	0	115	80 - 120				
Potassium	5.356	0.200	5	0	107	80 - 120				
Selenium	0.05392	0.00200	0.05	0	108	80 - 120				
Sodium	5.611	0.200	5	0	112	80 - 120				

MS Sample ID: **HS19020902-03MS** Units: **mg/L** Analysis Date: **28-Feb-2019 01:28**
Client ID: Run ID: **ICPMS04_333622** SeqNo: **4968832** PrepDate: **26-Feb-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.0554	0.0200	0.05	0.002406	106	80 - 120				
Arsenic	0.07072	0.0200	0.05	0.0162	109	80 - 120				
Cadmium	0.06146	0.0200	0.05	0.000137	123	80 - 120				S
Calcium	319.8	5.00	5	278.6	825	80 - 120				SO
Iron	6.733	2.00	5	0.5248	124	80 - 120				S
Lead	0.05716	0.0200	0.05	0.000768	113	80 - 120				
Magnesium	935.6	2.00	5	804.9	2610	80 - 120				SO
Potassium	310.3	2.00	5	276.6	673	80 - 120				SO
Selenium	0.06741	0.0200	0.05	0.006925	121	80 - 120				S
Sodium	8057	2.00	5	6944	22300	80 - 120				SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021248

QC BATCH REPORT

Batch ID: 138128 **Instrument: ICPMS05** **Method: SW6020**

MSD Sample ID: **HS19020902-03MSD** Units: **mg/L** Analysis Date: **28-Feb-2019 01:31**
Client ID: Run ID: **ICPMS04_333622** SeqNo: **4968833** PrepDate: **26-Feb-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05416	0.0200	0.05	0.002406	104	80 - 120	0.0554	2.26	20	
Arsenic	0.07009	0.0200	0.05	0.0162	108	80 - 120	0.07072	0.896	20	
Cadmium	0.0558	0.0200	0.05	0.000137	111	80 - 120	0.06146	9.65	20	
Calcium	314	5.00	5	278.6	708	80 - 120	319.8	1.84	20	SO
Iron	6.79	2.00	5	0.5248	125	80 - 120	6.733	0.847	20	S
Lead	0.05495	0.0200	0.05	0.000768	108	80 - 120	0.05716	3.95	20	
Magnesium	875.3	2.00	5	804.9	1410	80 - 120	935.6	6.66	20	SO
Potassium	301.4	2.00	5	276.6	496	80 - 120	310.3	2.89	20	SO
Selenium	0.05699	0.0200	0.05	0.006925	100	80 - 120	0.06741	16.7	20	
Sodium	7500	2.00	5	6944	11100	80 - 120	8057	7.16	20	SEO

PDS Sample ID: **HS19020902-03PDS** Units: **mg/L** Analysis Date: **28-Feb-2019 01:33**
Client ID: Run ID: **ICPMS04_333622** SeqNo: **4968834** PrepDate: **26-Feb-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.906	0.0200	1	0.002406	90.4	75 - 125				
Arsenic	0.9788	0.0200	1	0.0162	96.3	75 - 125				
Cadmium	1.049	0.0200	1	0.000137	105	75 - 125				
Calcium	384.6	5.00	100	278.6	106	75 - 125				
Iron	107.2	2.00	100	0.5248	107	75 - 125				
Lead	1.035	0.0200	1	0.000768	103	75 - 125				
Magnesium	914.8	2.00	100	804.9	110	75 - 125				O
Potassium	378.5	2.00	100	276.6	102	75 - 125				
Selenium	0.9842	0.0200	1	0.006925	97.7	75 - 125				

PDS Sample ID: **HS19020902-03PDS** Units: **mg/L** Analysis Date: **28-Feb-2019 13:08**
Client ID: Run ID: **ICPMS04_333735** SeqNo: **4969847** PrepDate: **26-Feb-2019** DF: **500**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	12680	100	5000	7507	104	75 - 125				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021248

QC BATCH REPORT

Batch ID: 138128 **Instrument: ICPMS05** **Method: SW6020**

SD Sample ID: **HS19020902-03SD** Units: **mg/L** Analysis Date: **28-Feb-2019 01:26**
Client ID: Run ID: **ICPMS04_333622** SeqNo: **4968831** PrepDate: **26-Feb-2019** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.100					0.002406	0	10	
Arsenic	U	0.100					0.0162	0	10	
Cadmium	U	0.100					0.000137	0	10	
Calcium	292.4	25.0					278.6	4.98	10	
Iron	3.812	10.0					0.5248	0	10	J
Lead	U	0.100					0.000768	0	10	
Magnesium	871	10.0					804.9	8.21	10	
Potassium	297.1	10.0					276.6	7.4	10	
Selenium	U	0.100					0.006925	0	10	

SD Sample ID: **HS19020902-03SD** Units: **mg/L** Analysis Date: **28-Feb-2019 13:06**
Client ID: Run ID: **ICPMS04_333735** SeqNo: **4969846** PrepDate: **26-Feb-2019** DF: **2500**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Sodium	7394	500					7507	1.51	10	

The following samples were analyzed in this batch:

HS19021248-11	HS19021248-12	HS19021248-13	HS19021248-14
HS19021248-15	HS19021248-16	HS19021248-17	HS19021248-18
HS19021248-19	HS19021248-20	HS19021248-22	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021248

QC BATCH REPORT

Batch ID: 138133 **Instrument: ICPMS04** **Method: SW6020**

MBLK Sample ID: **MBLK-138133** Units: **mg/L** Analysis Date: **28-Feb-2019 00:55**
Client ID: Run ID: **ICPMS04_333622** SeqNo: **4968817** PrepDate: **26-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01069	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	0.1031	0.200								J

LCS Sample ID: **LCS-138133** Units: **mg/L** Analysis Date: **28-Feb-2019 00:57**
Client ID: Run ID: **ICPMS04_333622** SeqNo: **4968818** PrepDate: **26-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05105	0.00200	0.05	0	102	80 - 120				
Arsenic	0.05014	0.00200	0.05	0	100	80 - 120				
Cadmium	0.0506	0.00200	0.05	0	101	80 - 120				
Calcium	5.262	0.500	5	0	105	80 - 120				
Iron	5.302	0.200	5	0	106	80 - 120				
Lead	0.04678	0.00200	0.05	0	93.6	80 - 120				
Magnesium	5.396	0.200	5	0	108	80 - 120				
Potassium	5.352	0.200	5	0	107	80 - 120				
Selenium	0.05182	0.00200	0.05	0	104	80 - 120				
Sodium	5.318	0.200	5	0	106	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021248

QC BATCH REPORT

Batch ID: 138133 **Instrument: ICPMS04** **Method: SW6020**

MS Sample ID: **HS19020902-03MS** Units: **mg/L** Analysis Date: **28-Feb-2019 01:04**
Client ID: Run ID: **ICPMS04_333622** SeqNo: **4968821** PrepDate: **26-Feb-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05478	0.0200	0.05	0.000771	108	80 - 120				
Arsenic	0.07432	0.0200	0.05	0.01761	113	80 - 120				
Cadmium	0.05838	0.0200	0.05	0.000191	116	80 - 120				
Calcium	313.7	5.00	5	271.7	841	80 - 120				SO
Iron	6.407	2.00	5	0.4551	119	80 - 120				
Lead	0.05728	0.0200	0.05	0.000386	114	80 - 120				
Magnesium	905.5	2.00	5	771	2690	80 - 120				SO
Potassium	299.4	2.00	5	262	749	80 - 120				SO
Selenium	0.06159	0.0200	0.05	0.006135	111	80 - 120				
Sodium	7675	2.00	5	6756	18400	80 - 120				SEO

MSD Sample ID: **HS19020902-03MSD** Units: **mg/L** Analysis Date: **28-Feb-2019 01:06**
Client ID: Run ID: **ICPMS04_333622** SeqNo: **4968822** PrepDate: **26-Feb-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05052	0.0200	0.05	0.000771	99.5	80 - 120	0.05478	8.09	20	
Arsenic	0.0657	0.0200	0.05	0.01761	96.2	80 - 120	0.07432	12.3	20	
Cadmium	0.05313	0.0200	0.05	0.000191	106	80 - 120	0.05838	9.41	20	
Calcium	288.6	5.00	5	271.7	339	80 - 120	313.7	8.34	20	SO
Iron	6.28	2.00	5	0.4551	117	80 - 120	6.407	1.99	20	
Lead	0.05341	0.0200	0.05	0.000386	106	80 - 120	0.05728	7	20	
Magnesium	861.3	2.00	5	771	1800	80 - 120	905.5	5.01	20	SO
Potassium	284.3	2.00	5	262	445	80 - 120	299.4	5.19	20	SO
Selenium	0.06115	0.0200	0.05	0.006135	110	80 - 120	0.06159	0.72	20	
Sodium	7347	2.00	5	6756	11800	80 - 120	7675	4.37	20	SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021248

QC BATCH REPORT

Batch ID: 138133 **Instrument: ICPMS04** **Method: SW6020**

PDS Sample ID: **HS19020902-03PDS** Units: **mg/L** Analysis Date: **28-Feb-2019 01:08**
Client ID: Run ID: **ICPMS04_333622** SeqNo: **4968823** PrepDate: **26-Feb-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.8827	0.0200	1	0.000771	88.2	75 - 125				
Arsenic	0.9902	0.0200	1	0.01761	97.3	75 - 125				
Cadmium	1.059	0.0200	1	0	106	75 - 125				
Calcium	365.1	5.00	100	271.7	93.5	75 - 125				
Iron	104.9	2.00	100	0	105	75 - 125				
Lead	1.037	0.0200	1	0	104	75 - 125				
Magnesium	887	2.00	100	771	116	75 - 125				O
Potassium	369.2	2.00	100	262	107	75 - 125				
Selenium	0.9872	0.0200	1	0	98.7	75 - 125				

PDS Sample ID: **HS19020902-03PDS** Units: **mg/L** Analysis Date: **28-Feb-2019 12:59**
Client ID: Run ID: **ICPMS04_333735** SeqNo: **4969699** PrepDate: **26-Feb-2019** DF: **500**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	11570	100	5000	6899	93.5	75 - 125				

SD Sample ID: **HS19020902-03SD** Units: **mg/L** Analysis Date: **28-Feb-2019 01:01**
Client ID: Run ID: **ICPMS04_333622** SeqNo: **4968820** PrepDate: **26-Feb-2019** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.100					0.000771	0	10	
Arsenic	U	0.100					0.01761	0	10	
Cadmium	U	0.100					0.000191	0	10	
Calcium	276	25.0					271.7	1.59	10	
Iron	3.434	10.0					0.4551	0	10	J
Lead	U	0.100					0.000386	0	10	
Magnesium	790.5	10.0					771	2.53	10	
Potassium	273.1	10.0					262	4.22	10	
Selenium	U	0.100					0.006135	0	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021248

QC BATCH REPORT

Batch ID: 138133 **Instrument: ICPMS04** **Method: SW6020**

SD Sample ID: **HS19020902-03SD** Units: **mg/L** Analysis Date: **28-Feb-2019 12:57**
Client ID: Run ID: **ICPMS04_333735** SeqNo: **4969698** PrepDate: **26-Feb-2019** DF: **2500**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Sodium	7172	500					6899	3.96	10	

The following samples were analyzed in this batch:

HS19021248-01	HS19021248-02	HS19021248-03	HS19021248-04
HS19021248-05	HS19021248-06	HS19021248-07	HS19021248-08
HS19021248-09	HS19021248-10	HS19021248-21	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19021248**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
California	2919, 2018-2019	30-Apr-2019
Maryland	343, 2018-2019	30-Jun-2019

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19021248

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19021248-01	20190208-DGW-MW3-PV30out-controlD	Login	2/25/2019 9:52:46 AM	NDR	MET034
HS19021248-02	20190208-DGW-MW3-PV30out-30D	Login	2/25/2019 9:52:46 AM	NDR	MET034
HS19021248-03	20190208-DGW-MW3-PV30out-35D	Login	2/25/2019 9:52:46 AM	NDR	MET034
HS19021248-04	20190208-DGW-MW3-PV30out-40D	Login	2/25/2019 9:52:46 AM	NDR	MET034
HS19021248-05	20190208-DGW-MW3-PV30inlet-controlD	Login	2/25/2019 9:52:46 AM	NDR	MET034
HS19021248-06	20190208-DGW-MW3-PV30inlet-30-35-40D	Login	2/25/2019 9:52:46 AM	NDR	MET034
HS19021248-07	20190210-DGW-MW3-PV30mid-controlD	Login	2/25/2019 9:52:46 AM	NDR	MET034
HS19021248-08	20190210-DGW-MW3-PV30mid-30D	Login	2/25/2019 9:52:46 AM	NDR	MET034
HS19021248-09	20190210-DGW-MW3-PV30mid-35D	Login	2/25/2019 9:52:46 AM	NDR	MET034
HS19021248-10	20190210-DGW-MW3-PV30mid-40D	Login	2/25/2019 9:52:46 AM	NDR	MET034
HS19021248-11	20190208-DGW-MW3-PV30out-controlT	Login	2/25/2019 9:52:46 AM	NDR	MET034
HS19021248-12	20190208-DGW-MW3-PV30out-30T	Login	2/25/2019 9:52:46 AM	NDR	MET034
HS19021248-13	20190208-DGW-MW3-PV30out-35T	Login	2/25/2019 9:52:46 AM	NDR	MET034
HS19021248-14	20190208-DGW-MW3-PV30out-40T	Login	2/25/2019 9:52:46 AM	NDR	MET034
HS19021248-15	20190208-DGW-MW3-PV30inlet-controlT	Login	2/25/2019 9:52:46 AM	NDR	MET034
HS19021248-16	20190208-DGW-MW3-PV30inlet-30-35-40T	Login	2/25/2019 9:52:46 AM	NDR	MET034
HS19021248-17	20190210-DGW-MW3-PV30mid-controlT	Login	2/25/2019 9:52:46 AM	NDR	MET034
HS19021248-18	20190210-DGW-MW3-PV30mid-30T	Login	2/25/2019 9:52:46 AM	NDR	MET034
HS19021248-19	20190210-DGW-MW3-PV30mid-35T	Login	2/25/2019 9:52:46 AM	NDR	MET034
HS19021248-20	20190210-DGW-MW3-PV30mid-40T	Login	2/25/2019 9:52:46 AM	NDR	MET034

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19021248

Date/Time Received: **25-Feb-2019 08:08**
Received by: **NDR**

Checklist completed by: *Nilesh D. Ranchod* eSignature — 25-Feb-2019 Date

Reviewed by: *Dane J. Wacasey* eSignature — 26-Feb-2019 Date

Matrices: **Water**

Carrier name: **FedEx International Priority**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	2 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	16.5C/16.5C UC/C	IR # 11
Cooler(s)/Kit(s):	44338	
Date/Time sample(s) sent to storage:	02/25/2019 10:50PM	

Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

ALS Environmental

Chain of Custody Form

Page 2 of 3

HS19021248

Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information		Analysis/Method Request for Analysis	
PO Number	130-2086-01	Project Name	Exide column studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrette Parkway Drive, Suit	E	ICP TW (6020A total metals (6)+cations)
				F	ICP DISS (6020A diss metals (6)+cations-FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin Mo 63021	G	
Phone	314 984-8800	Phone	314 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190208-DGW-MW3-PV30out-controlD	02-08-19	12:30 PM	GW	2	1						X					
2	20190208-DGW-MW3-PV30out-30D	02-08-19	12:30 PM	GW	2	1						X					
3	20190208-DGW-MW3-PV30out-35D	02-08-19	12:30 PM	GW	2	1						X					
4	20190208-DGW-MW3-PV30out-40D	02-08-19	12:30 PM	GW	2	1						X					
5	20190208-DGW-MW3-PV30inlet-controlD	02-08-19	12:35 PM	GW	2	1						X					
6	20190208-DGW-MW3-PV30inlet-30-35-40D	02-08-19	12:35 PM	GW	2	1						X					
7	20190210-DGW-MW3-PV30mid-controlD	02-10-19	8:45 PM	GW	2	1						X					
8	20190210-DGW-MW3-PV30mid-30D	02-10-19	8:45 PM	GW	2	1						X					
9	20190210-DGW-MW3-PV30mid-35D	02-10-19	8:45 PM	GW	2	1						X					
10	20190210-DGW-MW3-PV30mid-40D	02-10-19	8:45 PM	GW	2	1						X					

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method:

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by:	Date:	Time:	Received by:	Notes:
Giovanna Llamosas	2019/02/18	15:30		
Relinquished by:	Date: 2/25/19	Time: 05:03	Received by (Laboratory): NC	Cooler Temp. 4°C
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	16.5

QC Package: (Check Box Below)

	Level II: Standard QC	x	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other: _____		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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Chain of Custody Form

Page 2 of 3

HS19021248

Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information	
PO Number	130-2086-01	Project Name	Exide column studies
Work Order		Project Number	130-2086
Company Name	Golder Associates	Bill To Company	Golder Associates
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrette Parkway Drive, Suit
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin Mo 63021
Phone	314 984-8800	Phone	314 984-8800
Fax		Fax	
e-Mail Address	ewhite@golder.com	e-Mail Address	

Parameter/Method Request for Analysis

A	300 W (300Cl, SO4, NO3-48h HT)
B	TDS W 2540C (2540C TDS)
C	ALK W 2320B (2320B alkalinity)
D	HARD (2340B hardness (calc))
E	ICP TW (6020A total metals (6)+cations)
F	ICP DISS (6020A diss metals (6)+cations-FldFltr)
G	
H	
I	
J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190208-DGW-MW3-PV30out-controlT	02-08-19	12:30 PM	GW	2	1				X	X						
2	20190208-DGW-MW3-PV30out-30T	02-08-19	12:30 PM	GW	2	1				X	X						
3	20190208-DGW-MW3-PV30out-35T	02-08-19	12:30 PM	GW	2	1				X	X						
4	20190208-DGW-MW3-PV30out-40T	02-08-19	12:30 PM	GW	2	1				X	X						
5	20190208-DGW-MW3-PV30inlet-controlT	02-08-19	12:35 PM	GW	2	1				X	X						
6	20190208-DGW-MW3-PV30inlet-30-35-40T	02-08-19	12:35 PM	GW	2	1				X	X						
7	20190210-DGW-MW3-PV30mid-controlT	02-10-19	8:45 PM	GW	2	1				X	X						
8	20190210-DGW-MW3-PV30mid-30T	02-10-19	8:45 PM	GW	2	1				X	X						
9	20190210-DGW-MW3-PV30mid-35T	02-10-19	8:45 PM	GW	2	1				X	X						
10	20190210-DGW-MW3-PV30mid-40T	02-10-19	8:45 PM	GW	2	1				X	X						

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method:

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by: Giovanna Llamosas	Date: 2019/02/18	Time: 15:30	Received by:	Notes:
Relinquished by:	Date: 2/25/19	Time: 08:03	Received by (Laboratory): NA	Cooler Temp. 4/C
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	1&F

QC Package: (Check Box Below)

	Level II: Standard QC	x	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other: _____		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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Chain of Custody Form

Page 1 of 3

HS19021248

Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086-01	Project Name	Exide column studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrette Parkway Drive, Suit	E	ICP TW (6020A total metals (6)+cations)
				F	ICP DISS (6020A diss metals (6)+cations-FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin Mo 63021	G	
Phone	314 984-8800	Phone	314 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190205-DGW-MW11-PV20out-35D-DUP	02-05-19	12:30 PM	GW	2	1						X					
2	20190205-DGW-MW11-PV20out-35T-DUP	02-05-19	12:30 PM	GW	2	1				X	X						
3	20190205-FD-PV20out-30D-DUP	02-05-19	12:15 PM	GW	2	1						X					
4	20190205-FD-PV20out-30T-DUP	02-05-19	12:15 PM	GW	2	1				X	X						
5	20190208-DGW-MW3-PV30inlet-controlD-DUP	02-08-19	12:35 PM	GW	2	1						X					
6	20190208-DGW-MW3-PV30inlet-controlT-DUP	02-08-19	12:35 PM	GW	2	1				X	X						
7																	
8																	
9																	
10																	

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method:

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by: Giovanna Llamosas	Date: 2019/02/18	Time: 15:30	Received by:	Notes:	
Relinquished by:	Date: 2/21/19	Time: 09:03	Received by (Laboratory):	Cooler Temp. 0.1°C	QC Package: (Check Box Below)
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	16.0	☐ Level II: Standard QC ☒ TRRP-Checklist ☐ Level III: Std QC + Raw Data ☐ TRRP Level IV ☐ Level IV: SW846 CLP-Like ☐ Other: _____

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

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ORIGIN ID:YUXA (514) 383-0990
AUDREY ETHEVES
GOLDER ASSOCIATES LTD
7250 RUE DU MILE END
3E ETAGE
MONTREAL, PQ H2R3A4
CANADA CA

SHIP DATE: 22FEB19
ACTWGT: 19.25 LB
CAD: 108680724/INET4102

BILL RECIPIENT

TO **DANE WACASEY**
ALS HOUSTON LABORATORY
10450 STANCLIFF RD
STE 210
HOUSTON TX 77099
(281) 530-5656 REF:
INV:
PO: DEPT.

(US)

565J2/0E3D/23AD

FedEx Express

TRK# 0430 **7745 3445 0443**

10:30A
INTL PRIORITY

XH SGRA

77099
TX-US **IAH**

Après l'impression de cette étiquette :
COPIE DU DESTINATAIRE - VEUILLEZ LA PLACER DEVANT LA POCHETTE
1. Pliez la page imprimée le long de la ligne horizontale.
2. Placez l'étiquette dans la pochette d'expédition et fixez-la à votre paquet.

DÉFINITIONS. Dans le présent contrat de transport aérien, « nous », « notre » et « FedEx » se rapportent à Federal Express Corporation, ses filiales, succursales et leurs employés, mandataires et prestataires assumés. « Vous » et « votre » se rapportent à l'expéditeur, ses employés, donneurs d'ordre et mandataires. Si l'envoi n'a pas été transporté par FedEx, « vous » se rapportera également à tout transporteur avec lequel vous avez conclu un contrat de transport aérien ou à tout autre transporteur auquel vous avez donné l'ordre de transporter l'envoi. « Envoi » se rapportera à tout ou partie de l'envoi, y compris les emballages, transporté par nous en vertu du présent contrat. « Déclaration de valeur » se rapportera à la déclaration de valeur de l'envoi que vous avez faite conformément à la section 4 ci-dessous. « Convention de Varsovie » se rapportera à la Convention pour l'unification de certaines règles relatives au transport aérien international, signée à Varsovie le 12 octobre 1929, telle que modifiée par le Protocole de La Haye du 28 septembre 1955, la Convention de Guadalajara du 18 septembre 1961 ou le Protocole de Montréal n° 4 du 25 septembre 1975, selon le cas. « Convention de Montréal » se rapportera à la Convention pour l'unification de certaines règles relatives au transport aérien international, signée à Montréal le 28 mai 1999. « Convention » se rapportera à la Convention de Varsovie ou à la Convention de Montréal, selon le cas. « Limite de responsabilité » se rapportera à la limite de responsabilité applicable en vertu de la Convention de Varsovie ou de la Convention de Montréal, selon le cas. « Dommage corporel » se rapportera à la mort ou à toute autre lésion corporelle subie par un passager, y compris, dans le cas d'un transport effectué par un transporteur aérien public régulier, les dommages psychologiques ou psychiatriques. « Retard » se rapportera à tout retard dans le transport aérien de l'envoi. « Jour » se rapportera à un jour civil, et non à un jour ouvrable. « Nous avons le droit » se rapportera à notre droit, mais non à notre obligation, d'agir d'une certaine manière. « Nous sommes autorisés à » se rapportera à notre droit, mais non à notre obligation, d'agir d'une certaine manière, sauf indication contraire dans le présent contrat. « Nous ne sommes pas responsables » se rapportera à notre absence de responsabilité, sauf indication contraire dans le présent contrat.

TRANSPORT AÉRIEN. Le transport effectué en vertu du présent contrat est soumis à la Convention de Varsovie, sauf si ce transport est qualifié de transport international par la Convention de Montréal, auquel cas il est soumis à la Convention de Montréal. Le transport effectué en vertu du présent contrat peut faire l'objet de plusieurs conventions successives. Le transport effectué en vertu du présent contrat peut également faire l'objet d'un transport par d'autres transporteurs aériens ou terrestres. Dans la mesure où la Convention de Varsovie ne s'applique pas à un transport effectué en vertu du présent contrat, ou dans la mesure où la Convention de Varsovie permet à un transporteur de modifier les conditions de son contrat de transport, le transport effectué en vertu du présent contrat est soumis à la législation locale applicable. Si une disposition du présent contrat est incompatible avec la Convention de Varsovie ou avec la législation locale applicable, cette disposition sera, dans la mesure nécessaire, inapplicable, mais le reste du présent contrat restera en vigueur. Si vous confiez à FedEx un envoi qui, de par sa nature ou son emballage, est susceptible de mettre en danger des personnes ou des biens, vous acceptez de nous informer de la nature dangereuse de l'envoi et de le préparer, le marquer et le déclarer conformément aux règlements applicables avant de nous le remettre. Vous acceptez également de nous indemniser, de nous défendre et de nous dégager de toute responsabilité en cas de réclamation, de poursuite, de jugement, de dommages, de pertes et de frais découlant de votre manquement à cette obligation. Nous sommes autorisés à ouvrir et à inspecter l'envoi sans vous en aviser si nous pensons qu'il contient des marchandises dangereuses. Nous sommes autorisés à refuser le transport de tout envoi que nous pensons contenir des marchandises dangereuses. Nous sommes autorisés à retirer du transport aérien tout envoi que nous pensons contenir des marchandises dangereuses. Nous sommes autorisés à détruire ou à rendre inoffensif tout envoi que nous pensons contenir des marchandises dangereuses. Nous ne sommes pas responsables des pertes ou dommages subis par vous ou par des tiers en raison de marchandises dangereuses contenues dans votre envoi. Nous sommes autorisés à transporter des animaux vivants, mais nous ne sommes pas responsables de la perte, de la blessure ou de la mort d'un animal vivant, sauf si cette perte, cette blessure ou cette mort est causée par notre négligence. Nous sommes autorisés à transporter des restes humains. Nous sommes autorisés à transporter des armes à feu, des munitions, des explosifs, des narcotiques et des substances illégales, sauf indication contraire dans le présent contrat. Nous sommes autorisés à transporter des espèces, des devises, des titres négociables, des documents de valeur, des bijoux, des métaux précieux, des pierres précieuses, des articles de collection, des œuvres d'art, des documents irremplaçables, des échantillons commerciaux, des échantillons médicaux, des échantillons de diagnostic, des échantillons de laboratoire, des échantillons de recherche, des échantillons de test, des échantillons de démonstration, des échantillons de formation, des échantillons de présentation, des échantillons de vente, des échantillons de marketing, des échantillons de publicité, des échantillons de promotion, des échantillons de commerce, des échantillons de foire commerciale, des échantillons de salon professionnel, des échantillons de conférence, des échantillons de séminaire, des échantillons de réunion, des échantillons de convention, des échantillons de voyage, des échantillons de vente au détail, des échantillons de vente en gros, des échantillons de vente directe, des échantillons de vente par correspondance, des échantillons de vente par catalogue, des échantillons de vente par Internet, des échantillons de vente par téléphone, des échantillons de vente par télécopieur, des échantillons de vente par courrier électronique, des échantillons de vente par messagerie instantanée, des échantillons de vente par SMS, des échantillons de vente par MMS, des échantillons de vente par réseaux sociaux, des échantillons de vente par blogs, des échantillons de vente par podcasts, des échantillons de vente par vidéos, des échantillons de vente par webinaires, des échantillons de vente par webcasts, des échantillons de vente par webconférences, des échantillons de vente par webséminaires, des échantillons de vente par webréunions, des échantillons de vente par webconventions, des échantillons de vente par webcongrès, des échantillons de vente par webforums, des échantillons de vente par webpanels, des échantillons de vente par webdiscussions, des échantillons de vente par webdébats, des échantillons de vente par webenquêtes, des échantillons de vente par webquestionnaires, des échantillons de vente par webformulaires, des échantillons de vente par webcommandes, des échantillons de vente par webpaiements, des échantillons de vente par webfacturation, des échantillons de vente par webcomptabilité, des échantillons de vente par webgestion, des échantillons de vente par webadministration, des échantillons de vente par webmaintenance, des échantillons de vente par webassistance, des échantillons de vente par webformation, des échantillons de vente par webdéveloppement, des échantillons de vente par webdesign, des échantillons de vente par webgraphisme, des échantillons de vente par webanimation, des échantillons de vente par webvidéo, des échantillons de vente par webaudio, des échantillons de vente par webmultimédia, des échantillons de vente par webinteractivité, des échantillons de vente par webcommunication, des échantillons de vente par webcollaboration, des échantillons de vente par webpartage, des échantillons de vente par webstockage, des échantillons de vente par webarchivage, des échantillons de vente par webrestauration, des échantillons de vente par webdestruction, des échantillons de vente par webrecyclage, des échantillons de vente par webélimination, des échantillons de vente par webtraitement, des échantillons de vente par webanalyse, des échantillons de vente par webrapport, des échantillons de vente par webstatistique, des échantillons de vente par webmesure, des échantillons de vente par webévaluation, des échantillons de vente par webcontrôle, des échantillons de vente par webinspection, des échantillons de vente par webaudit, des échantillons de vente par webcertification, des échantillons de vente par webaccréditation, des échantillons de vente par webhomologation, des échantillons de vente par webconformité, des échantillons de vente par webnormalisation, des échantillons de vente par webréglementation, des échantillons de vente par webloi, des échantillons de vente par webjurisprudence, des échantillons de vente par webdoctrine, des échantillons de vente par webcoutume, des échantillons de vente par webusage, des échantillons de vente par webpratique, des échantillons de vente par webprocédure, des échantillons de vente par webprotocole, des échantillons de vente par webstandard, des échantillons de vente par webspécification, des échantillons de vente par webexigence, des échantillons de vente par webcritère, des échantillons de vente par webobjectif, des échantillons de vente par webbut, des échantillons de vente par webmission, des échantillons de vente par webvision, des échantillons de vente par webvaleur, des échantillons de vente par webprincipe, des échantillons de vente par webéthique, des échantillons de vente par webmorale, des échantillons de vente par webdéontologie, des échantillons de vente par webdéontologie professionnelle, des échantillons de vente par webdéontologie médicale, des échantillons de vente par webdéontologie pharmaceutique, des échantillons de vente par webdéontologie vétérinaire, des échantillons de vente par webdéontologie scientifique, des échantillons de vente par webdéontologie technique, des échantillons de vente par webdéontologie industrielle, des échantillons de vente par webdéontologie commerciale, des échantillons de vente par webdéontologie financière, des échantillons de vente par webdéontologie juridique, des échantillons de vente par webdéontologie sociale, des échantillons de vente par webdéontologie environnementale, des échantillons de vente par webdéontologie de la sécurité, des échantillons de vente par webdéontologie de la santé, des échantillons de vente par webdéontologie de la qualité, des échantillons de vente par webdéontologie de la gestion, des échantillons de vente par webdéontologie de l'audit, des échantillons de vente par webdéontologie de la certification, des échantillons de vente par webdéontologie de l'accréditation, des échantillons de vente par webdéontologie de l'homologation, des échantillons de vente par webdéontologie de la conformité, des échantillons de vente par webdéontologie de la normalisation, des échantillons de vente par webdéontologie de la réglementation, des échantillons de vente par webdéontologie de la loi, des échantillons de vente par webdéontologie de la jurisprudence, des échantillons de vente par webdéontologie de la doctrine, des échantillons de vente par webdéontologie de la coutume, des échantillons de vente par webdéontologie de l'usage, des échantillons de vente par webdéontologie de la pratique, des échantillons de vente par webdéontologie de la procédure, des échantillons de vente par webdéontologie du protocole, des échantillons de vente par webdéontologie du standard, des échantillons de vente par webdéontologie de la spécification, des échantillons de vente par webdéontologie de l'exigence, des échantillons de vente par webdéontologie du critère, des échantillons de vente par webdéontologie de l'objectif, des échantillons de vente par webdéontologie du but, des échantillons de vente par webdéontologie de la mission, des échantillons de vente par webdéontologie de la vision, des échantillons de vente par webdéontologie de la valeur, des échantillons de vente par webdéontologie du principe, des échantillons de vente par webdéontologie de l'éthique, des échantillons de vente par webdéontologie de la morale, des échantillons de vente par webdéontologie de la déontologie.

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SHIP DATE: 22FEB19
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EIN/VAT:

TO Dane Wacasey (281) 530-5656
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

(US)

FedEx Express

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TRK# 7745 3445 0443

Form 0430

10:30A
INTL PRIORITY

REF:
DESC1:Bouteille d'eau
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: audrey etheves
T/C: R 967554812
D/T: R 967554812

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T: +1 281 530 5656
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February 28, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19021249**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 22 sample(s) on Feb 25, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DAYNA.FISHER
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19021249**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19021249**	

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 02/28/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19021249				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 138117, 138130, R333799				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?			X		
		Were analytical duplicates analyzed at the appropriate frequency?			X		
		Were RPDs or relative standard deviations within the laboratory QC limits?			X		
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 02/28/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19021249				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 138117, 138130, R333799				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			2
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		X			3
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports		
Laboratory Name: ALS Laboratory Group		LRC Date: 02/28/2019
Project Name: Exide Column Studies		Laboratory Job Number: HS19021249
Reviewer Name: Dane Wacasey		Prep Batch Number(s): 138117, 138130, R333799
ER#[5]	**Description**	
1	Batch 138117, Metals Method SW6020, sample HS19020899-01, MS and MSD were performed on unrelated sample. Batch 138130, Dissolved Metals Method SW6020, sample HS19020822-05, MS and MSD were performed on unrelated sample.	
2	See Run Log and CCB Exceptions Report. For RunID ICPMS05_333607, the samples bracketed by CCB 4 and CCB 5 have concentration of sodium >10x the level of the CCB concentration.	
3	Batch 138117, Metals Method SW6020, sample HS19020899-01, PDS was performed on unrelated sample.	

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021249
Start Date: 27-Feb-2019 End Date: 28-Feb-2019

Run ID:ICPMS05_333607
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	27-Feb-2019 12:05	020_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	27-Feb-2019 12:07	021SMPL.d	CA NA
LLICV5	1	27-Feb-2019 12:09	022LICV.d	CA NA
ICB	1	27-Feb-2019 12:12	023_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	27-Feb-2019 12:17	024ICSA.d	CA NA
ICSAB	1	27-Feb-2019 12:19	025ICSB.d	CA NA
CCV 1	1	27-Feb-2019 12:57	036_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	27-Feb-2019 12:59	037_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	27-Feb-2019 13:53	051_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	27-Feb-2019 13:55	052_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	27-Feb-2019 15:10	063_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	27-Feb-2019 15:12	064_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-138117	1	27-Feb-2019 15:18	065SMPL.d	AS CA CD FE K MG NA PB SB SE
LCS-138117	1	27-Feb-2019 15:20	066SMPL.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	27-Feb-2019 15:43	076_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	27-Feb-2019 15:55	078_CCV.d	AS CA CD FE K MG NA PB SB SE
20190214-FD-PV25out-controlT	10	27-Feb-2019 16:01	079SMPL.d	CA NA
20190214-FD-PV25out-30T	10	27-Feb-2019 16:04	080SMPL.d	CA NA
20190214-FD-PV25out-35T	10	27-Feb-2019 16:06	081SMPL.d	CA NA
20190214-FD-PV25out-40T	10	27-Feb-2019 16:08	082SMPL.d	CA NA
20190214-FD-PV25inlet-controlT	10	27-Feb-2019 16:11	083SMPL.d	CA NA
20190214-FD-PV25inlet-30-35-40T	10	27-Feb-2019 16:13	084SMPL.d	CA NA
20190215-FD-PV25mid-controlT	10	27-Feb-2019 16:15	085SMPL.d	CA NA
20190215-FD-PV25mid-30T	10	27-Feb-2019 16:17	086SMPL.d	CA NA
20190215-FD-PV25mid-35T	10	27-Feb-2019 16:20	087SMPL.d	CA NA
CCV 5	1	27-Feb-2019 16:22	088_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	27-Feb-2019 16:40	091_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	27-Feb-2019 17:17	100_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	27-Feb-2019 17:19	101_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	27-Feb-2019 17:26	103_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	27-Feb-2019 17:28	104_CCB.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	27-Feb-2019 18:33	127SMPL.d	CA NA
LLCCV5	1	27-Feb-2019 18:35	128LICV.d	CA NA
ICCB 8	1	27-Feb-2019 18:37	129_ICB.d	AS CA CD FE K MG NA PB SB SE
ICCV 8	1	27-Feb-2019 18:46	131_ICV.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	27-Feb-2019 19:11	140_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	27-Feb-2019 19:13	141_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 10	1	27-Feb-2019 19:42	152_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	27-Feb-2019 19:44	153_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 11	1	27-Feb-2019 20:09	164_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	27-Feb-2019 20:11	165_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLKF1-138130	1	27-Feb-2019 20:13	166SMPL.d	AS CA CD FE K MG NA PB SB SE
MBLK-138130	1	27-Feb-2019 20:15	167SMPL.d	AS CA CD FE K MG NA PB SB SE
LCS-138130	1	27-Feb-2019 20:18	168SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZSD	5	27-Feb-2019 20:22	170SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZMS	1	27-Feb-2019 20:24	171SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZMSD	1	27-Feb-2019 20:27	172SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZPDS	1	27-Feb-2019 20:29	173SMPL.d	AS CA CD FE K MG NA PB SB SE
20190214-FD-PV25out-controlD	10	27-Feb-2019 20:31	174SMPL.d	CA NA
CCV 12	1	27-Feb-2019 20:36	176_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 12	1	27-Feb-2019 20:38	177_CCB.d	AS CA CD FE K MG NA PB SB SE

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021249
Start Date: 27-Feb-2019 End Date: 28-Feb-2019

Run ID:ICPMS05_333607
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
CCV 13	1	27-Feb-2019 20:40	178_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 13	1	27-Feb-2019 20:42	179_CCB.d	AS CA CD FE K MG NA PB SB SE
20190214-FD-PV25out-30D	10	27-Feb-2019 20:45	180SMPL.d	CA NA
20190214-FD-PV25out-35D	10	27-Feb-2019 20:47	181SMPL.d	CA NA
20190214-FD-PV25out-40D	10	27-Feb-2019 20:49	182SMPL.d	CA NA
20190214-FD-PV25inlet-controlD	10	27-Feb-2019 20:52	183SMPL.d	CA NA
20190214-FD-PV25inlet-30-35-40D	10	27-Feb-2019 20:54	184SMPL.d	CA NA
20190215-FD-PV25mid-controlD	10	27-Feb-2019 20:56	185SMPL.d	CA NA
20190215-FD-PV25mid-30D	10	27-Feb-2019 20:58	186SMPL.d	CA NA
20190215-FD-PV25mid-35D	10	27-Feb-2019 21:01	187SMPL.d	CA NA
20190215-FD-PV25mid-40D	10	27-Feb-2019 21:03	188SMPL.d	CA NA
20190205-FD-PV20out-30D-DUP	10	27-Feb-2019 21:05	189SMPL.d	CA NA
CCV 14	1	27-Feb-2019 21:07	190_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 14	1	27-Feb-2019 21:10	191_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 15	1	27-Feb-2019 22:34	196_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 15	1	27-Feb-2019 22:37	197_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 16	1	27-Feb-2019 22:50	203_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 16	1	27-Feb-2019 22:52	204_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 17	1	27-Feb-2019 23:28	215_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 17	1	27-Feb-2019 23:30	216_CCB.d	AS CA CD FE K MG NA PB SB SE
20190215-FD-PV25mid-40T	10	27-Feb-2019 23:33	217SMPL.d	CA NA
20190205-FD-PV20out-30T-DUP	10	27-Feb-2019 23:35	218SMPL.d	CA NA
CCV 18	1	27-Feb-2019 23:54	226_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 18	1	27-Feb-2019 23:57	227_CCB.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZSD	50	28-Feb-2019 00:01	229SMPL.d	AS CA CD FE K MG PB SB SE
ZZZZZZMS	10	28-Feb-2019 00:04	230SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZMSD	10	28-Feb-2019 00:06	231SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZPDS	10	28-Feb-2019 00:08	232SMPL.d	AS CA CD FE K MG PB SB SE
CCV 19	1	28-Feb-2019 00:15	235_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 19	1	28-Feb-2019 00:17	236_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 20	1	28-Feb-2019 00:40	246_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 20	1	28-Feb-2019 00:42	247_CCB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	28-Feb-2019 00:44	248ICSA.d	CA NA
ICSAB	1	28-Feb-2019 00:47	249ICSB.d	CA NA
CCV 21	1	28-Feb-2019 01:07	258_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 21	1	28-Feb-2019 01:09	259_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 22	1	28-Feb-2019 01:32	269_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 22	1	28-Feb-2019 01:34	270_CCB.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	28-Feb-2019 01:36	271SMPL.d	CA NA
LLICV5	1	28-Feb-2019 01:39	272LICV.d	CA NA
ICSA	1	28-Feb-2019 01:41	273ICSA.d	CA NA
ICSAB	1	28-Feb-2019 01:43	274ICSB.d	CA NA

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021249

Run ID:ICPMS05_333607
Instrument:ICPMS05
Method:SW6020

CCB 1	Date: 27-Feb-2019 12:59	Seq: 4967915	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.368	0.4	2	
Calcium	-36.1	34	500	
Sodium	17.68	14	200	

CCB 2	Date: 27-Feb-2019 13:55	Seq: 4967924	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.379	0.4	2	
Potassium	18.72	18	200	
Sodium	17.78	14	200	

CCB 3	Date: 27-Feb-2019 15:12	Seq: 4968073	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.578	0.4	2	
Calcium	-40.71	34	500	
Sodium	19.88	14	200	

CCB 4	Date: 27-Feb-2019 15:43	Seq: 4968507	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.026	0.4	2	
Magnesium	24.63	10	200	
Potassium	52.54	18	200	
Sodium	1235	14	200	

CCB 5	Date: 27-Feb-2019 16:40	Seq: 4968522	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	-36.87	34	500	
Potassium	30.47	18	200	
Sodium	206.3	14	200	

CCB 6	Date: 27-Feb-2019 17:19	Seq: 4968532	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.924	0.4	2	
Potassium	28.94	18	200	
Sodium	202.1	14	200	

CCB 7	Date: 27-Feb-2019 17:28	Seq: 4968535	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	34.29	18	200	
Selenium	1.255	1.1	2	
Sodium	198.4	14	200	

ICCB 8	Date: 27-Feb-2019 18:37	Seq: 4968614	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	-35.32	34	500	

CCB 9	Date: 27-Feb-2019 19:13	Seq: 4968626	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.628	0.4	2	
Calcium	-34.47	34	500	
Sodium	-14.61	14	200	

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021249

Run ID:ICPMS05_333607
Instrument:ICPMS05
Method:SW6020

CCB 10	Date: 27-Feb-2019 19:44	Seq: 4968638		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.401	0.4	2	
CCB 11	Date: 27-Feb-2019 20:11	Seq: 4968650		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Calcium	-35.6	34	500	
CCB 12	Date: 27-Feb-2019 20:38	Seq: 4968662		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.463	0.4	2	
	Sodium	-24.47	14	200	
CCB 13	Date: 27-Feb-2019 20:42	Seq: 4968664		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.421	0.4	2	
	Sodium	-29.41	14	200	
CCB 14	Date: 27-Feb-2019 21:10	Seq: 4968676		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	-26.34	14	200	
CCB 15	Date: 27-Feb-2019 22:37	Seq: 4968681		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	-36.42	14	200	
CCB 16	Date: 27-Feb-2019 22:52	Seq: 4968688		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	-25.48	14	200	
CCB 17	Date: 27-Feb-2019 23:30	Seq: 4968700		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.617	0.4	2	
	Sodium	-56.3	14	200	
CCB 18	Date: 27-Feb-2019 23:57	Seq: 4968757		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	-25.44	14	200	
CCB 19	Date: 28-Feb-2019 00:17	Seq: 4968766		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Calcium	-38.36	34	500	
	Potassium	-18.93	18	200	
	Sodium	83.64	14	200	
CCB 20	Date: 28-Feb-2019 00:42	Seq: 4968786		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	83.45	14	200	
CCB 21	Date: 28-Feb-2019 01:09	Seq: 4968798		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	50.4	14	200	
CCB 22	Date: 28-Feb-2019 01:34	Seq: 4968809		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021249
Start Date: 28-Feb-2019 End Date: 28-Feb-2019

Run ID:ICPMS05_333724
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	28-Feb-2019 11:15	022_ICV.d	AS CA CD FE K MG NA P PB SB SE
LLICV2	1	28-Feb-2019 11:17	023SMPL.d	AS CD FE K MG P PB SB SE
LLICV5	1	28-Feb-2019 11:19	024LICV.d	AS CD FE K MG P PB SB SE
ICB	1	28-Feb-2019 11:21	025_ICB.d	AS CA CD FE K MG NA P PB SB SE
ICSA	1	28-Feb-2019 11:24	026ICSA.d	AS CD FE K MG P PB SB SE
ICSAB	1	28-Feb-2019 11:27	027ICSB.d	AS CD FE K MG P PB SB SE
ZZZZZZSD	2500	28-Feb-2019 11:41	030SMPL.d	NA
ZZZZZZPDS	500	28-Feb-2019 11:43	031SMPL.d	NA
CCV 1	1	28-Feb-2019 11:59	038_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 1	1	28-Feb-2019 12:01	039_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 2	1	28-Feb-2019 12:26	050_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 2	1	28-Feb-2019 12:28	051_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 3	1	28-Feb-2019 12:57	062_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 3	1	28-Feb-2019 12:59	063_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 4	1	28-Feb-2019 13:14	069_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 4	1	28-Feb-2019 13:17	070_CCB.d	AS CA CD FE K MG NA P PB SB SE
20190214-FD-PV25out-controlD	1	28-Feb-2019 13:28	075SMPL.d	AS CD FE K MG P PB SB SE
20190214-FD-PV25out-30D	1	28-Feb-2019 13:30	076SMPL.d	AS CD FE K MG P PB SB SE
20190214-FD-PV25out-35D	1	28-Feb-2019 13:33	077SMPL.d	AS CD FE K MG P PB SB SE
20190214-FD-PV25out-40D	1	28-Feb-2019 13:35	078SMPL.d	AS CD FE K MG P PB SB SE
20190214-FD-PV25inlet-controlD	1	28-Feb-2019 13:37	079SMPL.d	AS CD FE K MG P PB SB SE
CCV 5	1	28-Feb-2019 14:00	084_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 5	1	28-Feb-2019 14:02	085_CCB.d	AS CA CD FE K MG NA P PB SB SE
20190214-FD-PV25inlet-30-35-40D	1	28-Feb-2019 14:14	088SMPL.d	AS CD FE K MG P PB SB SE
20190215-FD-PV25mid-controlD	1	28-Feb-2019 14:16	089SMPL.d	AS CD FE K MG P PB SB SE
20190215-FD-PV25mid-30D	1	28-Feb-2019 14:18	090SMPL.d	AS CD FE K MG P PB SB SE
20190215-FD-PV25mid-35D	1	28-Feb-2019 14:24	092SMPL.d	AS CD FE K MG P PB SB SE
20190215-FD-PV25mid-40D	1	28-Feb-2019 14:26	093SMPL.d	AS CD FE K MG P PB SB SE
20190205-FD-PV20out-30D-DUP	1	28-Feb-2019 14:29	094SMPL.d	AS CD FE K MG P PB SB SE
20190214-FD-PV25out-controlT	1	28-Feb-2019 14:31	095SMPL.d	AS CD FE K MG PB SB SE
CCV 6	1	28-Feb-2019 14:33	096_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 6	1	28-Feb-2019 14:35	097_CCB.d	AS CA CD FE K MG NA P PB SB SE
20190214-FD-PV25out-30T	1	28-Feb-2019 14:57	101SMPL.d	AS CD FE K MG PB SB SE
20190214-FD-PV25out-35T	1	28-Feb-2019 15:00	102SMPL.d	AS CD FE K MG PB SB SE
20190214-FD-PV25out-40T	1	28-Feb-2019 15:02	103SMPL.d	AS CD FE K MG PB SB SE
20190214-FD-PV25inlet-controlT	1	28-Feb-2019 15:04	104SMPL.d	AS CD FE K MG PB SB SE
20190214-FD-PV25inlet-30-35-40T	1	28-Feb-2019 15:06	105SMPL.d	AS CD FE K MG PB SB SE
20190215-FD-PV25mid-controlT	1	28-Feb-2019 15:09	106SMPL.d	AS CD FE K MG PB SB SE
20190215-FD-PV25mid-30T	1	28-Feb-2019 15:11	107SMPL.d	AS CD FE K MG PB SB SE
CCV 7	1	28-Feb-2019 15:13	108_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 7	1	28-Feb-2019 15:15	109_CCB.d	AS CA CD FE K MG NA P PB SB SE
20190215-FD-PV25mid-35T	1	28-Feb-2019 15:19	110SMPL.d	AS CD FE K MG PB SB SE
20190215-FD-PV25mid-40T	1	28-Feb-2019 15:22	111SMPL.d	AS CD FE K MG PB SB SE
20190205-FD-PV20out-30T-DUP	1	28-Feb-2019 15:24	112SMPL.d	AS CD FE K MG PB SB SE
CCV 8	1	28-Feb-2019 15:40	119_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 8	1	28-Feb-2019 15:42	120_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 9	1	28-Feb-2019 16:18	129_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 9	1	28-Feb-2019 16:21	130_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 10	1	28-Feb-2019 16:35	136_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 10	1	28-Feb-2019 16:38	137_CCB.d	AS CA CD FE K MG NA P PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021249

Run ID:ICPMS05_333724
Instrument:ICPMS05
Method:SW6020

CCB 3	Date: 28-Feb-2019 12:59	Seq: 4969695	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	19.58	18	200	
Selenium	1.289	1.1	2	
Sodium	127.7	14	200	

CCB 4	Date: 28-Feb-2019 13:17	Seq: 4970166	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	33.28	14	200	

CCB 5	Date: 28-Feb-2019 14:02	Seq: 4970181	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	51.92	14	200	

CCB 6	Date: 28-Feb-2019 14:35	Seq: 4970256	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	28.24	18	200	
Sodium	149.5	14	200	

CCB 7	Date: 28-Feb-2019 15:15	Seq: 4970268	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	139.7	14	200	

CCB 8	Date: 28-Feb-2019 15:42	Seq: 4970279	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	18.93	18	200	
Sodium	144.5	14	200	

CCB 9	Date: 28-Feb-2019 16:21	Seq: 4970363	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	26.47	18	200	
Sodium	149.5	14	200	

CCB 10	Date: 28-Feb-2019 16:38	Seq: 4970370	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	21.68	18	200	
Sodium	163	14	200	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19021249

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19021249-01	20190214-FD-PV25out-controlD	Groundwater		14-Feb-2019 17:15	25-Feb-2019 08:08	☐
HS19021249-02	20190214-FD-PV25out-30D	Groundwater		14-Feb-2019 17:15	25-Feb-2019 08:08	☐
HS19021249-03	20190214-FD-PV25out-35D	Groundwater		14-Feb-2019 17:15	25-Feb-2019 08:08	☐
HS19021249-04	20190214-FD-PV25out-40D	Groundwater		14-Feb-2019 17:15	25-Feb-2019 08:08	☐
HS19021249-05	20190214-FD-PV25inlet-controlD	Groundwater		14-Feb-2019 17:30	25-Feb-2019 08:08	☐
HS19021249-06	20190214-FD-PV25inlet-30-35-40D	Groundwater		14-Feb-2019 17:30	25-Feb-2019 08:08	☐
HS19021249-07	20190215-FD-PV25mid-controlD	Groundwater		15-Feb-2019 19:25	25-Feb-2019 08:08	☐
HS19021249-08	20190215-FD-PV25mid-30D	Groundwater		15-Feb-2019 19:25	25-Feb-2019 08:08	☐
HS19021249-09	20190215-FD-PV25mid-35D	Groundwater		15-Feb-2019 19:25	25-Feb-2019 08:08	☐
HS19021249-10	20190215-FD-PV25mid-40D	Groundwater		15-Feb-2019 19:25	25-Feb-2019 08:08	☐
HS19021249-11	20190214-FD-PV25out-controlT	Groundwater		14-Feb-2019 17:15	25-Feb-2019 08:08	☐
HS19021249-12	20190214-FD-PV25out-30T	Groundwater		14-Feb-2019 17:15	25-Feb-2019 08:08	☐
HS19021249-13	20190214-FD-PV25out-35T	Groundwater		14-Feb-2019 17:15	25-Feb-2019 08:08	☐
HS19021249-14	20190214-FD-PV25out-40T	Groundwater		14-Feb-2019 17:15	25-Feb-2019 08:08	☐
HS19021249-15	20190214-FD-PV25inlet-controlT	Groundwater		14-Feb-2019 17:30	25-Feb-2019 08:08	☐
HS19021249-16	20190214-FD-PV25inlet-30-35-40T	Groundwater		14-Feb-2019 17:30	25-Feb-2019 08:08	☐
HS19021249-17	20190215-FD-PV25mid-controlT	Groundwater		15-Feb-2019 19:25	25-Feb-2019 08:08	☐
HS19021249-18	20190215-FD-PV25mid-30T	Groundwater		15-Feb-2019 19:25	25-Feb-2019 08:08	☐
HS19021249-19	20190215-FD-PV25mid-35T	Groundwater		15-Feb-2019 19:25	25-Feb-2019 08:08	☐
HS19021249-20	20190215-FD-PV25mid-40T	Groundwater		15-Feb-2019 19:25	25-Feb-2019 08:08	☐
HS19021249-21	20190205-FD-PV20out-30D-DUP	Groundwater		05-Feb-2019 12:15	25-Feb-2019 08:08	☐
HS19021249-22	20190205-FD-PV20out-30T-DUP	Groundwater		05-Feb-2019 12:15	25-Feb-2019 08:08	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190214-FD-PV25out-controlD
Collection Date: 14-Feb-2019 17:15

ANALYTICAL REPORT
WorkOrder:HS19021249
Lab ID:HS19021249-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	**0.0342**		**0.000400**	**0.00200**	**mg/L**	1	28-Feb-2019 13:28
Arsenic	**0.00117**	J	**0.000400**	**0.00200**	**mg/L**	1	28-Feb-2019 13:28
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 13:28
Calcium	**203**		**0.340**	**5.00**	**mg/L**	10	27-Feb-2019 20:31
Iron	U		0.0120	0.200	mg/L	1	28-Feb-2019 13:28
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 13:28
Magnesium	**1.17**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 13:28
Potassium	**12.5**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 13:28
Selenium	**0.00564**		**0.00110**	**0.00200**	**mg/L**	1	28-Feb-2019 13:28
Sodium	**271**		**0.140**	**2.00**	**mg/L**	10	27-Feb-2019 20:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190214-FD-PV25out-30D
Collection Date: 14-Feb-2019 17:15

ANALYTICAL REPORT
WorkOrder:HS19021249
Lab ID:HS19021249-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	28-Feb-2019 13:30
Arsenic	U		0.000400	0.00200	mg/L	1	28-Feb-2019 13:30
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 13:30
Calcium	**213**		**0.340**	**5.00**	**mg/L**	10	27-Feb-2019 20:45
Iron	**0.0159**	J	**0.0120**	**0.200**	**mg/L**	1	28-Feb-2019 13:30
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 13:30
Magnesium	**0.857**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 13:30
Potassium	**13.3**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 13:30
Selenium	U		0.00110	0.00200	mg/L	1	28-Feb-2019 13:30
Sodium	**286**		**0.140**	**2.00**	**mg/L**	10	27-Feb-2019 20:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190214-FD-PV25out-35D
Collection Date: 14-Feb-2019 17:15

ANALYTICAL REPORT
WorkOrder:HS19021249
Lab ID:HS19021249-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	28-Feb-2019 13:33
Arsenic	U		0.000400	0.00200	mg/L	1	28-Feb-2019 13:33
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 13:33
Calcium	**188**		**0.340**	**5.00**	**mg/L**	10	27-Feb-2019 20:47
Iron	U		0.0120	0.200	mg/L	1	28-Feb-2019 13:33
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 13:33
Magnesium	**1.01**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 13:33
Potassium	**13.3**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 13:33
Selenium	U		0.00110	0.00200	mg/L	1	28-Feb-2019 13:33
Sodium	**258**		**0.140**	**2.00**	**mg/L**	10	27-Feb-2019 20:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190214-FD-PV25out-40D
Collection Date: 14-Feb-2019 17:15

ANALYTICAL REPORT
WorkOrder:HS19021249
Lab ID:HS19021249-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	28-Feb-2019 13:35
Arsenic	U		0.000400	0.00200	mg/L	1	28-Feb-2019 13:35
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 13:35
Calcium	**201**		**0.340**	**5.00**	**mg/L**	10	27-Feb-2019 20:49
Iron	U		0.0120	0.200	mg/L	1	28-Feb-2019 13:35
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 13:35
Magnesium	**1.09**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 13:35
Potassium	**13.4**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 13:35
Selenium	U		0.00110	0.00200	mg/L	1	28-Feb-2019 13:35
Sodium	**272**		**0.140**	**2.00**	**mg/L**	10	27-Feb-2019 20:49

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190214-FD-PV25inlet-controlD
Collection Date: 14-Feb-2019 17:30

ANALYTICAL REPORT
WorkOrder:HS19021249
Lab ID:HS19021249-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	**0.0358**		**0.000400**	**0.00200**	**mg/L**	1	28-Feb-2019 13:37
Arsenic	**0.00122**	J	**0.000400**	**0.00200**	**mg/L**	1	28-Feb-2019 13:37
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 13:37
Calcium	**200**		**0.340**	**5.00**	**mg/L**	10	27-Feb-2019 20:52
Iron	U		0.0120	0.200	mg/L	1	28-Feb-2019 13:37
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 13:37
Magnesium	**1.20**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 13:37
Potassium	**13.0**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 13:37
Selenium	**0.00698**		**0.00110**	**0.00200**	**mg/L**	1	28-Feb-2019 13:37
Sodium	**261**		**0.140**	**2.00**	**mg/L**	10	27-Feb-2019 20:52

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190214-FD-PV25inlet-30-35-40D
Collection Date: 14-Feb-2019 17:30

ANALYTICAL REPORT
WorkOrder:HS19021249
Lab ID:HS19021249-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	**0.0359**		**0.000400**	**0.00200**	**mg/L**	1	28-Feb-2019 14:14
Arsenic	**0.00128**	J	**0.000400**	**0.00200**	**mg/L**	1	28-Feb-2019 14:14
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 14:14
Calcium	**195**		**0.340**	**5.00**	**mg/L**	10	27-Feb-2019 20:54
Iron	U		0.0120	0.200	mg/L	1	28-Feb-2019 14:14
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 14:14
Magnesium	**1.17**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 14:14
Potassium	**12.9**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 14:14
Selenium	**0.00662**		**0.00110**	**0.00200**	**mg/L**	1	28-Feb-2019 14:14
Sodium	**252**		**0.140**	**2.00**	**mg/L**	10	27-Feb-2019 20:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190215-FD-PV25mid-controlD
Collection Date: 15-Feb-2019 19:25

ANALYTICAL REPORT
WorkOrder:HS19021249
Lab ID:HS19021249-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	**0.0355**		**0.000400**	**0.00200**	**mg/L**	1	28-Feb-2019 14:16
Arsenic	**0.000990**	J	**0.000400**	**0.00200**	**mg/L**	1	28-Feb-2019 14:16
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 14:16
Calcium	**188**		**0.340**	**5.00**	**mg/L**	10	27-Feb-2019 20:56
Iron	U		0.0120	0.200	mg/L	1	28-Feb-2019 14:16
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 14:16
Magnesium	**1.24**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 14:16
Potassium	**13.3**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 14:16
Selenium	**0.00590**		**0.00110**	**0.00200**	**mg/L**	1	28-Feb-2019 14:16
Sodium	**251**		**0.140**	**2.00**	**mg/L**	10	27-Feb-2019 20:56

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190215-FD-PV25mid-30D
Collection Date: 15-Feb-2019 19:25

ANALYTICAL REPORT
WorkOrder:HS19021249
Lab ID:HS19021249-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	28-Feb-2019 14:18
Arsenic	U		0.000400	0.00200	mg/L	1	28-Feb-2019 14:18
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 14:18
Calcium	**179**		**0.340**	**5.00**	**mg/L**	10	27-Feb-2019 20:58
Iron	**0.0638**	J	**0.0120**	**0.200**	**mg/L**	1	28-Feb-2019 14:18
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 14:18
Magnesium	**0.861**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 14:18
Potassium	**12.8**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 14:18
Selenium	**0.00121**	J	**0.00110**	**0.00200**	**mg/L**	1	28-Feb-2019 14:18
Sodium	**244**		**0.140**	**2.00**	**mg/L**	10	27-Feb-2019 20:58

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190215-FD-PV25mid-35D
Collection Date: 15-Feb-2019 19:25

ANALYTICAL REPORT
WorkOrder:HS19021249
Lab ID:HS19021249-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	28-Feb-2019 14:24
Arsenic	U		0.000400	0.00200	mg/L	1	28-Feb-2019 14:24
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 14:24
Calcium	**193**		**0.340**	**5.00**	**mg/L**	10	27-Feb-2019 21:01
Iron	**0.209**		**0.0120**	**0.200**	**mg/L**	1	28-Feb-2019 14:24
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 14:24
Magnesium	**0.965**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 14:24
Potassium	**12.7**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 14:24
Selenium	U		0.00110	0.00200	mg/L	1	28-Feb-2019 14:24
Sodium	**260**		**0.140**	**2.00**	**mg/L**	10	27-Feb-2019 21:01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190215-FD-PV25mid-40D
Collection Date: 15-Feb-2019 19:25

ANALYTICAL REPORT
WorkOrder:HS19021249
Lab ID:HS19021249-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	28-Feb-2019 14:26
Arsenic	U		0.000400	0.00200	mg/L	1	28-Feb-2019 14:26
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 14:26
Calcium	**195**		**0.340**	**5.00**	**mg/L**	10	27-Feb-2019 21:03
Iron	**0.0252**	J	**0.0120**	**0.200**	**mg/L**	1	28-Feb-2019 14:26
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 14:26
Magnesium	**1.10**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 14:26
Potassium	**13.2**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 14:26
Selenium	U		0.00110	0.00200	mg/L	1	28-Feb-2019 14:26
Sodium	**261**		**0.140**	**2.00**	**mg/L**	10	27-Feb-2019 21:03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190214-FD-PV25out-controlT
Collection Date: 14-Feb-2019 17:15

ANALYTICAL REPORT
WorkOrder:HS19021249
Lab ID:HS19021249-11
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**504**		**2.00**	**2.00**	**mg/L**	1	28-Feb-2019 17:21
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	**0.0350**		**0.000400**	**0.00200**	**mg/L**	1	28-Feb-2019 14:31
Arsenic	**0.00113**	J	**0.000400**	**0.00200**	**mg/L**	1	28-Feb-2019 14:31
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 14:31
Calcium	**200**		**0.340**	**5.00**	**mg/L**	10	27-Feb-2019 16:01
Iron	U		0.0120	0.200	mg/L	1	28-Feb-2019 14:31
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 14:31
Magnesium	**1.20**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 14:31
Potassium	**12.5**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 14:31
Selenium	**0.00568**		**0.00110**	**0.00200**	**mg/L**	1	28-Feb-2019 14:31
Sodium	**275**		**0.140**	**2.00**	**mg/L**	10	27-Feb-2019 16:01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190214-FD-PV25out-30T
Collection Date: 14-Feb-2019 17:15

ANALYTICAL REPORT
WorkOrder:HS19021249
Lab ID:HS19021249-12
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**483**		**2.00**	**2.00**	**mg/L**	1	28-Feb-2019 17:21
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	28-Feb-2019 14:57
Arsenic	U		0.000400	0.00200	mg/L	1	28-Feb-2019 14:57
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 14:57
Calcium	**192**		**0.340**	**5.00**	**mg/L**	10	27-Feb-2019 16:04
Iron	**0.0362**	J	**0.0120**	**0.200**	**mg/L**	1	28-Feb-2019 14:57
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 14:57
Magnesium	**0.862**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 14:57
Potassium	**13.3**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 14:57
Selenium	U		0.00110	0.00200	mg/L	1	28-Feb-2019 14:57
Sodium	**271**		**0.140**	**2.00**	**mg/L**	10	27-Feb-2019 16:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190214-FD-PV25out-35T
Collection Date: 14-Feb-2019 17:15

ANALYTICAL REPORT
WorkOrder:HS19021249
Lab ID:HS19021249-13
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**469**		**2.00**	**2.00**	**mg/L**	1	28-Feb-2019 17:21
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	28-Feb-2019 15:00
Arsenic	U		0.000400	0.00200	mg/L	1	28-Feb-2019 15:00
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 15:00
Calcium	**186**		**0.340**	**5.00**	**mg/L**	10	27-Feb-2019 16:06
Iron	**0.209**		**0.0120**	**0.200**	**mg/L**	1	28-Feb-2019 15:00
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 15:00
Magnesium	**1.03**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 15:00
Potassium	**13.2**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 15:00
Selenium	U		0.00110	0.00200	mg/L	1	28-Feb-2019 15:00
Sodium	**267**		**0.140**	**2.00**	**mg/L**	10	27-Feb-2019 16:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190214-FD-PV25out-40T
Collection Date: 14-Feb-2019 17:15

ANALYTICAL REPORT
WorkOrder:HS19021249
Lab ID:HS19021249-14
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**479**		**2.00**	**2.00**	**mg/L**	1	28-Feb-2019 17:21
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	28-Feb-2019 15:02
Arsenic	U		0.000400	0.00200	mg/L	1	28-Feb-2019 15:02
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 15:02
Calcium	**190**		**0.340**	**5.00**	**mg/L**	10	27-Feb-2019 16:08
Iron	**0.0473**	J	**0.0120**	**0.200**	**mg/L**	1	28-Feb-2019 15:02
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 15:02
Magnesium	**1.07**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 15:02
Potassium	**13.8**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 15:02
Selenium	U		0.00110	0.00200	mg/L	1	28-Feb-2019 15:02
Sodium	**272**		**0.140**	**2.00**	**mg/L**	10	27-Feb-2019 16:08

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190214-FD-PV25inlet-controlT
Collection Date: 14-Feb-2019 17:30

ANALYTICAL REPORT
WorkOrder:HS19021249
Lab ID:HS19021249-15
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**532**		**2.00**	**2.00**	**mg/L**	1	28-Feb-2019 17:21
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	**0.0333**		**0.000400**	**0.00200**	**mg/L**	1	28-Feb-2019 15:04
Arsenic	**0.00130**	J	**0.000400**	**0.00200**	**mg/L**	1	28-Feb-2019 15:04
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 15:04
Calcium	**211**		**0.340**	**5.00**	**mg/L**	10	27-Feb-2019 16:11
Iron	U		0.0120	0.200	mg/L	1	28-Feb-2019 15:04
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 15:04
Magnesium	**1.14**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 15:04
Potassium	**12.3**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 15:04
Selenium	**0.00610**		**0.00110**	**0.00200**	**mg/L**	1	28-Feb-2019 15:04
Sodium	**288**		**0.140**	**2.00**	**mg/L**	10	27-Feb-2019 16:11

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190214-FD-PV25inlet-30-35-40T
Collection Date: 14-Feb-2019 17:30

ANALYTICAL REPORT
WorkOrder:HS19021249
Lab ID:HS19021249-16
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**512**		**2.00**	**2.00**	**mg/L**	1	28-Feb-2019 17:21
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	**0.0360**		**0.000400**	**0.00200**	**mg/L**	1	28-Feb-2019 15:06
Arsenic	**0.00130**	J	**0.000400**	**0.00200**	**mg/L**	1	28-Feb-2019 15:06
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 15:06
Calcium	**203**		**0.340**	**5.00**	**mg/L**	10	27-Feb-2019 16:13
Iron	U		0.0120	0.200	mg/L	1	28-Feb-2019 15:06
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 15:06
Magnesium	**1.19**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 15:06
Potassium	**12.8**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 15:06
Selenium	**0.00694**		**0.00110**	**0.00200**	**mg/L**	1	28-Feb-2019 15:06
Sodium	**272**		**0.140**	**2.00**	**mg/L**	10	27-Feb-2019 16:13

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190215-FD-PV25mid-controlT
Collection Date: 15-Feb-2019 19:25

ANALYTICAL REPORT
WorkOrder:HS19021249
Lab ID:HS19021249-17
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**460**		**2.00**	**2.00**	**mg/L**	1	28-Feb-2019 17:21
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	**0.0350**		**0.000400**	**0.00200**	**mg/L**	1	28-Feb-2019 15:09
Arsenic	**0.00125**	J	**0.000400**	**0.00200**	**mg/L**	1	28-Feb-2019 15:09
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 15:09
Calcium	**182**		**0.340**	**5.00**	**mg/L**	10	27-Feb-2019 16:15
Iron	U		0.0120	0.200	mg/L	1	28-Feb-2019 15:09
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 15:09
Magnesium	**1.24**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 15:09
Potassium	**13.4**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 15:09
Selenium	**0.00588**		**0.00110**	**0.00200**	**mg/L**	1	28-Feb-2019 15:09
Sodium	**256**		**0.140**	**2.00**	**mg/L**	10	27-Feb-2019 16:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190215-FD-PV25mid-30T
Collection Date: 15-Feb-2019 19:25

ANALYTICAL REPORT
WorkOrder:HS19021249
Lab ID:HS19021249-18
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**433**		**2.00**	**2.00**	**mg/L**	1	28-Feb-2019 17:21
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	28-Feb-2019 15:11
Arsenic	**0.000457**	J	**0.000400**	**0.00200**	**mg/L**	1	28-Feb-2019 15:11
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 15:11
Calcium	**172**		**0.340**	**5.00**	**mg/L**	10	27-Feb-2019 16:17
Iron	**0.402**		**0.0120**	**0.200**	**mg/L**	1	28-Feb-2019 15:11
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 15:11
Magnesium	**0.841**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 15:11
Potassium	**12.7**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 15:11
Selenium	U		0.00110	0.00200	mg/L	1	28-Feb-2019 15:11
Sodium	**251**		**0.140**	**2.00**	**mg/L**	10	27-Feb-2019 16:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190215-FD-PV25mid-35T
Collection Date: 15-Feb-2019 19:25

ANALYTICAL REPORT
WorkOrder:HS19021249
Lab ID:HS19021249-19
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**489**		**2.00**	**2.00**	**mg/L**	1	28-Feb-2019 17:21
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	28-Feb-2019 15:19
Arsenic	U		0.000400	0.00200	mg/L	1	28-Feb-2019 15:19
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 15:19
Calcium	**194**		**0.340**	**5.00**	**mg/L**	10	27-Feb-2019 16:20
Iron	**0.771**		**0.0120**	**0.200**	**mg/L**	1	28-Feb-2019 15:19
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 15:19
Magnesium	**0.999**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 15:19
Potassium	**12.5**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 15:19
Selenium	U		0.00110	0.00200	mg/L	1	28-Feb-2019 15:19
Sodium	**279**		**0.140**	**2.00**	**mg/L**	10	27-Feb-2019 16:20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190215-FD-PV25mid-40T
Collection Date: 15-Feb-2019 19:25

ANALYTICAL REPORT
WorkOrder:HS19021249
Lab ID:HS19021249-20
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**559**		**2.00**	**2.00**	**mg/L**	1	28-Feb-2019 17:21
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	28-Feb-2019 15:22
Arsenic	U		0.000400	0.00200	mg/L	1	28-Feb-2019 15:22
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 15:22
Calcium	**222**		**0.340**	**5.00**	**mg/L**	10	27-Feb-2019 23:33
Iron	**0.334**		**0.0120**	**0.200**	**mg/L**	1	28-Feb-2019 15:22
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 15:22
Magnesium	**1.10**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 15:22
Potassium	**12.7**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 15:22
Selenium	U		0.00110	0.00200	mg/L	1	28-Feb-2019 15:22
Sodium	**302**		**0.140**	**2.00**	**mg/L**	10	27-Feb-2019 23:33

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190205-FD-PV20out-30D-DUP
Collection Date: 05-Feb-2019 12:15

ANALYTICAL REPORT
WorkOrder:HS19021249
Lab ID:HS19021249-21
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	28-Feb-2019 14:29
Arsenic	U		0.000400	0.00200	mg/L	1	28-Feb-2019 14:29
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 14:29
Calcium	**202**		**0.340**	**5.00**	**mg/L**	10	27-Feb-2019 21:05
Iron	U		0.0120	0.200	mg/L	1	28-Feb-2019 14:29
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 14:29
Magnesium	**0.785**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 14:29
Potassium	**12.7**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 14:29
Selenium	U		0.00110	0.00200	mg/L	1	28-Feb-2019 14:29
Sodium	**279**		**0.140**	**2.00**	**mg/L**	10	27-Feb-2019 21:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190205-FD-PV20out-30T-DUP
Collection Date: 05-Feb-2019 12:15

ANALYTICAL REPORT
WorkOrder:HS19021249
Lab ID:HS19021249-22
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**523**		**2.00**	**2.00**	**mg/L**	1	28-Feb-2019 17:21
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	28-Feb-2019 15:24
Arsenic	U		0.000400	0.00200	mg/L	1	28-Feb-2019 15:24
Cadmium	U		0.000200	0.00200	mg/L	1	28-Feb-2019 15:24
Calcium	**208**		**0.340**	**5.00**	**mg/L**	10	27-Feb-2019 23:35
Iron	**0.0853**	J	**0.0120**	**0.200**	**mg/L**	1	28-Feb-2019 15:24
Lead	U		0.000600	0.00200	mg/L	1	28-Feb-2019 15:24
Magnesium	**0.815**		**0.0100**	**0.200**	**mg/L**	1	28-Feb-2019 15:24
Potassium	**13.4**		**0.0180**	**0.200**	**mg/L**	1	28-Feb-2019 15:24
Selenium	U		0.00110	0.00200	mg/L	1	28-Feb-2019 15:24
Sodium	**291**		**0.140**	**2.00**	**mg/L**	10	27-Feb-2019 23:35

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021249

Batch ID: 138117 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19021249-11	1	10	10 (mL)	1
HS19021249-12	1	10	10 (mL)	1
HS19021249-13	1	10	10 (mL)	1
HS19021249-14	1	10	10 (mL)	1
HS19021249-15	1	10	10 (mL)	1
HS19021249-16	1	10	10 (mL)	1
HS19021249-17	1	10	10 (mL)	1
HS19021249-18	1	10	10 (mL)	1
HS19021249-19	1	10	10 (mL)	1
HS19021249-20	1	10	10 (mL)	1
HS19021249-22	1	10	10 (mL)	1

Batch ID: 138130 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19021249-01	1	10	10 (mL)	1
HS19021249-02	1	10	10 (mL)	1
HS19021249-03	1	10	10 (mL)	1
HS19021249-04	1	10	10 (mL)	1
HS19021249-05	1	10	10 (mL)	1
HS19021249-06	1	10	10 (mL)	1
HS19021249-07	1	10	10 (mL)	1
HS19021249-08	1	10	10 (mL)	1
HS19021249-09	1	10	10 (mL)	1
HS19021249-10	1	10	10 (mL)	1
HS19021249-21	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021249

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 138117	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19021249-11	20190214-FD-PV25out-controlT	14 Feb 2019 17:15		26 Feb 2019 11:00	28 Feb 2019 14:31	1
HS19021249-11	20190214-FD-PV25out-controlT	14 Feb 2019 17:15		26 Feb 2019 11:00	27 Feb 2019 16:01	10
HS19021249-12	20190214-FD-PV25out-30T	14 Feb 2019 17:15		26 Feb 2019 11:00	28 Feb 2019 14:57	1
HS19021249-12	20190214-FD-PV25out-30T	14 Feb 2019 17:15		26 Feb 2019 11:00	27 Feb 2019 16:04	10
HS19021249-13	20190214-FD-PV25out-35T	14 Feb 2019 17:15		26 Feb 2019 11:00	28 Feb 2019 15:00	1
HS19021249-13	20190214-FD-PV25out-35T	14 Feb 2019 17:15		26 Feb 2019 11:00	27 Feb 2019 16:06	10
HS19021249-14	20190214-FD-PV25out-40T	14 Feb 2019 17:15		26 Feb 2019 11:00	28 Feb 2019 15:02	1
HS19021249-14	20190214-FD-PV25out-40T	14 Feb 2019 17:15		26 Feb 2019 11:00	27 Feb 2019 16:08	10
HS19021249-15	20190214-FD-PV25inlet-controlT	14 Feb 2019 17:30		26 Feb 2019 11:00	28 Feb 2019 15:04	1
HS19021249-15	20190214-FD-PV25inlet-controlT	14 Feb 2019 17:30		26 Feb 2019 11:00	27 Feb 2019 16:11	10
HS19021249-16	20190214-FD-PV25inlet-30-35-40T	14 Feb 2019 17:30		26 Feb 2019 11:00	28 Feb 2019 15:06	1
HS19021249-16	20190214-FD-PV25inlet-30-35-40T	14 Feb 2019 17:30		26 Feb 2019 11:00	27 Feb 2019 16:13	10
HS19021249-17	20190215-FD-PV25mid-controlT	15 Feb 2019 19:25		26 Feb 2019 11:00	28 Feb 2019 15:09	1
HS19021249-17	20190215-FD-PV25mid-controlT	15 Feb 2019 19:25		26 Feb 2019 11:00	27 Feb 2019 16:15	10
HS19021249-18	20190215-FD-PV25mid-30T	15 Feb 2019 19:25		26 Feb 2019 11:00	28 Feb 2019 15:11	1
HS19021249-18	20190215-FD-PV25mid-30T	15 Feb 2019 19:25		26 Feb 2019 11:00	27 Feb 2019 16:17	10
HS19021249-19	20190215-FD-PV25mid-35T	15 Feb 2019 19:25		26 Feb 2019 11:00	28 Feb 2019 15:19	1
HS19021249-19	20190215-FD-PV25mid-35T	15 Feb 2019 19:25		26 Feb 2019 11:00	27 Feb 2019 16:20	10
HS19021249-20	20190215-FD-PV25mid-40T	15 Feb 2019 19:25		26 Feb 2019 11:00	28 Feb 2019 15:22	1
HS19021249-20	20190215-FD-PV25mid-40T	15 Feb 2019 19:25		26 Feb 2019 11:00	27 Feb 2019 23:33	10
HS19021249-22	20190205-FD-PV20out-30T-DUP	05 Feb 2019 12:15		26 Feb 2019 11:00	28 Feb 2019 15:24	1
HS19021249-22	20190205-FD-PV20out-30T-DUP	05 Feb 2019 12:15		26 Feb 2019 11:00	27 Feb 2019 23:35	10

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021249

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 138130	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS19021249-01	20190214-FD-PV25out-controlD	14 Feb 2019 17:15		26 Feb 2019 11:00	28 Feb 2019 13:28	1
HS19021249-01	20190214-FD-PV25out-controlD	14 Feb 2019 17:15		26 Feb 2019 11:00	27 Feb 2019 20:31	10
HS19021249-02	20190214-FD-PV25out-30D	14 Feb 2019 17:15		26 Feb 2019 11:00	28 Feb 2019 13:30	1
HS19021249-02	20190214-FD-PV25out-30D	14 Feb 2019 17:15		26 Feb 2019 11:00	27 Feb 2019 20:45	10
HS19021249-03	20190214-FD-PV25out-35D	14 Feb 2019 17:15		26 Feb 2019 11:00	28 Feb 2019 13:33	1
HS19021249-03	20190214-FD-PV25out-35D	14 Feb 2019 17:15		26 Feb 2019 11:00	27 Feb 2019 20:47	10
HS19021249-04	20190214-FD-PV25out-40D	14 Feb 2019 17:15		26 Feb 2019 11:00	28 Feb 2019 13:35	1
HS19021249-04	20190214-FD-PV25out-40D	14 Feb 2019 17:15		26 Feb 2019 11:00	27 Feb 2019 20:49	10
HS19021249-05	20190214-FD-PV25inlet-controlD	14 Feb 2019 17:30		26 Feb 2019 11:00	28 Feb 2019 13:37	1
HS19021249-05	20190214-FD-PV25inlet-controlD	14 Feb 2019 17:30		26 Feb 2019 11:00	27 Feb 2019 20:52	10
HS19021249-06	20190214-FD-PV25inlet-30-35-40D	14 Feb 2019 17:30		26 Feb 2019 11:00	28 Feb 2019 14:14	1
HS19021249-06	20190214-FD-PV25inlet-30-35-40D	14 Feb 2019 17:30		26 Feb 2019 11:00	27 Feb 2019 20:54	10
HS19021249-07	20190215-FD-PV25mid-controlD	15 Feb 2019 19:25		26 Feb 2019 11:00	28 Feb 2019 14:16	1
HS19021249-07	20190215-FD-PV25mid-controlD	15 Feb 2019 19:25		26 Feb 2019 11:00	27 Feb 2019 20:56	10
HS19021249-08	20190215-FD-PV25mid-30D	15 Feb 2019 19:25		26 Feb 2019 11:00	28 Feb 2019 14:18	1
HS19021249-08	20190215-FD-PV25mid-30D	15 Feb 2019 19:25		26 Feb 2019 11:00	27 Feb 2019 20:58	10
HS19021249-09	20190215-FD-PV25mid-35D	15 Feb 2019 19:25		26 Feb 2019 11:00	28 Feb 2019 14:24	1
HS19021249-09	20190215-FD-PV25mid-35D	15 Feb 2019 19:25		26 Feb 2019 11:00	27 Feb 2019 21:01	10
HS19021249-10	20190215-FD-PV25mid-40D	15 Feb 2019 19:25		26 Feb 2019 11:00	28 Feb 2019 14:26	1
HS19021249-10	20190215-FD-PV25mid-40D	15 Feb 2019 19:25		26 Feb 2019 11:00	27 Feb 2019 21:03	10
HS19021249-21	20190205-FD-PV20out-30D-DUP	05 Feb 2019 12:15		26 Feb 2019 11:00	28 Feb 2019 14:29	1
HS19021249-21	20190205-FD-PV20out-30D-DUP	05 Feb 2019 12:15		26 Feb 2019 11:00	27 Feb 2019 21:05	10
Batch ID R333799	**Test Name :** HARDNESS, TOTAL AS CACO3 BY SM2340B			**Matrix:** Groundwater		
HS19021249-11	20190214-FD-PV25out-controlT	14 Feb 2019 17:15			28 Feb 2019 17:21	1
HS19021249-12	20190214-FD-PV25out-30T	14 Feb 2019 17:15			28 Feb 2019 17:21	1
HS19021249-13	20190214-FD-PV25out-35T	14 Feb 2019 17:15			28 Feb 2019 17:21	1
HS19021249-14	20190214-FD-PV25out-40T	14 Feb 2019 17:15			28 Feb 2019 17:21	1
HS19021249-15	20190214-FD-PV25inlet-controlT	14 Feb 2019 17:30			28 Feb 2019 17:21	1
HS19021249-16	20190214-FD-PV25inlet-30-35-40T	14 Feb 2019 17:30			28 Feb 2019 17:21	1
HS19021249-17	20190215-FD-PV25mid-controlT	15 Feb 2019 19:25			28 Feb 2019 17:21	1
HS19021249-18	20190215-FD-PV25mid-30T	15 Feb 2019 19:25			28 Feb 2019 17:21	1
HS19021249-19	20190215-FD-PV25mid-35T	15 Feb 2019 19:25			28 Feb 2019 17:21	1
HS19021249-20	20190215-FD-PV25mid-40T	15 Feb 2019 19:25			28 Feb 2019 17:21	1
HS19021249-22	20190205-FD-PV20out-30T-DUP	05 Feb 2019 12:15			28 Feb 2019 17:21	1

WorkOrder: HS19021249
InstrumentID: ICPMS05
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000555	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000460	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000554	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0537	0.0340	0.500
A	Iron	7439-89-6	0.0500	0.0549	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.00100	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0680	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0542	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00280	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0459	0.0140	0.200

WorkOrder: HS19021249
InstrumentID: ICPMS05
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000555	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000460	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000554	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0537	0.0340	0.500
A	Iron	7439-89-6	0.0500	0.0549	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.00100	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0680	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0542	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00280	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0459	0.0140	0.200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021249

QC BATCH REPORT

Batch ID: 138117 **Instrument: ICPMS05** **Method: SW6020**

MBLK Sample ID: **MBLK-138117** Units: **mg/L** Analysis Date: **27-Feb-2019 15:18**
Client ID: Run ID: **ICPMS05_333607** SeqNo: **4968496** PrepDate: **26-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01061	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	0.02008	0.200								J

LCS Sample ID: **LCS-138117** Units: **mg/L** Analysis Date: **27-Feb-2019 15:20**
Client ID: Run ID: **ICPMS05_333607** SeqNo: **4968497** PrepDate: **26-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05314	0.00200	0.05	0	106	80 - 120				
Arsenic	0.04978	0.00200	0.05	0	99.6	80 - 120				
Cadmium	0.05316	0.00200	0.05	0	106	80 - 120				
Calcium	5.278	0.500	5	0	106	80 - 120				
Iron	5.365	0.200	5	0	107	80 - 120				
Lead	0.0507	0.00200	0.05	0	101	80 - 120				
Magnesium	5.486	0.200	5	0	110	80 - 120				
Potassium	5.403	0.200	5	0	108	80 - 120				
Selenium	0.04839	0.00200	0.05	0	96.8	80 - 120				
Sodium	5.451	0.200	5	0	109	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021249

QC BATCH REPORT

Batch ID: 138117 **Instrument: ICPMS05** **Method: SW6020**

MS Sample ID: **HS19020899-01MS** Units: **mg/L** Analysis Date: **28-Feb-2019 00:04**
Client ID: Run ID: **ICPMS05_333607** SeqNo: **4968760** PrepDate: **26-Feb-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05391	0.0200	0.05	0.000144	108	80 - 120				
Arsenic	0.06128	0.0200	0.05	0.001897	119	80 - 120				
Cadmium	0.05516	0.0200	0.05	0.000123	110	80 - 120				
Calcium	309	5.00	5	276.7	645	80 - 120				SO
Iron	5.785	2.00	5	0.1163	113	80 - 120				
Lead	0.05625	0.0200	0.05	-0.000013	113	80 - 120				
Magnesium	893.3	2.00	5	790.2	2060	80 - 120				SO
Potassium	276.2	2.00	5	245.9	604	80 - 120				SO
Selenium	0.05655	0.0200	0.05	0.001913	109	80 - 120				
Sodium	7524	2.00	5	6701	16500	80 - 120				SEO

MSD Sample ID: **HS19020899-01MSD** Units: **mg/L** Analysis Date: **28-Feb-2019 00:06**
Client ID: Run ID: **ICPMS05_333607** SeqNo: **4968761** PrepDate: **26-Feb-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04948	0.0200	0.05	0.000144	98.7	80 - 120	0.05391	8.57	20	
Arsenic	0.05193	0.0200	0.05	0.001897	100	80 - 120	0.06128	16.5	20	
Cadmium	0.04995	0.0200	0.05	0.000123	99.7	80 - 120	0.05516	9.92	20	
Calcium	273.9	5.00	5	276.7	-57.6	80 - 120	309	12	20	SO
Iron	5.155	2.00	5	0.1163	101	80 - 120	5.785	11.5	20	
Lead	0.05001	0.0200	0.05	-0.000013	100	80 - 120	0.05625	11.7	20	
Magnesium	790.2	2.00	5	790.2	-1.29	80 - 120	893.3	12.3	20	SO
Potassium	241.9	2.00	5	245.9	-81.3	80 - 120	276.2	13.2	20	SO
Selenium	0.05409	0.0200	0.05	0.001913	104	80 - 120	0.05655	4.43	20	
Sodium	6554	2.00	5	6701	-2940	80 - 120	7524	13.8	20	SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021249

QC BATCH REPORT

Batch ID: 138117 **Instrument: ICPMS05** **Method: SW6020**

PDS Sample ID: **HS19020899-01PDS** Units: **mg/L** Analysis Date: **28-Feb-2019 00:08**
Client ID: Run ID: **ICPMS05_333607** SeqNo: **4968762** PrepDate: **26-Feb-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.9971	0.0200	1	0	99.7	75 - 125				
Arsenic	1.09	0.0200	1	0	109	75 - 125				
Cadmium	1.045	0.0200	1	0	104	75 - 125				
Calcium	388.7	5.00	100	276.7	112	75 - 125				
Iron	105.8	2.00	100	0	106	75 - 125				
Lead	1.04	0.0200	1	0	104	75 - 125				
Magnesium	913.2	2.00	100	790.2	123	75 - 125				O
Potassium	353.3	2.00	10	245.9	1070	75 - 125				SO
Selenium	1.083	0.0200	1	0	108	75 - 125				

PDS Sample ID: **HS19020899-01PDS** Units: **mg/L** Analysis Date: **28-Feb-2019 11:43**
Client ID: Run ID: **ICPMS05_333724** SeqNo: **4969546** PrepDate: **26-Feb-2019** DF: **500**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	11110	100	5000	6415	93.9	75 - 125				

SD Sample ID: **HS19020899-01SD** Units: **mg/L** Analysis Date: **28-Feb-2019 00:01**
Client ID: Run ID: **ICPMS05_333607** SeqNo: **4968759** PrepDate: **26-Feb-2019** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.100					0.000144	0	10	
Arsenic	U	0.100					0.001897	0	10	
Cadmium	U	0.100					0.000123	0	10	
Calcium	277.5	25.0					276.7	0.259	10	
Iron	U	10.0					0.1163	0	10	
Lead	U	0.100					-0.000013	0	10	
Magnesium	831.7	10.0					790.2	5.25	10	
Potassium	249.9	10.0					245.9	1.61	10	
Selenium	U	0.100					0.001913	0	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021249

QC BATCH REPORT

Batch ID: 138117 **Instrument: ICPMS05** **Method: SW6020**

SD Sample ID: **HS19020899-01SD** Units: **mg/L** Analysis Date: **28-Feb-2019 11:41**
Client ID: Run ID: **ICPMS05_333724** SeqNo: **4969545** PrepDate: **26-Feb-2019** DF: **2500**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Sodium	6768	500					6415	5.51	10	

The following samples were analyzed in this batch:

HS19021249-11	HS19021249-12	HS19021249-13	HS19021249-14
HS19021249-15	HS19021249-16	HS19021249-17	HS19021249-18
HS19021249-19	HS19021249-20	HS19021249-22	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021249

QC BATCH REPORT

Batch ID: 138130 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLKF1-138130** Units: **mg/L** Analysis Date: **27-Feb-2019 20:13**
Client ID: Run ID: **ICPMS05_333607** SeqNo: **4968651** PrepDate: **26-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	U	0.200								
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	U	0.200								

MBLK Sample ID: **MBLK-138130** Units: **mg/L** Analysis Date: **27-Feb-2019 20:15**
Client ID: Run ID: **ICPMS05_333607** SeqNo: **4968652** PrepDate: **26-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	U	0.200								
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	U	0.200								

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021249

QC BATCH REPORT

Batch ID: 138130 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

LCS Sample ID: **LCS-138130** Units: **mg/L** Analysis Date: **27-Feb-2019 20:18**
Client ID: Run ID: **ICPMS05_333607** SeqNo: **4968653** PrepDate: **26-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05223	0.00200	0.05	0	104	80 - 120				
Arsenic	0.05234	0.00200	0.05	0	105	80 - 120				
Cadmium	0.05176	0.00200	0.05	0	104	80 - 120				
Calcium	5.42	0.500	5	0	108	80 - 120				
Iron	5.416	0.200	5	0	108	80 - 120				
Lead	0.0523	0.00200	0.05	0	105	80 - 120				
Magnesium	5.48	0.200	5	0	110	80 - 120				
Potassium	5.517	0.200	5	0	110	80 - 120				
Selenium	0.05159	0.00200	0.05	0	103	80 - 120				
Sodium	5.495	0.200	5	0	110	80 - 120				

MS Sample ID: **HS19020822-05MS** Units: **mg/L** Analysis Date: **27-Feb-2019 20:24**
Client ID: Run ID: **ICPMS05_333607** SeqNo: **4968656** PrepDate: **26-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05084	0.00200	0.05	0.000069	102	75 - 125				
Arsenic	0.06099	0.00200	0.05	0.00969	103	75 - 125				
Cadmium	0.05074	0.00200	0.05	0.000028	101	75 - 125				
Calcium	100	0.500	5	98.35	33.0	75 - 125				SO
Iron	5.129	0.200	5	0.01057	102	75 - 125				
Lead	0.05077	0.00200	0.05	0.000016	102	75 - 125				
Magnesium	35.52	0.200	5	31.4	82.3	75 - 125				O
Potassium	15.17	0.200	5	10.3	97.3	75 - 125				
Selenium	0.05066	0.00200	0.05	0.000165	101	75 - 125				
Sodium	71.24	0.200	5	68.01	64.6	75 - 125				SO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021249

QC BATCH REPORT

Batch ID: 138130 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MSD Sample ID: **HS19020822-05MSD** Units: **mg/L** Analysis Date: **27-Feb-2019 20:27**
Client ID: Run ID: **ICPMS05_333607** SeqNo: **4968657** PrepDate: **26-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05408	0.00200	0.05	0.000069	108	75 - 125	0.05084	6.18	20	
Arsenic	0.06372	0.00200	0.05	0.00969	108	75 - 125	0.06099	4.38	20	
Cadmium	0.05224	0.00200	0.05	0.000028	104	75 - 125	0.05074	2.92	20	
Calcium	104.1	0.500	5	98.35	116	75 - 125	100	4.05	20	O
Iron	5.495	0.200	5	0.01057	110	75 - 125	5.129	6.89	20	
Lead	0.05262	0.00200	0.05	0.000016	105	75 - 125	0.05077	3.58	20	
Magnesium	37.87	0.200	5	31.4	129	75 - 125	35.52	6.39	20	SO
Potassium	15.74	0.200	5	10.3	109	75 - 125	15.17	3.7	20	
Selenium	0.05468	0.00200	0.05	0.000165	109	75 - 125	0.05066	7.63	20	
Sodium	75.28	0.200	5	68.01	145	75 - 125	71.24	5.51	20	SO

PDS Sample ID: **HS19020822-05PDS** Units: **mg/L** Analysis Date: **27-Feb-2019 20:29**
Client ID: Run ID: **ICPMS05_333607** SeqNo: **4968658** PrepDate: **26-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09781	0.00200	0.1	0.000069	97.7	75 - 125				
Arsenic	0.1128	0.00200	0.1	0.00969	103	75 - 125				
Cadmium	0.1027	0.00200	0.1	0.000028	103	75 - 125				
Calcium	107.3	0.500	10	98.35	89.2	75 - 125				O
Iron	10.41	0.200	10	0.01057	104	75 - 125				
Lead	0.1016	0.00200	0.1	0.000016	102	75 - 125				
Magnesium	41.07	0.200	10	31.4	96.7	75 - 125				
Potassium	20.51	0.200	10	10.3	102	75 - 125				
Selenium	0.102	0.00200	0.1	0.000165	102	75 - 125				
Sodium	77.22	0.200	10	68.01	92.1	75 - 125				O

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021249

QC BATCH REPORT

Batch ID: 138130 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

SD Sample ID: **HS19020822-05SD** Units: **mg/L** Analysis Date: **27-Feb-2019 20:22**
Client ID: Run ID: **ICPMS05_333607** SeqNo: **4968655** PrepDate: **26-Feb-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000069	0	10	
Arsenic	0.009249	0.0100					0.00969	0	10	J
Cadmium	U	0.0100					0.000028	0	10	
Calcium	91.73	2.50					98.35	6.73	10	
Iron	U	1.00					0.01057	0	10	
Lead	U	0.0100					0.000016	0	10	
Magnesium	31.58	1.00					31.4	0.57	10	
Potassium	9.798	1.00					10.3	4.91	10	
Selenium	U	0.0100					0.000165	0	10	
Sodium	68.66	1.00					68.01	0.955	10	

The following samples were analyzed in this batch:

HS19021249-01	HS19021249-02	HS19021249-03	HS19021249-04
HS19021249-05	HS19021249-06	HS19021249-07	HS19021249-08
HS19021249-09	HS19021249-10	HS19021249-21	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19021249**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
California	2919, 2018-2019	30-Apr-2019
Maryland	343, 2018-2019	30-Jun-2019

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19021249

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19021249-01	20190214-FD-PV25out-controlD	Login	2/25/2019 10:37:31 AM	NDR	MET088
HS19021249-02	20190214-FD-PV25out-30D	Login	2/25/2019 10:37:31 AM	NDR	MET088
HS19021249-03	20190214-FD-PV25out-35D	Login	2/25/2019 10:37:31 AM	NDR	MET088
HS19021249-04	20190214-FD-PV25out-40D	Login	2/25/2019 10:37:31 AM	NDR	MET088
HS19021249-05	20190214-FD-PV25inlet-controlD	Login	2/25/2019 10:37:31 AM	NDR	MET088
HS19021249-06	20190214-FD-PV25inlet-30-35-40D	Login	2/25/2019 10:37:31 AM	NDR	MET088
HS19021249-07	20190215-FD-PV25mid-controlD	Login	2/25/2019 10:37:31 AM	NDR	MET088
HS19021249-08	20190215-FD-PV25mid-30D	Login	2/25/2019 10:37:31 AM	NDR	MET088
HS19021249-09	20190215-FD-PV25mid-35D	Login	2/25/2019 10:37:31 AM	NDR	MET088
HS19021249-10	20190215-FD-PV25mid-40D	Login	2/25/2019 10:37:31 AM	NDR	MET088
HS19021249-11	20190214-FD-PV25out-controlT	Login	2/25/2019 10:37:31 AM	NDR	MET088
HS19021249-12	20190214-FD-PV25out-30T	Login	2/25/2019 10:37:31 AM	NDR	MET088
HS19021249-13	20190214-FD-PV25out-35T	Login	2/25/2019 10:37:31 AM	NDR	MET088
HS19021249-14	20190214-FD-PV25out-40T	Login	2/25/2019 10:37:31 AM	NDR	MET088
HS19021249-15	20190214-FD-PV25inlet-controlT	Login	2/25/2019 10:37:31 AM	NDR	MET088
HS19021249-16	20190214-FD-PV25inlet-30-35-40T	Login	2/25/2019 10:37:31 AM	NDR	MET088
HS19021249-17	20190215-FD-PV25mid-controlT	Login	2/25/2019 10:37:31 AM	NDR	MET088
HS19021249-18	20190215-FD-PV25mid-30T	Login	2/25/2019 10:37:31 AM	NDR	MET088
HS19021249-19	20190215-FD-PV25mid-35T	Login	2/25/2019 10:37:31 AM	NDR	MET088
HS19021249-20	20190215-FD-PV25mid-40T	Login	2/25/2019 10:37:31 AM	NDR	MET088
HS19021249-21	20190205-FD-PV20out-30D-DUP	Login	2/25/2019 10:37:31 AM	NDR	MET088
HS19021249-22	20190205-FD-PV20out-30T-DUP	Login	2/25/2019 10:37:31 AM	NDR	MET088

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19021249

Date/Time Received: **25-Feb-2019 08:08**
Received by: **NDR**

Checklist completed by: *Nilesh D. Ranchod* eSignature — 25-Feb-2019 Date

Reviewed by: *Dane J. Wacasey* eSignature — 26-Feb-2019 Date

Matrices: **Water**

Carrier name: **FedEx International Priority**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	2 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Samplers name present on COC?	Yes ☐	No ☑	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	16.5C/16.5C UC/C	IR # 11
Cooler(s)/Kit(s):	44338	
Date/Time sample(s) sent to storage:	02/25/2019 10:50PM	

Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

ALS Environmental

Chain of Custody Form

Page 1 of 2

HS19021249

Golder Associates

Exide Column Studies

ALS Project Manager:

Customer Information		Project Information			Analysis Request
PO Number	130-2086-01	Project Name	Exide column studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrette Parkway Drive, Suit	E	ICP TW (6020A total metals (6)+cations)
				F	ICP DISS (6020A diss metals (6)+cations-FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin Mo 63021	G	
Phone	314 984-8800	Phone	314 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190214-FD-PV25out-controlD	02-14-19	5:15 PM	GW	2	1						x					
2	20190214-FD-PV25out-30D	02-14-19	5:15 PM	GW	2	1						x					
3	20190214-FD-PV25out-35D	02-14-19	5:15 PM	GW	2	1						x					
4	20190214-FD-PV25out-40D	02-14-19	5:15 PM	GW	2	1						x					
5	20190214-FD-PV25inlet-controlD	02-14-19	5:30 PM	GW	2	1						x					
6	20190214-FD-PV25inlet-30-35-40D	02-14-19	5:30 PM	GW	2	1						x					
7	20190215-FD-PV25mid-controlD	02-15-19	7:25 PM	GW	2	1						x					
8	20190215-FD-PV25mid-30D	02-15-19	7:25 PM	GW	2	1						x					
9	20190215-FD-PV25mid-35D	02-15-19	7:25 PM	GW	2	1						x					
10	20190215-FD-PV25mid-40D	02-15-19	7:25 PM	GW	2	1						x					

Sampler(s): Please Print & Sign: Giovanna Llamosas

Shipment Method:

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by: Giovanna Llamosas	Date: 2019/02/22	Time: 15:30	Received by:	Notes:	
Relinquished by:	Date: 2/23/19	Time: 08:05	Received by (Laboratory):	Cooler Temp. 4.6	QC Package: (Check Box Below)
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	16.5	☐ Level II: Standard QC ☒ TRRP-Checklist ☐ Level III: Std QC + Raw Data ☐ TRRP Level IV ☐ Level IV: SW846 CLP-Like ☐ Other: _____

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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Chain of Custody Form

Page 2 of 2

HS19021249

Golder Associates
Exide Column Studies

Customer Information		Project Information		ALS Project Manager:	
PO Number	130-2086-01	Project Name	Exide column studies		
Work Order		Project Number	130-2086		
Company Name	Golder Associates	Bill To Company	Golder Associates		
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P		
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrette Parkway Drive, Suit		
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin Mo 63021		
Phone	314 984-8800	Phone	314 984-8800		
Fax		Fax			
e-Mail Address	ewhite@golder.com	e-Mail Address			

Analysis/Method Request for Analysis

A	300 W (300Cl, SO4, NO3-48h HT)
B	TDS W 2540C (2540C TDS)
C	ALK W 2320B (2320B alkalinity)
D	HARD (2340B hardness (calc))
E	ICP TW (6020A total metals (6)+cations)
F	ICP DISS (6020A diss metals (6)+cations-FldFltr)
G	
H	
I	
J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190214-FD-PV25out-controlT	02-14-19	5:15 PM	GW	2	1				x	x						
2	20190214-FD-PV25out-30T	02-14-19	5:15 PM	GW	2	1				x	x						
3	20190214-FD-PV25out-35T	02-14-19	5:15 PM	GW	2	1				x	x						
4	20190214-FD-PV25out-40T	02-14-19	5:15 PM	GW	2	1				x	x						
5	20190214-FD-PV25inlet-controlT	02-14-19	5:30 PM	GW	2	1				x	x						
6	20190214-FD-PV25inlet-30-35-40T	02-14-19	5:30 PM	GW	2	1				x	x						
7	20190215-FD-PV25mid-controlT	02-15-19	7:25 PM	GW	2	1				x	x						
8	20190215-FD-PV25mid-30T	02-15-19	7:25 PM	GW	2	1				x	x						
9	20190215-FD-PV25mid-35T	02-15-19	7:25 PM	GW	2	1				x	x						
10	20190215-FD-PV25mid-40T	02-15-19	7:25 PM	GW	2	1				x	x						

Sampler(s): Please Print & Sign: Giovanna Llamosas

Shipment Method:

Required Turnaround Time: ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by: Giovanna Llamosas	Date: 2019/02/22	Time: 15:30	Received by:	Notes:	
Relinquished by:	Date: 2/25/19	Time: 0320	Received by (Laboratory): NA	Cooler Temp. 4.6	QC Package: (Check Box Below)
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	16.5	☐ Level II: Standard QC ☒ TRRP-Checklist ☐ Level III: Std QC + Raw Data ☐ TRRP Level IV ☐ Level IV: SW846 CLP-Like ☐ Other: _____

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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Chain of Custody Form

Page 1 of 3

HS19021249

Golder Associates
Exide Column Studies

Customer Information		Project Information		ALS Project Manager:
PO Number	130-2086-01	Project Name	Exide column studies	
Work Order		Project Number	130-2086	
Company Name	Golder Associates	Bill To Company	Golder Associates	
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrette Parkway Drive, Suit	
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin Mo 63021	
Phone	314 984-8800	Phone	314 984-8800	
Fax		Fax		
e-Mail Address	ewhite@golder.com	e-Mail Address		

A	300 W (300Cl, SO4, NO3-48h HT)
B	TDS W 2540C (2540C TDS)
C	ALK W 2320B (2320B alkalinity)
D	HARD (2340B hardness (calc))
E	ICP TW (6020A total metals (6)+cations)
F	ICP DISS (6020A diss metals (6)+cations-FldFltr)
G	
H	
I	
J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190205-DGW-MW11-PV20out-35D-DUP	02-05-19	12:30 PM	GW	2	1						X					
2	20190205-DGW-MW11-PV20out-35T-DUP	02-05-19	12:30 PM	GW	2	1				X	X						
3	20190205-FD-PV20out-30D-DUP	02-05-19	12:15 PM	GW	2	1						X					
4	20190205-FD-PV20out-30T-DUP	02-05-19	12:15 PM	GW	2	1				X	X						
5	20190208-DGW-MW3-PV30inlet-controlD-DUP	02-08-19	12:35 PM	GW	2	1						X					
6	20190208-DGW-MW3-PV30inlet-controlT-DUP	02-08-19	12:35 PM	GW	2	1				X	X						
7																	
8																	
9																	
10																	

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method:

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by: Giovanna Llamosas	Date: 2019/02/18	Time: 15:30	Received by:	Notes:
Relinquished by:	Date: 2/25/19	Time: 0803	Received by (Laboratory): JN	Cooler Temp. 1.4
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory): KAJ	

QC Package: (Check Box Below)

	Level II: Standard QC	x	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other: _____		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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ORIGIN ID:YUXA (514) 383-0990
AUDREY ETHEVES
GOLDER ASSOCIATES LTD
7250 RUE DU MILE END
3E ETAGE
MONTREAL, PQ H2R3A4
CANADA CA

SHIP DATE: 22FEB19
ACTWGT: 19.25 LB
CAD: 108680724/INET4102

BILL RECIPIENT

TO **DANE WACASEY**
ALS HOUSTON LABORATORY
10450 STANCLIFF RD
STE 210
HOUSTON TX 77099 **(US)**
(281) 530-5656 REF:
INV:
PO: DEPT:

565J2/0E3D/23AD

FedEx Express

E

TRK# 0430 **7745 3445 0443**

10:30A
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ORIGIN ID:YUXA (514) 383-0990
audrey etheves
Golder Associates Ltd
7250 rue du Mile End
3e etage
MONTREAL, PQ H2R3A4
CANADA, CA

SHIP DATE: 22FEB19
ACTWGT: 19.25 LB
CAD: 106680724/INET4102

BILL RECIPIENT
EIN/VAT:

TO Dane Wacasey
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

(281) 530-5656

FedEx Express

(US)

J910180107200V

AWB

XH SGRA

PKG:YOUR PKG

TRK# 7745 3445 0443

Form
0430

10:30A
INTL PRIORITY

REF:
DESC1:Bouteille d'eau
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: audrey etheves
T/C: R 967554812
D/T: R 967554812

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10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

February 28, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19021252**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 22 sample(s) on Feb 25, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DAYNA.FISHER
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19021252**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19021252**	

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data								
Laboratory Name: ALS Laboratory Group			LRC Date: 02/28/2019					
Project Name: Exide Column Studies			Laboratory Job Number: HS19021252					
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 138117, 138128, 138131, R333799					
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]	
R1	OI	**Chain-of-custody (C-O-C)**						
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X					
		Were all departures from standard conditions described in an exception report?	X					
R2	OI	**Sample and quality control (QC) identification**						
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X					
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X					
R3	OI	**Test reports**						
		Were all samples prepared and analyzed within holding times?	X					
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X					
		Were calculations checked by a peer or supervisor?	X					
		Were all analyte identifications checked by a peer or supervisor?	X					
		Were sample detection limits reported for all analytes not detected?	X					
		Were all results for soil and sediment samples reported on a dry weight basis?			X			
		Were % moisture (or solids) reported for all soil and sediment samples?			X			
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X			
		If required for the project, TICs reported?			X			
R4	O	**Surrogate recovery data**						
		Were surrogates added prior to extraction?			X			
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X			
R5	OI	**Test reports/summary forms for blank samples**						
		Were appropriate type(s) of blanks analyzed?	X					
		Were blanks analyzed at the appropriate frequency?	X					
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X					
		Were blank concentrations < MQL?	X					
R6	OI	**Laboratory control samples (LCS):**						
		Were all COCs included in the LCS?	X					
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X					
		Were LCSs analyzed at the required frequency?	X					
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X					
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X					
		Was the LCSD RPD within QC limits?	X					
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**						
		Were the project/method specified analytes included in the MS and MSD?	X					
		Were MS/MSD analyzed at the appropriate frequency?	X					
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1	
		Were MS/MSD RPDs within laboratory QC limits?	X					
R8	OI	**Analytical duplicate data**						
		Were appropriate analytical duplicates analyzed for each matrix?			X			
		Were analytical duplicates analyzed at the appropriate frequency?			X			
		Were RPDs or relative standard deviations within the laboratory QC limits?			X			
R9	OI	**Method quantitation limits (MQLs):**						
		Are the MQLs for each method analyte included in the laboratory data package?	X					
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X					
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X					
R10	OI	**Other problems/anomalies**						
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X					
		Were all necessary corrective actions performed for the reported data?	X					
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				2	
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X					

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 02/28/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19021252				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 138117, 138128, 138131, R333799				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			3
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		X			4
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports		
Laboratory Name: ALS Laboratory Group		LRC Date: 02/28/2019
Project Name: Exide Column Studies		Laboratory Job Number: HS19021252
Reviewer Name: Dane Wacasey		Prep Batch Number(s): 138117, 138128, 138131, R333799
ER#[5]	**Description**	
1	Batch 138117, Metals Method SW6020, sample HS19020899-01, MS and MSD were performed on unrelated sample. Batch 138128, Metals Method SW6020, sample HS19020902-03, MS and MSD were performed on unrelated sample. Batch 138131, Dissolved Metals Method SW6020, sample HS19020899-01, MS and MSD were performed on unrelated sample.	
2	Batch 138128, Metals Method SW6020, samples diluted due to high sodium concentration Batch 138131, Dissolved Metals Method SW6020, samples diluted due to high sodium concentration	
3	See Run Log and CCB Exceptions Report.	
4	Batch 138117, Metals Method SW6020, sample HS19020899-01, PDS was performed on unrelated sample. Batch 138131, Dissolved Metals Method SW6020, sample HS19020899-01, PDS was performed on unrelated sample.	

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021252
Start Date: 28-Feb-2019 End Date: 28-Feb-2019

Run ID:ICPMS04_333735
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	28-Feb-2019 12:18	018_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	28-Feb-2019 12:20	019SMPL.d	AS CD FE K NA PB SB SE
LLICV5	1	28-Feb-2019 12:23	020LICV.d	AS CD FE K NA PB SB SE
ICB	1	28-Feb-2019 12:25	021_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	28-Feb-2019 12:37	024ICSA.d	AS CD FE K NA PB SB SE
ICSAB	1	28-Feb-2019 12:48	027ICSB.d	AS CD FE K NA PB SB SE
ZZZZZZSD	2500	28-Feb-2019 13:06	034SMPL.d	NA
ZZZZZZPDS	500	28-Feb-2019 13:08	035SMPL.d	NA
CCB 1	1	28-Feb-2019 13:15	038_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 1	1	28-Feb-2019 13:40	040_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	28-Feb-2019 14:05	051_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	28-Feb-2019 14:14	053_CCV.d	AS CA CD FE K MG NA PB SB SE
20190219-DGW-MW11-PV25inlet-30-35-40T	5	28-Feb-2019 14:23	057SMPL.d	AS CD FE K PB SB SE
20190219-DGW-MW11-PV25mid-controlT	5	28-Feb-2019 14:26	058SMPL.d	AS CD FE K PB SB SE
20190219-DGW-MW11-PV25mid-30T	5	28-Feb-2019 14:28	059SMPL.d	AS CD FE K PB SB SE
20190219-DGW-MW11-PV25mid-35T	5	28-Feb-2019 14:30	060SMPL.d	AS CD FE K PB SB SE
20190219-DGW-MW11-PV25mid-40T	5	28-Feb-2019 14:33	061SMPL.d	AS CD FE K PB SB SE
20190205-DGW-MW11-PV20out-35T-DUP	5	28-Feb-2019 14:35	062SMPL.d	AS CD FE K PB SB SE
CCB 3	1	28-Feb-2019 14:39	064_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	28-Feb-2019 14:55	066_CCV.d	AS CA CD FE K MG NA PB SB SE
ICCV 4	1	28-Feb-2019 15:45	084_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	28-Feb-2019 15:47	085SMPL.d	AS CD FE K NA PB SB SE
LLCCV5	1	28-Feb-2019 15:49	086LICV.d	AS CD FE K NA PB SB SE
ICCB 4	1	28-Feb-2019 15:51	087_ICB.d	AS CA CD FE K MG NA PB SB SE
20190219-DGW-MW11-PV25inlet-30-35-40T	100	28-Feb-2019 15:56	089SMPL.d	NA
20190219-DGW-MW11-PV25mid-controlT	100	28-Feb-2019 15:58	090SMPL.d	NA
20190219-DGW-MW11-PV25mid-30T	100	28-Feb-2019 16:01	091SMPL.d	NA
20190219-DGW-MW11-PV25mid-35T	100	28-Feb-2019 16:03	092SMPL.d	NA
20190219-DGW-MW11-PV25mid-40T	100	28-Feb-2019 16:05	093SMPL.d	NA
20190205-DGW-MW11-PV20out-35T-DUP	100	28-Feb-2019 16:08	094SMPL.d	NA
CCV 5	1	28-Feb-2019 16:20	097_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	28-Feb-2019 16:22	098_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	28-Feb-2019 16:54	109_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	28-Feb-2019 16:56	110_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	28-Feb-2019 17:25	121_CCV.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021252

Run ID:ICPMS04_333735
Instrument:ICPMS04
Method:SW6020

CCB 1	Date: 28-Feb-2019 13:15	Seq: 4969850	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.532	0.4	2	
Sodium	15.82	14	200	

CCB 2	Date: 28-Feb-2019 14:05	Seq: 4970105	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	68.33	12	200	
Sodium	64.57	14	200	

CCB 3	Date: 28-Feb-2019 14:39	Seq: 4970121	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	64.2	12	200	
Potassium	-21.4	18	200	
Sodium	181.8	14	200	

ICCB 4	Date: 28-Feb-2019 15:51	Seq: 4970253	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	-46.19	12	200	
Sodium	-15.06	14	200	

CCB 5	Date: 28-Feb-2019 16:22	Seq: 4970298	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	-77.44	12	200	

CCB 6	Date: 28-Feb-2019 16:56	Seq: 4970452	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.697	0.4	2	
Iron	-67.43	12	200	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021252
Start Date: 28-Feb-2019 End Date: 28-Feb-2019

Run ID:ICPMS05_333724
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
CCV 6	1	28-Feb-2019 14:33	096_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	28-Feb-2019 14:35	097_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	28-Feb-2019 15:13	108_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	28-Feb-2019 15:15	109_CCB.d	AS CA CD FE K MG NA PB SB SE
20190218-DGW-MW11-PV25out-controlT	5	28-Feb-2019 15:26	113SMPL.d	AS CD FE K PB SB SE
20190218-DGW-MW11-PV25out-30T	5	28-Feb-2019 15:28	114SMPL.d	AS CD FE K PB SB SE
20190218-DGW-MW11-PV25out-35T	5	28-Feb-2019 15:31	115SMPL.d	AS CD FE K PB SB SE
20190218-DGW-MW11-PV25out-40T	5	28-Feb-2019 15:33	116SMPL.d	AS CD FE K PB SB SE
20190219-DGW-MW11-PV25inlet-controlT	5	28-Feb-2019 15:35	117SMPL.d	AS CD FE K PB SB SE
CCV 8	1	28-Feb-2019 15:40	119_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	28-Feb-2019 15:42	120_CCB.d	AS CA CD FE K MG NA PB SB SE
20190214-DGW-MW11-PV25out-controlD	5	28-Feb-2019 15:45	121SMPL.d	AS CD FE K PB SB SE
20190214-DGW-MW11-PV25out-30D	5	28-Feb-2019 15:47	122SMPL.d	AS CD FE K PB SB SE
20190218-DGW-MW11-PV25out-35D	5	28-Feb-2019 15:49	123SMPL.d	AS CD FE K PB SB SE
20190218-DGW-MW11-PV25out-40D	5	28-Feb-2019 15:51	124SMPL.d	AS CD FE K PB SB SE
20190219-DGW-MW11-PV25inlet-controlD	5	28-Feb-2019 16:09	125SMPL.d	AS CD FE K PB SB SE
20190219-DGW-MW11-PV25inlet-30-35-40D	5	28-Feb-2019 16:12	126SMPL.d	AS CD FE K PB SB SE
20190219-DGW-MW11-PV25mid-controlD	5	28-Feb-2019 16:14	127SMPL.d	AS CD FE K PB SB SE
CCV 9	1	28-Feb-2019 16:18	129_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	28-Feb-2019 16:21	130_CCB.d	AS CA CD FE K MG NA PB SB SE
20190219-DGW-MW11-PV25mid-30D	5	28-Feb-2019 16:24	131SMPL.d	AS CD FE K PB SB SE
20190219-DGW-MW11-PV25mid-35D	5	28-Feb-2019 16:26	132SMPL.d	AS CD FE K PB SB SE
20190219-DGW-MW11-PV25mid-40D	5	28-Feb-2019 16:29	133SMPL.d	AS CD FE K PB SB SE
20190205-DGW-MW11-PV20out-35D-DUP	5	28-Feb-2019 16:31	134SMPL.d	AS CD FE K PB SB SE
CCV 10	1	28-Feb-2019 16:35	136_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	28-Feb-2019 16:38	137_CCB.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021252

Run ID:ICPMS05_333724
Instrument:ICPMS05
Method:SW6020

CCB 1	Date: 28-Feb-2019 12:01	Seq: 4969554	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	-44.08	34	500	

CCB 2	Date: 28-Feb-2019 12:28	Seq: 4969581	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	-36.89	34	500	

CCB 3	Date: 28-Feb-2019 12:59	Seq: 4969695	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	19.58	18	200	
Selenium	1.289	1.1	2	
Sodium	127.7	14	200	

CCB 4	Date: 28-Feb-2019 13:17	Seq: 4970166	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	33.28	14	200	

CCB 5	Date: 28-Feb-2019 14:02	Seq: 4970181	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	51.92	14	200	

CCB 6	Date: 28-Feb-2019 14:35	Seq: 4970256	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	28.24	18	200	
Sodium	149.5	14	200	

CCB 7	Date: 28-Feb-2019 15:15	Seq: 4970268	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	139.7	14	200	

CCB 8	Date: 28-Feb-2019 15:42	Seq: 4970279	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	18.93	18	200	
Sodium	144.5	14	200	

CCB 9	Date: 28-Feb-2019 16:21	Seq: 4970363	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	26.47	18	200	
Sodium	149.5	14	200	

CCB 10	Date: 28-Feb-2019 16:38	Seq: 4970370	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	21.68	18	200	
Sodium	163	14	200	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19021252

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19021252-01	20190214-DGW-MW11-PV25out-controlD	Groundwater		18-Feb-2019 16:30	25-Feb-2019 08:08	☐
HS19021252-02	20190214-DGW-MW11-PV25out-30D	Groundwater		18-Feb-2019 16:30	25-Feb-2019 08:08	☐
HS19021252-03	20190218-DGW-MW11-PV25out-35D	Groundwater		18-Feb-2019 16:30	25-Feb-2019 08:08	☐
HS19021252-04	20190218-DGW-MW11-PV25out-40D	Groundwater		18-Feb-2019 16:30	25-Feb-2019 08:08	☐
HS19021252-05	20190219-DGW-MW11-PV25inlet-controlD	Groundwater		19-Feb-2019 16:00	25-Feb-2019 08:08	☐
HS19021252-06	20190219-DGW-MW11-PV25inlet-30-35-40D	Groundwater		19-Feb-2019 16:00	25-Feb-2019 08:08	☐
HS19021252-07	20190219-DGW-MW11-PV25mid-controlD	Groundwater		19-Feb-2019 15:45	25-Feb-2019 08:08	☐
HS19021252-08	20190219-DGW-MW11-PV25mid-30D	Groundwater		19-Feb-2019 15:45	25-Feb-2019 08:08	☐
HS19021252-09	20190219-DGW-MW11-PV25mid-35D	Groundwater		19-Feb-2019 15:45	25-Feb-2019 08:08	☐
HS19021252-10	20190219-DGW-MW11-PV25mid-40D	Groundwater		19-Feb-2019 15:45	25-Feb-2019 08:08	☐
HS19021252-11	20190218-DGW-MW11-PV25out-controlT	Groundwater		18-Feb-2019 16:30	25-Feb-2019 08:08	☐
HS19021252-12	20190218-DGW-MW11-PV25out-30T	Groundwater		18-Feb-2019 16:30	25-Feb-2019 08:08	☐
HS19021252-13	20190218-DGW-MW11-PV25out-35T	Groundwater		18-Feb-2019 16:30	25-Feb-2019 08:08	☐
HS19021252-14	20190218-DGW-MW11-PV25out-40T	Groundwater		18-Feb-2019 16:30	25-Feb-2019 08:08	☐
HS19021252-15	20190219-DGW-MW11-PV25inlet-controlT	Groundwater		19-Feb-2019 16:00	25-Feb-2019 08:08	☐
HS19021252-16	20190219-DGW-MW11-PV25inlet-30-35-40T	Groundwater		19-Feb-2019 16:00	25-Feb-2019 08:08	☐
HS19021252-17	20190219-DGW-MW11-PV25mid-controlT	Groundwater		19-Feb-2019 15:45	25-Feb-2019 08:08	☐
HS19021252-18	20190219-DGW-MW11-PV25mid-30T	Groundwater		19-Feb-2019 15:45	25-Feb-2019 08:08	☐
HS19021252-19	20190219-DGW-MW11-PV25mid-35T	Groundwater		19-Feb-2019 15:45	25-Feb-2019 08:08	☐
HS19021252-20	20190219-DGW-MW11-PV25mid-40T	Groundwater		19-Feb-2019 15:45	25-Feb-2019 08:08	☐
HS19021252-21	20190205-DGW-MW11-PV20out-35D-DUP	Groundwater		05-Feb-2019 12:30	25-Feb-2019 08:08	☐
HS19021252-22	20190205-DGW-MW11-PV20out-35T-DUP	Groundwater		05-Feb-2019 12:30	25-Feb-2019 08:08	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190214-DGW-MW11-PV25out-controlD
Collection Date: 18-Feb-2019 16:30

ANALYTICAL REPORT
WorkOrder:HS19021252
Lab ID:HS19021252-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	28-Feb-2019 15:45
Arsenic	U		0.00200	0.0100	mg/L	5	28-Feb-2019 15:45
Cadmium	**0.00474**	J	**0.00100**	**0.0100**	**mg/L**	5	28-Feb-2019 15:45
Calcium	**534**		**0.340**	**5.00**	**mg/L**	10	28-Feb-2019 00:58
Iron	U		0.0600	1.00	mg/L	5	28-Feb-2019 15:45
Lead	U		0.00300	0.0100	mg/L	5	28-Feb-2019 15:45
Magnesium	**305**		**0.100**	**2.00**	**mg/L**	10	28-Feb-2019 00:58
Potassium	**19.0**		**0.0900**	**1.00**	**mg/L**	5	28-Feb-2019 15:45
Selenium	U		0.00550	0.0100	mg/L	5	28-Feb-2019 15:45
Sodium	**1,830**		**1.40**	**20.0**	**mg/L**	100	28-Feb-2019 12:10

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190214-DGW-MW11-PV25out-30D
Collection Date: 18-Feb-2019 16:30

ANALYTICAL REPORT
WorkOrder:HS19021252
Lab ID:HS19021252-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	28-Feb-2019 15:47
Arsenic	U		0.00200	0.0100	mg/L	5	28-Feb-2019 15:47
Cadmium	U		0.00100	0.0100	mg/L	5	28-Feb-2019 15:47
Calcium	**254**		**0.340**	**5.00**	**mg/L**	10	28-Feb-2019 01:00
Iron	U		0.0600	1.00	mg/L	5	28-Feb-2019 15:47
Lead	U		0.00300	0.0100	mg/L	5	28-Feb-2019 15:47
Magnesium	**273**		**0.100**	**2.00**	**mg/L**	10	28-Feb-2019 01:00
Potassium	**18.1**		**0.0900**	**1.00**	**mg/L**	5	28-Feb-2019 15:47
Selenium	U		0.00550	0.0100	mg/L	5	28-Feb-2019 15:47
Sodium	**1,840**		**1.40**	**20.0**	**mg/L**	100	28-Feb-2019 12:13

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190218-DGW-MW11-PV25out-35D
Collection Date: 18-Feb-2019 16:30

ANALYTICAL REPORT
WorkOrder:HS19021252
Lab ID:HS19021252-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	28-Feb-2019 15:49
Arsenic	U		0.00200	0.0100	mg/L	5	28-Feb-2019 15:49
Cadmium	U		0.00100	0.0100	mg/L	5	28-Feb-2019 15:49
Calcium	**223**		**0.340**	**5.00**	**mg/L**	10	28-Feb-2019 01:03
Iron	U		0.0600	1.00	mg/L	5	28-Feb-2019 15:49
Lead	U		0.00300	0.0100	mg/L	5	28-Feb-2019 15:49
Magnesium	**235**		**0.100**	**2.00**	**mg/L**	10	28-Feb-2019 01:03
Potassium	**19.8**		**0.0900**	**1.00**	**mg/L**	5	28-Feb-2019 15:49
Selenium	U		0.00550	0.0100	mg/L	5	28-Feb-2019 15:49
Sodium	**1,930**		**1.40**	**20.0**	**mg/L**	100	28-Feb-2019 12:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190218-DGW-MW11-PV25out-40D
Collection Date: 18-Feb-2019 16:30

ANALYTICAL REPORT
WorkOrder:HS19021252
Lab ID:HS19021252-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	28-Feb-2019 15:51
Arsenic	U		0.00200	0.0100	mg/L	5	28-Feb-2019 15:51
Cadmium	U		0.00100	0.0100	mg/L	5	28-Feb-2019 15:51
Calcium	**231**		**0.340**	**5.00**	**mg/L**	10	28-Feb-2019 01:05
Iron	U		0.0600	1.00	mg/L	5	28-Feb-2019 15:51
Lead	U		0.00300	0.0100	mg/L	5	28-Feb-2019 15:51
Magnesium	**262**		**0.100**	**2.00**	**mg/L**	10	28-Feb-2019 01:05
Potassium	**18.7**		**0.0900**	**1.00**	**mg/L**	5	28-Feb-2019 15:51
Selenium	U		0.00550	0.0100	mg/L	5	28-Feb-2019 15:51
Sodium	**1,810**		**1.40**	**20.0**	**mg/L**	100	28-Feb-2019 12:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190219-DGW-MW11-PV25inlet-controlD
Collection Date: 19-Feb-2019 16:00

ANALYTICAL REPORT
WorkOrder:HS19021252
Lab ID:HS19021252-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	28-Feb-2019 16:09
Arsenic	U		0.00200	0.0100	mg/L	5	28-Feb-2019 16:09
Cadmium	**0.00616**	J	**0.00100**	**0.0100**	**mg/L**	5	28-Feb-2019 16:09
Calcium	**475**		**0.340**	**5.00**	**mg/L**	10	28-Feb-2019 01:12
Iron	U		0.0600	1.00	mg/L	5	28-Feb-2019 16:09
Lead	U		0.00300	0.0100	mg/L	5	28-Feb-2019 16:09
Magnesium	**276**		**0.100**	**2.00**	**mg/L**	10	28-Feb-2019 01:12
Potassium	**18.4**		**0.0900**	**1.00**	**mg/L**	5	28-Feb-2019 16:09
Selenium	U		0.00550	0.0100	mg/L	5	28-Feb-2019 16:09
Sodium	**1,640**		**1.40**	**20.0**	**mg/L**	100	28-Feb-2019 12:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190219-DGW-MW11-PV25inlet-30-35-40D
Collection Date: 19-Feb-2019 16:00

ANALYTICAL REPORT
WorkOrder:HS19021252
Lab ID:HS19021252-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	28-Feb-2019 16:12
Arsenic	U		0.00200	0.0100	mg/L	5	28-Feb-2019 16:12
Cadmium	**0.00272**	J	**0.00100**	**0.0100**	**mg/L**	5	28-Feb-2019 16:12
Calcium	**509**		**0.340**	**5.00**	**mg/L**	10	28-Feb-2019 01:14
Iron	U		0.0600	1.00	mg/L	5	28-Feb-2019 16:12
Lead	U		0.00300	0.0100	mg/L	5	28-Feb-2019 16:12
Magnesium	**283**		**0.100**	**2.00**	**mg/L**	10	28-Feb-2019 01:14
Potassium	**18.1**		**0.0900**	**1.00**	**mg/L**	5	28-Feb-2019 16:12
Selenium	U		0.00550	0.0100	mg/L	5	28-Feb-2019 16:12
Sodium	**1,860**		**1.40**	**20.0**	**mg/L**	100	28-Feb-2019 12:22

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190219-DGW-MW11-PV25mid-controlD
Collection Date: 19-Feb-2019 15:45

ANALYTICAL REPORT
WorkOrder:HS19021252
Lab ID:HS19021252-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	28-Feb-2019 16:14
Arsenic	U		0.00200	0.0100	mg/L	5	28-Feb-2019 16:14
Cadmium	**0.00554**	J	**0.00100**	**0.0100**	**mg/L**	5	28-Feb-2019 16:14
Calcium	**502**		**0.340**	**5.00**	**mg/L**	10	28-Feb-2019 01:16
Iron	U		0.0600	1.00	mg/L	5	28-Feb-2019 16:14
Lead	U		0.00300	0.0100	mg/L	5	28-Feb-2019 16:14
Magnesium	**291**		**0.100**	**2.00**	**mg/L**	10	28-Feb-2019 01:16
Potassium	**19.1**		**0.0900**	**1.00**	**mg/L**	5	28-Feb-2019 16:14
Selenium	U		0.00550	0.0100	mg/L	5	28-Feb-2019 16:14
Sodium	**1,760**		**1.40**	**20.0**	**mg/L**	100	28-Feb-2019 12:24

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190219-DGW-MW11-PV25mid-30D
Collection Date: 19-Feb-2019 15:45

ANALYTICAL REPORT
WorkOrder:HS19021252
Lab ID:HS19021252-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	28-Feb-2019 16:24
Arsenic	U		0.00200	0.0100	mg/L	5	28-Feb-2019 16:24
Cadmium	U		0.00100	0.0100	mg/L	5	28-Feb-2019 16:24
Calcium	**340**		**0.340**	**5.00**	**mg/L**	10	28-Feb-2019 01:18
Iron	U		0.0600	1.00	mg/L	5	28-Feb-2019 16:24
Lead	U		0.00300	0.0100	mg/L	5	28-Feb-2019 16:24
Magnesium	**291**		**0.100**	**2.00**	**mg/L**	10	28-Feb-2019 01:18
Potassium	**18.7**		**0.0900**	**1.00**	**mg/L**	5	28-Feb-2019 16:24
Selenium	U		0.00550	0.0100	mg/L	5	28-Feb-2019 16:24
Sodium	**1,950**		**1.40**	**20.0**	**mg/L**	100	28-Feb-2019 13:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190219-DGW-MW11-PV25mid-35D
Collection Date: 19-Feb-2019 15:45

ANALYTICAL REPORT
WorkOrder:HS19021252
Lab ID:HS19021252-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	28-Feb-2019 16:26
Arsenic	U		0.00200	0.0100	mg/L	5	28-Feb-2019 16:26
Cadmium	U		0.00100	0.0100	mg/L	5	28-Feb-2019 16:26
Calcium	**325**		**0.340**	**5.00**	**mg/L**	10	28-Feb-2019 01:21
Iron	**0.142**	J	**0.0600**	**1.00**	**mg/L**	5	28-Feb-2019 16:26
Lead	U		0.00300	0.0100	mg/L	5	28-Feb-2019 16:26
Magnesium	**295**		**0.100**	**2.00**	**mg/L**	10	28-Feb-2019 01:21
Potassium	**19.4**		**0.0900**	**1.00**	**mg/L**	5	28-Feb-2019 16:26
Selenium	U		0.00550	0.0100	mg/L	5	28-Feb-2019 16:26
Sodium	**1,910**		**1.40**	**20.0**	**mg/L**	100	28-Feb-2019 13:21

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190219-DGW-MW11-PV25mid-40D
Collection Date: 19-Feb-2019 15:45

ANALYTICAL REPORT
WorkOrder:HS19021252
Lab ID:HS19021252-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	28-Feb-2019 16:29
Arsenic	U		0.00200	0.0100	mg/L	5	28-Feb-2019 16:29
Cadmium	U		0.00100	0.0100	mg/L	5	28-Feb-2019 16:29
Calcium	**301**		**0.340**	**5.00**	**mg/L**	10	28-Feb-2019 01:23
Iron	U		0.0600	1.00	mg/L	5	28-Feb-2019 16:29
Lead	U		0.00300	0.0100	mg/L	5	28-Feb-2019 16:29
Magnesium	**290**		**0.100**	**2.00**	**mg/L**	10	28-Feb-2019 01:23
Potassium	**19.4**		**0.0900**	**1.00**	**mg/L**	5	28-Feb-2019 16:29
Selenium	U		0.00550	0.0100	mg/L	5	28-Feb-2019 16:29
Sodium	**1,940**		**1.40**	**20.0**	**mg/L**	100	28-Feb-2019 13:24

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190218-DGW-MW11-PV25out-controlT
Collection Date: 18-Feb-2019 16:30

ANALYTICAL REPORT
WorkOrder:HS19021252
Lab ID:HS19021252-11
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,470**		**2.00**	**2.00**	**mg/L**	1	28-Feb-2019 17:21
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	28-Feb-2019 15:26
Arsenic	U		0.00200	0.0100	mg/L	5	28-Feb-2019 15:26
Cadmium	**0.00524**	J	**0.00100**	**0.0100**	**mg/L**	5	28-Feb-2019 15:26
Calcium	**509**		**0.340**	**5.00**	**mg/L**	10	27-Feb-2019 23:37
Iron	U		0.0600	1.00	mg/L	5	28-Feb-2019 15:26
Lead	U		0.00300	0.0100	mg/L	5	28-Feb-2019 15:26
Magnesium	**290**		**0.100**	**2.00**	**mg/L**	10	27-Feb-2019 23:37
Potassium	**19.1**		**0.0900**	**1.00**	**mg/L**	5	28-Feb-2019 15:26
Selenium	U		0.00550	0.0100	mg/L	5	28-Feb-2019 15:26
Sodium	**1,760**		**1.40**	**20.0**	**mg/L**	100	28-Feb-2019 11:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190218-DGW-MW11-PV25out-30T
Collection Date: 18-Feb-2019 16:30

ANALYTICAL REPORT
WorkOrder:HS19021252
Lab ID:HS19021252-12
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**1,760**		**2.00**	**2.00**	**mg/L**	1	28-Feb-2019 17:21
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	28-Feb-2019 15:28
Arsenic	U		0.00200	0.0100	mg/L	5	28-Feb-2019 15:28
Cadmium	U		0.00100	0.0100	mg/L	5	28-Feb-2019 15:28
Calcium	**256**		**0.340**	**5.00**	**mg/L**	10	27-Feb-2019 23:43
Iron	**5.09**		**0.0600**	**1.00**	**mg/L**	5	28-Feb-2019 15:28
Lead	U		0.00300	0.0100	mg/L	5	28-Feb-2019 15:28
Magnesium	**273**		**0.100**	**2.00**	**mg/L**	10	27-Feb-2019 23:43
Potassium	**18.8**		**0.0900**	**1.00**	**mg/L**	5	28-Feb-2019 15:28
Selenium	U		0.00550	0.0100	mg/L	5	28-Feb-2019 15:28
Sodium	**1,870**		**1.40**	**20.0**	**mg/L**	100	28-Feb-2019 11:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190218-DGW-MW11-PV25out-35T
Collection Date: 18-Feb-2019 16:30

ANALYTICAL REPORT
WorkOrder:HS19021252
Lab ID:HS19021252-13
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**1,820**		**2.00**	**2.00**	**mg/L**	1	28-Feb-2019 17:21
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	28-Feb-2019 15:31
Arsenic	U		0.00200	0.0100	mg/L	5	28-Feb-2019 15:31
Cadmium	U		0.00100	0.0100	mg/L	5	28-Feb-2019 15:31
Calcium	**268**		**0.340**	**5.00**	**mg/L**	10	27-Feb-2019 23:45
Iron	**1.33**		**0.0600**	**1.00**	**mg/L**	5	28-Feb-2019 15:31
Lead	U		0.00300	0.0100	mg/L	5	28-Feb-2019 15:31
Magnesium	**279**		**0.100**	**2.00**	**mg/L**	10	27-Feb-2019 23:45
Potassium	**18.5**		**0.0900**	**1.00**	**mg/L**	5	28-Feb-2019 15:31
Selenium	U		0.00550	0.0100	mg/L	5	28-Feb-2019 15:31
Sodium	**1,890**		**1.40**	**20.0**	**mg/L**	100	28-Feb-2019 11:50

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190218-DGW-MW11-PV25out-40T
Collection Date: 18-Feb-2019 16:30

ANALYTICAL REPORT
WorkOrder:HS19021252
Lab ID:HS19021252-14
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**1,780**		**2.00**	**2.00**	**mg/L**	1	28-Feb-2019 17:21
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	28-Feb-2019 15:33
Arsenic	U		0.00200	0.0100	mg/L	5	28-Feb-2019 15:33
Cadmium	U		0.00100	0.0100	mg/L	5	28-Feb-2019 15:33
Calcium	**247**		**0.340**	**5.00**	**mg/L**	10	27-Feb-2019 23:48
Iron	**1.05**		**0.0600**	**1.00**	**mg/L**	5	28-Feb-2019 15:33
Lead	U		0.00300	0.0100	mg/L	5	28-Feb-2019 15:33
Magnesium	**283**		**0.100**	**2.00**	**mg/L**	10	27-Feb-2019 23:48
Potassium	**19.0**		**0.0900**	**1.00**	**mg/L**	5	28-Feb-2019 15:33
Selenium	U		0.00550	0.0100	mg/L	5	28-Feb-2019 15:33
Sodium	**1,910**		**1.40**	**20.0**	**mg/L**	100	28-Feb-2019 11:52

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190219-DGW-MW11-PV25inlet-controlT
Collection Date: 19-Feb-2019 16:00

ANALYTICAL REPORT
WorkOrder:HS19021252
Lab ID:HS19021252-15
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,470**		**2.00**	**2.00**	**mg/L**	1	28-Feb-2019 17:21
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	28-Feb-2019 15:35
Arsenic	U		0.00200	0.0100	mg/L	5	28-Feb-2019 15:35
Cadmium	**0.00651**	J	**0.00100**	**0.0100**	**mg/L**	5	28-Feb-2019 15:35
Calcium	**510**		**0.340**	**5.00**	**mg/L**	10	27-Feb-2019 23:50
Iron	**2.45**		**0.0600**	**1.00**	**mg/L**	5	28-Feb-2019 15:35
Lead	U		0.00300	0.0100	mg/L	5	28-Feb-2019 15:35
Magnesium	**290**		**0.100**	**2.00**	**mg/L**	10	27-Feb-2019 23:50
Potassium	**18.8**		**0.0900**	**1.00**	**mg/L**	5	28-Feb-2019 15:35
Selenium	U		0.00550	0.0100	mg/L	5	28-Feb-2019 15:35
Sodium	**1,750**		**1.40**	**20.0**	**mg/L**	100	28-Feb-2019 11:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190219-DGW-MW11-PV25inlet-30-35-40T
Collection Date: 19-Feb-2019 16:00

ANALYTICAL REPORT
WorkOrder:HS19021252
Lab ID:HS19021252-16
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,440**		**2.00**	**2.00**	**mg/L**	1	28-Feb-2019 17:21
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 26-Feb-2019		Analyst: JCJ
Antimony	U		0.00200	0.0100	mg/L	5	28-Feb-2019 14:23
Arsenic	U		0.00200	0.0100	mg/L	5	28-Feb-2019 14:23
Cadmium	**0.00305**	J	**0.00100**	**0.0100**	**mg/L**	5	28-Feb-2019 14:23
Calcium	**518**		**0.340**	**5.00**	**mg/L**	10	28-Feb-2019 02:13
Iron	**6.71**		**0.0600**	**1.00**	**mg/L**	5	28-Feb-2019 14:23
Lead	**0.00576**	J	**0.00300**	**0.0100**	**mg/L**	5	28-Feb-2019 14:23
Magnesium	**279**		**0.100**	**2.00**	**mg/L**	10	28-Feb-2019 02:13
Potassium	**17.7**		**0.0900**	**1.00**	**mg/L**	5	28-Feb-2019 14:23
Selenium	U		0.00550	0.0100	mg/L	5	28-Feb-2019 14:23
Sodium	**2,080**		**1.40**	**20.0**	**mg/L**	100	28-Feb-2019 15:56

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190219-DGW-MW11-PV25mid-controlT
Collection Date: 19-Feb-2019 15:45

ANALYTICAL REPORT
WorkOrder:HS19021252
Lab ID:HS19021252-17
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,660**		**2.00**	**2.00**	**mg/L**	1	28-Feb-2019 17:21
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 26-Feb-2019		Analyst: JCJ
Antimony	U		0.00200	0.0100	mg/L	5	28-Feb-2019 14:26
Arsenic	U		0.00200	0.0100	mg/L	5	28-Feb-2019 14:26
Cadmium	**0.00506**	J	**0.00100**	**0.0100**	**mg/L**	5	28-Feb-2019 14:26
Calcium	**542**		**0.340**	**5.00**	**mg/L**	10	28-Feb-2019 02:16
Iron	**0.648**	J	**0.0600**	**1.00**	**mg/L**	5	28-Feb-2019 14:26
Lead	U		0.00300	0.0100	mg/L	5	28-Feb-2019 14:26
Magnesium	**317**		**0.100**	**2.00**	**mg/L**	10	28-Feb-2019 02:16
Potassium	**18.9**		**0.0900**	**1.00**	**mg/L**	5	28-Feb-2019 14:26
Selenium	U		0.00550	0.0100	mg/L	5	28-Feb-2019 14:26
Sodium	**2,030**		**1.40**	**20.0**	**mg/L**	100	28-Feb-2019 15:58

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190219-DGW-MW11-PV25mid-30T
Collection Date: 19-Feb-2019 15:45

ANALYTICAL REPORT
WorkOrder:HS19021252
Lab ID:HS19021252-18
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**1,990**		**2.00**	**2.00**	**mg/L**	1	28-Feb-2019 17:21
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 26-Feb-2019		Analyst: JCJ
Antimony	U		0.00200	0.0100	mg/L	5	28-Feb-2019 14:28
Arsenic	U		0.00200	0.0100	mg/L	5	28-Feb-2019 14:28
Cadmium	U		0.00100	0.0100	mg/L	5	28-Feb-2019 14:28
Calcium	**338**		**0.340**	**5.00**	**mg/L**	10	28-Feb-2019 02:18
Iron	**8.70**		**0.0600**	**1.00**	**mg/L**	5	28-Feb-2019 14:28
Lead	U		0.00300	0.0100	mg/L	5	28-Feb-2019 14:28
Magnesium	**278**		**0.100**	**2.00**	**mg/L**	10	28-Feb-2019 02:18
Potassium	**18.6**		**0.0900**	**1.00**	**mg/L**	5	28-Feb-2019 14:28
Selenium	U		0.00550	0.0100	mg/L	5	28-Feb-2019 14:28
Sodium	**2,240**		**1.40**	**20.0**	**mg/L**	100	28-Feb-2019 16:01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190219-DGW-MW11-PV25mid-35T
Collection Date: 19-Feb-2019 15:45

ANALYTICAL REPORT
WorkOrder:HS19021252
Lab ID:HS19021252-19
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**1,940**		**2.00**	**2.00**	**mg/L**	1	28-Feb-2019 17:21
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 26-Feb-2019		Analyst: JCJ
Antimony	U		0.00200	0.0100	mg/L	5	28-Feb-2019 14:30
Arsenic	U		0.00200	0.0100	mg/L	5	28-Feb-2019 14:30
Cadmium	U		0.00100	0.0100	mg/L	5	28-Feb-2019 14:30
Calcium	**317**		**0.340**	**5.00**	**mg/L**	10	28-Feb-2019 02:20
Iron	**4.56**		**0.0600**	**1.00**	**mg/L**	5	28-Feb-2019 14:30
Lead	U		0.00300	0.0100	mg/L	5	28-Feb-2019 14:30
Magnesium	**278**		**0.100**	**2.00**	**mg/L**	10	28-Feb-2019 02:20
Potassium	**19.8**		**0.0900**	**1.00**	**mg/L**	5	28-Feb-2019 14:30
Selenium	U		0.00550	0.0100	mg/L	5	28-Feb-2019 14:30
Sodium	**2,250**		**1.40**	**20.0**	**mg/L**	100	28-Feb-2019 16:03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190219-DGW-MW11-PV25mid-40T
Collection Date: 19-Feb-2019 15:45

ANALYTICAL REPORT
WorkOrder:HS19021252
Lab ID:HS19021252-20
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**1,830**		**2.00**	**2.00**	**mg/L**	1	28-Feb-2019 17:21
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 26-Feb-2019		Analyst: JCJ
Antimony	U		0.00200	0.0100	mg/L	5	28-Feb-2019 14:33
Arsenic	U		0.00200	0.0100	mg/L	5	28-Feb-2019 14:33
Cadmium	U		0.00100	0.0100	mg/L	5	28-Feb-2019 14:33
Calcium	**275**		**0.340**	**5.00**	**mg/L**	10	28-Feb-2019 02:22
Iron	**1.47**		**0.0600**	**1.00**	**mg/L**	5	28-Feb-2019 14:33
Lead	U		0.00300	0.0100	mg/L	5	28-Feb-2019 14:33
Magnesium	**278**		**0.100**	**2.00**	**mg/L**	10	28-Feb-2019 02:22
Potassium	**18.8**		**0.0900**	**1.00**	**mg/L**	5	28-Feb-2019 14:33
Selenium	U		0.00550	0.0100	mg/L	5	28-Feb-2019 14:33
Sodium	**2,060**		**1.40**	**20.0**	**mg/L**	100	28-Feb-2019 16:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190205-DGW-MW11-PV20out-35D-DUP
Collection Date: 05-Feb-2019 12:30

ANALYTICAL REPORT
WorkOrder:HS19021252
Lab ID:HS19021252-21
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 26-Feb-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	28-Feb-2019 16:31
Arsenic	U		0.00200	0.0100	mg/L	5	28-Feb-2019 16:31
Cadmium	U		0.00100	0.0100	mg/L	5	28-Feb-2019 16:31
Calcium	**356**		**0.340**	**5.00**	**mg/L**	10	28-Feb-2019 01:25
Iron	U		0.0600	1.00	mg/L	5	28-Feb-2019 16:31
Lead	U		0.00300	0.0100	mg/L	5	28-Feb-2019 16:31
Magnesium	**292**		**0.100**	**2.00**	**mg/L**	10	28-Feb-2019 01:25
Potassium	**21.3**		**0.0900**	**1.00**	**mg/L**	5	28-Feb-2019 16:31
Selenium	U		0.00550	0.0100	mg/L	5	28-Feb-2019 16:31
Sodium	**1,580**		**1.40**	**20.0**	**mg/L**	100	28-Feb-2019 13:26

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190205-DGW-MW11-PV20out-35T-DUP
Collection Date: 05-Feb-2019 12:30

ANALYTICAL REPORT
WorkOrder:HS19021252
Lab ID:HS19021252-22
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,150**		**2.00**	**2.00**	**mg/L**	1	28-Feb-2019 17:21
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 26-Feb-2019		Analyst: JCJ
Antimony	U		0.00200	0.0100	mg/L	5	28-Feb-2019 14:35
Arsenic	U		0.00200	0.0100	mg/L	5	28-Feb-2019 14:35
Cadmium	U		0.00100	0.0100	mg/L	5	28-Feb-2019 14:35
Calcium	**368**		**0.340**	**5.00**	**mg/L**	10	28-Feb-2019 02:25
Iron	**2.64**		**0.0600**	**1.00**	**mg/L**	5	28-Feb-2019 14:35
Lead	U		0.00300	0.0100	mg/L	5	28-Feb-2019 14:35
Magnesium	**300**		**0.100**	**2.00**	**mg/L**	10	28-Feb-2019 02:25
Potassium	**22.7**		**0.0900**	**1.00**	**mg/L**	5	28-Feb-2019 14:35
Selenium	U		0.00550	0.0100	mg/L	5	28-Feb-2019 14:35
Sodium	**1,830**		**1.40**	**20.0**	**mg/L**	100	28-Feb-2019 16:08

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021252

Batch ID: 138117 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19021252-11	1	10	10 (mL)	1
HS19021252-12	1	10	10 (mL)	1
HS19021252-13	1	10	10 (mL)	1
HS19021252-14	1	10	10 (mL)	1
HS19021252-15	1	10	10 (mL)	1

Batch ID: 138128 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19021252-16	1	10	10 (mL)	1
HS19021252-17	1	10	10 (mL)	1
HS19021252-18	1	10	10 (mL)	1
HS19021252-19	1	10	10 (mL)	1
HS19021252-20	1	10	10 (mL)	1
HS19021252-22	1	10	10 (mL)	1

Batch ID: 138131 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19021252-01	1	10	10 (mL)	1
HS19021252-02	1	10	10 (mL)	1
HS19021252-03	1	10	10 (mL)	1
HS19021252-04	1	10	10 (mL)	1
HS19021252-05	1	10	10 (mL)	1
HS19021252-06	1	10	10 (mL)	1
HS19021252-07	1	10	10 (mL)	1
HS19021252-08	1	10	10 (mL)	1
HS19021252-09	1	10	10 (mL)	1
HS19021252-10	1	10	10 (mL)	1
HS19021252-21	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021252

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 138117	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19021252-11	20190218-DGW-MW11-PV25out-controlT	18 Feb 2019 16:30		26 Feb 2019 11:00	28 Feb 2019 15:26	5
HS19021252-11	20190218-DGW-MW11-PV25out-controlT	18 Feb 2019 16:30		26 Feb 2019 11:00	28 Feb 2019 11:45	100
HS19021252-11	20190218-DGW-MW11-PV25out-controlT	18 Feb 2019 16:30		26 Feb 2019 11:00	27 Feb 2019 23:37	10
HS19021252-12	20190218-DGW-MW11-PV25out-30T	18 Feb 2019 16:30		26 Feb 2019 11:00	28 Feb 2019 15:28	5
HS19021252-12	20190218-DGW-MW11-PV25out-30T	18 Feb 2019 16:30		26 Feb 2019 11:00	28 Feb 2019 11:47	100
HS19021252-12	20190218-DGW-MW11-PV25out-30T	18 Feb 2019 16:30		26 Feb 2019 11:00	27 Feb 2019 23:43	10
HS19021252-13	20190218-DGW-MW11-PV25out-35T	18 Feb 2019 16:30		26 Feb 2019 11:00	28 Feb 2019 15:31	5
HS19021252-13	20190218-DGW-MW11-PV25out-35T	18 Feb 2019 16:30		26 Feb 2019 11:00	28 Feb 2019 11:50	100
HS19021252-13	20190218-DGW-MW11-PV25out-35T	18 Feb 2019 16:30		26 Feb 2019 11:00	27 Feb 2019 23:45	10
HS19021252-14	20190218-DGW-MW11-PV25out-40T	18 Feb 2019 16:30		26 Feb 2019 11:00	28 Feb 2019 15:33	5
HS19021252-14	20190218-DGW-MW11-PV25out-40T	18 Feb 2019 16:30		26 Feb 2019 11:00	28 Feb 2019 11:52	100
HS19021252-14	20190218-DGW-MW11-PV25out-40T	18 Feb 2019 16:30		26 Feb 2019 11:00	27 Feb 2019 23:48	10
HS19021252-15	20190219-DGW-MW11-PV25inlet-controlT	19 Feb 2019 16:00		26 Feb 2019 11:00	28 Feb 2019 15:35	5
HS19021252-15	20190219-DGW-MW11-PV25inlet-controlT	19 Feb 2019 16:00		26 Feb 2019 11:00	28 Feb 2019 11:54	100
HS19021252-15	20190219-DGW-MW11-PV25inlet-controlT	19 Feb 2019 16:00		26 Feb 2019 11:00	27 Feb 2019 23:50	10

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021252

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 138128	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19021252-16	20190219-DGW-MW11-PV25inlet-30-35-40T	19 Feb 2019 16:00		26 Feb 2019 11:00	28 Feb 2019 15:56	100
HS19021252-16	20190219-DGW-MW11-PV25inlet-30-35-40T	19 Feb 2019 16:00		26 Feb 2019 11:00	28 Feb 2019 14:23	5
HS19021252-16	20190219-DGW-MW11-PV25inlet-30-35-40T	19 Feb 2019 16:00		26 Feb 2019 11:00	28 Feb 2019 02:13	10
HS19021252-17	20190219-DGW-MW11-PV25mid-controlT	19 Feb 2019 15:45		26 Feb 2019 11:00	28 Feb 2019 15:58	100
HS19021252-17	20190219-DGW-MW11-PV25mid-controlT	19 Feb 2019 15:45		26 Feb 2019 11:00	28 Feb 2019 14:26	5
HS19021252-17	20190219-DGW-MW11-PV25mid-controlT	19 Feb 2019 15:45		26 Feb 2019 11:00	28 Feb 2019 02:16	10
HS19021252-18	20190219-DGW-MW11-PV25mid-30T	19 Feb 2019 15:45		26 Feb 2019 11:00	28 Feb 2019 16:01	100
HS19021252-18	20190219-DGW-MW11-PV25mid-30T	19 Feb 2019 15:45		26 Feb 2019 11:00	28 Feb 2019 14:28	5
HS19021252-18	20190219-DGW-MW11-PV25mid-30T	19 Feb 2019 15:45		26 Feb 2019 11:00	28 Feb 2019 02:18	10
HS19021252-19	20190219-DGW-MW11-PV25mid-35T	19 Feb 2019 15:45		26 Feb 2019 11:00	28 Feb 2019 16:03	100
HS19021252-19	20190219-DGW-MW11-PV25mid-35T	19 Feb 2019 15:45		26 Feb 2019 11:00	28 Feb 2019 14:30	5
HS19021252-19	20190219-DGW-MW11-PV25mid-35T	19 Feb 2019 15:45		26 Feb 2019 11:00	28 Feb 2019 02:20	10
HS19021252-20	20190219-DGW-MW11-PV25mid-40T	19 Feb 2019 15:45		26 Feb 2019 11:00	28 Feb 2019 16:05	100
HS19021252-20	20190219-DGW-MW11-PV25mid-40T	19 Feb 2019 15:45		26 Feb 2019 11:00	28 Feb 2019 14:33	5
HS19021252-20	20190219-DGW-MW11-PV25mid-40T	19 Feb 2019 15:45		26 Feb 2019 11:00	28 Feb 2019 02:22	10
HS19021252-22	20190205-DGW-MW11-PV20out-35T-DUP	05 Feb 2019 12:30		26 Feb 2019 11:00	28 Feb 2019 16:08	100
HS19021252-22	20190205-DGW-MW11-PV20out-35T-DUP	05 Feb 2019 12:30		26 Feb 2019 11:00	28 Feb 2019 14:35	5
HS19021252-22	20190205-DGW-MW11-PV20out-35T-DUP	05 Feb 2019 12:30		26 Feb 2019 11:00	28 Feb 2019 02:25	10

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021252

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 138131	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS19021252-01	20190214-DGW-MW11-PV25out-controlD	18 Feb 2019 16:30		26 Feb 2019 11:00	28 Feb 2019 15:45	5
HS19021252-01	20190214-DGW-MW11-PV25out-controlD	18 Feb 2019 16:30		26 Feb 2019 11:00	28 Feb 2019 12:10	100
HS19021252-01	20190214-DGW-MW11-PV25out-controlD	18 Feb 2019 16:30		26 Feb 2019 11:00	28 Feb 2019 00:58	10
HS19021252-02	20190214-DGW-MW11-PV25out-30D	18 Feb 2019 16:30		26 Feb 2019 11:00	28 Feb 2019 15:47	5
HS19021252-02	20190214-DGW-MW11-PV25out-30D	18 Feb 2019 16:30		26 Feb 2019 11:00	28 Feb 2019 12:13	100
HS19021252-02	20190214-DGW-MW11-PV25out-30D	18 Feb 2019 16:30		26 Feb 2019 11:00	28 Feb 2019 01:00	10
HS19021252-03	20190218-DGW-MW11-PV25out-35D	18 Feb 2019 16:30		26 Feb 2019 11:00	28 Feb 2019 15:49	5
HS19021252-03	20190218-DGW-MW11-PV25out-35D	18 Feb 2019 16:30		26 Feb 2019 11:00	28 Feb 2019 12:15	100
HS19021252-03	20190218-DGW-MW11-PV25out-35D	18 Feb 2019 16:30		26 Feb 2019 11:00	28 Feb 2019 01:03	10
HS19021252-04	20190218-DGW-MW11-PV25out-40D	18 Feb 2019 16:30		26 Feb 2019 11:00	28 Feb 2019 15:51	5
HS19021252-04	20190218-DGW-MW11-PV25out-40D	18 Feb 2019 16:30		26 Feb 2019 11:00	28 Feb 2019 12:17	100
HS19021252-04	20190218-DGW-MW11-PV25out-40D	18 Feb 2019 16:30		26 Feb 2019 11:00	28 Feb 2019 01:05	10
HS19021252-05	20190219-DGW-MW11-PV25inlet-controlD	19 Feb 2019 16:00		26 Feb 2019 11:00	28 Feb 2019 16:09	5
HS19021252-05	20190219-DGW-MW11-PV25inlet-controlD	19 Feb 2019 16:00		26 Feb 2019 11:00	28 Feb 2019 12:19	100
HS19021252-05	20190219-DGW-MW11-PV25inlet-controlD	19 Feb 2019 16:00		26 Feb 2019 11:00	28 Feb 2019 01:12	10
HS19021252-06	20190219-DGW-MW11-PV25inlet-30-35-40D	19 Feb 2019 16:00		26 Feb 2019 11:00	28 Feb 2019 16:12	5
HS19021252-06	20190219-DGW-MW11-PV25inlet-30-35-40D	19 Feb 2019 16:00		26 Feb 2019 11:00	28 Feb 2019 12:22	100
HS19021252-06	20190219-DGW-MW11-PV25inlet-30-35-40D	19 Feb 2019 16:00		26 Feb 2019 11:00	28 Feb 2019 01:14	10
HS19021252-07	20190219-DGW-MW11-PV25mid-controlD	19 Feb 2019 15:45		26 Feb 2019 11:00	28 Feb 2019 16:14	5
HS19021252-07	20190219-DGW-MW11-PV25mid-controlD	19 Feb 2019 15:45		26 Feb 2019 11:00	28 Feb 2019 12:24	100
HS19021252-07	20190219-DGW-MW11-PV25mid-controlD	19 Feb 2019 15:45		26 Feb 2019 11:00	28 Feb 2019 01:16	10
HS19021252-08	20190219-DGW-MW11-PV25mid-30D	19 Feb 2019 15:45		26 Feb 2019 11:00	28 Feb 2019 16:24	5
HS19021252-08	20190219-DGW-MW11-PV25mid-30D	19 Feb 2019 15:45		26 Feb 2019 11:00	28 Feb 2019 13:19	100
HS19021252-08	20190219-DGW-MW11-PV25mid-30D	19 Feb 2019 15:45		26 Feb 2019 11:00	28 Feb 2019 01:18	10
HS19021252-09	20190219-DGW-MW11-PV25mid-35D	19 Feb 2019 15:45		26 Feb 2019 11:00	28 Feb 2019 16:26	5
HS19021252-09	20190219-DGW-MW11-PV25mid-35D	19 Feb 2019 15:45		26 Feb 2019 11:00	28 Feb 2019 13:21	100
HS19021252-09	20190219-DGW-MW11-PV25mid-35D	19 Feb 2019 15:45		26 Feb 2019 11:00	28 Feb 2019 01:21	10
HS19021252-10	20190219-DGW-MW11-PV25mid-40D	19 Feb 2019 15:45		26 Feb 2019 11:00	28 Feb 2019 16:29	5
HS19021252-10	20190219-DGW-MW11-PV25mid-40D	19 Feb 2019 15:45		26 Feb 2019 11:00	28 Feb 2019 13:24	100
HS19021252-10	20190219-DGW-MW11-PV25mid-40D	19 Feb 2019 15:45		26 Feb 2019 11:00	28 Feb 2019 01:23	10

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021252

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
HS19021252-21	20190205-DGW-MW11-PV20out-35D-DUP	05 Feb 2019 12:30		26 Feb 2019 11:00	28 Feb 2019 16:31	5
HS19021252-21	20190205-DGW-MW11-PV20out-35D-DUP	05 Feb 2019 12:30		26 Feb 2019 11:00	28 Feb 2019 13:26	100
HS19021252-21	20190205-DGW-MW11-PV20out-35D-DUP	05 Feb 2019 12:30		26 Feb 2019 11:00	28 Feb 2019 01:25	10
Batch ID R333799	**Test Name :** HARDNESS, TOTAL AS CACO3 BY SM2340B			**Matrix:** Groundwater		
HS19021252-11	20190218-DGW-MW11-PV25out-controlT	18 Feb 2019 16:30			28 Feb 2019 17:21	1
HS19021252-12	20190218-DGW-MW11-PV25out-30T	18 Feb 2019 16:30			28 Feb 2019 17:21	1
HS19021252-13	20190218-DGW-MW11-PV25out-35T	18 Feb 2019 16:30			28 Feb 2019 17:21	1
HS19021252-14	20190218-DGW-MW11-PV25out-40T	18 Feb 2019 16:30			28 Feb 2019 17:21	1
HS19021252-15	20190219-DGW-MW11-PV25inlet-controlT	19 Feb 2019 16:00			28 Feb 2019 17:21	1
HS19021252-16	20190219-DGW-MW11-PV25inlet-30-35-40T	19 Feb 2019 16:00			28 Feb 2019 17:21	1
HS19021252-17	20190219-DGW-MW11-PV25mid-controlT	19 Feb 2019 15:45			28 Feb 2019 17:21	1
HS19021252-18	20190219-DGW-MW11-PV25mid-30T	19 Feb 2019 15:45			28 Feb 2019 17:21	1
HS19021252-19	20190219-DGW-MW11-PV25mid-35T	19 Feb 2019 15:45			28 Feb 2019 17:21	1
HS19021252-20	20190219-DGW-MW11-PV25mid-40T	19 Feb 2019 15:45			28 Feb 2019 17:21	1
HS19021252-22	20190205-DGW-MW11-PV20out-35T-DUP	05 Feb 2019 12:30			28 Feb 2019 17:21	1

WorkOrder: HS19021252
InstrumentID: ICPMS05
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000555	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000460	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000554	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0537	0.0340	0.500
A	Iron	7439-89-6	0.0500	0.0549	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.00100	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0680	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0542	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00280	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0459	0.0140	0.200

WorkOrder: HS19021252
InstrumentID: ICPMS05
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000555	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000460	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000554	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0537	0.0340	0.500
A	Iron	7439-89-6	0.0500	0.0549	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.00100	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0680	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0542	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00280	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0459	0.0140	0.200

WorkOrder: HS19021252
InstrumentID: ICPMS04
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000521	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000340	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000553	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0523	0.0340	0.500
A	Iron	7439-89-6	0.0250	0.0205	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000916	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0700	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0418	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00274	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0556	0.0140	0.200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021252

QC BATCH REPORT

Batch ID: 138117 **Instrument: ICPMS05** **Method: SW6020**

MBLK Sample ID: **MBLK-138117** Units: **mg/L** Analysis Date: **27-Feb-2019 15:18**
Client ID: Run ID: **ICPMS05_333607** SeqNo: **4968496** PrepDate: **26-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01061	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	0.02008	0.200								J

LCS Sample ID: **LCS-138117** Units: **mg/L** Analysis Date: **27-Feb-2019 15:20**
Client ID: Run ID: **ICPMS05_333607** SeqNo: **4968497** PrepDate: **26-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05314	0.00200	0.05	0	106	80 - 120				
Arsenic	0.04978	0.00200	0.05	0	99.6	80 - 120				
Cadmium	0.05316	0.00200	0.05	0	106	80 - 120				
Calcium	5.278	0.500	5	0	106	80 - 120				
Iron	5.365	0.200	5	0	107	80 - 120				
Lead	0.0507	0.00200	0.05	0	101	80 - 120				
Magnesium	5.486	0.200	5	0	110	80 - 120				
Potassium	5.403	0.200	5	0	108	80 - 120				
Selenium	0.04839	0.00200	0.05	0	96.8	80 - 120				
Sodium	5.451	0.200	5	0	109	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021252

QC BATCH REPORT

Batch ID: 138117 **Instrument: ICPMS05** **Method: SW6020**

MS Sample ID: **HS19020899-01MS** Units: **mg/L** Analysis Date: **28-Feb-2019 00:04**
Client ID: Run ID: **ICPMS05_333607** SeqNo: **4968760** PrepDate: **26-Feb-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05391	0.0200	0.05	0.000144	108	80 - 120				
Arsenic	0.06128	0.0200	0.05	0.001897	119	80 - 120				
Cadmium	0.05516	0.0200	0.05	0.000123	110	80 - 120				
Calcium	309	5.00	5	276.7	645	80 - 120				SO
Iron	5.785	2.00	5	0.1163	113	80 - 120				
Lead	0.05625	0.0200	0.05	-0.000013	113	80 - 120				
Magnesium	893.3	2.00	5	790.2	2060	80 - 120				SO
Potassium	276.2	2.00	5	245.9	604	80 - 120				SO
Selenium	0.05655	0.0200	0.05	0.001913	109	80 - 120				
Sodium	7524	2.00	5	6701	16500	80 - 120				SEO

MSD Sample ID: **HS19020899-01MSD** Units: **mg/L** Analysis Date: **28-Feb-2019 00:06**
Client ID: Run ID: **ICPMS05_333607** SeqNo: **4968761** PrepDate: **26-Feb-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04948	0.0200	0.05	0.000144	98.7	80 - 120	0.05391	8.57	20	
Arsenic	0.05193	0.0200	0.05	0.001897	100	80 - 120	0.06128	16.5	20	
Cadmium	0.04995	0.0200	0.05	0.000123	99.7	80 - 120	0.05516	9.92	20	
Calcium	273.9	5.00	5	276.7	-57.6	80 - 120	309	12	20	SO
Iron	5.155	2.00	5	0.1163	101	80 - 120	5.785	11.5	20	
Lead	0.05001	0.0200	0.05	-0.000013	100	80 - 120	0.05625	11.7	20	
Magnesium	790.2	2.00	5	790.2	-1.29	80 - 120	893.3	12.3	20	SO
Potassium	241.9	2.00	5	245.9	-81.3	80 - 120	276.2	13.2	20	SO
Selenium	0.05409	0.0200	0.05	0.001913	104	80 - 120	0.05655	4.43	20	
Sodium	6554	2.00	5	6701	-2940	80 - 120	7524	13.8	20	SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021252

QC BATCH REPORT

Batch ID: 138117 **Instrument: ICPMS05** **Method: SW6020**

PDS Sample ID: **HS19020899-01PDS** Units: **mg/L** Analysis Date: **28-Feb-2019 00:08**
Client ID: Run ID: **ICPMS05_333607** SeqNo: **4968762** PrepDate: **26-Feb-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.9971	0.0200	1	0	99.7	75 - 125				
Arsenic	1.09	0.0200	1	0	109	75 - 125				
Cadmium	1.045	0.0200	1	0	104	75 - 125				
Calcium	388.7	5.00	100	276.7	112	75 - 125				
Iron	105.8	2.00	100	0	106	75 - 125				
Lead	1.04	0.0200	1	0	104	75 - 125				
Magnesium	913.2	2.00	100	790.2	123	75 - 125				O
Potassium	353.3	2.00	10	245.9	1070	75 - 125				SO
Selenium	1.083	0.0200	1	0	108	75 - 125				

PDS Sample ID: **HS19020899-01PDS** Units: **mg/L** Analysis Date: **28-Feb-2019 11:43**
Client ID: Run ID: **ICPMS05_333724** SeqNo: **4969546** PrepDate: **26-Feb-2019** DF: **500**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	11110	100	5000	6415	93.9	75 - 125				

SD Sample ID: **HS19020899-01SD** Units: **mg/L** Analysis Date: **28-Feb-2019 00:01**
Client ID: Run ID: **ICPMS05_333607** SeqNo: **4968759** PrepDate: **26-Feb-2019** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.100					0.000144	0	10	
Arsenic	U	0.100					0.001897	0	10	
Cadmium	U	0.100					0.000123	0	10	
Calcium	277.5	25.0					276.7	0.259	10	
Iron	U	10.0					0.1163	0	10	
Lead	U	0.100					-0.000013	0	10	
Magnesium	831.7	10.0					790.2	5.25	10	
Potassium	249.9	10.0					245.9	1.61	10	
Selenium	U	0.100					0.001913	0	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021252

QC BATCH REPORT

Batch ID: 138117 **Instrument: ICPMS05** **Method: SW6020**

SD Sample ID: **HS19020899-01SD** Units: **mg/L** Analysis Date: **28-Feb-2019 11:41**
Client ID: Run ID: **ICPMS05_333724** SeqNo: **4969545** PrepDate: **26-Feb-2019** DF: **2500**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Sodium	6768	500					6415	5.51	10	

The following samples were analyzed in this batch: HS19021252-11 HS19021252-12 HS19021252-13 HS19021252-14 HS19021252-15

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021252

QC BATCH REPORT

Batch ID: 138128 **Instrument: ICPMS05** **Method: SW6020**

MBLK Sample ID: **MBLK-138128** Units: **mg/L** Analysis Date: **28-Feb-2019 01:19**
Client ID: Run ID: **ICPMS04_333622** SeqNo: **4968828** PrepDate: **26-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01211	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	0.2187	0.200								

MBLK Sample ID: **MBLK-138128** Units: **mg/L** Analysis Date: **28-Feb-2019 12:31**
Client ID: Run ID: **ICPMS05_333724** SeqNo: **4969684** PrepDate: **26-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	0.000743	0.00200								J
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	U	0.200								
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	0.03231	0.200								J

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021252

QC BATCH REPORT

Batch ID: 138128 **Instrument: ICPMS05** **Method: SW6020**

LCS Sample ID: **LCS-138128** Units: **mg/L** Analysis Date: **28-Feb-2019 01:22**
Client ID: Run ID: **ICPMS04_333622** SeqNo: **4968829** PrepDate: **26-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.0506	0.00200	0.05	0	101	80 - 120				
Arsenic	0.04994	0.00200	0.05	0	99.9	80 - 120				
Cadmium	0.05155	0.00200	0.05	0	103	80 - 120				
Calcium	5.478	0.500	5	0	110	80 - 120				
Iron	5.355	0.200	5	0	107	80 - 120				
Lead	0.04869	0.00200	0.05	0	97.4	80 - 120				
Magnesium	5.746	0.200	5	0	115	80 - 120				
Potassium	5.356	0.200	5	0	107	80 - 120				
Selenium	0.05392	0.00200	0.05	0	108	80 - 120				
Sodium	5.611	0.200	5	0	112	80 - 120				

MS Sample ID: **HS19020902-03MS** Units: **mg/L** Analysis Date: **28-Feb-2019 01:28**
Client ID: Run ID: **ICPMS04_333622** SeqNo: **4968832** PrepDate: **26-Feb-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.0554	0.0200	0.05	0.002406	106	80 - 120				
Arsenic	0.07072	0.0200	0.05	0.0162	109	80 - 120				
Cadmium	0.06146	0.0200	0.05	0.000137	123	80 - 120				S
Calcium	319.8	5.00	5	278.6	825	80 - 120				SO
Iron	6.733	2.00	5	0.5248	124	80 - 120				S
Lead	0.05716	0.0200	0.05	0.000768	113	80 - 120				
Magnesium	935.6	2.00	5	804.9	2610	80 - 120				SO
Potassium	310.3	2.00	5	276.6	673	80 - 120				SO
Selenium	0.06741	0.0200	0.05	0.006925	121	80 - 120				S
Sodium	8057	2.00	5	6944	22300	80 - 120				SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021252

QC BATCH REPORT

Batch ID: 138128 **Instrument: ICPMS05** **Method: SW6020**

MSD Sample ID: **HS19020902-03MSD** Units: **mg/L** Analysis Date: **28-Feb-2019 01:31**
Client ID: Run ID: **ICPMS04_333622** SeqNo: **4968833** PrepDate: **26-Feb-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05416	0.0200	0.05	0.002406	104	80 - 120	0.0554	2.26	20	
Arsenic	0.07009	0.0200	0.05	0.0162	108	80 - 120	0.07072	0.896	20	
Cadmium	0.0558	0.0200	0.05	0.000137	111	80 - 120	0.06146	9.65	20	
Calcium	314	5.00	5	278.6	708	80 - 120	319.8	1.84	20	SO
Iron	6.79	2.00	5	0.5248	125	80 - 120	6.733	0.847	20	S
Lead	0.05495	0.0200	0.05	0.000768	108	80 - 120	0.05716	3.95	20	
Magnesium	875.3	2.00	5	804.9	1410	80 - 120	935.6	6.66	20	SO
Potassium	301.4	2.00	5	276.6	496	80 - 120	310.3	2.89	20	SO
Selenium	0.05699	0.0200	0.05	0.006925	100	80 - 120	0.06741	16.7	20	
Sodium	7500	2.00	5	6944	11100	80 - 120	8057	7.16	20	SEO

PDS Sample ID: **HS19020902-03PDS** Units: **mg/L** Analysis Date: **28-Feb-2019 01:33**
Client ID: Run ID: **ICPMS04_333622** SeqNo: **4968834** PrepDate: **26-Feb-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.906	0.0200	1	0.002406	90.4	75 - 125				
Arsenic	0.9788	0.0200	1	0.0162	96.3	75 - 125				
Cadmium	1.049	0.0200	1	0.000137	105	75 - 125				
Calcium	384.6	5.00	100	278.6	106	75 - 125				
Iron	107.2	2.00	100	0.5248	107	75 - 125				
Lead	1.035	0.0200	1	0.000768	103	75 - 125				
Magnesium	914.8	2.00	100	804.9	110	75 - 125				O
Potassium	378.5	2.00	100	276.6	102	75 - 125				
Selenium	0.9842	0.0200	1	0.006925	97.7	75 - 125				

PDS Sample ID: **HS19020902-03PDS** Units: **mg/L** Analysis Date: **28-Feb-2019 13:08**
Client ID: Run ID: **ICPMS04_333735** SeqNo: **4969847** PrepDate: **26-Feb-2019** DF: **500**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	12680	100	5000	7507	104	75 - 125				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021252

QC BATCH REPORT

Batch ID: 138128 **Instrument: ICPMS05** **Method: SW6020**

SD Sample ID: **HS19020902-03SD** Units: **mg/L** Analysis Date: **28-Feb-2019 01:26**
Client ID: Run ID: **ICPMS04_333622** SeqNo: **4968831** PrepDate: **26-Feb-2019** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.100					0.002406	0	10	
Arsenic	U	0.100					0.0162	0	10	
Cadmium	U	0.100					0.000137	0	10	
Calcium	292.4	25.0					278.6	4.98	10	
Iron	3.812	10.0					0.5248	0	10	J
Lead	U	0.100					0.000768	0	10	
Magnesium	871	10.0					804.9	8.21	10	
Potassium	297.1	10.0					276.6	7.4	10	
Selenium	U	0.100					0.006925	0	10	

SD Sample ID: **HS19020902-03SD** Units: **mg/L** Analysis Date: **28-Feb-2019 13:06**
Client ID: Run ID: **ICPMS04_333735** SeqNo: **4969846** PrepDate: **26-Feb-2019** DF: **2500**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Sodium	7394	500					7507	1.51	10	

The following samples were analyzed in this batch: HS19021252-16 HS19021252-17 HS19021252-18 HS19021252-19 HS19021252-20 HS19021252-22

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021252

QC BATCH REPORT

Batch ID: 138131 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLK-138131** Units: **mg/L** Analysis Date: **28-Feb-2019 00:19**
Client ID: Run ID: **ICPMS05_333607** SeqNo: **4968776** PrepDate: **26-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01457	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	0.05674	0.200								J

LCS Sample ID: **LCS-138131** Units: **mg/L** Analysis Date: **28-Feb-2019 00:22**
Client ID: Run ID: **ICPMS05_333607** SeqNo: **4968777** PrepDate: **26-Feb-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05362	0.00200	0.05	0	107	80 - 120				
Arsenic	0.05314	0.00200	0.05	0	106	80 - 120				
Cadmium	0.05154	0.00200	0.05	0	103	80 - 120				
Calcium	5.554	0.500	5	0	111	80 - 120				
Iron	5.456	0.200	5	0	109	80 - 120				
Lead	0.0526	0.00200	0.05	0	105	80 - 120				
Magnesium	5.694	0.200	5	0	114	80 - 120				
Potassium	5.629	0.200	5	0	113	80 - 120				
Selenium	0.05257	0.00200	0.05	0	105	80 - 120				
Sodium	5.621	0.200	5	0	112	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021252

QC BATCH REPORT

Batch ID: 138131 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MS Sample ID: **HS19020899-01MS** Units: **mg/L** Analysis Date: **28-Feb-2019 00:28**
Client ID: Run ID: **ICPMS05_333607** SeqNo: **4968780** PrepDate: **26-Feb-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05884	0.0200	0.05	0.001154	115	75 - 125				
Arsenic	0.06073	0.0200	0.05	0.002353	117	75 - 125				
Cadmium	0.05703	0.0200	0.05	0.000126	114	75 - 125				
Calcium	328	5.00	5	283.4	892	75 - 125				SO
Iron	5.775	2.00	5	0.05481	114	75 - 125				
Lead	0.05733	0.0200	0.05	0.000204	114	75 - 125				
Magnesium	921.8	2.00	5	834.9	1740	75 - 125				SO
Potassium	287.9	2.00	5	253.9	681	75 - 125				SO
Selenium	0.06399	0.0200	0.05	0.008312	111	75 - 125				
Sodium	7741	2.00	5	6980	15200	75 - 125				SEO

MSD Sample ID: **HS19020899-01MSD** Units: **mg/L** Analysis Date: **28-Feb-2019 00:31**
Client ID: Run ID: **ICPMS05_333607** SeqNo: **4968781** PrepDate: **26-Feb-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05933	0.0200	0.05	0.001154	116	75 - 125	0.05884	0.836	20	
Arsenic	0.06119	0.0200	0.05	0.002353	118	75 - 125	0.06073	0.75	20	
Cadmium	0.05692	0.0200	0.05	0.000126	114	75 - 125	0.05703	0.191	20	
Calcium	328	5.00	5	283.4	891	75 - 125	328	0.00492	20	SO
Iron	5.964	2.00	5	0.05481	118	75 - 125	5.775	3.22	20	
Lead	0.05788	0.0200	0.05	0.000204	115	75 - 125	0.05733	0.941	20	
Magnesium	960	2.00	5	834.9	2500	75 - 125	921.8	4.05	20	SO
Potassium	295.3	2.00	5	253.9	828	75 - 125	287.9	2.53	20	SO
Selenium	0.06157	0.0200	0.05	0.008312	107	75 - 125	0.06399	3.86	20	
Sodium	7870	2.00	5	6980	17800	75 - 125	7741	1.66	20	SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021252

QC BATCH REPORT

Batch ID: 138131 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

PDS Sample ID: **HS19020899-01PDS** Units: **mg/L** Analysis Date: **28-Feb-2019 00:33**
Client ID: Run ID: **ICPMS05_333607** SeqNo: **4968782** PrepDate: **26-Feb-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	1.01	0.0200	1	0	101	75 - 125				
Arsenic	1.089	0.0200	1	0	109	75 - 125				
Cadmium	1.021	0.0200	1	0	102	75 - 125				
Calcium	412.6	5.00	100	283.4	129	75 - 125				S
Iron	108.6	2.00	100	0	109	75 - 125				
Lead	1.034	0.0200	1	0	103	75 - 125				
Magnesium	972.5	2.00	100	834.9	138	75 - 125				SO
Potassium	372.3	2.00	100	253.9	118	75 - 125				
Selenium	1.088	0.0200	1	0	109	75 - 125				

PDS Sample ID: **HS19020899-01PDS** Units: **mg/L** Analysis Date: **28-Feb-2019 12:08**
Client ID: Run ID: **ICPMS05_333724** SeqNo: **4969572** PrepDate: **26-Feb-2019** DF: **500**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	11930	100	5000	6835	102	75 - 125				

SD Sample ID: **HS19020899-01SD** Units: **mg/L** Analysis Date: **28-Feb-2019 00:26**
Client ID: Run ID: **ICPMS05_333607** SeqNo: **4968779** PrepDate: **26-Feb-2019** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.100					0.001154	0	10	
Arsenic	U	0.100					0.002353	0	10	
Cadmium	U	0.100					0.000126	0	10	
Calcium	278.9	25.0					283.4	1.58	10	
Iron	U	10.0					0.05481	0	10	
Lead	U	0.100					0.000204	0	10	
Magnesium	838.9	10.0					834.9	0.478	10	
Potassium	256	10.0					253.9	0.814	10	
Selenium	U	0.100					0.008312	0	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19021252

QC BATCH REPORT

Batch ID: 138131 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

SD Sample ID: **HS19020899-01SD** Units: **mg/L** Analysis Date: **28-Feb-2019 12:06**
Client ID: Run ID: **ICPMS05_333724** SeqNo: **4969571** PrepDate: **26-Feb-2019** DF: **2500**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Sodium	7199	500					6835	5.32	10	

The following samples were analyzed in this batch:

HS19021252-01	HS19021252-02	HS19021252-03	HS19021252-04
HS19021252-05	HS19021252-06	HS19021252-07	HS19021252-08
HS19021252-09	HS19021252-10	HS19021252-21	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19021252**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
California	2919, 2018-2019	30-Apr-2019
Maryland	343, 2018-2019	30-Jun-2019

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19021252

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19021252-01	20190214-DGW-MW11-PV25out-controlD	Login	2/25/2019 11:09:14 AM	NDR	MET088
HS19021252-02	20190214-DGW-MW11-PV25out-30D	Login	2/25/2019 11:09:14 AM	NDR	MET088
HS19021252-03	20190218-DGW-MW11-PV25out-35D	Login	2/25/2019 11:09:14 AM	NDR	MET088
HS19021252-04	20190218-DGW-MW11-PV25out-40D	Login	2/25/2019 11:09:14 AM	NDR	MET088
HS19021252-05	20190219-DGW-MW11-PV25inlet-controlD	Login	2/25/2019 11:09:14 AM	NDR	MET088
HS19021252-06	20190219-DGW-MW11-PV25inlet-30-35-40D	Login	2/25/2019 11:09:14 AM	NDR	MET088
HS19021252-07	20190219-DGW-MW11-PV25mid-controlD	Login	2/25/2019 11:09:14 AM	NDR	MET088
HS19021252-08	20190219-DGW-MW11-PV25mid-30D	Login	2/25/2019 11:09:14 AM	NDR	MET088
HS19021252-09	20190219-DGW-MW11-PV25mid-35D	Login	2/25/2019 11:09:14 AM	NDR	MET088
HS19021252-10	20190219-DGW-MW11-PV25mid-40D	Login	2/25/2019 11:09:14 AM	NDR	MET088
HS19021252-11	20190218-DGW-MW11-PV25out-controlT	Login	2/25/2019 11:09:14 AM	NDR	MET088
HS19021252-12	20190218-DGW-MW11-PV25out-30T	Login	2/25/2019 11:09:14 AM	NDR	MET088
HS19021252-13	20190218-DGW-MW11-PV25out-35T	Login	2/25/2019 11:09:14 AM	NDR	MET088
HS19021252-14	20190218-DGW-MW11-PV25out-40T	Login	2/25/2019 11:09:14 AM	NDR	MET088
HS19021252-15	20190219-DGW-MW11-PV25inlet-controlT	Login	2/25/2019 11:09:14 AM	NDR	MET088
HS19021252-16	20190219-DGW-MW11-PV25inlet-30-35-40T	Login	2/25/2019 11:09:14 AM	NDR	MET088
HS19021252-17	20190219-DGW-MW11-PV25mid-controlT	Login	2/25/2019 11:09:14 AM	NDR	MET088
HS19021252-18	20190219-DGW-MW11-PV25mid-30T	Login	2/25/2019 11:09:14 AM	NDR	MET088
HS19021252-19	20190219-DGW-MW11-PV25mid-35T	Login	2/25/2019 11:09:14 AM	NDR	MET088
HS19021252-20	20190219-DGW-MW11-PV25mid-40T	Login	2/25/2019 11:09:14 AM	NDR	MET088
HS19021252-21	20190205-DGW-MW11-PV20out-35D-DUP	Login	2/25/2019 11:09:14 AM	NDR	MET088
HS19021252-22	20190205-DGW-MW11-PV20out-35T-DUP	Login	2/25/2019 11:09:14 AM	NDR	MET088

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19021252
Date/Time Received: **25-Feb-2019 08:08**
Received by: **NDR**

Checklist completed by: *Nilesh D. Ranchod* eSignature — 25-Feb-2019 Date
Reviewed by: *Dane J. Wacasey* eSignature — 26-Feb-2019 Date

Matrices: **Water**
Carrier name: **FedEx International Priority**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	2 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☐	No ☑	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	16.5C/16.5C UC/C	IR # 11
Cooler(s)/Kit(s):	44338	
Date/Time sample(s) sent to storage:	02/25/2019 10:50PM	

Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes: Sx ids do not match. COC= 20190219-DGW-MW11-PV25out-Control D.
Labels = PV25out-30D, 35D & 40D
Labels = PV25out-30T, 35T & 40T .
Logged in per label Ids.

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

ALS Environmental

Chain of Custody Form

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HS19021252

Golder Associates
Exide Column Studies

Customer Information		Project Information			
PO Number	130-2086-01	Project Name	Exide column studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrette Parkway Drive, Suit	E	ICP TW (6020A total metals (6)+cations)
				F	ICP DISS (6020A diss metals (6)+cations-FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin Mo 63021	G	
Phone	314 984-8800	Phone	314 984-8800	H	
Fax		Fax		I	
e-Mail Address	evhite@golder.com	e-Mail Address		J	

ALS Project Manager:

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190218-DGW-MW11-PV25out-controlD	02-18-19	4:30 PM	GW	2	1						x					
2	20190218-DGW-MW11-PV25out-controlD	02-18-19	4:30 PM	GW	2	1						x					
3	20190218-DGW-MW11-PV25out-controlD	02-18-19	4:30 PM	GW	2	1						x					
4	20190218-DGW-MW11-PV25out-controlD	02-18-19	4:30 PM	GW	2	1						x					
5	20190219-DGW-MW11-PV25inlet-controlD	02-19-19	4:00 PM	GW	2	1						x					
6	20190219-DGW-MW11-PV25inlet-30-35-40D	02-19-19	4:00 PM	GW	2	1						x					
7	20190219-DGW-MW11-PV25mid-controlD	02-19-19	3:45 PM	GW	2	1						x					
8	20190219-DGW-MW11-PV25mid-30D	02-19-19	3:45 PM	GW	2	1						x					
9	20190219-DGW-MW11-PV25mid-35D	02-19-19	3:45 PM	GW	2	1						x					
10	20190219-DGW-MW11-PV25mid-40D	02-19-19	3:45 PM	GW	2	1						x					

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method:

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by: Giovanna Llamosas	Date: 2019/02/22	Time: 15:30	Received by:	Notes:	
Relinquished by:	Date: 2/21/19	Time: 09:08	Received by (Laboratory):	Cooler Temp. 16.1	QC Package: (Check Box Below)
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):		Level II: Standard QC [x] TRRP-Checklist
					Level III: Std QC + Raw Data [ ] TRRP Level IV
					Level IV: SW846 CLP-Like
					Other: _____

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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Chain of Custody Form

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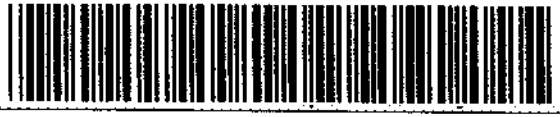
HS19021252

Golder Associates
Exide Column Studies



ALS Project Manager:

Customer Information		Project Information			
PO Number	130-2086-01	Project Name	Exide column studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrette Parkway Drive, Suit	E	ICP TW (6020A total metals (6)+cations)
				F	ICP DISS (6020A diss metals (6)+cations-FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin Mo 63021	G	
Phone	314 984-8800	Phone	314 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190218-DGW-MW11-PV25out-controlT	02-18-19	4:30 PM	GW	2	1				x	x						
2	20190218-DGW-MW11-PV25out-controlT	02-18-19	4:30 PM	GW	2	1				x	x						
3	20190218-DGW-MW11-PV25out-controlT	02-18-19	4:30 PM	GW	2	1				x	x						
4	20190218-DGW-MW11-PV25out-controlT	02-18-19	4:30 PM	GW	2	1				x	x						
5	20190219-DGW-MW11-PV25inlet-controlT	02-19-19	4:00 PM	GW	2	1				x	x						
6	20190219-DGW-MW11-PV25inlet-30-35-40T	02-19-19	4:00 PM	GW	2	1				x	x						
7	20190219-DGW-MW11-PV25mid-controlT	02-19-19	3:45 PM	GW	2	1				x	x						
8	20190219-DGW-MW11-PV25mid-30T	02-19-19	3:45 PM	GW	2	1				x	x						
9	20190219-DGW-MW11-PV25mid-35T	02-19-19	3:45 PM	GW	2	1				x	x						
10	20190219-DGW-MW11-PV25mid-40T	02-19-19	3:45 PM	GW	2	1				x	x						

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method:

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by: Giovanna Llamosas	Date: 2019/02/22	Time: 15:30	Received by:	Notes:
Relinquished by:	Date: 2/21/19	Time: 08:28	Received by (Laboratory):	Cooler Temp. 11.6
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	16.5

QC Package: (Check Box Below)

	Level II: Standard QC	x	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other: _____		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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Chain of Custody Form

Page 1 of 3

HS19021252

Golder Associates
Exide Column Studies

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222

Customer Information		Project Information		ALS Project Manager:
PO Number	130-2086-01	Project Name	Exide column studies	
Work Order		Project Number	130-2086	
Company Name	Golder Associates	Bill To Company	Golder Associates	
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrette Parkway Drive, Suit	
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin Mo 63021	
Phone	314 984-8800	Phone	314 984-8800	
Fax		Fax		
e-Mail Address	gwhite@golder.com	e-Mail Address		

	Parameter/Method Request for Analysis
A	300 W (300Cl, SO4, NO3-48h HT)
B	TDS W 2540C (2540C TDS)
C	ALK W 2320B (2320B alkalinity)
D	HARD (2340B hardness (calc))
E	ICP TW (6020A total metals (6)+cations)
F	ICP DISS (6020A diss metals (6)+cations-FldFltr)
G	
H	
I	
J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190205-DGW-MW11-PV20out-35D-DUP	02-05-19	12:30 PM	GW	2	1						X					
2	20190205-DGW-MW11-PV20out-35T-DUP	02-05-19	12:30 PM	GW	2	1				X	X						
3	20190205-FD-PV20out-30D-DUP	02-05-19	12:15 PM	GW	2	1						X					
4	20190205-FD-PV20out-30T-DUP	02-05-19	12:15 PM	GW	2	1				X	X						
5	20190208-DGW-MW3-PV30inlet-controlD-DUP	02-08-19	12:35 PM	GW	2	1						X					
6	20190208-DGW-MW3-PV30inlet-controlT-DUP	02-08-19	12:35 PM	GW	2	1				X	X						
7																	
8																	
9																	
10																	

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method:

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by: Giovanna Llamosas	Date: 2019/02/18	Time: 15:30	Received by:	Notes:	
Relinquished by:	Date: 2/25/19	Time: 08:08	Received by (Laboratory):	Cooler Temp. 16.5	QC Package: (Check Box Below)
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):		Level II: Standard QC; x TRRP-Checklist
					Level III: Std QC + Raw Data; TRRP Level IV
					Level IV: SW846 CLP-Like
					Other: _____

Preservative Key: 1-HCl 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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ORIGIN ID:YUXA (514) 382-4930
AUDREY ETHEVES
GOUDER ASSOCIATES LTD
7250 RUE DU MILE END
3E ETAGE
MONTREAL, PQ H2R3A4
CANADA CA

SHIP DATE: 22FEB19
ACTWGT: 19.25 LB
CAD: 104680724/INET4102

BILL RECIPIENT

TO DANE WACASEY
ALS HOUSTON LABORATORY
10450 STANCLIFF RD
STE 210
HOUSTON TX 77099
(281) 530-5656
INV:
PO:
REF:
DEPT:

(US)

565J2/0E3D/23AD

FedEx Express

TRK# 7745 3445 0443
0430

XH SGRA

77099
TX-US IAH

10:30A
INTL PRIORITY

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1. Pliez la page imprimée le long de la ligne horizontale.
2. Placez l'étiquette dans la pochette d'expédition et fixez-la à votre paquet.

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Les envois correspondant uniquement par voie terrestre vont ou depuis un pays ayant ratifié la Convention de Varsovie ou la Convention relative au contrat de transport international de marchandises par route (« CMR ») vont ou sont soumis aux termes et conditions de la CMR, sans préjudice de toute autre disposition contraire de la présente lettre de transport aérien. Conformément aux lois applicables, les dispositions de la CMR peuvent en cas de conflit entre les dispositions de la CMR et celles de la présente lettre de transport aérien, LIMITATION DE RESPONSABILITÉ. La responsabilité maximale de FedEx en cas de dommage, perte, retard, manque, erreur de livraison, défaut de livraison, information incorrecte ou défaut d'information relatives à l'envoi est limitée par le présent Contrat et conformément aux termes et conditions du contrat d'expédition, sauf en cas de responsabilité n'ayant pas lieu d'être par la Convention de Varsovie, la CMR ou autres traités internationaux, lois, dispositions réglementaires, décrets ou décisions. Veuillez vous référer à la section d'expédition ci-dessus dans le Guide des Services FedEx en vigueur ou document équivalent afin de déterminer les limites correspondantes. FedEx ne propose pas de responsabilité marchandises ni assurance tout risque. Sauf indication contraire, la valeur déclarée est supérieure et doit être indiquée. Si la valeur d'expédition déclarée est supérieure à 100 $ US, des frais supplémentaires sont acquittés, la responsabilité de FedEx équivaut alors à la valeur la plus faible entre la valeur déclarée et les dommages réels. EXCLUSION DE RESPONSABILITÉ. FEDEX NE SAURAIT EN AUCUN CAS ÊTRE TENU POUR RESPONSABLE DE TOUT DOMMAGE DIRECT, INDIRECT, ACCESSOIRE, SPÉCIAL OU CONSÉCUTIF SUPÉRIEUR À LA VALEUR D'EXPÉDITION DÉCLARÉE (Y COMPRIS, SANS QUE CELA SOIT LIMITATIF, DE PERTES DE REVENUS OU BÉNÉFICES) QUEL QUE SOIT LA VALEUR RÉELLE DE L'ENVOI, SI CELLE-CI EST INFÉRIEURE. SAUF DANS LES CAS OÙ LA LOI PROHIBE CETTE EXCLUSION, FEDEX N'EST PAS TENU DE VERSER DES DOMMAGES POURSUITES OU PÉNALITÉS, QUELLE QU'EN SOIT LA NATURE, RÉSULTANT DE L'UTILISATION DE VOTRE ENVOI. Par exemple, mais sans s'y limiter, FedEx ne saurait en aucun cas être tenu pour responsable de vos bénéfices ou économies, y compris, sans que cela soit limitatif, de détérioration incorrecte de marchandises, d'emballages, rétractation, marquage ou adressage inadéquats ou insuffisants de l'envoi, et dont également du fait ou omission du destinataire ou de quiconque pourrait être concerné par votre envoi, ni de la violation par l'une des parties des clauses du présent contrat. FedEx ne saurait en aucun cas être tenu pour responsable de tous dommages, pertes, retards, manques, erreurs de livraison, interruptions, inexactitudes ou défauts d'information relativement aux envois de liquides, dérivés ou autres marchandises inertes, ni d'événements hors de notre contrôle tels que risques climatiques naturels, risques aériens, conditions météorologiques, retards mécaniques, actes de terrorisme, grèves, émeutes publics, et des agissements ou omissions des autorités publiques (notamment dont des douanes ou représentants de la santé publique) ayant donné lieu à un DÉFAUT DE GARANTIE. Nous n'accordons aucune garantie, explicite ou tacite. RECOURS EN CAS DE PERTE, DOMMAGE OU RETARD. TOUS RECOURS DOIT ÊTRE EXERCÉ PAR ÉCRIT ET DANS DES DÉLAIS STRICTS. VOIR NOS TARIFS, LE GUIDE DES SERVICES FEDEX EN VIGUEUR OU LES CONDITIONS STANDARD D'EXPÉDITION POUR PLUS D'INFORMATIONS. La Convention de Varsovie prévoit des procédures de recours écrites spécifiques en cas de dommage, retard ou défaut de livraison des envois. En outre, l'interprétation et la mise en application des dispositions relatives aux délais de recours de la Convention de Varsovie peuvent varier d'un pays à l'autre. Veuillez vous référer à la Convention pour déterminer les délais de recours applicables à votre envoi. Le droit à dommages-intérêts présent, tout autre recours est limité dans un délai de deux ans, comme spécifié dans la Convention. FedEx n'est pas tenu de répondre à aucun recours n'ayant pas fait l'objet d'une réclamation écrite dans les délais susmentionnés. Le montant du recours peut ne pas être déduit des frais d'expédition. Si la destruction, perte ou l'envoi sans retour aucun dommage sur la totalité de l'envoi, FedEx considérera alors que la marchandise a été perdue dans des termes similaires. Afin que nous puissions répondre aux demandes de dommages, nous vous demandons de vérifier à votre disposition les contenus, contenu d'expédition et emballages d'origine à des fins d'inspection. DROIT IMPÉRATIF. Dès lors que l'une des dispositions est jugée ou déclarée nulle et privée de toute force ou effet par un tribunal, les dispositions restant en vigueur dans le cadre du présent contrat dans la mesure où celui-ci n'est pas annulé. Le fait que l'une des dispositions soit invalide ou inapplicable n'affecte pas les autres parties de la présente lettre de transport aérien. Seule juridiction connaître, FEDERAL EXPRESS CORPORATION, 2005 Corporate Avenue, Memphis, TN 38132, USA, est le premier transporteur du présent envoi.

ORIGIN ID:YUXA (514) 383-0990
audrey etheves
Golder Associates Ltd
7250 rue du Mile End
3e etage
MONTREAL, PQ H2R3A4
CANADA, CA

SHIP DATE: 22FEB19
ACTWGT: 19.25 LB
CAD: 106680724/NET4102

BILL RECIPIENT
EINVAT:

TO Dane Wacasey
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

(281) 530-5656

FedEx Express

(US)

J19109019025dv

AWB

XH SGRA

PKG:YOUR PKG

TRK# 7745 3445 0443

Form
0430

10:30A
INTL PRIORITY

REF:
DESC1:Bouteille d'eau
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: audrey etheves
T/C: R 967554812
D/T: R 967554812

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2. Placez l'étiquette dans la pochette d'expédition et fixez-la à votre paquet.

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

March 20, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19030525**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 4 sample(s) on Mar 12, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19030525**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19030525**	

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 03/20/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19030525				
Reviewer Name: Bernadette Fini			Prep Batch Number(s): R334416,R334465,R334738				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	X				
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?	X				
		Were analytical duplicates analyzed at the appropriate frequency?	X				
		Were RPDs or relative standard deviations within the laboratory QC limits?	X				
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 03/20/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19030525				
Reviewer Name: Bernadette Fini			Prep Batch Number(s): R334416,R334465,R334738				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			1
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports	
Laboratory Name: ALS Laboratory Group	LRC Date: 03/20/2019
Project Name: Exide Column Studies	Laboratory Job Number: HS19030525
Reviewer Name: Bernadette Fini	Prep Batch Number(s): R334416,R334465,R334738

ER#[5]	Description
1	See Run Log and CCB Exceptions Report.

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030525
Start Date: 12-Mar-2019 End Date: 13-Mar-2019

Run ID:ICS2100_334465
Instrument:ICS2100
Method:E300

Sample No.	D/F	Time	FileID	Analytes
CCV 1	1	12-Mar-2019 14:57		CL NO3N SO4
CCB 1	1	12-Mar-2019 15:12		CL NO3N SO4
WBLKW1-031219	1	12-Mar-2019 15:26		CL NO3N SO4
WLCSW1-031219	1	12-Mar-2019 15:41		CL NO3N SO4
WLCSDW1-031219	1	12-Mar-2019 15:56		CL NO3N SO4
ZZZZZZMS	1	12-Mar-2019 18:28		CL NO3N SO4
ZZZZZZMSD	1	12-Mar-2019 18:42		CL NO3N SO4
CCB 2	1	12-Mar-2019 19:41		CL NO3N SO4
20190311-DGW-MW3-PV40out-Control	5	12-Mar-2019 20:10		SO4
20190311-DGW-MW3-PV40out-30	2	12-Mar-2019 20:25		SO4
20190311-DGW-MW3-PV40out-35	2	12-Mar-2019 20:39		SO4
20190311-DGW-MW3-PV40out-40	2	12-Mar-2019 20:54		SO4
ZZZZZZMS	10	12-Mar-2019 21:53		CL NO3N SO4
ZZZZZZMSD	10	12-Mar-2019 22:07		CL NO3N SO4
CCV 2	1	12-Mar-2019 22:22		CL NO3N SO4
CCB 3	1	12-Mar-2019 22:37		CL NO3N SO4
20190311-DGW-MW3-PV40out-Control	1	12-Mar-2019 23:06		CL NO3N
20190311-DGW-MW3-PV40out-30	1	12-Mar-2019 23:21		CL NO3N
20190311-DGW-MW3-PV40out-35	1	12-Mar-2019 23:35		CL NO3N
20190311-DGW-MW3-PV40out-40	1	12-Mar-2019 23:50		CL NO3N
CCB 4	1	13-Mar-2019 01:32		CL NO3N SO4
CCV 3	1	13-Mar-2019 04:13		CL NO3N SO4
CCB 5	1	13-Mar-2019 04:28		CL NO3N SO4

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030525

Run ID:ICS2100_334465
Instrument:ICS2100
Method:E300

CCB 2 Date: 12-Mar-2019 19:41 Seq: 4989006 D/F: 1 Units: ug/L

Analyte	Result	MDL	Report Limit
Chloride	215	200	500
Sulfate	260	200	500

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19030525

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19030525-01	20190311-DGW-MW3-PV40out-Control	Groundwater		11-Mar-2019 10:55	12-Mar-2019 07:55	☐
HS19030525-02	20190311-DGW-MW3-PV40out-30	Groundwater		11-Mar-2019 10:55	12-Mar-2019 07:55	☐
HS19030525-03	20190311-DGW-MW3-PV40out-35	Groundwater		11-Mar-2019 10:55	12-Mar-2019 07:55	☐
HS19030525-04	20190311-DGW-MW3-PV40out-40	Groundwater		11-Mar-2019 10:55	12-Mar-2019 07:55	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190311-DGW-MW3-PV40out-Control
Collection Date: 11-Mar-2019 10:55

ANALYTICAL REPORT
WorkOrder:HS19030525
Lab ID:HS19030525-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**48.9**		**0.200**	**0.500**	**mg/L**	1	12-Mar-2019 23:06
Nitrogen, Nitrate (As N)	U		0.0300	0.100	mg/L	1	12-Mar-2019 23:06
Sulfate	**224**		**1.00**	**2.50**	**mg/L**	5	12-Mar-2019 20:10
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	**774**		**5.00**	**10.0**	**mg/L**	1	18-Mar-2019 08:15
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**453**		**5.00**	**5.00**	**mg/L**	1	13-Mar-2019 02:52
Alkalinity, Carbonate (As CaCO3)	**28.8**		**5.00**	**5.00**	**mg/L**	1	13-Mar-2019 02:52
Alkalinity, Total (As CaCO3)	**482**		**5.00**	**5.00**	**mg/L**	1	13-Mar-2019 02:52

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190311-DGW-MW3-PV40out-30
Collection Date: 11-Mar-2019 10:55

ANALYTICAL REPORT
WorkOrder:HS19030525
Lab ID:HS19030525-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**45.8**		**0.200**	**0.500**	**mg/L**	1	12-Mar-2019 23:21
Nitrogen, Nitrate (As N)	U		0.0300	0.100	mg/L	1	12-Mar-2019 23:21
Sulfate	**145**		**0.400**	**1.00**	**mg/L**	2	12-Mar-2019 20:25
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	**504**		**5.00**	**10.0**	**mg/L**	1	18-Mar-2019 08:15
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**233**		**5.00**	**5.00**	**mg/L**	1	13-Mar-2019 03:16
Alkalinity, Carbonate (As CaCO3)	**64.2**		**5.00**	**5.00**	**mg/L**	1	13-Mar-2019 03:16
Alkalinity, Total (As CaCO3)	**298**		**5.00**	**5.00**	**mg/L**	1	13-Mar-2019 03:16

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190311-DGW-MW3-PV40out-35
Collection Date: 11-Mar-2019 10:55

ANALYTICAL REPORT
WorkOrder:HS19030525
Lab ID:HS19030525-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**45.5**		**0.200**	**0.500**	**mg/L**	1	12-Mar-2019 23:35
Nitrogen, Nitrate (As N)	U		0.0300	0.100	mg/L	1	12-Mar-2019 23:35
Sulfate	**150**		**0.400**	**1.00**	**mg/L**	2	12-Mar-2019 20:39
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	**456**		**5.00**	**10.0**	**mg/L**	1	18-Mar-2019 08:15
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**217**		**5.00**	**5.00**	**mg/L**	1	13-Mar-2019 03:23
Alkalinity, Carbonate (As CaCO3)	**63.0**		**5.00**	**5.00**	**mg/L**	1	13-Mar-2019 03:23
Alkalinity, Total (As CaCO3)	**280**		**5.00**	**5.00**	**mg/L**	1	13-Mar-2019 03:23

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190311-DGW-MW3-PV40out-40
Collection Date: 11-Mar-2019 10:55

ANALYTICAL REPORT
WorkOrder:HS19030525
Lab ID:HS19030525-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**47.7**		**0.200**	**0.500**	**mg/L**	1	12-Mar-2019 23:50
Nitrogen, Nitrate (As N)	U		0.0300	0.100	mg/L	1	12-Mar-2019 23:50
Sulfate	**144**		**0.400**	**1.00**	**mg/L**	2	12-Mar-2019 20:54
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	**424**		**5.00**	**10.0**	**mg/L**	1	18-Mar-2019 08:15
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**233**		**5.00**	**5.00**	**mg/L**	1	13-Mar-2019 03:30
Alkalinity, Carbonate (As CaCO3)	**46.4**		**5.00**	**5.00**	**mg/L**	1	13-Mar-2019 03:30
Alkalinity, Total (As CaCO3)	**279**		**5.00**	**5.00**	**mg/L**	1	13-Mar-2019 03:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030525

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R334416	**Test Name :** ALKALINITY BY SM2320B				**Matrix:** Groundwater	
HS19030525-01	20190311-DGW-MW3-PV40out-Control	11 Mar 2019 10:55			13 Mar 2019 02:52	1
HS19030525-02	20190311-DGW-MW3-PV40out-30	11 Mar 2019 10:55			13 Mar 2019 03:16	1
HS19030525-03	20190311-DGW-MW3-PV40out-35	11 Mar 2019 10:55			13 Mar 2019 03:23	1
HS19030525-04	20190311-DGW-MW3-PV40out-40	11 Mar 2019 10:55			13 Mar 2019 03:30	1
Batch ID R334465	**Test Name :** ANIONS BY E300.0				**Matrix:** Groundwater	
HS19030525-01	20190311-DGW-MW3-PV40out-Control	11 Mar 2019 10:55			12 Mar 2019 23:06	1
HS19030525-01	20190311-DGW-MW3-PV40out-Control	11 Mar 2019 10:55			12 Mar 2019 20:10	5
HS19030525-02	20190311-DGW-MW3-PV40out-30	11 Mar 2019 10:55			12 Mar 2019 23:21	1
HS19030525-02	20190311-DGW-MW3-PV40out-30	11 Mar 2019 10:55			12 Mar 2019 20:25	2
HS19030525-03	20190311-DGW-MW3-PV40out-35	11 Mar 2019 10:55			12 Mar 2019 23:35	1
HS19030525-03	20190311-DGW-MW3-PV40out-35	11 Mar 2019 10:55			12 Mar 2019 20:39	2
HS19030525-04	20190311-DGW-MW3-PV40out-40	11 Mar 2019 10:55			12 Mar 2019 23:50	1
HS19030525-04	20190311-DGW-MW3-PV40out-40	11 Mar 2019 10:55			12 Mar 2019 20:54	2
Batch ID R334738	**Test Name :** TOTAL DISSOLVED SOLIDS BY SM2540C				**Matrix:** Groundwater	
HS19030525-01	20190311-DGW-MW3-PV40out-Control	11 Mar 2019 10:55			18 Mar 2019 08:15	1
HS19030525-02	20190311-DGW-MW3-PV40out-30	11 Mar 2019 10:55			18 Mar 2019 08:15	1
HS19030525-03	20190311-DGW-MW3-PV40out-35	11 Mar 2019 10:55			18 Mar 2019 08:15	1
HS19030525-04	20190311-DGW-MW3-PV40out-40	11 Mar 2019 10:55			18 Mar 2019 08:15	1

WorkOrder: HS19030525
InstrumentID: ICS2100
Test Code: 300_W
Test Number: E300
Test Name: Anions by E300.0

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Chloride	16887-00-6	0.500	0.581	0.200	0.500
A	Nitrogen, Nitrate (As N)	14797-55-8	0.100	0.107	0.0300	0.100
A	Sulfate	14808-79-8	0.500	0.626	0.200	0.500

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030525

QC BATCH REPORT NEW

Batch ID: R334416 (0) **Instrument: ManTech01** **Method: ALKALINITY BY SM2320B**

MBLK Sample ID: **WBLKW2-190312** Units: **mg/L** Analysis Date: **12-Mar-2019 23:38**
Client ID: Run ID: **ManTech01_334416** SeqNo: **4987980** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	U	5.00								
Alkalinity, Carbonate (As CaCO3)	U	5.00								
Alkalinity, Total (As CaCO3)	U	5.00								

LCS Sample ID: **WLCS2-190312** Units: **mg/L** Analysis Date: **12-Mar-2019 23:46**
Client ID: Run ID: **ManTech01_334416** SeqNo: **4987981** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1047	5.00	1000	0	105	85 - 115				
Alkalinity, Total (As CaCO3)	1065	5.00	1000	0	106	85 - 115				

LCSD Sample ID: **WLCSD2-190312** Units: **mg/L** Analysis Date: **12-Mar-2019 23:55**
Client ID: Run ID: **ManTech01_334416** SeqNo: **4987982** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1048	5.00	1000	0	105	85 - 115	1047	0.0115	20	
Alkalinity, Total (As CaCO3)	1065	5.00	1000	0	106	85 - 115	1065	0.0301	20	

DUP Sample ID: **HS19030358-01DUP** Units: **mg/L** Analysis Date: **13-Mar-2019 00:40**
Client ID: Run ID: **ManTech01_334416** SeqNo: **4987986** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	2106	5.00					2107	0.0603	20	
Alkalinity, Carbonate (As CaCO3)	251.4	5.00					254.9	1.41	20	
Alkalinity, Total (As CaCO3)	2357	5.00					2362	0.204	20	

The following samples were analyzed in this batch: HS19030525-01 HS19030525-02 HS19030525-03 HS19030525-04

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030525

QC BATCH REPORT NEW

Batch ID: R334465 (0) **Instrument: ICS2100** **Method: ANIONS BY E300.0**

MBLK Sample ID: **WBLKW1-031219** Units: **mg/L** Analysis Date: **12-Mar-2019 15:26**
Client ID: Run ID: **ICS2100_334465** SeqNo: **4988995** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	0.500								
Nitrogen, Nitrate (As N)	U	0.100								
Sulfate	U	0.500								

LCS Sample ID: **WLCSW1-031219** Units: **mg/L** Analysis Date: **12-Mar-2019 15:41**
Client ID: Run ID: **ICS2100_334465** SeqNo: **4988996** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.83	0.500	20	0	99.1	90 - 110				
Nitrogen, Nitrate (As N)	3.872	0.100	4	0	96.8	90 - 110				
Sulfate	19.73	0.500	20	0	98.6	90 - 110				

LCSD Sample ID: **WLCSDW1-031219** Units: **mg/L** Analysis Date: **12-Mar-2019 15:56**
Client ID: Run ID: **ICS2100_334465** SeqNo: **4988997** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.67	0.500	20	0	98.4	90 - 110	19.83	0.795	20	
Nitrogen, Nitrate (As N)	3.834	0.100	4	0	95.8	90 - 110	3.872	0.986	20	
Sulfate	19.62	0.500	20	0	98.1	90 - 110	19.73	0.585	20	

MS Sample ID: **HS19030509-01MS** Units: **mg/L** Analysis Date: **12-Mar-2019 18:28**
Client ID: Run ID: **ICS2100_334465** SeqNo: **4989001** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	69.69	0.500	10	60.03	96.6	80 - 120				O
Nitrogen, Nitrate (As N)	1.824	0.100	2	0.08	87.2	80 - 120				
Sulfate	20.48	0.500	10	10.7	97.8	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030525

QC BATCH REPORT NEW

Batch ID: R334465 (0) **Instrument: ICS2100** **Method: ANIONS BY E300.0**

MS Sample ID: **HS19030118-01MS** Units: **mg/L** Analysis Date: **12-Mar-2019 21:53**
Client ID: Run ID: **ICS2100_334465** SeqNo: **4989014** PrepDate: DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	395.4	5.00	100	294.3	101	80 - 120				
Nitrogen, Nitrate (As N)	25.18	1.00	20	6.142	95.2	80 - 120				
Sulfate	177.7	5.00	100	78.8	98.9	80 - 120				

MSD Sample ID: **HS19030509-01MSD** Units: **mg/L** Analysis Date: **12-Mar-2019 18:42**
Client ID: Run ID: **ICS2100_334465** SeqNo: **4989002** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	70.44	0.500	10	60.03	104	80 - 120	69.69	1.07	20	O
Nitrogen, Nitrate (As N)	1.849	0.100	2	0.08	88.4	80 - 120	1.824	1.36	20	
Sulfate	20.69	0.500	10	10.7	99.9	80 - 120	20.48	1	20	

MSD Sample ID: **HS19030118-01MSD** Units: **mg/L** Analysis Date: **12-Mar-2019 22:07**
Client ID: Run ID: **ICS2100_334465** SeqNo: **4989015** PrepDate: DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	399.3	5.00	100	294.3	105	80 - 120	395.4	0.979	20	
Nitrogen, Nitrate (As N)	25.52	1.00	20	6.142	96.9	80 - 120	25.18	1.36	20	
Sulfate	179.8	5.00	100	78.8	101	80 - 120	177.7	1.16	20	

The following samples were analyzed in this batch: HS19030525-01 HS19030525-02 HS19030525-03 HS19030525-04

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030525

QC BATCH REPORT NEW

Batch ID: R334738 (0) **Instrument: Balance1** **Method: TOTAL DISSOLVED SOLIDS BY SM2540C**

MBLK Sample ID: **WBLK-031819** Units: **mg/L** Analysis Date: **18-Mar-2019 08:15**
Client ID: Run ID: **Balance1_334738** SeqNo: **4994518** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	U	10.0								

LCS Sample ID: **WLCS-031819** Units: **mg/L** Analysis Date: **18-Mar-2019 08:15**
Client ID: Run ID: **Balance1_334738** SeqNo: **4994519** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	1056	10.0	1000	0	106	85 - 115				

DUP Sample ID: **HS19030751-01DUP** Units: **mg/L** Analysis Date: **18-Mar-2019 08:15**
Client ID: Run ID: **Balance1_334738** SeqNo: **4994516** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	26180	10.0					26860	2.56	5	

DUP Sample ID: **HS19030715-01DUP** Units: **mg/L** Analysis Date: **18-Mar-2019 08:15**
Client ID: Run ID: **Balance1_334738** SeqNo: **4996343** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	874	10.0					870	0.459	5	

The following samples were analyzed in this batch: HS19030525-01 HS19030525-02 HS19030525-03 HS19030525-04

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19030525**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
California	2919, 2018-2019	30-Apr-2019
Maryland	343, 2018-2019	30-Jun-2019

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19030525
Date/Time Received: **12-Mar-2019 07:55**
Received by: **JRM**

Checklist completed by: *Pablo Marinez* eSignature 15-Jan-2019 Date
Reviewed by: *Bernadette A. Fini* eSignature 13-Mar-2019 Date

Matrices: **WATER**
Carrier name: **FedEx International Priority**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	0.9c/0.9c UC/C	IR25	
Cooler(s)/Kit(s):	44478		
Date/Time sample(s) sent to storage:	03/12/2019 10:10		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

ALS Environmental

Chain of Custody Form

Page 1 of 1

HS19030525

Golder Associates
Exide Column Studies

Work Order #:

ALS Project Manager:

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086-06	Project Name	Exide Column Studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086-06	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suite 260	Address	13515 Barrett Parkway Drive, Suite 260	E	ICP TW (6020A total metals (6)+cations)
				F	ICP DISS (6020A diss metals (6)+cations-FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	G	
Phone	314 984-8800	Phone	314 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190311-DGW-MW3-PV40out-control	03-11-19	10:55 AM	GW	8	1	x	x	x								
2	20190311-DGW-MW3-PV40out-30	03-11-19	10:55 AM	GW	8	1	x	x	x								
3	20190311-DGW-MW3-PV40out-35	03-11-19	10:55 AM	GW	8	1	x	x	x								
4	20190311-DGW-MW3-PV40out-40	03-11-19	10:55 AM	GW	8	1	x	x	x								
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method:

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by: Giovanna Llamosas	Date: 2019/03/11	Time: 15:30	Received by:	Notes:
Relinquished by:	Date: 3/12/19	Time: 08:50	Received by (Laboratory): 5 maroon	Cooler Temp. uc
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	0.9

QC Package: (Check Box Below)

	Level II: Standard QC	x	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other: _____		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

H2S @ 0.0

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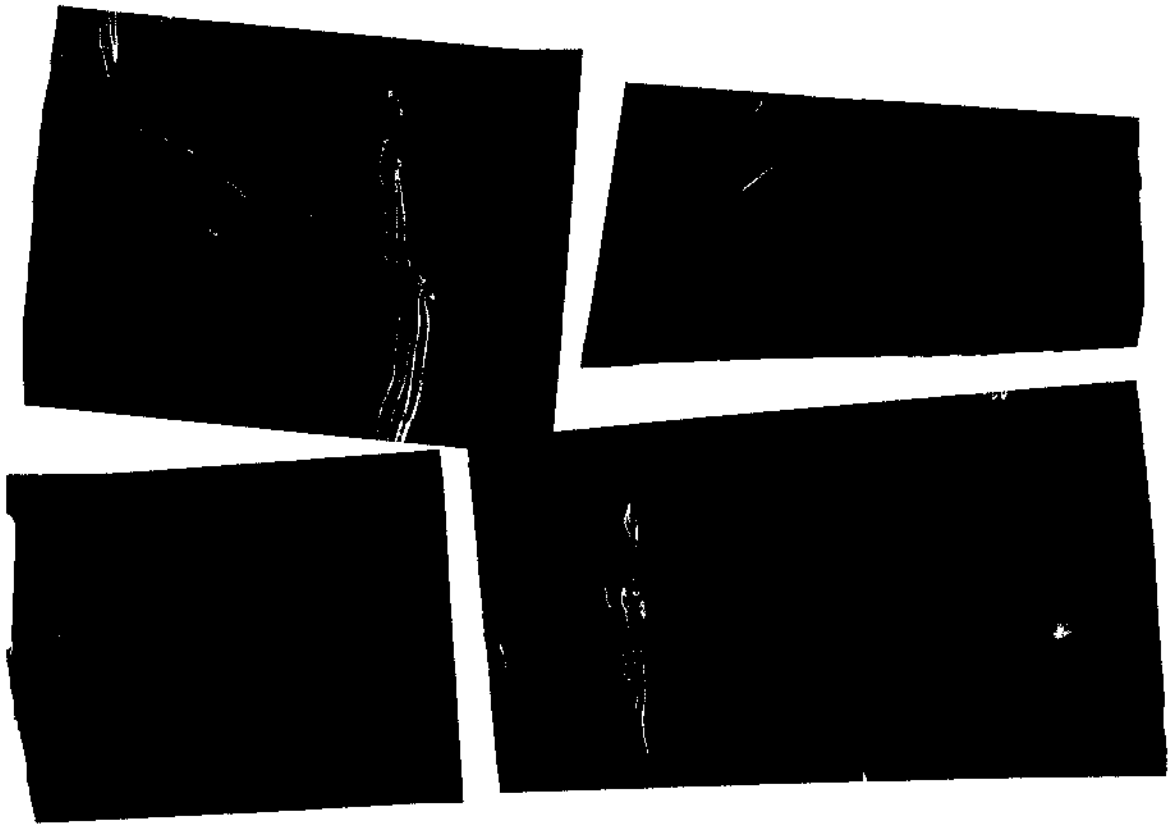

ORIGIN ID:YUXA (514) 383-0990
TATIANA LOPEZ (NATALIE)
GOLDER ASSOCIATES LTD
7250 RUE DU MILE END
3E ETAGE
MONTREAL, PQ H2R3A4
CANADA CA

SHIP DATE: 11MAR19
ACTWGT: 36.00 LB
CAD: 108860724/INET4100
DIMS: 13x25x14 IN

BILL RECIPIENT

TO DANE WACASEY
ALS HOUSTON LABORATORY
10450 STANCLIFF RD
STE 210
HOUSTON TX 77099
(281) 530-5656 REF: BETTINA EMILE
INV:
PO: DEPT:

(US)

565J1/4603/23AD

FedEx Express

E

TRK# 7746 7156 0488
0430

X1 SGRA

8:00A
INTL FIRST

77099
TX-US IAH

Après l'impression de cette étiquette:

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MODALITÉS JURIDIQUES RELATIVES AUX DÉFINITIONS DES EXPÉDITIONS FEDEX. Sur la présente lettre de transport aérien, "nous", "notre" et "FedEx" désignent Federal Express Corporation, ses filiales et succursales ainsi que leurs employés, agents et entrepreneurs indépendants respectifs. "Vous" et "votre" désignent l'expéditeur, ses employés, commettants et agents. Si votre envoi provient de l'extérieur des États-Unis, votre contrat de transport est conclu avec la filiale, la succursale ou l'entrepreneur indépendant de FedEx ayant initialement accepté l'envoi de votre part. "Colis" s'entend de tout contenant que nous acceptons pour livraison, y compris les articles que vous soumettez par nos systèmes automatisés, appareils de mesure ou lettres de transport aérien. "Envoi" désigne tous les colis qui nous sont présentés et que nous acceptons de faire figurer sur une seule lettre de transport aérien. NOTIFICATION DE TRANSPORT AÉRIEN. La Convention de Varsovie, telle que modifiée, peut s'appliquer à n'importe quel envoi à destination internationale acheminé par voie aérienne. Dans un tel cas, la Convention régit et, dans la plupart des cas, limite la responsabilité de FedEx en ce qui a trait à la perte, au retard ou à l'endommagement de votre envoi. La Convention de Varsovie, telle que modifiée, limite la responsabilité de FedEx. Par exemple, aux États-Unis, notre responsabilité se limite à 20 $ par kilogramme (9,07 $ par livre), à moins que vous ne déclariez une valeur supérieure, comme précisé ci-dessous, et que vous acquittiez tout supplément applicable. L'interprétation et l'application des limites de responsabilité prévues par la Convention de Varsovie peuvent varier selon le pays. Aucun arrêt spécifique n'est convenu à l'avance et FedEx se réserve le droit d'acheminer l'envoi de la manière qui lui semble la plus appropriée. NOTIFICATION DE TRANSPORT TERRESTRE. Les envois transportés exclusivement par voie terrestre, à partir ou vers un pays qui adhère à la Convention de Varsovie ou à la Convention relative au transport des marchandises par route (CMR), sont soumis aux modalités de la CMR, nonobstant toute disposition contraire dans la présente lettre de transport aérien. Pour les envois transportés uniquement par voie terrestre, en cas de conflit entre les dispositions de la CMR et celles de la présente lettre de transport aérien, les modalités de la CMR prévaudront. LIMITE DE RESPONSABILITÉ. Si elle n'est pas régie par la Convention de Varsovie, la CMR ou d'autres traités ou lois internationaux, réglementations gouvernementales, décrets ou exigences, la responsabilité maximale de FedEx pour les dommages, pertes, objets manquants, mauvaise livraison, non-livraison, renseignements erronés ou défaut de fournir des renseignements liés à votre envoi est limitée par la présente entente et les modalités et conditions du contrat de transport. Veuillez vous reporter au contrat de transport établi dans le Guide des services de FedEx applicable ou son équivalent, afin de déterminer les limites contractuelles. FedEx ne fournit pas d'assurance tous risques ou des marchandises, mais il vous est possible de payer une somme supplémentaire pour chaque 100 $US supplémentaire (ou devise locale équivalente pour le pays d'origine) de la valeur déclarée de transport. Si vous déclarez une valeur de transport plus élevée et que vous payez les frais additionnels, la responsabilité maximale de FedEx s'élèvera à la valeur déclarée pour le transport ou à la valeur des dommages réels, soit le moins élevé. RESPONSABILITÉS NON ASSUMÉES. FEDEX NE POURRA EN AUCUN CAS ÊTRE RESPONSABLE DES DOMMAGES DIRECTS, INDIRECTS, ACCESSOIRES, SPÉCIAUX OU CONSÉCUTIFS EN EXCÉDENT DE LA VALEUR DÉCLARÉE POUR LE TRANSPORT (Y COMPRIS, SANS S'Y LIMITER, CEUX RÉSULTANT DE PERTES DE REVENUS OU DE PROFITS) OU DE LA VALEUR RÉELLE DE L'ENVOI, SI ELLE EST INFÉRIEURE, QUE FEDEX SACHE OU AURAIT DU SAVOIR OU NON QUE DES DOMMAGES POUVAIENT ÊTRE ENCOURUS. FedEx ne sera pas responsable de vos actes ou omissions, y compris, mais sans s'y limiter, de toute déclaration de marchandises inexacte, d'emballage, de protection, de marquage ou d'indication d'adresse inadéquats ou insuffisants, ou encore des actes ou omissions du destinataire ou de toute personne ayant un intérêt dans l'envoi, ou si l'une ou l'autre partie manquait à toute condition de notre accord. FedEx ne sera pas responsable en cas de pertes, de dommages, de délais, d'objets manquants, de livraison erronée, de livraison non effectuée, de fausses informations ou d'informations manquantes relativement aux envois d'argent comptant, de devises ou d'autres articles prohibés, ou en cas d'événements indépendants de la volonté de FedEx, tels que des cas fortuits ou de force majeure, des risques du transport aérien, des conditions météorologiques, des retards mécaniques, des actes d'ennemis publics, des guerres, des grèves, des agitations civiles ou des actes ou omissions des autorités publiques (y compris les fonctionnaires de la douane et de la santé) ayant l'autorité réelle ou apparente. INEXISTENCE DE GARANTIE. Nous n'offrons aucune garantie, expresse ou tacite. DEMANDES RELATIVES À UNE PERTE, UN DOMMAGE OU UN RETARD. TOUTES LES RÉCLAMATIONS DOIVENT NOUS ÊTRE SIGNALÉES PAR ÉCRIT, ET À L'INTÉRIEUR DE DÉLAIS STRICTS. CONSULTEZ NOTRE TARIF, LE GUIDE DES SERVICES DE FEDEX APPLICABLE OU LES CONDITIONS STANDARD DE TRANSPORT POUR PLUS DE DÉTAILS. La Convention de Varsovie a établi des procédures de réclamation écrites détaillées pour les dommages, retards ou non-livraison des envois. En outre, l'interprétation et l'application des dispositions relatives aux réclamations telles qu'elles sont stipulées dans la Convention de Varsovie peuvent varier selon les pays. Veuillez vous reporter à la Convention afin de déterminer la période de réclamation qui se rapporte à votre envoi. Le réclamant ne pourra plus réclamer de dommages-intérêts à FedEx si aucune poursuite n'est engagée dans un délai de deux ans, tel que stipulé dans la Convention. FedEx n'est pas tenue de répondre à quelque réclamation que ce soit avant que tous les frais de transport aient été réglés. Le montant de la réclamation ne peut être déduit des frais de transport. Si le destinataire accepte l'envoi sans prendre note de dommages au registre de livraison, FedEx assumera que l'envoi a été livré en bon état. Afin de nous permettre de traiter les réclamations pour dommages, le contenu, les cartons et emballages d'expédition d'origine doivent être conservés pour nous permettre de les examiner. DISPOSITIONS IMPÉRATIVES. Dans la mesure où l'une des dispositions contenues ou indiquées dans la présente lettre de transport aérien est contraire à tout traité international, loi, réglementation, ordonnance ou exigence gouvernementale en vigueur, ladite disposition restera applicable en tant que partie de notre accord tant qu'elle ne sera pas rendue caduque. L'invalidité ou le caractère inexécutoire de toute disposition n'affectera aucune autre partie de la présente lettre de transport aérien. À moins d'indications contraires, FEDERAL EXPRESS CORPORATION, 2005 Corporate Avenue, Memphis, TN 38132, USA, est le transporteur principal de l'envoi. Adresse de courriel sur le site www.fedex.com

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

March 20, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19030568**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 20 sample(s) on Mar 12, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19030568**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19030568**	

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data								
Laboratory Name: ALS Laboratory Group			LRC Date: 03/20/2019					
Project Name: Exide Column Studies			Laboratory Job Number: HS19030568					
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 138728,138730,R334820					
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]	
R1	OI	**Chain-of-custody (C-O-C)**						
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X					
		Were all departures from standard conditions described in an exception report?	X					
R2	OI	**Sample and quality control (QC) identification**						
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X					
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X					
R3	OI	**Test reports**						
		Were all samples prepared and analyzed within holding times?	X					
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X					
		Were calculations checked by a peer or supervisor?	X					
		Were all analyte identifications checked by a peer or supervisor?	X					
		Were sample detection limits reported for all analytes not detected?	X					
		Were all results for soil and sediment samples reported on a dry weight basis?			X			
		Were % moisture (or solids) reported for all soil and sediment samples?			X			
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X			
		If required for the project, TICs reported?			X			
R4	O	**Surrogate recovery data**						
		Were surrogates added prior to extraction?			X			
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X			
R5	OI	**Test reports/summary forms for blank samples**						
		Were appropriate type(s) of blanks analyzed?	X					
		Were blanks analyzed at the appropriate frequency?	X					
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X					
		Were blank concentrations < MQL?	X					
R6	OI	**Laboratory control samples (LCS):**						
		Were all COCs included in the LCS?	X					
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X					
		Were LCSs analyzed at the required frequency?	X					
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X					
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X					
		Was the LCSD RPD within QC limits?	X					
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**						
		Were the project/method specified analytes included in the MS and MSD?	X					
		Were MS/MSD analyzed at the appropriate frequency?	X					
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1	
		Were MS/MSD RPDs within laboratory QC limits?	X					
R8	OI	**Analytical duplicate data**						
		Were appropriate analytical duplicates analyzed for each matrix?			X			
		Were analytical duplicates analyzed at the appropriate frequency?			X			
		Were RPDs or relative standard deviations within the laboratory QC limits?			X			
R9	OI	**Method quantitation limits (MQLs):**						
		Are the MQLs for each method analyte included in the laboratory data package?	X					
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X					
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X					
R10	OI	**Other problems/anomalies**						
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X					
		Were all necessary corrective actions performed for the reported data?	X					
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X					
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X					

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 03/20/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19030568				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 138728,138730,R334820				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			2
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports		
Laboratory Name: ALS Laboratory Group		LRC Date: 03/20/2019
Project Name: Exide Column Studies		Laboratory Job Number: HS19030568
Reviewer Name: Dane Wacasey		Prep Batch Number(s): 138728,138730,R334820
ER#[5]	**Description**	
1	Batch 138728, Metals Method SW6020, sample 20190225-DGW-MW3-PV35outcontrolT, MS and MSD recovered outside the control limits for Calcium and Sodium, however, the result in the parent sample is greater than 4x the spike amount. Batch 138730, Metals Method SW6020, sample 20190225-DGW-MW3-PV35outcontrolD, MS and MSD recovered outside the control limits for Sodium, however, the result in the parent sample is greater than 4x the spike amount.	
2	See Run Log and CCB Exceptions Report.	

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030568
Start Date: 18-Mar-2019 End Date: 18-Mar-2019

Run ID:ICPMS04_334708
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	18-Mar-2019 12:52	033_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	18-Mar-2019 12:54	034SMPL.d	AS CA CD FE K MG NA PB SB SE
LLICV5	1	18-Mar-2019 12:57	035LICV.d	AS CA CD FE K MG NA PB SB SE
ICB	1	18-Mar-2019 12:59	036_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	18-Mar-2019 13:08	038ICSA.d	AS CA CD FE K MG NA PB SB SE
ICSAB	1	18-Mar-2019 13:10	039ICSB.d	AS CA CD FE K MG NA PB SB SE
CCV 1	1	18-Mar-2019 13:39	048_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	18-Mar-2019 13:42	049_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	18-Mar-2019 14:38	055_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	18-Mar-2019 14:45	058_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-138730	1	18-Mar-2019 14:51	059SMPL.d	AS CA CD FE K MG NA PB SB SE
LCS-138730	1	18-Mar-2019 14:53	060SMPL.d	AS CA CD FE K MG NA PB SB SE
20190225-DGW-MW3-PV35out-controlD	10	18-Mar-2019 14:56	061SMPL.d	CA NA
20190225-DGW-MW3-PV35out-controlDSD	50	18-Mar-2019 14:58	062SMPL.d	CA NA
20190225-DGW-MW3-PV35out-controlDMS	10	18-Mar-2019 15:00	063SMPL.d	CA NA
20190225-DGW-MW3-PV35out-controlDMSD	10	18-Mar-2019 15:02	064SMPL.d	CA NA
20190225-DGW-MW3-PV35out-controlDPDS	10	18-Mar-2019 15:05	065SMPL.d	CA NA
20190225-DGW-MW3-PV35out-30D	1	18-Mar-2019 15:07	066SMPL.d	AS CA CD FE K MG PB SB SE
20190225-DGW-MW3-PV35out-35D	1	18-Mar-2019 15:09	067SMPL.d	AS CA CD FE K MG PB SB SE
CCV 3	1	18-Mar-2019 15:15	069_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	18-Mar-2019 15:23	072_CCB.d	AS CA CD FE K MG NA PB SB SE
20190225-DGW-MW3-PV35out-40D	1	18-Mar-2019 15:31	073SMPL.d	AS CA CD FE K MG PB SB SE
20190225-DGW-MW3-PV35inlet-controlD	1	18-Mar-2019 15:33	074SMPL.d	AS CA CD FE K MG PB SB SE
20190225-DGW-MW3-PV35inlet-30-35-40D	1	18-Mar-2019 15:35	075SMPL.d	AS CA CD FE K MG PB SB SE
20190226-DGW-MW3-PV35mid-controlD	1	18-Mar-2019 15:37	076SMPL.d	AS CA CD FE K MG PB SB SE
20190226-DGW-MW3-PV35mid-30D	1	18-Mar-2019 15:40	077SMPL.d	AS CA CD FE K MG PB SB SE
20190226-DGW-MW3-PV35mid-35D	1	18-Mar-2019 15:42	078SMPL.d	AS CA CD FE K MG PB SB SE
20190226-DGW-MW3-PV35mid-40D	1	18-Mar-2019 15:44	079SMPL.d	AS CA CD FE K MG PB SB SE
CCV 4	1	18-Mar-2019 15:53	083_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	18-Mar-2019 15:55	084_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	18-Mar-2019 16:39	095_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	18-Mar-2019 16:42	096_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	18-Mar-2019 17:12	103_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	18-Mar-2019 17:14	104_CCB.d	AS CA CD FE K MG NA PB SB SE
20190225-DGW-MW3-PV35out-30D	10	18-Mar-2019 17:21	105SMPL.d	NA
20190225-DGW-MW3-PV35out-35D	10	18-Mar-2019 17:24	106SMPL.d	NA
20190225-DGW-MW3-PV35out-40D	10	18-Mar-2019 17:26	107SMPL.d	NA
20190225-DGW-MW3-PV35inlet-controlD	10	18-Mar-2019 17:28	108SMPL.d	NA
20190225-DGW-MW3-PV35inlet-30-35-40D	10	18-Mar-2019 17:30	109SMPL.d	NA

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030568
Start Date: 18-Mar-2019 End Date: 18-Mar-2019

Run ID:ICPMS04_334708
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
20190226-DGW-MW3-PV35mid-controlD	10	18-Mar-2019 17:33	110SMPL.d	NA
20190226-DGW-MW3-PV35mid-30D	10	18-Mar-2019 17:35	111SMPL.d	NA
20190226-DGW-MW3-PV35mid-35D	10	18-Mar-2019 17:37	112SMPL.d	NA
20190226-DGW-MW3-PV35mid-40D	10	18-Mar-2019 17:39	113SMPL.d	NA
CCV 7	1	18-Mar-2019 17:46	115_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	18-Mar-2019 17:48	116_CCB.d	AS CA CD FE K MG NA PB SB SE
20190225-DGW-MW3-PV35out-controlD	1	18-Mar-2019 17:57	118SMPL.d	AS CD FE K MG PB SB SE
20190225-DGW-MW3-PV35out-controlDSD	5	18-Mar-2019 17:59	119SMPL.d	AS CD FE K MG PB SB SE
20190225-DGW-MW3-PV35out-controlDMS	1	18-Mar-2019 18:01	120SMPL.d	AS CD FE K MG PB SB SE
20190225-DGW-MW3-PV35out-controlDMSD	1	18-Mar-2019 18:04	121SMPL.d	AS CD FE K MG PB SB SE
20190225-DGW-MW3-PV35out-controlDPDS	1	18-Mar-2019 18:06	122SMPL.d	AS CD FE K MG PB SB SE
CCV 8	1	18-Mar-2019 18:17	127_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	18-Mar-2019 18:19	128_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	18-Mar-2019 18:47	139_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	18-Mar-2019 18:49	140_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-138728	1	18-Mar-2019 18:57	141SMPL.d	AS CA CD FE K MG NA PB SB SE
LCS-138728	1	18-Mar-2019 18:59	142SMPL.d	AS CA CD FE K MG NA PB SB SE
20190225-DGW-MW3-PV35out-controlT	1	18-Mar-2019 19:06	145SMPL.d	AS CD FE K MG PB SB SE
20190225-DGW-MW3-PV35out-controlTSD	5	18-Mar-2019 19:08	146SMPL.d	AS CD FE K MG PB SB SE
20190225-DGW-MW3-PV35out-controlTMS	1	18-Mar-2019 19:10	147SMPL.d	AS CA CD FE K MG NA PB SB SE
20190225-DGW-MW3-PV35out-controlTMSD	1	18-Mar-2019 19:13	148SMPL.d	AS CA CD FE K MG NA PB SB SE
20190225-DGW-MW3-PV35out-controlTPDS	1	18-Mar-2019 19:15	149SMPL.d	AS CD FE K MG PB SB SE
CCV 10	1	18-Mar-2019 19:19	151_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	18-Mar-2019 19:21	152_CCB.d	AS CA CD FE K MG NA PB SB SE
20190225-DGW-MW3-PV35out-30T	1	18-Mar-2019 19:24	153SMPL.d	AS CA CD FE K MG PB SB SE
20190225-DGW-MW3-PV35out-35T	1	18-Mar-2019 19:26	154SMPL.d	AS CA CD FE K MG PB SB SE
20190225-DGW-MW3-PV35out-40T	1	18-Mar-2019 19:28	155SMPL.d	AS CA CD FE K MG PB SB SE
20190225-DGW-MW3-PV35inlet-controlT	1	18-Mar-2019 19:30	156SMPL.d	AS CA CD FE K MG PB SB SE
20190225-DGW-MW3-PV35inlet-30-35-40T	1	18-Mar-2019 19:33	157SMPL.d	AS CA CD FE K MG PB SB SE
20190226-DGW-MW3-PV35mid-controlT	1	18-Mar-2019 19:35	158SMPL.d	AS CA CD FE K MG PB SB SE
20190226-DGW-MW3-PV35mid-30T	1	18-Mar-2019 19:37	159SMPL.d	AS CA CD FE K MG PB SB SE
20190226-DGW-MW3-PV35mid-35T	1	18-Mar-2019 19:40	160SMPL.d	AS CA CD FE K MG PB SB SE
20190226-DGW-MW3-PV35mid-40T	1	18-Mar-2019 19:42	161SMPL.d	AS CA CD FE K MG PB SB SE
CCV 11	1	18-Mar-2019 19:46	163_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	18-Mar-2019 19:48	164_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 12	1	18-Mar-2019 20:13	175_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 12	1	18-Mar-2019 20:15	176_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 13	1	18-Mar-2019 22:20	191_ICV.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030568

Run ID:ICPMS04_334708
Instrument:ICPMS04
Method:SW6020

ICB	Date: 18-Mar-2019 12:59	Seq: 4994001	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.538	0.4	2	

CCB 1	Date: 18-Mar-2019 13:42	Seq: 4994119	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	2.109	0.4	2	

CCB 2	Date: 18-Mar-2019 14:45	Seq: 4994272	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.422	0.4	2	

CCB 4	Date: 18-Mar-2019 15:55	Seq: 4994469	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.688	0.4	2	
Iron	16.21	12	200	
Sodium	37.39	14	200	

CCB 5	Date: 18-Mar-2019 16:42	Seq: 4994566	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.53	0.4	2	
Iron	56.45	12	200	
Sodium	176.6	14	200	

CCB 6	Date: 18-Mar-2019 17:14	Seq: 4994650	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.545	0.4	2	
Iron	55.85	12	200	
Sodium	149.4	14	200	

CCB 7	Date: 18-Mar-2019 17:48	Seq: 4994723	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.421	0.4	2	
Iron	30.27	12	200	
Sodium	67.77	14	200	

CCB 8	Date: 18-Mar-2019 18:19	Seq: 4994766	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.41	0.4	2	
Iron	16.94	12	200	
Sodium	74.9	14	200	

CCB 9	Date: 18-Mar-2019 18:49	Seq: 4994789	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.097	0.4	2	
Iron	17.42	12	200	
Sodium	57.3	14	200	

CCB 10	Date: 18-Mar-2019 19:21	Seq: 4994852	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.37	0.4	2	
Iron	18.85	12	200	
Sodium	128.8	14	200	

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030568

Run ID:ICPMS04_334708
Instrument:ICPMS04
Method:SW6020

CCB 11	Date: 18-Mar-2019 19:48	Seq: 4994864	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.108	0.4	2	
Iron	52.66	12	200	
Sodium	143.5	14	200	

CCB 12	Date: 18-Mar-2019 20:15	Seq: 4994876	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.9	0.4	2	
Iron	63.09	12	200	
Sodium	166.3	14	200	

ICCB 13	Date: 18-Mar-2019 22:29	Seq: 4995054	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.891	0.4	2	
Iron	-36.66	12	200	

CCB 14	Date: 18-Mar-2019 23:26	Seq: 4995061	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.698	0.4	2	
Iron	-39.4	12	200	

CCB 15	Date: 18-Mar-2019 23:33	Seq: 4995064	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.724	0.4	2	
Iron	-40.59	12	200	
Sodium	-15.86	14	200	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030568
Start Date: 19-Mar-2019 End Date: 20-Mar-2019

Run ID:ICPMS04_334782
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
LLICV2	1	19-Mar-2019 12:14	024SMPL.d	CA NA
LLICV5	1	19-Mar-2019 12:16	025LICV.d	CA NA
ICB	1	19-Mar-2019 12:18	026_ICB.d	AS CA CD FE K MG NA PB SB SE
ICV	1	19-Mar-2019 12:21	027_ICV.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	19-Mar-2019 12:28	029ICSA.d	CA NA
ICSAB	1	19-Mar-2019 12:30	030ICSB.d	CA NA
20190225-DGW-MW3-PV35out-controlT	10	19-Mar-2019 12:39	032SMPL.d	CA NA
20190225-DGW-MW3-PV35out-controlTSD	50	19-Mar-2019 12:41	033SMPL.d	CA NA
20190225-DGW-MW3-PV35out-controlTPDS	10	19-Mar-2019 12:43	034SMPL.d	CA NA
20190225-DGW-MW3-PV35out-30T	10	19-Mar-2019 12:45	035SMPL.d	NA
20190225-DGW-MW3-PV35out-35T	10	19-Mar-2019 12:47	036SMPL.d	NA
20190225-DGW-MW3-PV35out-40T	10	19-Mar-2019 12:50	037SMPL.d	NA
20190225-DGW-MW3-PV35inlet-controlT	10	19-Mar-2019 12:52	038SMPL.d	NA
20190225-DGW-MW3-PV35inlet-30-35-40T	10	19-Mar-2019 12:54	039SMPL.d	NA
CCV 1	1	19-Mar-2019 12:58	041_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	19-Mar-2019 13:01	042_CCB.d	AS CA CD FE K MG NA PB SB SE
20190226-DGW-MW3-PV35mid-controlT	10	19-Mar-2019 13:03	043SMPL.d	NA
20190226-DGW-MW3-PV35mid-30T	10	19-Mar-2019 13:05	044SMPL.d	NA
20190226-DGW-MW3-PV35mid-35T	10	19-Mar-2019 13:08	045SMPL.d	NA
20190226-DGW-MW3-PV35mid-40T	10	19-Mar-2019 13:10	046SMPL.d	NA
CCV 2	1	19-Mar-2019 13:25	053_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	19-Mar-2019 13:28	054_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	19-Mar-2019 13:52	065_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	19-Mar-2019 13:54	066_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	19-Mar-2019 14:19	077_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	19-Mar-2019 14:22	078_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	19-Mar-2019 14:52	089_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	19-Mar-2019 14:54	090_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	19-Mar-2019 15:21	101_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	19-Mar-2019 15:23	102_CCB.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	19-Mar-2019 16:21	119SMPL.d	CA NA
LLCCV5	1	19-Mar-2019 16:23	120LICV.d	CA NA
ICCB 7	1	19-Mar-2019 16:25	121_ICB.d	AS CA CD FE K MG NA PB SB SE
ICCV 7	1	19-Mar-2019 16:27	122_ICV.d	AS CA CD FE K MG NA PB SB SE
CCV 8	1	19-Mar-2019 17:08	133_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	19-Mar-2019 17:10	134_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	19-Mar-2019 17:27	139_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	19-Mar-2019 17:29	140_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 10	1	19-Mar-2019 17:52	148_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	19-Mar-2019 17:55	149_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 11	1	19-Mar-2019 18:29	160_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	19-Mar-2019 18:31	161_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 12	1	19-Mar-2019 18:33	162_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 12	1	19-Mar-2019 18:35	163_CCB.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030568

Run ID:ICPMS04_334782
Instrument:ICPMS04
Method:SW6020

CCB 1	Date: 19-Mar-2019 13:01	Seq: 4995888		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		21.44	14	200	
CCB 2	Date: 19-Mar-2019 13:28	Seq: 4995900		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		19.49	14	200	
CCB 3	Date: 19-Mar-2019 13:54	Seq: 4995966		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		19.37	14	200	
CCB 4	Date: 19-Mar-2019 14:22	Seq: 4995978		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		20.73	14	200	
CCB 5	Date: 19-Mar-2019 14:54	Seq: 4996040		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		35.51	14	200	
CCB 6	Date: 19-Mar-2019 15:23	Seq: 4996052		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		25.22	14	200	
CCB 11	Date: 19-Mar-2019 18:31	Seq: 4996676		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		52.73	14	200	
CCB 12	Date: 19-Mar-2019 18:35	Seq: 4996678		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		30.78	14	200	
CCB 13	Date: 19-Mar-2019 19:02	Seq: 4996690		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		140.8	14	200	
CCB 14	Date: 19-Mar-2019 19:29	Seq: 4996702		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		137.2	14	200	
CCB 16	Date: 19-Mar-2019 23:37	Seq: 4996865		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		19.47	14	200	
CCB 17	Date: 19-Mar-2019 23:57	Seq: 4996874		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		24.52	14	200	
CCB 18	Date: 20-Mar-2019 00:18	Seq: 4996896		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		116	14	200	
CCB 19	Date: 20-Mar-2019 00:38	Seq: 4996905		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		119.3	14	200	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19030568

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19030568-01	20190225-DGW-MW3-PV35out-controlD	Groundwater		25-Feb-2019 16:40	12-Mar-2019 08:50	☐
HS19030568-02	20190225-DGW-MW3-PV35out-30D	Groundwater		25-Feb-2019 16:40	12-Mar-2019 08:50	☐
HS19030568-03	20190225-DGW-MW3-PV35out-35D	Groundwater		25-Feb-2019 16:40	12-Mar-2019 08:50	☐
HS19030568-04	20190225-DGW-MW3-PV35out-40D	Groundwater		25-Feb-2019 16:40	12-Mar-2019 08:50	☐
HS19030568-05	20190225-DGW-MW3-PV35inlet-controlD	Groundwater		25-Feb-2019 16:40	12-Mar-2019 08:50	☐
HS19030568-06	20190225-DGW-MW3-PV35inlet-30-35-40D	Groundwater		25-Feb-2019 16:40	12-Mar-2019 08:50	☐
HS19030568-07	20190226-DGW-MW3-PV35mid-controlD	Groundwater		26-Feb-2019 07:25	12-Mar-2019 08:50	☐
HS19030568-08	20190226-DGW-MW3-PV35mid-30D	Groundwater		26-Feb-2019 07:25	12-Mar-2019 08:50	☐
HS19030568-09	20190226-DGW-MW3-PV35mid-35D	Groundwater		26-Feb-2019 07:25	12-Mar-2019 08:50	☐
HS19030568-10	20190226-DGW-MW3-PV35mid-40D	Groundwater		26-Feb-2019 07:25	12-Mar-2019 08:50	☐
HS19030568-11	20190225-DGW-MW3-PV35out-controlT	Groundwater		25-Feb-2019 16:40	12-Mar-2019 08:50	☐
HS19030568-12	20190225-DGW-MW3-PV35out-30T	Groundwater		25-Feb-2019 16:40	12-Mar-2019 08:50	☐
HS19030568-13	20190225-DGW-MW3-PV35out-35T	Groundwater		25-Feb-2019 16:40	12-Mar-2019 08:50	☐
HS19030568-14	20190225-DGW-MW3-PV35out-40T	Groundwater		25-Feb-2019 16:40	12-Mar-2019 08:50	☐
HS19030568-15	20190225-DGW-MW3-PV35inlet-controlT	Groundwater		25-Feb-2019 16:40	12-Mar-2019 08:50	☐
HS19030568-16	20190225-DGW-MW3-PV35inlet-30-35-40T	Groundwater		25-Feb-2019 16:40	12-Mar-2019 08:50	☐
HS19030568-17	20190226-DGW-MW3-PV35mid-controlT	Groundwater		26-Feb-2019 07:25	12-Mar-2019 08:50	☐
HS19030568-18	20190226-DGW-MW3-PV35mid-30T	Groundwater		26-Feb-2019 07:25	12-Mar-2019 08:50	☐
HS19030568-19	20190226-DGW-MW3-PV35mid-35T	Groundwater		26-Feb-2019 07:25	12-Mar-2019 08:50	☐
HS19030568-20	20190226-DGW-MW3-PV35mid-40T	Groundwater		26-Feb-2019 07:25	12-Mar-2019 08:50	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190225-DGW-MW3-PV35out-controlD
Collection Date: 25-Feb-2019 16:40

ANALYTICAL REPORT
WorkOrder:HS19030568
Lab ID:HS19030568-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	18-Mar-2019 17:57
Arsenic	**0.00484**		**0.000400**	**0.00200**	**mg/L**	1	18-Mar-2019 17:57
Cadmium	U		0.000200	0.00200	mg/L	1	18-Mar-2019 17:57
Calcium	**113**		**0.340**	**5.00**	**mg/L**	10	18-Mar-2019 14:56
Iron	**0.0677**	J	**0.0120**	**0.200**	**mg/L**	1	18-Mar-2019 17:57
Lead	U		0.000600	0.00200	mg/L	1	18-Mar-2019 17:57
Magnesium	**21.2**		**0.0100**	**0.200**	**mg/L**	1	18-Mar-2019 17:57
Potassium	**2.07**		**0.0180**	**0.200**	**mg/L**	1	18-Mar-2019 17:57
Selenium	**0.00127**	J	**0.00110**	**0.00200**	**mg/L**	1	18-Mar-2019 17:57
Sodium	**198**		**0.140**	**2.00**	**mg/L**	10	18-Mar-2019 14:56

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190225-DGW-MW3-PV35out-30D
Collection Date: 25-Feb-2019 16:40

ANALYTICAL REPORT
WorkOrder:HS19030568
Lab ID:HS19030568-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	**0.00203**		**0.000400**	**0.00200**	**mg/L**	1	18-Mar-2019 15:07
Arsenic	U		0.000400	0.00200	mg/L	1	18-Mar-2019 15:07
Cadmium	U		0.000200	0.00200	mg/L	1	18-Mar-2019 15:07
Calcium	**6.69**		**0.0340**	**0.500**	**mg/L**	1	18-Mar-2019 15:07
Iron	**0.0189**	J	**0.0120**	**0.200**	**mg/L**	1	18-Mar-2019 15:07
Lead	U		0.000600	0.00200	mg/L	1	18-Mar-2019 15:07
Magnesium	**13.2**		**0.0100**	**0.200**	**mg/L**	1	18-Mar-2019 15:07
Potassium	**2.11**		**0.0180**	**0.200**	**mg/L**	1	18-Mar-2019 15:07
Selenium	U		0.00110	0.00200	mg/L	1	18-Mar-2019 15:07
Sodium	**204**		**0.140**	**2.00**	**mg/L**	10	18-Mar-2019 17:21

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190225-DGW-MW3-PV35out-35D
Collection Date: 25-Feb-2019 16:40

ANALYTICAL REPORT
WorkOrder:HS19030568
Lab ID:HS19030568-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	**0.000796**	J	**0.000400**	**0.00200**	**mg/L**	1	18-Mar-2019 15:09
Arsenic	U		0.000400	0.00200	mg/L	1	18-Mar-2019 15:09
Cadmium	U		0.000200	0.00200	mg/L	1	18-Mar-2019 15:09
Calcium	**6.24**		**0.0340**	**0.500**	**mg/L**	1	18-Mar-2019 15:09
Iron	**0.0413**	J	**0.0120**	**0.200**	**mg/L**	1	18-Mar-2019 15:09
Lead	U		0.000600	0.00200	mg/L	1	18-Mar-2019 15:09
Magnesium	**10.6**		**0.0100**	**0.200**	**mg/L**	1	18-Mar-2019 15:09
Potassium	**2.12**		**0.0180**	**0.200**	**mg/L**	1	18-Mar-2019 15:09
Selenium	U		0.00110	0.00200	mg/L	1	18-Mar-2019 15:09
Sodium	**198**		**0.140**	**2.00**	**mg/L**	10	18-Mar-2019 17:24

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190225-DGW-MW3-PV35out-40D
Collection Date: 25-Feb-2019 16:40

ANALYTICAL REPORT
WorkOrder:HS19030568
Lab ID:HS19030568-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	18-Mar-2019 15:31
Arsenic	U		0.000400	0.00200	mg/L	1	18-Mar-2019 15:31
Cadmium	U		0.000200	0.00200	mg/L	1	18-Mar-2019 15:31
Calcium	**5.89**		**0.0340**	**0.500**	**mg/L**	1	18-Mar-2019 15:31
Iron	U		0.0120	0.200	mg/L	1	18-Mar-2019 15:31
Lead	U		0.000600	0.00200	mg/L	1	18-Mar-2019 15:31
Magnesium	**11.0**		**0.0100**	**0.200**	**mg/L**	1	18-Mar-2019 15:31
Potassium	**2.15**		**0.0180**	**0.200**	**mg/L**	1	18-Mar-2019 15:31
Selenium	U		0.00110	0.00200	mg/L	1	18-Mar-2019 15:31
Sodium	**199**		**0.140**	**2.00**	**mg/L**	10	18-Mar-2019 17:26

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190225-DGW-MW3-PV35inlet-controlD
Collection Date: 25-Feb-2019 16:40

ANALYTICAL REPORT
WorkOrder:HS19030568
Lab ID:HS19030568-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	18-Mar-2019 15:33
Arsenic	**0.00773**		**0.000400**	**0.00200**	**mg/L**	1	18-Mar-2019 15:33
Cadmium	U		0.000200	0.00200	mg/L	1	18-Mar-2019 15:33
Calcium	**121**		**0.0340**	**0.500**	**mg/L**	1	18-Mar-2019 15:33
Iron	**0.153**	J	**0.0120**	**0.200**	**mg/L**	1	18-Mar-2019 15:33
Lead	U		0.000600	0.00200	mg/L	1	18-Mar-2019 15:33
Magnesium	**21.7**		**0.0100**	**0.200**	**mg/L**	1	18-Mar-2019 15:33
Potassium	**2.14**		**0.0180**	**0.200**	**mg/L**	1	18-Mar-2019 15:33
Selenium	U		0.00110	0.00200	mg/L	1	18-Mar-2019 15:33
Sodium	**196**		**0.140**	**2.00**	**mg/L**	10	18-Mar-2019 17:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190225-DGW-MW3-PV35inlet-30-35-40D
Collection Date: 25-Feb-2019 16:40

ANALYTICAL REPORT
WorkOrder:HS19030568
Lab ID:HS19030568-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	18-Mar-2019 15:35
Arsenic	**0.00892**		**0.000400**	**0.00200**	**mg/L**	1	18-Mar-2019 15:35
Cadmium	U		0.000200	0.00200	mg/L	1	18-Mar-2019 15:35
Calcium	**120**		**0.0340**	**0.500**	**mg/L**	1	18-Mar-2019 15:35
Iron	**0.0766**	J	**0.0120**	**0.200**	**mg/L**	1	18-Mar-2019 15:35
Lead	U		0.000600	0.00200	mg/L	1	18-Mar-2019 15:35
Magnesium	**21.4**		**0.0100**	**0.200**	**mg/L**	1	18-Mar-2019 15:35
Potassium	**2.05**		**0.0180**	**0.200**	**mg/L**	1	18-Mar-2019 15:35
Selenium	**0.00119**	J	**0.00110**	**0.00200**	**mg/L**	1	18-Mar-2019 15:35
Sodium	**191**		**0.140**	**2.00**	**mg/L**	10	18-Mar-2019 17:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190226-DGW-MW3-PV35mid-controlD
Collection Date: 26-Feb-2019 07:25

ANALYTICAL REPORT
WorkOrder:HS19030568
Lab ID:HS19030568-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	18-Mar-2019 15:37
Arsenic	**0.00531**		**0.000400**	**0.00200**	**mg/L**	1	18-Mar-2019 15:37
Cadmium	U		0.000200	0.00200	mg/L	1	18-Mar-2019 15:37
Calcium	**116**		**0.0340**	**0.500**	**mg/L**	1	18-Mar-2019 15:37
Iron	**0.0841**	J	**0.0120**	**0.200**	**mg/L**	1	18-Mar-2019 15:37
Lead	U		0.000600	0.00200	mg/L	1	18-Mar-2019 15:37
Magnesium	**21.5**		**0.0100**	**0.200**	**mg/L**	1	18-Mar-2019 15:37
Potassium	**2.11**		**0.0180**	**0.200**	**mg/L**	1	18-Mar-2019 15:37
Selenium	U		0.00110	0.00200	mg/L	1	18-Mar-2019 15:37
Sodium	**205**		**0.140**	**2.00**	**mg/L**	10	18-Mar-2019 17:33

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190226-DGW-MW3-PV35mid-30D
Collection Date: 26-Feb-2019 07:25

ANALYTICAL REPORT
WorkOrder:HS19030568
Lab ID:HS19030568-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	18-Mar-2019 15:40
Arsenic	U		0.000400	0.00200	mg/L	1	18-Mar-2019 15:40
Cadmium	U		0.000200	0.00200	mg/L	1	18-Mar-2019 15:40
Calcium	**8.69**		**0.0340**	**0.500**	**mg/L**	1	18-Mar-2019 15:40
Iron	**0.0865**	J	**0.0120**	**0.200**	**mg/L**	1	18-Mar-2019 15:40
Lead	U		0.000600	0.00200	mg/L	1	18-Mar-2019 15:40
Magnesium	**15.8**		**0.0100**	**0.200**	**mg/L**	1	18-Mar-2019 15:40
Potassium	**2.16**		**0.0180**	**0.200**	**mg/L**	1	18-Mar-2019 15:40
Selenium	U		0.00110	0.00200	mg/L	1	18-Mar-2019 15:40
Sodium	**202**		**0.140**	**2.00**	**mg/L**	10	18-Mar-2019 17:35

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190226-DGW-MW3-PV35mid-35D
Collection Date: 26-Feb-2019 07:25

ANALYTICAL REPORT
WorkOrder:HS19030568
Lab ID:HS19030568-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	18-Mar-2019 15:42
Arsenic	U		0.000400	0.00200	mg/L	1	18-Mar-2019 15:42
Cadmium	U		0.000200	0.00200	mg/L	1	18-Mar-2019 15:42
Calcium	**8.97**		**0.0340**	**0.500**	**mg/L**	1	18-Mar-2019 15:42
Iron	**0.0947**	J	**0.0120**	**0.200**	**mg/L**	1	18-Mar-2019 15:42
Lead	U		0.000600	0.00200	mg/L	1	18-Mar-2019 15:42
Magnesium	**14.8**		**0.0100**	**0.200**	**mg/L**	1	18-Mar-2019 15:42
Potassium	**1.99**		**0.0180**	**0.200**	**mg/L**	1	18-Mar-2019 15:42
Selenium	U		0.00110	0.00200	mg/L	1	18-Mar-2019 15:42
Sodium	**192**		**0.140**	**2.00**	**mg/L**	10	18-Mar-2019 17:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190226-DGW-MW3-PV35mid-40D
Collection Date: 26-Feb-2019 07:25

ANALYTICAL REPORT
WorkOrder:HS19030568
Lab ID:HS19030568-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	18-Mar-2019 15:44
Arsenic	U		0.000400	0.00200	mg/L	1	18-Mar-2019 15:44
Cadmium	U		0.000200	0.00200	mg/L	1	18-Mar-2019 15:44
Calcium	**8.92**		**0.0340**	**0.500**	**mg/L**	1	18-Mar-2019 15:44
Iron	**0.102**	J	**0.0120**	**0.200**	**mg/L**	1	18-Mar-2019 15:44
Lead	U		0.000600	0.00200	mg/L	1	18-Mar-2019 15:44
Magnesium	**15.9**		**0.0100**	**0.200**	**mg/L**	1	18-Mar-2019 15:44
Potassium	**2.42**		**0.0180**	**0.200**	**mg/L**	1	18-Mar-2019 15:44
Selenium	U		0.00110	0.00200	mg/L	1	18-Mar-2019 15:44
Sodium	**195**		**0.140**	**2.00**	**mg/L**	10	18-Mar-2019 17:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190225-DGW-MW3-PV35out-controlT
Collection Date: 25-Feb-2019 16:40

ANALYTICAL REPORT
WorkOrder:HS19030568
Lab ID:HS19030568-11
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**357**		**2.00**	**2.00**	**mg/L**	1	19-Mar-2019 17:18
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	18-Mar-2019 19:06
Arsenic	**0.00511**		**0.000400**	**0.00200**	**mg/L**	1	18-Mar-2019 19:06
Cadmium	U		0.000200	0.00200	mg/L	1	18-Mar-2019 19:06
Calcium	**106**		**0.340**	**5.00**	**mg/L**	10	19-Mar-2019 12:39
Iron	**0.130**	J	**0.0120**	**0.200**	**mg/L**	1	18-Mar-2019 19:06
Lead	U		0.000600	0.00200	mg/L	1	18-Mar-2019 19:06
Magnesium	**22.4**		**0.0100**	**0.200**	**mg/L**	1	18-Mar-2019 19:06
Potassium	**2.18**		**0.0180**	**0.200**	**mg/L**	1	18-Mar-2019 19:06
Selenium	**0.00111**	J	**0.00110**	**0.00200**	**mg/L**	1	18-Mar-2019 19:06
Sodium	**191**		**0.140**	**2.00**	**mg/L**	10	19-Mar-2019 12:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190225-DGW-MW3-PV35out-30T
Collection Date: 25-Feb-2019 16:40

ANALYTICAL REPORT
WorkOrder:HS19030568
Lab ID:HS19030568-12
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**71.5**		**2.00**	**2.00**	**mg/L**	1	19-Mar-2019 17:18
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	**0.000404**	J	**0.000400**	**0.00200**	**mg/L**	1	18-Mar-2019 19:24
Arsenic	U		0.000400	0.00200	mg/L	1	18-Mar-2019 19:24
Cadmium	U		0.000200	0.00200	mg/L	1	18-Mar-2019 19:24
Calcium	**6.55**		**0.0340**	**0.500**	**mg/L**	1	18-Mar-2019 19:24
Iron	**0.258**		**0.0120**	**0.200**	**mg/L**	1	18-Mar-2019 19:24
Lead	U		0.000600	0.00200	mg/L	1	18-Mar-2019 19:24
Magnesium	**13.4**		**0.0100**	**0.200**	**mg/L**	1	18-Mar-2019 19:24
Potassium	**2.10**		**0.0180**	**0.200**	**mg/L**	1	18-Mar-2019 19:24
Selenium	U		0.00110	0.00200	mg/L	1	18-Mar-2019 19:24
Sodium	**194**		**0.140**	**2.00**	**mg/L**	10	19-Mar-2019 12:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190225-DGW-MW3-PV35out-35T
Collection Date: 25-Feb-2019 16:40

ANALYTICAL REPORT
WorkOrder:HS19030568
Lab ID:HS19030568-13
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**59.8**		**2.00**	**2.00**	**mg/L**	1	19-Mar-2019 17:18
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	18-Mar-2019 19:26
Arsenic	U		0.000400	0.00200	mg/L	1	18-Mar-2019 19:26
Cadmium	U		0.000200	0.00200	mg/L	1	18-Mar-2019 19:26
Calcium	**6.12**		**0.0340**	**0.500**	**mg/L**	1	18-Mar-2019 19:26
Iron	**0.0592**	J	**0.0120**	**0.200**	**mg/L**	1	18-Mar-2019 19:26
Lead	U		0.000600	0.00200	mg/L	1	18-Mar-2019 19:26
Magnesium	**10.8**		**0.0100**	**0.200**	**mg/L**	1	18-Mar-2019 19:26
Potassium	**2.11**		**0.0180**	**0.200**	**mg/L**	1	18-Mar-2019 19:26
Selenium	U		0.00110	0.00200	mg/L	1	18-Mar-2019 19:26
Sodium	**190**		**0.140**	**2.00**	**mg/L**	10	19-Mar-2019 12:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190225-DGW-MW3-PV35out-40T
Collection Date: 25-Feb-2019 16:40

ANALYTICAL REPORT
WorkOrder:HS19030568
Lab ID:HS19030568-14
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**57.0**		**2.00**	**2.00**	**mg/L**	1	19-Mar-2019 17:18
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	18-Mar-2019 19:28
Arsenic	U		0.000400	0.00200	mg/L	1	18-Mar-2019 19:28
Cadmium	U		0.000200	0.00200	mg/L	1	18-Mar-2019 19:28
Calcium	**5.50**		**0.0340**	**0.500**	**mg/L**	1	18-Mar-2019 19:28
Iron	**0.0715**	J	**0.0120**	**0.200**	**mg/L**	1	18-Mar-2019 19:28
Lead	U		0.000600	0.00200	mg/L	1	18-Mar-2019 19:28
Magnesium	**10.5**		**0.0100**	**0.200**	**mg/L**	1	18-Mar-2019 19:28
Potassium	**2.04**		**0.0180**	**0.200**	**mg/L**	1	18-Mar-2019 19:28
Selenium	U		0.00110	0.00200	mg/L	1	18-Mar-2019 19:28
Sodium	**198**		**0.140**	**2.00**	**mg/L**	10	19-Mar-2019 12:50

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190225-DGW-MW3-PV35inlet-controlT
Collection Date: 25-Feb-2019 16:40

ANALYTICAL REPORT
WorkOrder:HS19030568
Lab ID:HS19030568-15
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**380**		**2.00**	**2.00**	**mg/L**	1	19-Mar-2019 17:18
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	18-Mar-2019 19:30
Arsenic	**0.0166**		**0.000400**	**0.00200**	**mg/L**	1	18-Mar-2019 19:30
Cadmium	U		0.000200	0.00200	mg/L	1	18-Mar-2019 19:30
Calcium	**116**		**0.0340**	**0.500**	**mg/L**	1	18-Mar-2019 19:30
Iron	**1.22**		**0.0120**	**0.200**	**mg/L**	1	18-Mar-2019 19:30
Lead	U		0.000600	0.00200	mg/L	1	18-Mar-2019 19:30
Magnesium	**21.9**		**0.0100**	**0.200**	**mg/L**	1	18-Mar-2019 19:30
Potassium	**2.06**		**0.0180**	**0.200**	**mg/L**	1	18-Mar-2019 19:30
Selenium	**0.00118**	J	**0.00110**	**0.00200**	**mg/L**	1	18-Mar-2019 19:30
Sodium	**186**		**0.140**	**2.00**	**mg/L**	10	19-Mar-2019 12:52

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190225-DGW-MW3-PV35inlet-30-35-40T
Collection Date: 25-Feb-2019 16:40

ANALYTICAL REPORT
WorkOrder:HS19030568
Lab ID:HS19030568-16
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**369**		**2.00**	**2.00**	**mg/L**	1	19-Mar-2019 17:18
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	18-Mar-2019 19:33
Arsenic	**0.0140**		**0.000400**	**0.00200**	**mg/L**	1	18-Mar-2019 19:33
Cadmium	U		0.000200	0.00200	mg/L	1	18-Mar-2019 19:33
Calcium	**113**		**0.0340**	**0.500**	**mg/L**	1	18-Mar-2019 19:33
Iron	**0.584**		**0.0120**	**0.200**	**mg/L**	1	18-Mar-2019 19:33
Lead	U		0.000600	0.00200	mg/L	1	18-Mar-2019 19:33
Magnesium	**21.1**		**0.0100**	**0.200**	**mg/L**	1	18-Mar-2019 19:33
Potassium	**1.98**		**0.0180**	**0.200**	**mg/L**	1	18-Mar-2019 19:33
Selenium	**0.00116**	J	**0.00110**	**0.00200**	**mg/L**	1	18-Mar-2019 19:33
Sodium	**188**		**0.140**	**2.00**	**mg/L**	10	19-Mar-2019 12:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190226-DGW-MW3-PV35mid-controlT
Collection Date: 26-Feb-2019 07:25

ANALYTICAL REPORT
WorkOrder:HS19030568
Lab ID:HS19030568-17
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**361**		**2.00**	**2.00**	**mg/L**	1	19-Mar-2019 17:18
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	18-Mar-2019 19:35
Arsenic	**0.00611**		**0.000400**	**0.00200**	**mg/L**	1	18-Mar-2019 19:35
Cadmium	U		0.000200	0.00200	mg/L	1	18-Mar-2019 19:35
Calcium	**110**		**0.0340**	**0.500**	**mg/L**	1	18-Mar-2019 19:35
Iron	**0.220**		**0.0120**	**0.200**	**mg/L**	1	18-Mar-2019 19:35
Lead	U		0.000600	0.00200	mg/L	1	18-Mar-2019 19:35
Magnesium	**21.0**		**0.0100**	**0.200**	**mg/L**	1	18-Mar-2019 19:35
Potassium	**2.01**		**0.0180**	**0.200**	**mg/L**	1	18-Mar-2019 19:35
Selenium	**0.00112**	J	**0.00110**	**0.00200**	**mg/L**	1	18-Mar-2019 19:35
Sodium	**195**		**0.140**	**2.00**	**mg/L**	10	19-Mar-2019 13:03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190226-DGW-MW3-PV35mid-30T
Collection Date: 26-Feb-2019 07:25

ANALYTICAL REPORT
WorkOrder:HS19030568
Lab ID:HS19030568-18
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**82.6**		**2.00**	**2.00**	**mg/L**	1	19-Mar-2019 17:18
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	18-Mar-2019 19:37
Arsenic	U		0.000400	0.00200	mg/L	1	18-Mar-2019 19:37
Cadmium	U		0.000200	0.00200	mg/L	1	18-Mar-2019 19:37
Calcium	**8.16**		**0.0340**	**0.500**	**mg/L**	1	18-Mar-2019 19:37
Iron	**0.173**	J	**0.0120**	**0.200**	**mg/L**	1	18-Mar-2019 19:37
Lead	U		0.000600	0.00200	mg/L	1	18-Mar-2019 19:37
Magnesium	**15.1**		**0.0100**	**0.200**	**mg/L**	1	18-Mar-2019 19:37
Potassium	**2.04**		**0.0180**	**0.200**	**mg/L**	1	18-Mar-2019 19:37
Selenium	U		0.00110	0.00200	mg/L	1	18-Mar-2019 19:37
Sodium	**198**		**0.140**	**2.00**	**mg/L**	10	19-Mar-2019 13:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190226-DGW-MW3-PV35mid-35T
Collection Date: 26-Feb-2019 07:25

ANALYTICAL REPORT
WorkOrder:HS19030568
Lab ID:HS19030568-19
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**84.1**		**2.00**	**2.00**	**mg/L**	1	19-Mar-2019 17:18
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	18-Mar-2019 19:40
Arsenic	U		0.000400	0.00200	mg/L	1	18-Mar-2019 19:40
Cadmium	U		0.000200	0.00200	mg/L	1	18-Mar-2019 19:40
Calcium	**8.96**		**0.0340**	**0.500**	**mg/L**	1	18-Mar-2019 19:40
Iron	**0.240**		**0.0120**	**0.200**	**mg/L**	1	18-Mar-2019 19:40
Lead	U		0.000600	0.00200	mg/L	1	18-Mar-2019 19:40
Magnesium	**15.0**		**0.0100**	**0.200**	**mg/L**	1	18-Mar-2019 19:40
Potassium	**2.00**		**0.0180**	**0.200**	**mg/L**	1	18-Mar-2019 19:40
Selenium	U		0.00110	0.00200	mg/L	1	18-Mar-2019 19:40
Sodium	**192**		**0.140**	**2.00**	**mg/L**	10	19-Mar-2019 13:08

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190226-DGW-MW3-PV35mid-40T
Collection Date: 26-Feb-2019 07:25

ANALYTICAL REPORT
WorkOrder:HS19030568
Lab ID:HS19030568-20
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**75.5**		**2.00**	**2.00**	**mg/L**	1	19-Mar-2019 17:18
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	18-Mar-2019 19:42
Arsenic	U		0.000400	0.00200	mg/L	1	18-Mar-2019 19:42
Cadmium	U		0.000200	0.00200	mg/L	1	18-Mar-2019 19:42
Calcium	**7.46**		**0.0340**	**0.500**	**mg/L**	1	18-Mar-2019 19:42
Iron	**0.218**		**0.0120**	**0.200**	**mg/L**	1	18-Mar-2019 19:42
Lead	U		0.000600	0.00200	mg/L	1	18-Mar-2019 19:42
Magnesium	**13.8**		**0.0100**	**0.200**	**mg/L**	1	18-Mar-2019 19:42
Potassium	**2.03**		**0.0180**	**0.200**	**mg/L**	1	18-Mar-2019 19:42
Selenium	U		0.00110	0.00200	mg/L	1	18-Mar-2019 19:42
Sodium	**194**		**0.140**	**2.00**	**mg/L**	10	19-Mar-2019 13:10

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030568

Batch ID: 138728 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19030568-11	1	10	10 (mL)	1
HS19030568-12	1	10	10 (mL)	1
HS19030568-13	1	10	10 (mL)	1
HS19030568-14	1	10	10 (mL)	1
HS19030568-15	1	10	10 (mL)	1
HS19030568-16	1	10	10 (mL)	1
HS19030568-17	1	10	10 (mL)	1
HS19030568-18	1	10	10 (mL)	1
HS19030568-19	1	10	10 (mL)	1
HS19030568-20	1	10	10 (mL)	1

Batch ID: 138730 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19030568-01	1	10	10 (mL)	1
HS19030568-02	1	10	10 (mL)	1
HS19030568-03	1	10	10 (mL)	1
HS19030568-04	1	10	10 (mL)	1
HS19030568-05	1	10	10 (mL)	1
HS19030568-06	1	10	10 (mL)	1
HS19030568-07	1	10	10 (mL)	1
HS19030568-08	1	10	10 (mL)	1
HS19030568-09	1	10	10 (mL)	1
HS19030568-10	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030568

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 138728	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19030568-11	20190225-DGW-MW3-PV35out-controlT	25 Feb 2019 16:40		15 Mar 2019 10:00	19 Mar 2019 12:39	10
HS19030568-11	20190225-DGW-MW3-PV35out-controlT	25 Feb 2019 16:40		15 Mar 2019 10:00	18 Mar 2019 19:06	1
HS19030568-12	20190225-DGW-MW3-PV35out-30T	25 Feb 2019 16:40		15 Mar 2019 10:00	19 Mar 2019 12:45	10
HS19030568-12	20190225-DGW-MW3-PV35out-30T	25 Feb 2019 16:40		15 Mar 2019 10:00	18 Mar 2019 19:24	1
HS19030568-13	20190225-DGW-MW3-PV35out-35T	25 Feb 2019 16:40		15 Mar 2019 10:00	19 Mar 2019 12:47	10
HS19030568-13	20190225-DGW-MW3-PV35out-35T	25 Feb 2019 16:40		15 Mar 2019 10:00	18 Mar 2019 19:26	1
HS19030568-14	20190225-DGW-MW3-PV35out-40T	25 Feb 2019 16:40		15 Mar 2019 10:00	19 Mar 2019 12:50	10
HS19030568-14	20190225-DGW-MW3-PV35out-40T	25 Feb 2019 16:40		15 Mar 2019 10:00	18 Mar 2019 19:28	1
HS19030568-15	20190225-DGW-MW3-PV35inlet-controlT	25 Feb 2019 16:40		15 Mar 2019 10:00	19 Mar 2019 12:52	10
HS19030568-15	20190225-DGW-MW3-PV35inlet-controlT	25 Feb 2019 16:40		15 Mar 2019 10:00	18 Mar 2019 19:30	1
HS19030568-16	20190225-DGW-MW3-PV35inlet-30-35-40T	25 Feb 2019 16:40		15 Mar 2019 10:00	19 Mar 2019 12:54	10
HS19030568-16	20190225-DGW-MW3-PV35inlet-30-35-40T	25 Feb 2019 16:40		15 Mar 2019 10:00	18 Mar 2019 19:33	1
HS19030568-17	20190226-DGW-MW3-PV35mid-controlT	26 Feb 2019 07:25		15 Mar 2019 10:00	19 Mar 2019 13:03	10
HS19030568-17	20190226-DGW-MW3-PV35mid-controlT	26 Feb 2019 07:25		15 Mar 2019 10:00	18 Mar 2019 19:35	1
HS19030568-18	20190226-DGW-MW3-PV35mid-30T	26 Feb 2019 07:25		15 Mar 2019 10:00	19 Mar 2019 13:05	10
HS19030568-18	20190226-DGW-MW3-PV35mid-30T	26 Feb 2019 07:25		15 Mar 2019 10:00	18 Mar 2019 19:37	1
HS19030568-19	20190226-DGW-MW3-PV35mid-35T	26 Feb 2019 07:25		15 Mar 2019 10:00	19 Mar 2019 13:08	10
HS19030568-19	20190226-DGW-MW3-PV35mid-35T	26 Feb 2019 07:25		15 Mar 2019 10:00	18 Mar 2019 19:40	1
HS19030568-20	20190226-DGW-MW3-PV35mid-40T	26 Feb 2019 07:25		15 Mar 2019 10:00	19 Mar 2019 13:10	10
HS19030568-20	20190226-DGW-MW3-PV35mid-40T	26 Feb 2019 07:25		15 Mar 2019 10:00	18 Mar 2019 19:42	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030568

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 138730	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS19030568-01	20190225-DGW-MW3-PV35out-controlD	25 Feb 2019 16:40		15 Mar 2019 10:00	18 Mar 2019 17:57	1
HS19030568-01	20190225-DGW-MW3-PV35out-controlD	25 Feb 2019 16:40		15 Mar 2019 10:00	18 Mar 2019 14:56	10
HS19030568-02	20190225-DGW-MW3-PV35out-30D	25 Feb 2019 16:40		15 Mar 2019 10:00	18 Mar 2019 17:21	10
HS19030568-02	20190225-DGW-MW3-PV35out-30D	25 Feb 2019 16:40		15 Mar 2019 10:00	18 Mar 2019 15:07	1
HS19030568-03	20190225-DGW-MW3-PV35out-35D	25 Feb 2019 16:40		15 Mar 2019 10:00	18 Mar 2019 17:24	10
HS19030568-03	20190225-DGW-MW3-PV35out-35D	25 Feb 2019 16:40		15 Mar 2019 10:00	18 Mar 2019 15:09	1
HS19030568-04	20190225-DGW-MW3-PV35out-40D	25 Feb 2019 16:40		15 Mar 2019 10:00	18 Mar 2019 17:26	10
HS19030568-04	20190225-DGW-MW3-PV35out-40D	25 Feb 2019 16:40		15 Mar 2019 10:00	18 Mar 2019 15:31	1
HS19030568-05	20190225-DGW-MW3-PV35inlet-controlD	25 Feb 2019 16:40		15 Mar 2019 10:00	18 Mar 2019 17:28	10
HS19030568-05	20190225-DGW-MW3-PV35inlet-controlD	25 Feb 2019 16:40		15 Mar 2019 10:00	18 Mar 2019 15:33	1
HS19030568-06	20190225-DGW-MW3-PV35inlet-30-35-40D	25 Feb 2019 16:40		15 Mar 2019 10:00	18 Mar 2019 17:30	10
HS19030568-06	20190225-DGW-MW3-PV35inlet-30-35-40D	25 Feb 2019 16:40		15 Mar 2019 10:00	18 Mar 2019 15:35	1
HS19030568-07	20190226-DGW-MW3-PV35mid-controlD	26 Feb 2019 07:25		15 Mar 2019 10:00	18 Mar 2019 17:33	10
HS19030568-07	20190226-DGW-MW3-PV35mid-controlD	26 Feb 2019 07:25		15 Mar 2019 10:00	18 Mar 2019 15:37	1
HS19030568-08	20190226-DGW-MW3-PV35mid-30D	26 Feb 2019 07:25		15 Mar 2019 10:00	18 Mar 2019 17:35	10
HS19030568-08	20190226-DGW-MW3-PV35mid-30D	26 Feb 2019 07:25		15 Mar 2019 10:00	18 Mar 2019 15:40	1
HS19030568-09	20190226-DGW-MW3-PV35mid-35D	26 Feb 2019 07:25		15 Mar 2019 10:00	18 Mar 2019 17:37	10
HS19030568-09	20190226-DGW-MW3-PV35mid-35D	26 Feb 2019 07:25		15 Mar 2019 10:00	18 Mar 2019 15:42	1
HS19030568-10	20190226-DGW-MW3-PV35mid-40D	26 Feb 2019 07:25		15 Mar 2019 10:00	18 Mar 2019 17:39	10
HS19030568-10	20190226-DGW-MW3-PV35mid-40D	26 Feb 2019 07:25		15 Mar 2019 10:00	18 Mar 2019 15:44	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030568

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R334820	**Test Name :** HARDNESS, TOTAL AS CACO3 BY SM2340B			**Matrix:** Groundwater		
HS19030568-11	20190225-DGW-MW3-PV35out-controlT	25 Feb 2019 16:40			19 Mar 2019 17:18	1
HS19030568-12	20190225-DGW-MW3-PV35out-30T	25 Feb 2019 16:40			19 Mar 2019 17:18	1
HS19030568-13	20190225-DGW-MW3-PV35out-35T	25 Feb 2019 16:40			19 Mar 2019 17:18	1
HS19030568-14	20190225-DGW-MW3-PV35out-40T	25 Feb 2019 16:40			19 Mar 2019 17:18	1
HS19030568-15	20190225-DGW-MW3-PV35inlet-controlT	25 Feb 2019 16:40			19 Mar 2019 17:18	1
HS19030568-16	20190225-DGW-MW3-PV35inlet-30-35-40T	25 Feb 2019 16:40			19 Mar 2019 17:18	1
HS19030568-17	20190226-DGW-MW3-PV35mid-controlT	26 Feb 2019 07:25			19 Mar 2019 17:18	1
HS19030568-18	20190226-DGW-MW3-PV35mid-30T	26 Feb 2019 07:25			19 Mar 2019 17:18	1
HS19030568-19	20190226-DGW-MW3-PV35mid-35T	26 Feb 2019 07:25			19 Mar 2019 17:18	1
HS19030568-20	20190226-DGW-MW3-PV35mid-40T	26 Feb 2019 07:25			19 Mar 2019 17:18	1

WorkOrder: HS19030568
InstrumentID: ICPMS04
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000521	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000340	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000553	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0523	0.0340	0.500
A	Iron	7439-89-6	0.0250	0.0205	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000916	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0700	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0418	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00274	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0556	0.0140	0.200

WorkOrder: HS19030568
InstrumentID: ICPMS04
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000521	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000340	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000553	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0523	0.0340	0.500
A	Iron	7439-89-6	0.0250	0.0205	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000916	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0700	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0418	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00274	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0556	0.0140	0.200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030568

QC BATCH REPORT NEW

Batch ID: 138728 (0) **Instrument: ICPMS04** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLK-138728** Units: **mg/L** Analysis Date: **18-Mar-2019 18:57**
Client ID: Run ID: **ICPMS04_334708** SeqNo: **4994841** PrepDate: **15-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	0.01542	0.200								J
Lead	U	0.00200								
Magnesium	0.01122	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	0.05078	0.200								J

LCS Sample ID: **LCS-138728** Units: **mg/L** Analysis Date: **18-Mar-2019 18:59**
Client ID: Run ID: **ICPMS04_334708** SeqNo: **4994842** PrepDate: **15-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05174	0.00200	0.05	0	103	80 - 120				
Arsenic	0.05132	0.00200	0.05	0	103	80 - 120				
Cadmium	0.05188	0.00200	0.05	0	104	80 - 120				
Calcium	5.31	0.500	5	0	106	80 - 120				
Iron	5.56	0.200	5	0	111	80 - 120				
Lead	0.05169	0.00200	0.05	0	103	80 - 120				
Magnesium	5.396	0.200	5	0	108	80 - 120				
Potassium	5.154	0.200	5	0	103	80 - 120				
Selenium	0.04842	0.00200	0.05	0	96.8	80 - 120				
Sodium	5.52	0.200	5	0	110	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030568

QC BATCH REPORT NEW

Batch ID: 138728 (0) **Instrument: ICPMS04** **Method: ICP-MS METALS BY SW6020A**

MS Sample ID: **HS19030568-11MS** Units: **mg/L** Analysis Date: **18-Mar-2019 19:10**
Client ID: **20190225-DGW-MW3-PV35out-controlT** Run ID: **ICPMS04_334708** SeqNo: **4994847** PrepDate: **15-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05068	0.00200	0.05	0.000219	101	80 - 120				
Arsenic	0.05481	0.00200	0.05	0.005114	99.4	80 - 120				
Cadmium	0.05028	0.00200	0.05	0.000009	101	80 - 120				
Calcium	126.2	0.500	5	123.9	45.8	80 - 120				SO
Iron	5.401	0.200	5	0.1305	105	80 - 120				
Lead	0.05056	0.00200	0.05	0.000079	101	80 - 120				
Magnesium	26.45	0.200	5	22.43	80.4	80 - 120				O
Potassium	7.277	0.200	5	2.176	102	80 - 120				
Selenium	0.04781	0.00200	0.05	0.001109	93.4	80 - 120				
Sodium	200.1	0.200	5	200	1.57	80 - 120				SEO

MSD Sample ID: **HS19030568-11MSD** Units: **mg/L** Analysis Date: **18-Mar-2019 19:13**
Client ID: **20190225-DGW-MW3-PV35out-controlT** Run ID: **ICPMS04_334708** SeqNo: **4994848** PrepDate: **15-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05159	0.00200	0.05	0.000219	103	80 - 120	0.05068	1.78	20	
Arsenic	0.05672	0.00200	0.05	0.005114	103	80 - 120	0.05481	3.43	20	
Cadmium	0.04931	0.00200	0.05	0.000009	98.6	80 - 120	0.05028	1.95	20	
Calcium	125.5	0.500	5	123.9	32.1	80 - 120	126.2	0.547	20	SO
Iron	5.242	0.200	5	0.1305	102	80 - 120	5.401	2.99	20	
Lead	0.04985	0.00200	0.05	0.000079	99.6	80 - 120	0.05056	1.41	20	
Magnesium	26.46	0.200	5	22.43	80.5	80 - 120	26.45	0.0132	20	O
Potassium	7.311	0.200	5	2.176	103	80 - 120	7.277	0.467	20	
Selenium	0.04981	0.00200	0.05	0.001109	97.4	80 - 120	0.04781	4.09	20	
Sodium	200.6	0.200	5	200	13.4	80 - 120	200.1	0.296	20	SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030568

QC BATCH REPORT NEW

Batch ID: 138728 (0) **Instrument: ICPMS04** **Method: ICP-MS METALS BY SW6020A**

PDS Sample ID: **HS19030568-11PDS** Units: **mg/L** Analysis Date: **18-Mar-2019 19:15**
Client ID: **20190225-DGW-MW3-PV35out-controlT** Run ID: **ICPMS04_334708** SeqNo: **4994849** PrepDate: **15-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09239	0.00200	0.1	0.000219	92.2	75 - 125				
Arsenic	0.1071	0.00200	0.1	0.005114	102	75 - 125				
Cadmium	0.1021	0.00200	0.1	0.000009	102	75 - 125				
Iron	10.72	0.200	10	0.1305	106	75 - 125				
Lead	0.1022	0.00200	0.1	0.000079	102	75 - 125				
Magnesium	30.04	0.200	10	22.43	76.1	75 - 125				
Potassium	12.27	0.200	10	2.176	101	75 - 125				
Selenium	0.09632	0.00200	0.1	0.001109	95.2	75 - 125				

PDS Sample ID: **HS19030568-11PDS** Units: **mg/L** Analysis Date: **19-Mar-2019 12:43**
Client ID: **20190225-DGW-MW3-PV35out-controlT** Run ID: **ICPMS04_334782** SeqNo: **4995880** PrepDate: **15-Mar-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	205.3	5.00	100	106.1	99.2	75 - 125				
Sodium	284.2	2.00	100	190.5	93.7	75 - 125				

SD Sample ID: **HS19030568-11SD** Units: **mg/L** Analysis Date: **18-Mar-2019 19:08**
Client ID: **20190225-DGW-MW3-PV35out-controlT** Run ID: **ICPMS04_334708** SeqNo: **4994846** PrepDate: **15-Mar-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000219	0	10	
Arsenic	0.004269	0.0100					0.005114	0	10	J
Cadmium	U	0.0100					0.000009	0	10	
Iron	0.339	1.00					0.1305	0	10	J
Lead	U	0.0100					0.000079	0	10	
Magnesium	20.34	1.00					22.43	9.33	10	
Potassium	2.076	1.00					2.176	4.6	10	
Selenium	U	0.0100					0.001109	0	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030568

QC BATCH REPORT NEW

Batch ID: 138728 (0) **Instrument:** ICPMS04 **Method:** ICP-MS METALS BY SW6020A

SD Sample ID: **HS19030568-11SD** Units: **mg/L** Analysis Date: **19-Mar-2019 12:41**
Client ID: **20190225-DGW-MW3-PV35out-controlT** Run ID: **ICPMS04_334782** SeqNo: **4995879** PrepDate: **15-Mar-2019** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	111.5	25.0					106.1	5.12	10	
Sodium	204.1	10.0					190.5	7.13	10	

The following samples were analyzed in this batch:

HS19030568-11	HS19030568-12	HS19030568-13	HS19030568-14
HS19030568-15	HS19030568-16	HS19030568-17	HS19030568-18
HS19030568-19	HS19030568-20		

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030568

QC BATCH REPORT NEW

Batch ID: 138730 (0) **Instrument: ICPMS04** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

MBLK Sample ID: **MBLK-138730** Units: **mg/L** Analysis Date: **18-Mar-2019 14:51**
Client ID: Run ID: **ICPMS04_334708** SeqNo: **4994332** PrepDate: **15-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01201	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	U	0.200								

LCS Sample ID: **LCS-138730** Units: **mg/L** Analysis Date: **18-Mar-2019 14:53**
Client ID: Run ID: **ICPMS04_334708** SeqNo: **4994333** PrepDate: **15-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05132	0.00200	0.05	0	103	80 - 120				
Arsenic	0.05029	0.00200	0.05	0	101	80 - 120				
Cadmium	0.05004	0.00200	0.05	0	100	80 - 120				
Calcium	5.168	0.500	5	0	103	80 - 120				
Iron	5.18	0.200	5	0	104	80 - 120				
Lead	0.04814	0.00200	0.05	0	96.3	80 - 120				
Magnesium	5.269	0.200	5	0	105	80 - 120				
Potassium	5.114	0.200	5	0	102	80 - 120				
Selenium	0.05073	0.00200	0.05	0	101	80 - 120				
Sodium	5.183	0.200	5	0	104	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030568

QC BATCH REPORT NEW

Batch ID: 138730 (0) **Instrument:** ICPMS04 **Method:** DISSOLVED METALS BY SW6020A (DISSOLVED)

MS Sample ID: **HS19030568-01MS** Units: **mg/L** Analysis Date: **18-Mar-2019 18:01**
Client ID: **20190225-DGW-MW3-PV35out-controlD** Run ID: **ICPMS04_334708** SeqNo: **4994753** PrepDate: **15-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05148	0.00200	0.05	0.000266	102	75 - 125				
Arsenic	0.05659	0.00200	0.05	0.004841	103	75 - 125				
Cadmium	0.0495	0.00200	0.05	0.000013	99.0	75 - 125				
Iron	5.349	0.200	5	0.06769	106	75 - 125				
Lead	0.05	0.00200	0.05	0.000021	100.0	75 - 125				
Magnesium	27.01	0.200	5	21.22	116	75 - 125				O
Potassium	7.392	0.200	5	2.074	106	75 - 125				
Selenium	0.04888	0.00200	0.05	0.001273	95.2	75 - 125				

MS Sample ID: **HS19030568-01MS** Units: **mg/L** Analysis Date: **18-Mar-2019 15:00**
Client ID: **20190225-DGW-MW3-PV35out-controlD** Run ID: **ICPMS04_334708** SeqNo: **4994336** PrepDate: **15-Mar-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	117.6	5.00	5	113.2	88.7	75 - 125				O
Sodium	199.5	2.00	5	198.2	24.9	75 - 125				SO

MSD Sample ID: **HS19030568-01MSD** Units: **mg/L** Analysis Date: **18-Mar-2019 18:04**
Client ID: **20190225-DGW-MW3-PV35out-controlD** Run ID: **ICPMS04_334708** SeqNo: **4994754** PrepDate: **15-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05097	0.00200	0.05	0.000266	101	75 - 125	0.05148	0.992	20	
Arsenic	0.05556	0.00200	0.05	0.004841	101	75 - 125	0.05659	1.84	20	
Cadmium	0.04995	0.00200	0.05	0.000013	99.9	75 - 125	0.0495	0.911	20	
Iron	5.366	0.200	5	0.06769	106	75 - 125	5.349	0.322	20	
Lead	0.05083	0.00200	0.05	0.000021	102	75 - 125	0.05	1.65	20	
Magnesium	26.12	0.200	5	21.22	98.0	75 - 125	27.01	3.35	20	O
Potassium	7.328	0.200	5	2.074	105	75 - 125	7.392	0.874	20	
Selenium	0.04673	0.00200	0.05	0.001273	90.9	75 - 125	0.04888	4.5	20	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030568

QC BATCH REPORT NEW

Batch ID: 138730 (0) **Instrument:** ICPMS04 **Method:** DISSOLVED METALS BY SW6020A (DISSOLVED)

MSD Sample ID: **HS19030568-01MSD** Units: **mg/L** Analysis Date: **18-Mar-2019 15:02**
Client ID: **20190225-DGW-MW3-PV35out-controlD** Run ID: **ICPMS04_334708** SeqNo: **4994337** PrepDate: **15-Mar-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	119.2	5.00	5	113.2	121	75 - 125	117.6	1.37	20	O
Sodium	204.5	2.00	5	198.2	126	75 - 125	199.5	2.49	20	SO

PDS Sample ID: **HS19030568-01PDS** Units: **mg/L** Analysis Date: **18-Mar-2019 18:06**
Client ID: **20190225-DGW-MW3-PV35out-controlD** Run ID: **ICPMS04_334708** SeqNo: **4994755** PrepDate: **15-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1029	0.00200	0.1	0.000266	103	75 - 125				
Arsenic	0.1183	0.00200	0.1	0.004841	113	75 - 125				
Cadmium	0.1143	0.00200	0.1	0.000013	114	75 - 125				
Iron	12.09	0.200	10	0.06769	120	75 - 125				
Lead	0.1149	0.00200	0.1	0.000021	115	75 - 125				
Magnesium	31.82	0.200	10	21.22	106	75 - 125				
Potassium	13.2	0.200	10	2.074	111	75 - 125				
Selenium	0.109	0.00200	0.1	0.001273	108	75 - 125				

PDS Sample ID: **HS19030568-01PDS** Units: **mg/L** Analysis Date: **18-Mar-2019 15:05**
Client ID: **20190225-DGW-MW3-PV35out-controlD** Run ID: **ICPMS04_334708** SeqNo: **4994338** PrepDate: **15-Mar-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	226.1	5.00	100	113.2	113	75 - 125				
Sodium	304.6	2.00	100	198.2	106	75 - 125				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030568

QC BATCH REPORT NEW

Batch ID: 138730 (0) **Instrument:** ICPMS04 **Method:** DISSOLVED METALS BY SW6020A (DISSOLVED)

SD Sample ID: **HS19030568-01SD** Units: **mg/L** Analysis Date: **18-Mar-2019 17:59**
Client ID: **20190225-DGW-MW3-PV35out-controlD** Run ID: **ICPMS04_334708** SeqNo: **4994752** PrepDate: **15-Mar-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000266	0	10	
Arsenic	0.004525	0.0100					0.004841	0	10	J
Cadmium	U	0.0100					0.000013	0	10	
Iron	0.3402	1.00					0.06769	0	10	J
Lead	U	0.0100					0.000021	0	10	
Magnesium	20.9	1.00					21.22	1.53	10	
Potassium	2.083	1.00					2.074	0.449	10	
Selenium	U	0.0100					0.001273	0	10	

SD Sample ID: **HS19030568-01SD** Units: **mg/L** Analysis Date: **18-Mar-2019 14:58**
Client ID: **20190225-DGW-MW3-PV35out-controlD** Run ID: **ICPMS04_334708** SeqNo: **4994335** PrepDate: **15-Mar-2019** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	112.7	25.0					113.2	0.428	10	
Sodium	205.9	10.0					198.2	3.88	10	

The following samples were analyzed in this batch:

HS19030568-01	HS19030568-02	HS19030568-03	HS19030568-04
HS19030568-05	HS19030568-06	HS19030568-07	HS19030568-08
HS19030568-09	HS19030568-10		

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19030568**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
California	2919, 2018-2019	30-Apr-2019
Maryland	343, 2018-2019	30-Jun-2019

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19030568

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19030568-01	20190225-DGW-MW3-PV35out-controlD	Login	3/12/2019 6:33:18 PM	JRM	MET088
HS19030568-02	20190225-DGW-MW3-PV35out-30D	Login	3/12/2019 6:33:18 PM	JRM	MET088
HS19030568-03	20190225-DGW-MW3-PV35out-35D	Login	3/12/2019 6:33:18 PM	JRM	MET088
HS19030568-04	20190225-DGW-MW3-PV35out-40D	Login	3/12/2019 6:33:18 PM	JRM	MET088
HS19030568-05	20190225-DGW-MW3-PV35inlet-controlD	Login	3/12/2019 6:33:18 PM	JRM	MET088
HS19030568-06	20190225-DGW-MW3-PV35inlet-30-35-40D	Login	3/12/2019 6:33:18 PM	JRM	MET088
HS19030568-07	20190226-DGW-MW3-PV35mid-controlD	Login	3/12/2019 6:33:18 PM	JRM	MET088
HS19030568-08	20190226-DGW-MW3-PV35mid-30D	Login	3/12/2019 6:33:18 PM	JRM	MET088
HS19030568-09	20190226-DGW-MW3-PV35mid-35D	Login	3/12/2019 6:33:18 PM	JRM	MET088
HS19030568-10	20190226-DGW-MW3-PV35mid-40D	Login	3/12/2019 6:33:18 PM	JRM	MET088
HS19030568-11	20190225-DGW-MW3-PV35out-controlT	Login	3/12/2019 6:33:18 PM	JRM	MET088
HS19030568-12	20190225-DGW-MW3-PV35out-30T	Login	3/12/2019 6:33:18 PM	JRM	MET088
HS19030568-13	20190225-DGW-MW3-PV35out-35T	Login	3/12/2019 6:33:18 PM	JRM	MET088
HS19030568-14	20190225-DGW-MW3-PV35out-40T	Login	3/12/2019 6:33:18 PM	JRM	MET088
HS19030568-15	20190225-DGW-MW3-PV35inlet-controlT	Login	3/12/2019 6:33:18 PM	JRM	MET088
HS19030568-16	20190225-DGW-MW3-PV35inlet-30-35-40T	Login	3/12/2019 6:33:18 PM	JRM	MET088
HS19030568-17	20190226-DGW-MW3-PV35mid-controlT	Login	3/12/2019 6:33:18 PM	JRM	MET088
HS19030568-18	20190226-DGW-MW3-PV35mid-30T	Login	3/12/2019 6:33:18 PM	JRM	MET088
HS19030568-19	20190226-DGW-MW3-PV35mid-35T	Login	3/12/2019 6:33:18 PM	JRM	MET088
HS19030568-20	20190226-DGW-MW3-PV35mid-40T	Login	3/12/2019 6:33:18 PM	JRM	MET088

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19030568
Date/Time Received: **12-Mar-2019 08:50**
Received by: **JRM**

Checklist completed by: *Jared R. Makan* eSignature 12-Mar-2019 Date
Reviewed by: *Bernadette A. Fini* eSignature 13-Mar-2019 Date

Matrices: **Water**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	0.9c/0.9c UC/C	IR25	
Cooler(s)/Kit(s):	44478		
Date/Time sample(s) sent to storage:	03/12/2019 18:50		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

ALS Environmental

Chain of Custody Form

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HS19030568

Golder Associates
Exide Column Studies

ALS Project Manager:

Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086-01	Project Name	Exide column studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrette Parkway Drive, Suit	E	ICP TW (6020A total metals (6)+cations)
				F	ICP DISS (6020A diss metals (6)+cations-FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin Mo 63021	G	
Phone	314 984-8800	Phone	314 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190225-DGW-MW3-PV35out-controlD	02-25-19	4:40 PM	GW	2	1						x					
2	20190225-DGW-MW3-PV35out-30D	02-25-19	4:40 PM	GW	2	1						x					
3	20190225-DGW-MW3-PV35out-35D	02-25-19	4:40 PM	GW	2	1						x					
4	20190225-DGW-MW3-PV35out-40D	02-25-19	4:40 PM	GW	2	1						x					
5	20190225-DGW-MW3-PV35inlet-controlD	02-25-19	4:40 PM	GW	2	1						x					
6	20190225-DGW-MW3-PV35inlet-30-35-40D	02-25-19	4:40 PM	GW	2	1						x					
7	20190226-DGW-MW3-PV35mid-controlD	02-26-19	7:25 PM	GW	2	1						x					
8	20190226-DGW-MW3-PV35mid-30D	02-26-19	7:25 PM	GW	2	1						x					
9	20190226-DGW-MW3-PV35mid-35D	02-26-19	7:25 PM	GW	2	1						x					
10	20190226-DGW-MW3-PV35mid-40D	02-26-19	7:25 PM	GW	2	1						x					

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method:

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by: Giovanna Llamosas	Date: 2019/03/11	Time: 15:30	Received by:	Notes:
Relinquished by:	Date: 3/12/19	Time: 03 50	Received by (Laboratory):	Cooler Temp. 2C
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	0.9

QC Package: (Check Box Below)

	Level II: Standard QC	x	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other:		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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Chain of Custody Form

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HS19030568

Golder Associates
Exide Column Studies

ALS Project Manager:

Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086-01	Project Name	Exide column studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrette Parkway Drive, Suit	E	ICP TW (6020A total metals (6)+cations)
				F	ICP DISS (6020A diss metals (6)+cations-FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin Mo 63021	G	
Phone	314 984-8800	Phone	314 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190225-DGW-MW3-PV35out-controlT	02-25-19	4:40 PM	GW	2	1				X	X						
2	20190225-DGW-MW3-PV35out-30T	02-25-19	4:40 PM	GW	2	1				X	X						
3	20190225-DGW-MW3-PV35out-35T	02-25-19	4:40 PM	GW	2	1				X	X						
4	20190225-DGW-MW3-PV35out-40T	02-25-19	4:40 PM	GW	2	1				X	X						
5	20190225-DGW-MW3-PV35inlet-controlT	02-25-19	4:40 PM	GW	2	1				X	X						
6	20190225-DGW-MW3-PV35inlet-30-35-40T	02-25-19	4:40 PM	GW	2	1				X	X						
7	20190226-DGW-MW3-PV35mid-controlT	02-26-19	7:25 PM	GW	2	1				X	X						
8	20190226-DGW-MW3-PV35mid-30T	02-26-19	7:25 PM	GW	2	1				X	X						
9	20190226-DGW-MW3-PV35mid-35T	02-26-19	7:25 PM	GW	2	1				X	X						
10	20190226-DGW-MW3-PV35mid-40T	02-26-19	7:25 PM	GW	2	1				X	X						

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method:

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by: Giovanna Llamosas	Date: 2019/03/11	Time: 15:30	Received by:	Notes:	
Relinquished by:	Date: 3/12/19	Time: 08:30	Received by (Laboratory):	Cooler Temp. 4C	QC Package: (Check Box Below)
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	0.9	☐ Level II: Standard QC ☒ TRRP-Checklist ☐ Level III: Std QC + Raw Data ☐ TRRP Level IV ☐ Level IV: SW846 CLP-Like ☐ Other:

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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Après l'impression de cette étiquette:
COPIE DU DESTINATAIRE - VEUILLEZ LA PLACER À L'AVANT DE LA POCHETTE
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2. Placez l'étiquette dans la pochette d'expédition et fixez cette dernière sur votre envoi.
Avertissement:Utilisez uniquement les originaux imprimés des étiquettes d'expédition. L'utilisation d'une photocopie de cette étiquette est considérée comme un acte frauduleux et pourrait entraîner des frais supplémentaires ainsi que la fermeture de votre compte FedEx.
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La Convention de Varsovie, telle que modifiée, peut s'appliquer à n'importe quel envoi à destination internationale acheminé par voie aérienne. Dans un tel cas, la Convention régit et, dans la plupart des cas, limite la responsabilité de FedEx en ce qui a trait à la perte, au retard ou à l'endommagement de votre envoi. La Convention de Varsovie, telle que modifiée, limite la responsabilité de FedEx. Par exemple, aux États-Unis, notre responsabilité se limite à 20 $ par kilogramme (9,07 $ par livre), à moins que vous ne déclariez une valeur supérieure, comme précisé ci-dessous, et que vous acquittiez tout supplément applicable. L'interprétation et l'application des limites de responsabilité prévues par la Convention de Varsovie peuvent varier selon le pays. Aucun ajout spécifique n'est convenu à l'avance et FedEx se réserve le droit d'acheminer l'envoi de la manière qui lui semble la plus appropriée. NOTIFICATION DE TRANSPORT TERRESTRE. Les envois transportés exclusivement par voie terrestre, à partir ou vers un pays qui adhère à la Convention de Varsovie ou à la Convention relative au transport des marchandises par route (CMR), sont soumis aux modalités de la CMR, nonobstant toute disposition contraire dans la présente lettre de transport aérien. Pour les envois transportés uniquement par voie terrestre, en cas de conflit entre les dispositions de la CMR et celles de la présente lettre de transport aérien, les modalités de la CMR prévaudront. LIMITE DE RESPONSABILITÉ. Si elle n'est pas régie par la Convention de Varsovie, la CMR ou d'autres lois internationaux, réglementations gouvernementales, décrets ou exigences, la responsabilité maximale de FedEx pour les dommages, pertes, objets manquants, mauvaise livraison, non-livraison, renseignements erronés ou défaut de fournir des renseignements liés à votre envoi est limitée par la présente entente et les modalités et conditions du contrat de transport. Veuillez vous reporter au contrat de transport établi dans le Guide des services de FedEx applicable ou son équivalent, afin de déterminer les limites contractuelles. FedEx ne fournit pas d'assurance tous risques ou des marchandises, mais il vous est possible de payer une somme supplémentaire pour chaque 100 $US supplémentaire (ou devise locale équivalente pour le pays d'origine) de la valeur déclarée de transport. Si vous déclarez une valeur de transport plus élevée et que vous payez les frais additionnels, la responsabilité maximale de FedEx s'élèvera à la valeur déclarée pour le transport ou à la valeur des dommages réels, soit le moins élevé. RESPONSABILITÉS NON ASSUMÉES. FEDEX NE POURRA EN AUCUN CAS ÊTRE RESPONSABLE DES DOMMAGES DIRECTS, INDIRECTS, ACCESSOIRES, SPÉCIAUX OU CONSÉCUTIFS EN EXCÉDENT DE LA VALEUR DÉCLARÉE POUR LE TRANSPORT (Y COMPRIS, SANS S'Y LIMITER, CEUX RÉSULTANT DE PERTES DE REVENUS OU DE PROFITS) OU DE LA VALEUR RÉELLE DE L'ENVOI, SI ELLE EST INFÉRIEURE, QUE FEDEX SACHE OU AURAIT DÛ SAVOIR OU NON QUE DES DOMMAGES POUVAIENT ÊTRE ENCOURUS. FedEx ne sera pas responsable de vos actes ou omissions, y compris, mais sans s'y limiter, de toute déclaration de marchandises inexacte, d'emballage, de protection, de marquage ou d'indication d'adresse inadéquats ou insuffisants, ou encore des actes ou omissions du destinataire ou de toute personne ayant un intérêt dans l'envoi, ou si l'une ou l'autre partie manquait à toute condition de notre accord. FedEx ne sera pas responsable en cas de pertes, de dommages, de délais, d'objets manquants, de livraison erronée, de livraison non effectuée, de fausses informations ou d'informations manquantes relativement aux envois d'argent comptant, de devises ou d'autres articles prohibés, ou en cas d'événements indépendants de la volonté de FedEx, tels que des cas fortuits ou de force majeure, des risques du transport aérien, des conditions météorologiques, des retards mécaniques, des actes d'ennemis publics, des guerres, des grèves, des agitations civiles ou des actes ou omissions des autorités publiques (y compris les fonctionnaires de la douane et de la santé) ayant l'autorité réelle ou apparente. INEXISTENCE DE GARANTIE. Nous n'offrons aucune garantie, expresse ou tacite. DEMANDES RELATIVES À UNE PERTE, UN DOMMAGE OU UN RETARD. TOUTES LES RÉCLAMATIONS DOIVENT NOUS ÊTRE SIGNALÉES PAR ÉCRIT, ET À L'INTÉRIEUR DE DÉLAIS STRICTS CONSULTEZ NOTRE TARIF, LE GUIDE DES SERVICES DE FEDEX APPLICABLE OU LES CONDITIONS STANDARD DE TRANSPORT POUR PLUS DE DÉTAILS. La Convention de Varsovie a établi des procédures de réclamation écrites détaillées pour les dommages, retards ou non-livraison des envois. En outre, l'interprétation et l'application des dispositions relatives aux réclamations telles qu'elles sont stipulées dans la Convention de Varsovie peuvent varier selon les pays. Veuillez vous reporter à la Convention afin de déterminer la période de réclamation qui se rapporte à votre envoi. Le réclamant ne pourra plus réclamer de dommages-intérêts à FedEx si l'action pour telle n'est engagée dans un délai de deux ans, tel que stipulé dans la Convention. FedEx n'est pas tenue de répondre à quelque réclamation que ce soit avant que tous les frais de transport aient été réglés. Le montant de la réclamation ne peut être déduit des frais de transport. Si le destinataire accepte l'envoi sans prendre note de dommages au registre de livraison, FedEx assumera que l'envoi a été livré en bon état. Afin de nous permettre de traiter les réclamations pour dommages, le contenu, les cartons et emballages d'expédition d'origine doivent être conservés pour nous permettre de les examiner. DISPOSITIONS IMPÉRATIVES. Dans la mesure où l'une des dispositions contenues ou indiquées dans la présente lettre de transport aérien est contraire à tout traité international, loi, réglementation, ordonnance ou exigence gouvernementale en vigueur, ladite disposition ne sera applicable en tant que partie de notre accord tant qu'elle ne sera pas rendue caduque. L'invalidité ou le caractère inexécutoire de toute disposition n'affectera aucune autre partie de la présente lettre de transport aérien. À moins d'indications contraires, FEDERAL EXPRESS CORPORATION, 2005 Corporate Avenue, Memphis, TN 38132, USA, est le transporteur principal de l'envoi. Adresse de courriel sur le site www.fedex.com.

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

March 20, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19030569**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 22 sample(s) on Mar 12, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19030569**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19030569**	

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data								
Laboratory Name: ALS Laboratory Group			LRC Date: 03/20/2019					
Project Name: Exide Column Studies			Laboratory Job Number: HS19030569					
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 138728,138729,138730,138731,R334820,R334821					
#[1]	A[2]	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?			X		
		Were analytical duplicates analyzed at the appropriate frequency?			X		
		Were RPDs or relative standard deviations within the laboratory QC limits?			X		
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				2
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 03/20/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19030569				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 138728,138729,138730,138731,R334820,R334821				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			3
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports	
Laboratory Name: ALS Laboratory Group	LRC Date: 03/20/2019
Project Name: Exide Column Studies	Laboratory Job Number: HS19030569
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 138728,138729,138730,138731,R334820,R334821

ER#[5]	Description
1	Batch 138728, Metals Method SW6020, sample HS19030568-11, MS and MSD were performed on unrelated sample. Batch 137729, Metals Method SW6020, sample 20190305-DGW-MW11-PV30mid-40T, MS and or MSD recovered outside the control limit for Calcium, Magnesium and Sodium, however, the result in the parent sample is greater than 4x the spike amount. Batch 138730, Dissolved Metals Method SW6020, sample HS19030568-01, MS and MSD were performed on unrelated sample. Batch 138731, Dissolved Metals Method SW6020, sample 20190303-DGW-MW11-PV30out-30D-DUP, MS and MSD recovered outside the control limits for Calcium, Magnesium and Sodium, however, the result in the parent sample is greater than 4x the spike amount.
2	Batch 138728, Metals Method SW6020, samples were analyzed at 5x dilution due to high concentration of Sodium. Batch 138730, Dissolved Metals Method SW6020, samples were analyzed at 5x dilution due to high concentration of Sodium.
3	See Run Log and CCB Exceptions Report.

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030569
Start Date: 18-Mar-2019 End Date: 18-Mar-2019

Run ID:ICPMS04_334708
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	18-Mar-2019 12:52	033_ICV.d	AS CA CD FE K MG NA P PB SB SE
LLICV2	1	18-Mar-2019 12:54	034SMPL.d	AS CA CD FE K MG NA P PB SB SE
LLICV5	1	18-Mar-2019 12:57	035LICV.d	AS CA CD FE K MG NA P PB SB SE
ICB	1	18-Mar-2019 12:59	036_ICB.d	AS CA CD FE K MG NA P PB SB SE
ICSA	1	18-Mar-2019 13:08	038ICSA.d	AS CA CD FE K MG NA P PB SB SE
ICSAB	1	18-Mar-2019 13:10	039ICSB.d	AS CA CD FE K MG NA P PB SB SE
CCV 1	1	18-Mar-2019 13:39	048_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 1	1	18-Mar-2019 13:42	049_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 2	1	18-Mar-2019 14:38	055_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 2	1	18-Mar-2019 14:45	058_CCB.d	AS CA CD FE K MG NA P PB SB SE
MBLK-138730	1	18-Mar-2019 14:51	059SMPL.d	AS CA CD FE K MG NA P PB SB SE
LCS-138730	1	18-Mar-2019 14:53	060SMPL.d	AS CA CD FE K MG NA P PB SB SE
ZZZZZZSD	50	18-Mar-2019 14:58	062SMPL.d	CA NA
ZZZZZZMS	10	18-Mar-2019 15:00	063SMPL.d	CA NA
ZZZZZZMSD	10	18-Mar-2019 15:02	064SMPL.d	CA NA
ZZZZZZPDS	10	18-Mar-2019 15:05	065SMPL.d	CA NA
CCV 3	1	18-Mar-2019 15:15	069_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 3	1	18-Mar-2019 15:23	072_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 4	1	18-Mar-2019 15:53	083_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 4	1	18-Mar-2019 15:55	084_CCB.d	AS CA CD FE K MG NA P PB SB SE
20190304-DGW-MW11-PV30out-controlD	5	18-Mar-2019 16:20	088SMPL.d	AS CA CD FE K MG P PB SB SE
20190304-DGW-MW11-PV30out-30D	5	18-Mar-2019 16:22	089SMPL.d	AS CA CD FE K MG P PB SB SE
20190304-DGW-MW11-PV30out-35D	5	18-Mar-2019 16:24	090SMPL.d	AS CA CD FE K MG P PB SB SE
20190304-DGW-MW11-PV30out-40D	5	18-Mar-2019 16:27	091SMPL.d	AS CA CD FE K MG P PB SB SE
20190304-DGW-MW11-PV30inlet-controlD	5	18-Mar-2019 16:32	092SMPL.d	AS CA CD FE K MG P PB SB SE
20190304-DGW-MW11-PV30inlet-30-35-40D	5	18-Mar-2019 16:34	093SMPL.d	AS CA CD FE K MG P PB SB SE
CCV 5	1	18-Mar-2019 16:39	095_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 5	1	18-Mar-2019 16:42	096_CCB.d	AS CA CD FE K MG NA P PB SB SE
20190305-DGW-MW11-PV30mid-controlD	5	18-Mar-2019 16:49	098SMPL.d	AS CA CD FE K MG PB SB SE
20190305-DGW-MW11-PV30mid-30D	5	18-Mar-2019 16:51	099SMPL.d	AS CA CD FE K MG PB SB SE
20190305-DGW-MW11-PV30mid-35D	5	18-Mar-2019 16:53	100SMPL.d	AS CA CD FE K MG PB SB SE
20190305-DGW-MW11-PV30mid-40D	5	18-Mar-2019 16:56	101SMPL.d	AS CA CD FE K MG PB SB SE
CCV 6	1	18-Mar-2019 17:12	103_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 6	1	18-Mar-2019 17:14	104_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 7	1	18-Mar-2019 17:46	115_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 7	1	18-Mar-2019 17:48	116_CCB.d	AS CA CD FE K MG NA P PB SB SE
ZZZZZZSD	5	18-Mar-2019 17:59	119SMPL.d	AS CD FE K MG PB SB SE
ZZZZZZMS	1	18-Mar-2019 18:01	120SMPL.d	AS CD FE K MG PB SB SE
ZZZZZZMSD	1	18-Mar-2019 18:04	121SMPL.d	AS CD FE K MG PB SB SE
ZZZZZZPDS	1	18-Mar-2019 18:06	122SMPL.d	AS CD FE K MG PB SB SE
20190304-DGW-MW11-PV30out-controlD	100	18-Mar-2019 18:10	124SMPL.d	NA
20190304-DGW-MW11-PV30out-30D	100	18-Mar-2019 18:13	125SMPL.d	NA
CCV 8	1	18-Mar-2019 18:17	127_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 8	1	18-Mar-2019 18:19	128_CCB.d	AS CA CD FE K MG NA P PB SB SE

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030569
Start Date: 18-Mar-2019 End Date: 18-Mar-2019

Run ID:ICPMS04_334708
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
20190304-DGW-MW11-PV30out-35D	100	18-Mar-2019 18:27	130SMPL.d	NA
20190304-DGW-MW11-PV30out-40D	100	18-Mar-2019 18:29	131SMPL.d	NA
20190304-DGW-MW11-PV30inlet-controlD	100	18-Mar-2019 18:31	132SMPL.d	NA
20190304-DGW-MW11-PV30inlet-30-35-40D	100	18-Mar-2019 18:34	133SMPL.d	NA
20190305-DGW-MW11-PV30mid-controlD	100	18-Mar-2019 18:36	134SMPL.d	NA
20190305-DGW-MW11-PV30mid-30D	100	18-Mar-2019 18:38	135SMPL.d	NA
20190305-DGW-MW11-PV30mid-35D	100	18-Mar-2019 18:40	136SMPL.d	NA
20190305-DGW-MW11-PV30mid-40D	100	18-Mar-2019 18:43	137SMPL.d	NA
CCV 9	1	18-Mar-2019 18:47	139_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 9	1	18-Mar-2019 18:49	140_CCB.d	AS CA CD FE K MG NA P PB SB SE
MBLK-138728	1	18-Mar-2019 18:57	141SMPL.d	AS CA CD FE K MG NA PB SB SE
LCS-138728	1	18-Mar-2019 18:59	142SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZSD	5	18-Mar-2019 19:08	146SMPL.d	AS CD FE K MG PB SB SE
ZZZZZZMS	1	18-Mar-2019 19:10	147SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZMSD	1	18-Mar-2019 19:13	148SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZPDS	1	18-Mar-2019 19:15	149SMPL.d	AS CD FE K MG PB SB SE
CCV 10	1	18-Mar-2019 19:19	151_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 10	1	18-Mar-2019 19:21	152_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 11	1	18-Mar-2019 19:46	163_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 11	1	18-Mar-2019 19:48	164_CCB.d	AS CA CD FE K MG NA P PB SB SE
20190304-DGW-MW11-PV30out-controlT	5	18-Mar-2019 19:51	165SMPL.d	AS CA CD FE K MG PB SB SE
20190304-DGW-MW11-PV30out-30T	5	18-Mar-2019 19:53	166SMPL.d	AS CA CD FE K MG PB SB SE
20190304-DGW-MW11-PV30out-35T	5	18-Mar-2019 19:55	167SMPL.d	AS CA CD FE K MG PB SB SE
20190304-DGW-MW11-PV30out-40T	5	18-Mar-2019 19:57	168SMPL.d	AS CA CD FE K MG PB SB SE
20190304-DGW-MW11-PV30inlet-controlT	5	18-Mar-2019 20:00	169SMPL.d	AS CA CD FE K MG PB SB SE
20190304-DGW-MW11-PV30inlet-30-35-40T	5	18-Mar-2019 20:02	170SMPL.d	AS CA CD FE K MG PB SB SE
20190305-DGW-MW11-PV30mid-controlT	5	18-Mar-2019 20:04	171SMPL.d	AS CA CD FE K MG PB SB SE
20190305-DGW-MW11-PV30mid-30T	5	18-Mar-2019 20:07	172SMPL.d	AS CA CD FE K MG PB SB SE
20190305-DGW-MW11-PV30mid-35T	5	18-Mar-2019 20:09	173SMPL.d	AS CA CD FE K MG PB SB SE
CCV 12	1	18-Mar-2019 20:13	175_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 12	1	18-Mar-2019 20:15	176_CCB.d	AS CA CD FE K MG NA P PB SB SE
ICCV 13	1	18-Mar-2019 22:20	191_ICV.d	AS CA CD FE K MG NA P PB SB SE
LLCCV2	1	18-Mar-2019 22:23	192SMPL.d	AS CA CD FE K MG NA P PB SB SE
LLCCV5	1	18-Mar-2019 22:25	193LICV.d	AS CA CD FE K MG NA P PB SB SE
ICCV 14	1	18-Mar-2019 22:27	194_ICV.d	AS CA CD FE K MG NA P PB SB SE
ICCB 13	1	18-Mar-2019 22:29	195_ICB.d	AS CA CD FE K MG NA P PB SB SE
CCV 15	1	18-Mar-2019 23:24	205_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 14	1	18-Mar-2019 23:26	206_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 16	1	18-Mar-2019 23:31	208_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 15	1	18-Mar-2019 23:33	209_CCB.d	AS CA CD FE K MG NA P PB SB SE
LLICV2	1	18-Mar-2019 23:35	210SMPL.d	AS CA CD FE K MG NA P PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030569

Run ID:ICPMS04_334708
Instrument:ICPMS04
Method:SW6020

ICB	Date: 18-Mar-2019 12:59	Seq: 4994001	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.538	0.4	2	

CCB 1	Date: 18-Mar-2019 13:42	Seq: 4994119	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	2.109	0.4	2	

CCB 2	Date: 18-Mar-2019 14:45	Seq: 4994272	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.422	0.4	2	

CCB 4	Date: 18-Mar-2019 15:55	Seq: 4994469	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.688	0.4	2	
Iron	16.21	12	200	
Sodium	37.39	14	200	

CCB 5	Date: 18-Mar-2019 16:42	Seq: 4994566	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.53	0.4	2	
Iron	56.45	12	200	
Sodium	176.6	14	200	

CCB 6	Date: 18-Mar-2019 17:14	Seq: 4994650	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.545	0.4	2	
Iron	55.85	12	200	
Sodium	149.4	14	200	

CCB 7	Date: 18-Mar-2019 17:48	Seq: 4994723	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.421	0.4	2	
Iron	30.27	12	200	
Sodium	67.77	14	200	

CCB 8	Date: 18-Mar-2019 18:19	Seq: 4994766	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.41	0.4	2	
Iron	16.94	12	200	
Sodium	74.9	14	200	

CCB 9	Date: 18-Mar-2019 18:49	Seq: 4994789	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.097	0.4	2	
Iron	17.42	12	200	
Sodium	57.3	14	200	

CCB 10	Date: 18-Mar-2019 19:21	Seq: 4994852	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.37	0.4	2	
Iron	18.85	12	200	
Sodium	128.8	14	200	

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030569

Run ID:ICPMS04_334708
Instrument:ICPMS04
Method:SW6020

CCB 11	Date: 18-Mar-2019 19:48	Seq: 4994864	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.108	0.4	2	
Iron	52.66	12	200	
Sodium	143.5	14	200	

CCB 12	Date: 18-Mar-2019 20:15	Seq: 4994876	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.9	0.4	2	
Iron	63.09	12	200	
Sodium	166.3	14	200	

ICCB 13	Date: 18-Mar-2019 22:29	Seq: 4995054	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.891	0.4	2	
Iron	-36.66	12	200	

CCB 14	Date: 18-Mar-2019 23:26	Seq: 4995061	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.698	0.4	2	
Iron	-39.4	12	200	

CCB 15	Date: 18-Mar-2019 23:33	Seq: 4995064	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.724	0.4	2	
Iron	-40.59	12	200	
Sodium	-15.86	14	200	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030569
Start Date: 19-Mar-2019 End Date: 20-Mar-2019

Run ID:ICPMS04_334782
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
LLICV2	1	19-Mar-2019 12:14	024SMPL.d	CA NA
LLICV5	1	19-Mar-2019 12:16	025LICV.d	CA NA
ICB	1	19-Mar-2019 12:18	026_ICB.d	AS CA CD FE K MG NA PB SB SE
ICV	1	19-Mar-2019 12:21	027_ICV.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	19-Mar-2019 12:28	029ICSA.d	CA NA
ICSAB	1	19-Mar-2019 12:30	030ICSB.d	CA NA
ZZZZZZSD	50	19-Mar-2019 12:41	033SMPL.d	CA NA
ZZZZZZPDS	10	19-Mar-2019 12:43	034SMPL.d	CA NA
CCV 1	1	19-Mar-2019 12:58	041_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	19-Mar-2019 13:01	042_CCB.d	AS CA CD FE K MG NA PB SB SE
20190304-DGW-MW11-PV30out-controlT	100	19-Mar-2019 13:12	047SMPL.d	NA
20190304-DGW-MW11-PV30out-30T	100	19-Mar-2019 13:14	048SMPL.d	NA
20190304-DGW-MW11-PV30out-35T	100	19-Mar-2019 13:17	049SMPL.d	NA
20190304-DGW-MW11-PV30out-40T	100	19-Mar-2019 13:19	050SMPL.d	NA
20190304-DGW-MW11-PV30inlet-controlT	100	19-Mar-2019 13:21	051SMPL.d	NA
CCV 2	1	19-Mar-2019 13:25	053_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	19-Mar-2019 13:28	054_CCB.d	AS CA CD FE K MG NA PB SB SE
20190304-DGW-MW11-PV30inlet-30-35-40T	100	19-Mar-2019 13:30	055SMPL.d	NA
20190305-DGW-MW11-PV30mid-controlT	100	19-Mar-2019 13:32	056SMPL.d	NA
20190305-DGW-MW11-PV30mid-30T	100	19-Mar-2019 13:34	057SMPL.d	NA
20190305-DGW-MW11-PV30mid-35T	100	19-Mar-2019 13:37	058SMPL.d	NA
20190303-DGW-MW11-PV30out-30D-DUP	100	19-Mar-2019 13:41	060SMPL.d	NA
20190303-DGW-MW11-PV30out-30D-DUPSD	500	19-Mar-2019 13:43	061SMPL.d	CA NA
20190303-DGW-MW11-PV30out-30D-DUPPDS	100	19-Mar-2019 13:46	062SMPL.d	CA NA
CCV 3	1	19-Mar-2019 13:52	065_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	19-Mar-2019 13:54	066_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	19-Mar-2019 14:19	077_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	19-Mar-2019 14:22	078_CCB.d	AS CA CD FE K MG NA PB SB SE
20190305-DGW-MW11-PV30mid-40T	100	19-Mar-2019 14:34	081SMPL.d	NA
20190305-DGW-MW11-PV30mid-40TSD	500	19-Mar-2019 14:37	082SMPL.d	NA
20190305-DGW-MW11-PV30mid-40TPDS	100	19-Mar-2019 14:39	083SMPL.d	NA
20190303-DGW-MW11-PV30out-30T-DUP	5	19-Mar-2019 14:41	084SMPL.d	CA
20190303-DGW-MW11-PV30out-30T-DUP	100	19-Mar-2019 14:43	085SMPL.d	NA
CCV 5	1	19-Mar-2019 14:52	089_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	19-Mar-2019 14:54	090_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	19-Mar-2019 15:21	101_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	19-Mar-2019 15:23	102_CCB.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	19-Mar-2019 16:21	119SMPL.d	CA NA
LLCCV5	1	19-Mar-2019 16:23	120LICV.d	CA NA
ICCB 7	1	19-Mar-2019 16:25	121_ICB.d	AS CA CD FE K MG NA PB SB SE
ICCV 7	1	19-Mar-2019 16:27	122_ICV.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030569

Run ID:ICPMS04_334782
Instrument:ICPMS04
Method:SW6020

CCB 1	Date: 19-Mar-2019 13:01	Seq: 4995888		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	21.44	14	200	
CCB 2	Date: 19-Mar-2019 13:28	Seq: 4995900		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	19.49	14	200	
CCB 3	Date: 19-Mar-2019 13:54	Seq: 4995966		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	19.37	14	200	
CCB 4	Date: 19-Mar-2019 14:22	Seq: 4995978		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	20.73	14	200	
CCB 5	Date: 19-Mar-2019 14:54	Seq: 4996040		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	35.51	14	200	
CCB 6	Date: 19-Mar-2019 15:23	Seq: 4996052		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	25.22	14	200	
CCB 11	Date: 19-Mar-2019 18:31	Seq: 4996676		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	52.73	14	200	
CCB 12	Date: 19-Mar-2019 18:35	Seq: 4996678		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	30.78	14	200	
CCB 13	Date: 19-Mar-2019 19:02	Seq: 4996690		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	140.8	14	200	
CCB 14	Date: 19-Mar-2019 19:29	Seq: 4996702		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	137.2	14	200	
CCB 16	Date: 19-Mar-2019 23:37	Seq: 4996865		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	19.47	14	200	
CCB 17	Date: 19-Mar-2019 23:57	Seq: 4996874		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	24.52	14	200	
CCB 18	Date: 20-Mar-2019 00:18	Seq: 4996896		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	116	14	200	
CCB 19	Date: 20-Mar-2019 00:38	Seq: 4996905		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	119.3	14	200	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030569
Start Date: 18-Mar-2019 End Date: 19-Mar-2019

Run ID:ICPMS05_334713
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	18-Mar-2019 12:51	020_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	18-Mar-2019 12:53	021SMPL.d	AS CA CD FE K MG PB SB SE
ICB	1	18-Mar-2019 12:58	023_ICB.d	AS CA CD FE K MG NA PB SB SE
LLICV5	1	18-Mar-2019 13:03	025LICV.d	AS CA CD FE K MG PB SB SE
ICSA	1	18-Mar-2019 13:16	026ICSA.d	AS CA CD FE K MG PB SB SE
ICSAB	1	18-Mar-2019 13:18	027ICSB.d	AS CA CD FE K MG PB SB SE
CCV 1	1	18-Mar-2019 13:47	036_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	18-Mar-2019 13:49	037_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	18-Mar-2019 14:13	045_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	18-Mar-2019 14:15	046_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	18-Mar-2019 14:49	058_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	18-Mar-2019 14:55	060_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	18-Mar-2019 15:19	070_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	18-Mar-2019 15:21	071_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	18-Mar-2019 15:50	083_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	18-Mar-2019 15:57	085_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	18-Mar-2019 16:20	095_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	18-Mar-2019 16:22	096_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	18-Mar-2019 16:46	106_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	18-Mar-2019 16:48	107_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-138731	1	18-Mar-2019 16:58	109SMPL.d	AS CA CD FE K MG NA PB SB SE
LCS-138731	1	18-Mar-2019 17:00	110SMPL.d	AS CA CD FE K MG NA PB SB SE
20190303-DGW-MW11-PV30out-30D-DUP	5	18-Mar-2019 17:02	111SMPL.d	AS CA CD FE K MG PB SB SE
20190303-DGW-MW11-PV30out-30D-DUPSD	25	18-Mar-2019 17:04	112SMPL.d	AS CA CD FE K MG PB SB SE
20190303-DGW-MW11-PV30out-30D-DUPMS	5	18-Mar-2019 17:09	113SMPL.d	AS CA CD FE K MG NA PB SB SE
20190303-DGW-MW11-PV30out-30D-DUPMSD	5	18-Mar-2019 17:11	114SMPL.d	AS CA CD FE K MG NA PB SB SE
20190303-DGW-MW11-PV30out-30D-DUPPDS	5	18-Mar-2019 17:13	115SMPL.d	AS CA CD FE K MG PB SB SE
CCV 8	1	18-Mar-2019 17:24	118_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	18-Mar-2019 17:26	119_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	18-Mar-2019 18:00	126_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	18-Mar-2019 18:02	127_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 10	1	18-Mar-2019 18:38	138_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	18-Mar-2019 18:40	139_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	18-Mar-2019 19:02	147_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 11	1	18-Mar-2019 19:04	148_CCV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	18-Mar-2019 22:07	190SMPL.d	AS CA CD FE K MG PB SB SE
LLCCV5	1	18-Mar-2019 22:09	191LICV.d	AS CA CD FE K MG PB SB SE
ICCV 12	1	18-Mar-2019 22:11	192_ICV.d	AS CA CD FE K MG NA PB SB SE
ICCB 12	1	18-Mar-2019 22:13	193_ICB.d	AS CA CD FE K MG NA PB SB SE
CCB 13	1	18-Mar-2019 22:36	203_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 13	1	18-Mar-2019 22:40	204_CCV.d	AS CA CD FE K MG NA PB SB SE
ICCV 14	1	18-Mar-2019 23:27	217_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	18-Mar-2019 23:29	218SMPL.d	AS CA CD FE K MG PB SB SE
LLCCV5	1	18-Mar-2019 23:31	219LICV.d	AS CA CD FE K MG PB SB SE
ICCB 14	1	18-Mar-2019 23:33	220_ICB.d	AS CA CD FE K MG NA PB SB SE
CCV 15	1	18-Mar-2019 23:56	230_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 15	1	18-Mar-2019 23:58	231_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 16	1	19-Mar-2019 00:18	240_CCV.d	AS CA CD FE K MG NA PB SB SE

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030569
Start Date: 18-Mar-2019 End Date: 19-Mar-2019

Run ID:ICPMS05_334713
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
CCB 16	1	19-Mar-2019 00:21	241_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 17	1	19-Mar-2019 00:46	252_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 17	1	19-Mar-2019 00:48	253_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-138729	1	19-Mar-2019 00:50	254SMPL.d	AS CA CD FE K MG NA PB SB SE
LCS-138729	1	19-Mar-2019 00:52	255SMPL.d	AS CA CD FE K MG NA PB SB SE
20190305-DGW-MW11-PV30mid-40T	5	19-Mar-2019 00:55	256SMPL.d	AS CA CD FE K MG PB SB SE
20190305-DGW-MW11-PV30mid-40TMS	5	19-Mar-2019 00:59	258SMPL.d	AS CA CD FE K MG NA PB SB SE
20190305-DGW-MW11-PV30mid-40TMSD	5	19-Mar-2019 01:01	259SMPL.d	AS CA CD FE K MG NA PB SB SE
20190305-DGW-MW11-PV30mid-40TPDS	5	19-Mar-2019 01:04	260SMPL.d	AS CA CD FE K MG PB SB SE
CCV 18	1	19-Mar-2019 01:06	261_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 18	1	19-Mar-2019 01:08	262_CCB.d	AS CA CD FE K MG NA PB SB SE
20190303-DGW-MW11-PV30out-30T-DUP	5	19-Mar-2019 01:11	263SMPL.d	AS CD FE K MG PB SB SE
CCV 19	1	19-Mar-2019 01:33	273_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 19	1	19-Mar-2019 01:35	274_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 20	1	19-Mar-2019 02:00	285_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 20	1	19-Mar-2019 02:03	286_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 21	1	19-Mar-2019 02:27	297_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 21	1	19-Mar-2019 02:29	298_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 22	1	19-Mar-2019 02:54	309_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 22	1	19-Mar-2019 02:56	310_CCB.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030569

Run ID:ICPMS05_334713
Instrument:ICPMS05
Method:SW6020

CCB 3	Date: 18-Mar-2019 14:49	Seq: 4994305	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	115	14	200	

CCB 4	Date: 18-Mar-2019 15:21	Seq: 4994424	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	48.24	34	500	
Sodium	47.93	14	200	

CCB 5	Date: 18-Mar-2019 15:50	Seq: 4994578	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	16.14	12	200	
Sodium	82.36	14	200	

CCB 6	Date: 18-Mar-2019 16:22	Seq: 4994591	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	68.55	34	500	
Iron	12.84	12	200	
Magnesium	13.22	10	200	
Potassium	35.07	18	200	
Sodium	152.9	14	200	

CCB 7	Date: 18-Mar-2019 16:48	Seq: 4994624	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	36.22	34	500	
Sodium	26.15	14	200	

CCB 8	Date: 18-Mar-2019 17:26	Seq: 4994744	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Arsenic	-0.462	0.4	2	
Cadmium	0.201	0.2	2	
Calcium	63.72	34	500	
Iron	40.73	12	200	
Magnesium	13.13	10	200	
Sodium	64.82	14	200	

CCB 9	Date: 18-Mar-2019 18:02	Seq: 4994730	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	37.86	34	500	
Sodium	44.33	14	200	

CCB 10	Date: 18-Mar-2019 18:40	Seq: 4994808	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Arsenic	-0.511	0.4	2	
Sodium	124.9	14	200	

CCB 11	Date: 18-Mar-2019 19:02	Seq: 4994816	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Arsenic	-0.548	0.4	2	
Calcium	40.74	34	500	
Sodium	125.7	14	200	

CCB 13	Date: 18-Mar-2019 22:36	Seq: 4994898	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030569

Run ID:ICPMS05_334713
Instrument:ICPMS05
Method:SW6020

	Antimony	0.487	0.4	2	
	Calcium	39.57	34	500	
	Sodium	56.74	14	200	
CCB 15	Date: 18-Mar-2019 23:58	Seq: 4995088	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	606.2	14	200	
CCB 16	Date: 19-Mar-2019 00:21	Seq: 4995169	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.628	0.4	2	
	Sodium	145.7	14	200	
CCB 17	Date: 19-Mar-2019 00:48	Seq: 4995181	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	173.5	14	200	
CCB 18	Date: 19-Mar-2019 01:08	Seq: 4995282	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.477	0.4	2	
	Sodium	263.5	14	200	
CCB 19	Date: 19-Mar-2019 01:35	Seq: 4995294	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	318.6	14	200	
CCB 20	Date: 19-Mar-2019 02:03	Seq: 4995306	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Potassium	-37	18	200	
	Sodium	133.3	14	200	
CCB 21	Date: 19-Mar-2019 02:29	Seq: 4995519	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Calcium	45.96	34	500	
	Iron	13.4	12	200	
	Potassium	-51.53	18	200	
CCB 22	Date: 19-Mar-2019 02:56	Seq: 4995531	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	4.49	0.4	2	
	Sodium	-14.12	14	200	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19030569

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19030569-01	20190304-DGW-MW11-PV30out-controlD	Groundwater		04-Mar-2019 15:30	12-Mar-2019 08:50	☐
HS19030569-02	20190304-DGW-MW11-PV30out-30D	Groundwater		04-Mar-2019 15:30	12-Mar-2019 08:50	☐
HS19030569-03	20190304-DGW-MW11-PV30out-35D	Groundwater		04-Mar-2019 15:30	12-Mar-2019 08:50	☐
HS19030569-04	20190304-DGW-MW11-PV30out-40D	Groundwater		04-Mar-2019 15:30	12-Mar-2019 08:50	☐
HS19030569-05	20190304-DGW-MW11-PV30inlet-controlD	Groundwater		04-Mar-2019 15:40	12-Mar-2019 08:50	☐
HS19030569-06	20190304-DGW-MW11-PV30inlet-30-35-40D	Groundwater		04-Mar-2019 15:40	12-Mar-2019 08:50	☐
HS19030569-07	20190305-DGW-MW11-PV30mid-controlD	Groundwater		05-Mar-2019 17:30	12-Mar-2019 08:50	☐
HS19030569-08	20190305-DGW-MW11-PV30mid-30D	Groundwater		05-Mar-2019 17:30	12-Mar-2019 08:50	☐
HS19030569-09	20190305-DGW-MW11-PV30mid-35D	Groundwater		05-Mar-2019 17:30	12-Mar-2019 08:50	☐
HS19030569-10	20190305-DGW-MW11-PV30mid-40D	Groundwater		05-Mar-2019 17:30	12-Mar-2019 08:50	☐
HS19030569-11	20190304-DGW-MW11-PV30out-controlT	Groundwater		04-Mar-2019 15:30	12-Mar-2019 08:50	☐
HS19030569-12	20190304-DGW-MW11-PV30out-30T	Groundwater		04-Mar-2019 15:30	12-Mar-2019 08:50	☐
HS19030569-13	20190304-DGW-MW11-PV30out-35T	Groundwater		04-Mar-2019 15:30	12-Mar-2019 08:50	☐
HS19030569-14	20190304-DGW-MW11-PV30out-40T	Groundwater		04-Mar-2019 15:30	12-Mar-2019 08:50	☐
HS19030569-15	20190304-DGW-MW11-PV30inlet-controlT	Groundwater		04-Mar-2019 15:40	12-Mar-2019 08:50	☐
HS19030569-16	20190304-DGW-MW11-PV30inlet-30-35-40T	Groundwater		04-Mar-2019 15:40	12-Mar-2019 08:50	☐
HS19030569-17	20190305-DGW-MW11-PV30mid-controlT	Groundwater		05-Mar-2019 17:30	12-Mar-2019 08:50	☐
HS19030569-18	20190305-DGW-MW11-PV30mid-30T	Groundwater		05-Mar-2019 17:30	12-Mar-2019 08:50	☐
HS19030569-19	20190305-DGW-MW11-PV30mid-35T	Groundwater		05-Mar-2019 17:30	12-Mar-2019 08:50	☐
HS19030569-20	20190305-DGW-MW11-PV30mid-40T	Groundwater		05-Mar-2019 17:30	12-Mar-2019 08:50	☐
HS19030569-21	20190303-DGW-MW11-PV30out-30D-DUP	Groundwater		03-Mar-2019 14:50	12-Mar-2019 08:50	☐
HS19030569-22	20190303-DGW-MW11-PV30out-30T-DUP	Groundwater		03-Mar-2019 14:50	12-Mar-2019 08:50	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190304-DGW-MW11-PV30out-controlD
Collection Date: 04-Mar-2019 15:30

ANALYTICAL REPORT
WorkOrder:HS19030569
Lab ID:HS19030569-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	18-Mar-2019 16:20
Arsenic	U		0.00200	0.0100	mg/L	5	18-Mar-2019 16:20
Cadmium	**0.00285**	J	**0.00100**	**0.0100**	**mg/L**	5	18-Mar-2019 16:20
Calcium	**468**		**0.170**	**2.50**	**mg/L**	5	18-Mar-2019 16:20
Iron	**0.516**	J	**0.0600**	**1.00**	**mg/L**	5	18-Mar-2019 16:20
Lead	U		0.00300	0.0100	mg/L	5	18-Mar-2019 16:20
Magnesium	**277**		**0.0500**	**1.00**	**mg/L**	5	18-Mar-2019 16:20
Potassium	**16.2**		**0.0900**	**1.00**	**mg/L**	5	18-Mar-2019 16:20
Selenium	U		0.00550	0.0100	mg/L	5	18-Mar-2019 16:20
Sodium	**1,840**		**1.40**	**20.0**	**mg/L**	100	18-Mar-2019 18:10

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190304-DGW-MW11-PV30out-30D
Collection Date: 04-Mar-2019 15:30

ANALYTICAL REPORT
WorkOrder:HS19030569
Lab ID:HS19030569-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	18-Mar-2019 16:22
Arsenic	U		0.00200	0.0100	mg/L	5	18-Mar-2019 16:22
Cadmium	U		0.00100	0.0100	mg/L	5	18-Mar-2019 16:22
Calcium	**332**		**0.170**	**2.50**	**mg/L**	5	18-Mar-2019 16:22
Iron	**0.547**	J	**0.0600**	**1.00**	**mg/L**	5	18-Mar-2019 16:22
Lead	U		0.00300	0.0100	mg/L	5	18-Mar-2019 16:22
Magnesium	**299**		**0.0500**	**1.00**	**mg/L**	5	18-Mar-2019 16:22
Potassium	**19.5**		**0.0900**	**1.00**	**mg/L**	5	18-Mar-2019 16:22
Selenium	U		0.00550	0.0100	mg/L	5	18-Mar-2019 16:22
Sodium	**1,770**		**1.40**	**20.0**	**mg/L**	100	18-Mar-2019 18:13

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190304-DGW-MW11-PV30out-35D
Collection Date: 04-Mar-2019 15:30

ANALYTICAL REPORT
WorkOrder:HS19030569
Lab ID:HS19030569-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	18-Mar-2019 16:24
Arsenic	U		0.00200	0.0100	mg/L	5	18-Mar-2019 16:24
Cadmium	U		0.00100	0.0100	mg/L	5	18-Mar-2019 16:24
Calcium	**317**		**0.170**	**2.50**	**mg/L**	5	18-Mar-2019 16:24
Iron	**0.573**	J	**0.0600**	**1.00**	**mg/L**	5	18-Mar-2019 16:24
Lead	U		0.00300	0.0100	mg/L	5	18-Mar-2019 16:24
Magnesium	**286**		**0.0500**	**1.00**	**mg/L**	5	18-Mar-2019 16:24
Potassium	**18.5**		**0.0900**	**1.00**	**mg/L**	5	18-Mar-2019 16:24
Selenium	U		0.00550	0.0100	mg/L	5	18-Mar-2019 16:24
Sodium	**1,750**		**1.40**	**20.0**	**mg/L**	100	18-Mar-2019 18:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190304-DGW-MW11-PV30out-40D
Collection Date: 04-Mar-2019 15:30

ANALYTICAL REPORT
WorkOrder:HS19030569
Lab ID:HS19030569-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	18-Mar-2019 16:27
Arsenic	U		0.00200	0.0100	mg/L	5	18-Mar-2019 16:27
Cadmium	U		0.00100	0.0100	mg/L	5	18-Mar-2019 16:27
Calcium	**290**		**0.170**	**2.50**	**mg/L**	5	18-Mar-2019 16:27
Iron	**0.647**	J	**0.0600**	**1.00**	**mg/L**	5	18-Mar-2019 16:27
Lead	U		0.00300	0.0100	mg/L	5	18-Mar-2019 16:27
Magnesium	**279**		**0.0500**	**1.00**	**mg/L**	5	18-Mar-2019 16:27
Potassium	**18.3**		**0.0900**	**1.00**	**mg/L**	5	18-Mar-2019 16:27
Selenium	U		0.00550	0.0100	mg/L	5	18-Mar-2019 16:27
Sodium	**1,740**		**1.40**	**20.0**	**mg/L**	100	18-Mar-2019 18:29

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190304-DGW-MW11-PV30inlet-controlD
Collection Date: 04-Mar-2019 15:40

ANALYTICAL REPORT
WorkOrder:HS19030569
Lab ID:HS19030569-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	18-Mar-2019 16:32
Arsenic	U		0.00200	0.0100	mg/L	5	18-Mar-2019 16:32
Cadmium	**0.00720**	J	**0.00100**	**0.0100**	**mg/L**	5	18-Mar-2019 16:32
Calcium	**466**		**0.170**	**2.50**	**mg/L**	5	18-Mar-2019 16:32
Iron	**0.853**	J	**0.0600**	**1.00**	**mg/L**	5	18-Mar-2019 16:32
Lead	U		0.00300	0.0100	mg/L	5	18-Mar-2019 16:32
Magnesium	**282**		**0.0500**	**1.00**	**mg/L**	5	18-Mar-2019 16:32
Potassium	**16.2**		**0.0900**	**1.00**	**mg/L**	5	18-Mar-2019 16:32
Selenium	U		0.00550	0.0100	mg/L	5	18-Mar-2019 16:32
Sodium	**1,820**		**1.40**	**20.0**	**mg/L**	100	18-Mar-2019 18:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190304-DGW-MW11-PV30inlet-30-35-40D
Collection Date: 04-Mar-2019 15:40

ANALYTICAL REPORT
WorkOrder:HS19030569
Lab ID:HS19030569-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	18-Mar-2019 16:34
Arsenic	U		0.00200	0.0100	mg/L	5	18-Mar-2019 16:34
Cadmium	**0.00677**	J	**0.00100**	**0.0100**	**mg/L**	5	18-Mar-2019 16:34
Calcium	**454**		**0.170**	**2.50**	**mg/L**	5	18-Mar-2019 16:34
Iron	**6.43**		**0.0600**	**1.00**	**mg/L**	5	18-Mar-2019 16:34
Lead	U		0.00300	0.0100	mg/L	5	18-Mar-2019 16:34
Magnesium	**290**		**0.0500**	**1.00**	**mg/L**	5	18-Mar-2019 16:34
Potassium	**18.1**		**0.0900**	**1.00**	**mg/L**	5	18-Mar-2019 16:34
Selenium	U		0.00550	0.0100	mg/L	5	18-Mar-2019 16:34
Sodium	**1,700**		**1.40**	**20.0**	**mg/L**	100	18-Mar-2019 18:34

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190305-DGW-MW11-PV30mid-controlD
Collection Date: 05-Mar-2019 17:30

ANALYTICAL REPORT
WorkOrder:HS19030569
Lab ID:HS19030569-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	**0.00259**	J	**0.00200**	**0.0100**	**mg/L**	5	18-Mar-2019 16:49
Arsenic	U		0.00200	0.0100	mg/L	5	18-Mar-2019 16:49
Cadmium	**0.00615**	J	**0.00100**	**0.0100**	**mg/L**	5	18-Mar-2019 16:49
Calcium	**476**		**0.170**	**2.50**	**mg/L**	5	18-Mar-2019 16:49
Iron	**0.437**	J	**0.0600**	**1.00**	**mg/L**	5	18-Mar-2019 16:49
Lead	U		0.00300	0.0100	mg/L	5	18-Mar-2019 16:49
Magnesium	**285**		**0.0500**	**1.00**	**mg/L**	5	18-Mar-2019 16:49
Potassium	**16.3**		**0.0900**	**1.00**	**mg/L**	5	18-Mar-2019 16:49
Selenium	U		0.00550	0.0100	mg/L	5	18-Mar-2019 16:49
Sodium	**1,900**		**1.40**	**20.0**	**mg/L**	100	18-Mar-2019 18:36

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190305-DGW-MW11-PV30mid-30D
Collection Date: 05-Mar-2019 17:30

ANALYTICAL REPORT
WorkOrder:HS19030569
Lab ID:HS19030569-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	18-Mar-2019 16:51
Arsenic	U		0.00200	0.0100	mg/L	5	18-Mar-2019 16:51
Cadmium	U		0.00100	0.0100	mg/L	5	18-Mar-2019 16:51
Calcium	**394**		**0.170**	**2.50**	**mg/L**	5	18-Mar-2019 16:51
Iron	**1.60**		**0.0600**	**1.00**	**mg/L**	5	18-Mar-2019 16:51
Lead	U		0.00300	0.0100	mg/L	5	18-Mar-2019 16:51
Magnesium	**308**		**0.0500**	**1.00**	**mg/L**	5	18-Mar-2019 16:51
Potassium	**19.3**		**0.0900**	**1.00**	**mg/L**	5	18-Mar-2019 16:51
Selenium	U		0.00550	0.0100	mg/L	5	18-Mar-2019 16:51
Sodium	**1,810**		**1.40**	**20.0**	**mg/L**	100	18-Mar-2019 18:38

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190305-DGW-MW11-PV30mid-35D
Collection Date: 05-Mar-2019 17:30

ANALYTICAL REPORT
WorkOrder:HS19030569
Lab ID:HS19030569-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	18-Mar-2019 16:53
Arsenic	U		0.00200	0.0100	mg/L	5	18-Mar-2019 16:53
Cadmium	U		0.00100	0.0100	mg/L	5	18-Mar-2019 16:53
Calcium	**357**		**0.170**	**2.50**	**mg/L**	5	18-Mar-2019 16:53
Iron	**1.23**		**0.0600**	**1.00**	**mg/L**	5	18-Mar-2019 16:53
Lead	U		0.00300	0.0100	mg/L	5	18-Mar-2019 16:53
Magnesium	**287**		**0.0500**	**1.00**	**mg/L**	5	18-Mar-2019 16:53
Potassium	**18.3**		**0.0900**	**1.00**	**mg/L**	5	18-Mar-2019 16:53
Selenium	U		0.00550	0.0100	mg/L	5	18-Mar-2019 16:53
Sodium	**1,710**		**1.40**	**20.0**	**mg/L**	100	18-Mar-2019 18:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190305-DGW-MW11-PV30mid-40D
Collection Date: 05-Mar-2019 17:30

ANALYTICAL REPORT
WorkOrder:HS19030569
Lab ID:HS19030569-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	18-Mar-2019 16:56
Arsenic	U		0.00200	0.0100	mg/L	5	18-Mar-2019 16:56
Cadmium	U		0.00100	0.0100	mg/L	5	18-Mar-2019 16:56
Calcium	**338**		**0.170**	**2.50**	**mg/L**	5	18-Mar-2019 16:56
Iron	**0.652**	J	**0.0600**	**1.00**	**mg/L**	5	18-Mar-2019 16:56
Lead	U		0.00300	0.0100	mg/L	5	18-Mar-2019 16:56
Magnesium	**300**		**0.0500**	**1.00**	**mg/L**	5	18-Mar-2019 16:56
Potassium	**19.3**		**0.0900**	**1.00**	**mg/L**	5	18-Mar-2019 16:56
Selenium	U		0.00550	0.0100	mg/L	5	18-Mar-2019 16:56
Sodium	**1,760**		**1.40**	**20.0**	**mg/L**	100	18-Mar-2019 18:43

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190304-DGW-MW11-PV30out-controlT
Collection Date: 04-Mar-2019 15:30

ANALYTICAL REPORT
WorkOrder:HS19030569
Lab ID:HS19030569-11
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,420**		**2.00**	**2.00**	**mg/L**	1	19-Mar-2019 17:18
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	**0.00273**	J	**0.00200**	**0.0100**	**mg/L**	5	18-Mar-2019 19:51
Arsenic	U		0.00200	0.0100	mg/L	5	18-Mar-2019 19:51
Cadmium	**0.00375**	J	**0.00100**	**0.0100**	**mg/L**	5	18-Mar-2019 19:51
Calcium	**491**		**0.170**	**2.50**	**mg/L**	5	18-Mar-2019 19:51
Iron	**0.334**	J	**0.0600**	**1.00**	**mg/L**	5	18-Mar-2019 19:51
Lead	U		0.00300	0.0100	mg/L	5	18-Mar-2019 19:51
Magnesium	**290**		**0.0500**	**1.00**	**mg/L**	5	18-Mar-2019 19:51
Potassium	**16.5**		**0.0900**	**1.00**	**mg/L**	5	18-Mar-2019 19:51
Selenium	U		0.00550	0.0100	mg/L	5	18-Mar-2019 19:51
Sodium	**1,880**		**1.40**	**20.0**	**mg/L**	100	19-Mar-2019 13:12

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190304-DGW-MW11-PV30out-30T
Collection Date: 04-Mar-2019 15:30

ANALYTICAL REPORT
WorkOrder:HS19030569
Lab ID:HS19030569-12
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,050**		**2.00**	**2.00**	**mg/L**	1	19-Mar-2019 17:18
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	18-Mar-2019 19:53
Arsenic	U		0.00200	0.0100	mg/L	5	18-Mar-2019 19:53
Cadmium	U		0.00100	0.0100	mg/L	5	18-Mar-2019 19:53
Calcium	**328**		**0.170**	**2.50**	**mg/L**	5	18-Mar-2019 19:53
Iron	**1.97**		**0.0600**	**1.00**	**mg/L**	5	18-Mar-2019 19:53
Lead	U		0.00300	0.0100	mg/L	5	18-Mar-2019 19:53
Magnesium	**298**		**0.0500**	**1.00**	**mg/L**	5	18-Mar-2019 19:53
Potassium	**19.0**		**0.0900**	**1.00**	**mg/L**	5	18-Mar-2019 19:53
Selenium	U		0.00550	0.0100	mg/L	5	18-Mar-2019 19:53
Sodium	**1,710**		**1.40**	**20.0**	**mg/L**	100	19-Mar-2019 13:14

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190304-DGW-MW11-PV30out-35T
Collection Date: 04-Mar-2019 15:30

ANALYTICAL REPORT
WorkOrder:HS19030569
Lab ID:HS19030569-13
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,030**		**2.00**	**2.00**	**mg/L**	1	19-Mar-2019 17:18
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	18-Mar-2019 19:55
Arsenic	U		0.00200	0.0100	mg/L	5	18-Mar-2019 19:55
Cadmium	U		0.00100	0.0100	mg/L	5	18-Mar-2019 19:55
Calcium	**324**		**0.170**	**2.50**	**mg/L**	5	18-Mar-2019 19:55
Iron	**2.02**		**0.0600**	**1.00**	**mg/L**	5	18-Mar-2019 19:55
Lead	U		0.00300	0.0100	mg/L	5	18-Mar-2019 19:55
Magnesium	**297**		**0.0500**	**1.00**	**mg/L**	5	18-Mar-2019 19:55
Potassium	**18.9**		**0.0900**	**1.00**	**mg/L**	5	18-Mar-2019 19:55
Selenium	U		0.00550	0.0100	mg/L	5	18-Mar-2019 19:55
Sodium	**1,720**		**1.40**	**20.0**	**mg/L**	100	19-Mar-2019 13:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190304-DGW-MW11-PV30out-40T
Collection Date: 04-Mar-2019 15:30

ANALYTICAL REPORT
WorkOrder:HS19030569
Lab ID:HS19030569-14
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**1,900**		**2.00**	**2.00**	**mg/L**	1	19-Mar-2019 17:18
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	18-Mar-2019 19:57
Arsenic	U		0.00200	0.0100	mg/L	5	18-Mar-2019 19:57
Cadmium	U		0.00100	0.0100	mg/L	5	18-Mar-2019 19:57
Calcium	**291**		**0.170**	**2.50**	**mg/L**	5	18-Mar-2019 19:57
Iron	**1.59**		**0.0600**	**1.00**	**mg/L**	5	18-Mar-2019 19:57
Lead	U		0.00300	0.0100	mg/L	5	18-Mar-2019 19:57
Magnesium	**286**		**0.0500**	**1.00**	**mg/L**	5	18-Mar-2019 19:57
Potassium	**18.4**		**0.0900**	**1.00**	**mg/L**	5	18-Mar-2019 19:57
Selenium	U		0.00550	0.0100	mg/L	5	18-Mar-2019 19:57
Sodium	**1,690**		**1.40**	**20.0**	**mg/L**	100	19-Mar-2019 13:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190304-DGW-MW11-PV30inlet-controlT
Collection Date: 04-Mar-2019 15:40

ANALYTICAL REPORT
WorkOrder:HS19030569
Lab ID:HS19030569-15
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,320**		**2.00**	**2.00**	**mg/L**	1	19-Mar-2019 17:18
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	18-Mar-2019 20:00
Arsenic	U		0.00200	0.0100	mg/L	5	18-Mar-2019 20:00
Cadmium	**0.00766**	J	**0.00100**	**0.0100**	**mg/L**	5	18-Mar-2019 20:00
Calcium	**468**		**0.170**	**2.50**	**mg/L**	5	18-Mar-2019 20:00
Iron	**1.87**		**0.0600**	**1.00**	**mg/L**	5	18-Mar-2019 20:00
Lead	U		0.00300	0.0100	mg/L	5	18-Mar-2019 20:00
Magnesium	**280**		**0.0500**	**1.00**	**mg/L**	5	18-Mar-2019 20:00
Potassium	**15.9**		**0.0900**	**1.00**	**mg/L**	5	18-Mar-2019 20:00
Selenium	U		0.00550	0.0100	mg/L	5	18-Mar-2019 20:00
Sodium	**1,840**		**1.40**	**20.0**	**mg/L**	100	19-Mar-2019 13:21

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190304-DGW-MW11-PV30inlet-30-35-40T
Collection Date: 04-Mar-2019 15:40

ANALYTICAL REPORT
WorkOrder:HS19030569
Lab ID:HS19030569-16
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,310**		**2.00**	**2.00**	**mg/L**	1	19-Mar-2019 17:18
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	18-Mar-2019 20:02
Arsenic	U		0.00200	0.0100	mg/L	5	18-Mar-2019 20:02
Cadmium	**0.00734**	J	**0.00100**	**0.0100**	**mg/L**	5	18-Mar-2019 20:02
Calcium	**455**		**0.170**	**2.50**	**mg/L**	5	18-Mar-2019 20:02
Iron	**9.92**		**0.0600**	**1.00**	**mg/L**	5	18-Mar-2019 20:02
Lead	U		0.00300	0.0100	mg/L	5	18-Mar-2019 20:02
Magnesium	**286**		**0.0500**	**1.00**	**mg/L**	5	18-Mar-2019 20:02
Potassium	**17.8**		**0.0900**	**1.00**	**mg/L**	5	18-Mar-2019 20:02
Selenium	U		0.00550	0.0100	mg/L	5	18-Mar-2019 20:02
Sodium	**1,660**		**1.40**	**20.0**	**mg/L**	100	19-Mar-2019 13:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190305-DGW-MW11-PV30mid-controlT
Collection Date: 05-Mar-2019 17:30

ANALYTICAL REPORT
WorkOrder:HS19030569
Lab ID:HS19030569-17
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,420**		**2.00**	**2.00**	**mg/L**	1	19-Mar-2019 17:18
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	18-Mar-2019 20:04
Arsenic	U		0.00200	0.0100	mg/L	5	18-Mar-2019 20:04
Cadmium	**0.00601**	J	**0.00100**	**0.0100**	**mg/L**	5	18-Mar-2019 20:04
Calcium	**488**		**0.170**	**2.50**	**mg/L**	5	18-Mar-2019 20:04
Iron	**0.419**	J	**0.0600**	**1.00**	**mg/L**	5	18-Mar-2019 20:04
Lead	U		0.00300	0.0100	mg/L	5	18-Mar-2019 20:04
Magnesium	**292**		**0.0500**	**1.00**	**mg/L**	5	18-Mar-2019 20:04
Potassium	**16.8**		**0.0900**	**1.00**	**mg/L**	5	18-Mar-2019 20:04
Selenium	U		0.00550	0.0100	mg/L	5	18-Mar-2019 20:04
Sodium	**1,880**		**1.40**	**20.0**	**mg/L**	100	19-Mar-2019 13:32

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190305-DGW-MW11-PV30mid-30T
Collection Date: 05-Mar-2019 17:30

ANALYTICAL REPORT
WorkOrder:HS19030569
Lab ID:HS19030569-18
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,200**		**2.00**	**2.00**	**mg/L**	1	19-Mar-2019 17:18
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	18-Mar-2019 20:07
Arsenic	U		0.00200	0.0100	mg/L	5	18-Mar-2019 20:07
Cadmium	U		0.00100	0.0100	mg/L	5	18-Mar-2019 20:07
Calcium	**385**		**0.170**	**2.50**	**mg/L**	5	18-Mar-2019 20:07
Iron	**7.54**		**0.0600**	**1.00**	**mg/L**	5	18-Mar-2019 20:07
Lead	U		0.00300	0.0100	mg/L	5	18-Mar-2019 20:07
Magnesium	**301**		**0.0500**	**1.00**	**mg/L**	5	18-Mar-2019 20:07
Potassium	**19.0**		**0.0900**	**1.00**	**mg/L**	5	18-Mar-2019 20:07
Selenium	U		0.00550	0.0100	mg/L	5	18-Mar-2019 20:07
Sodium	**1,760**		**1.40**	**20.0**	**mg/L**	100	19-Mar-2019 13:34

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190305-DGW-MW11-PV30mid-35T
Collection Date: 05-Mar-2019 17:30

ANALYTICAL REPORT
WorkOrder:HS19030569
Lab ID:HS19030569-19
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,090**		**2.00**	**2.00**	**mg/L**	1	19-Mar-2019 17:18
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	18-Mar-2019 20:09
Arsenic	U		0.00200	0.0100	mg/L	5	18-Mar-2019 20:09
Cadmium	U		0.00100	0.0100	mg/L	5	18-Mar-2019 20:09
Calcium	**359**		**0.170**	**2.50**	**mg/L**	5	18-Mar-2019 20:09
Iron	**8.64**		**0.0600**	**1.00**	**mg/L**	5	18-Mar-2019 20:09
Lead	U		0.00300	0.0100	mg/L	5	18-Mar-2019 20:09
Magnesium	**290**		**0.0500**	**1.00**	**mg/L**	5	18-Mar-2019 20:09
Potassium	**18.5**		**0.0900**	**1.00**	**mg/L**	5	18-Mar-2019 20:09
Selenium	U		0.00550	0.0100	mg/L	5	18-Mar-2019 20:09
Sodium	**1,690**		**1.40**	**20.0**	**mg/L**	100	19-Mar-2019 13:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190305-DGW-MW11-PV30mid-40T
Collection Date: 05-Mar-2019 17:30

ANALYTICAL REPORT
WorkOrder:HS19030569
Lab ID:HS19030569-20
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**1,880**		**2.00**	**2.00**	**mg/L**	1	19-Mar-2019 17:18
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	19-Mar-2019 00:55
Arsenic	U		0.00200	0.0100	mg/L	5	19-Mar-2019 00:55
Cadmium	U		0.00100	0.0100	mg/L	5	19-Mar-2019 00:55
Calcium	**315**		**0.170**	**2.50**	**mg/L**	5	19-Mar-2019 00:55
Iron	**1.75**		**0.0600**	**1.00**	**mg/L**	5	19-Mar-2019 00:55
Lead	U		0.00300	0.0100	mg/L	5	19-Mar-2019 00:55
Magnesium	**266**		**0.0500**	**1.00**	**mg/L**	5	19-Mar-2019 00:55
Potassium	**18.5**		**0.0900**	**1.00**	**mg/L**	5	19-Mar-2019 00:55
Selenium	U		0.00550	0.0100	mg/L	5	19-Mar-2019 00:55
Sodium	**1,740**		**1.40**	**20.0**	**mg/L**	100	19-Mar-2019 14:34

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190303-DGW-MW11-PV30out-30D-DUP
Collection Date: 03-Mar-2019 14:50

ANALYTICAL REPORT
WorkOrder:HS19030569
Lab ID:HS19030569-21
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	18-Mar-2019 17:02
Arsenic	U		0.00200	0.0100	mg/L	5	18-Mar-2019 17:02
Cadmium	U		0.00100	0.0100	mg/L	5	18-Mar-2019 17:02
Calcium	**302**		**0.170**	**2.50**	**mg/L**	5	18-Mar-2019 17:02
Iron	U		0.0600	1.00	mg/L	5	18-Mar-2019 17:02
Lead	U		0.00300	0.0100	mg/L	5	18-Mar-2019 17:02
Magnesium	**284**		**0.0500**	**1.00**	**mg/L**	5	18-Mar-2019 17:02
Potassium	**17.9**		**0.0900**	**1.00**	**mg/L**	5	18-Mar-2019 17:02
Selenium	U		0.00550	0.0100	mg/L	5	18-Mar-2019 17:02
Sodium	**1,810**		**1.40**	**20.0**	**mg/L**	100	19-Mar-2019 13:41

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190303-DGW-MW11-PV30out-30T-DUP
Collection Date: 03-Mar-2019 14:50

ANALYTICAL REPORT
WorkOrder:HS19030569
Lab ID:HS19030569-22
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**1,910**		**2.00**	**2.00**	**mg/L**	1	19-Mar-2019 17:33
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	19-Mar-2019 01:11
Arsenic	U		0.00200	0.0100	mg/L	5	19-Mar-2019 01:11
Cadmium	U		0.00100	0.0100	mg/L	5	19-Mar-2019 01:11
Calcium	**313**		**0.170**	**2.50**	**mg/L**	5	19-Mar-2019 14:41
Iron	**1.64**		**0.0600**	**1.00**	**mg/L**	5	19-Mar-2019 01:11
Lead	U		0.00300	0.0100	mg/L	5	19-Mar-2019 01:11
Magnesium	**273**		**0.0500**	**1.00**	**mg/L**	5	19-Mar-2019 01:11
Potassium	**18.0**		**0.0900**	**1.00**	**mg/L**	5	19-Mar-2019 01:11
Selenium	U		0.00550	0.0100	mg/L	5	19-Mar-2019 01:11
Sodium	**1,750**		**1.40**	**20.0**	**mg/L**	100	19-Mar-2019 14:43

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030569

Batch ID: 138728 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19030569-11	1	10	10 (mL)	1
HS19030569-12	1	10	10 (mL)	1
HS19030569-13	1	10	10 (mL)	1
HS19030569-14	1	10	10 (mL)	1
HS19030569-15	1	10	10 (mL)	1
HS19030569-16	1	10	10 (mL)	1
HS19030569-17	1	10	10 (mL)	1
HS19030569-18	1	10	10 (mL)	1
HS19030569-19	1	10	10 (mL)	1

Batch ID: 138729 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19030569-20	1	10	10 (mL)	1
HS19030569-22	1	10	10 (mL)	1

Batch ID: 138730 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19030569-01	1	10	10 (mL)	1
HS19030569-02	1	10	10 (mL)	1
HS19030569-03	1	10	10 (mL)	1
HS19030569-04	1	10	10 (mL)	1
HS19030569-05	1	10	10 (mL)	1
HS19030569-06	1	10	10 (mL)	1
HS19030569-07	1	10	10 (mL)	1
HS19030569-08	1	10	10 (mL)	1
HS19030569-09	1	10	10 (mL)	1
HS19030569-10	1	10	10 (mL)	1

Batch ID: 138731 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19030569-21	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030569

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 138728	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19030569-11	20190304-DGW-MW11-PV30out-controlT	04 Mar 2019 15:30		15 Mar 2019 10:00	19 Mar 2019 13:12	100
HS19030569-11	20190304-DGW-MW11-PV30out-controlT	04 Mar 2019 15:30		15 Mar 2019 10:00	18 Mar 2019 19:51	5
HS19030569-12	20190304-DGW-MW11-PV30out-30T	04 Mar 2019 15:30		15 Mar 2019 10:00	19 Mar 2019 13:14	100
HS19030569-12	20190304-DGW-MW11-PV30out-30T	04 Mar 2019 15:30		15 Mar 2019 10:00	18 Mar 2019 19:53	5
HS19030569-13	20190304-DGW-MW11-PV30out-35T	04 Mar 2019 15:30		15 Mar 2019 10:00	19 Mar 2019 13:17	100
HS19030569-13	20190304-DGW-MW11-PV30out-35T	04 Mar 2019 15:30		15 Mar 2019 10:00	18 Mar 2019 19:55	5
HS19030569-14	20190304-DGW-MW11-PV30out-40T	04 Mar 2019 15:30		15 Mar 2019 10:00	19 Mar 2019 13:19	100
HS19030569-14	20190304-DGW-MW11-PV30out-40T	04 Mar 2019 15:30		15 Mar 2019 10:00	18 Mar 2019 19:57	5
HS19030569-15	20190304-DGW-MW11-PV30inlet-controlT	04 Mar 2019 15:40		15 Mar 2019 10:00	19 Mar 2019 13:21	100
HS19030569-15	20190304-DGW-MW11-PV30inlet-controlT	04 Mar 2019 15:40		15 Mar 2019 10:00	18 Mar 2019 20:00	5
HS19030569-16	20190304-DGW-MW11-PV30inlet-30-35-40T	04 Mar 2019 15:40		15 Mar 2019 10:00	19 Mar 2019 13:30	100
HS19030569-16	20190304-DGW-MW11-PV30inlet-30-35-40T	04 Mar 2019 15:40		15 Mar 2019 10:00	18 Mar 2019 20:02	5
HS19030569-17	20190305-DGW-MW11-PV30mid-controlT	05 Mar 2019 17:30		15 Mar 2019 10:00	19 Mar 2019 13:32	100
HS19030569-17	20190305-DGW-MW11-PV30mid-controlT	05 Mar 2019 17:30		15 Mar 2019 10:00	18 Mar 2019 20:04	5
HS19030569-18	20190305-DGW-MW11-PV30mid-30T	05 Mar 2019 17:30		15 Mar 2019 10:00	19 Mar 2019 13:34	100
HS19030569-18	20190305-DGW-MW11-PV30mid-30T	05 Mar 2019 17:30		15 Mar 2019 10:00	18 Mar 2019 20:07	5
HS19030569-19	20190305-DGW-MW11-PV30mid-35T	05 Mar 2019 17:30		15 Mar 2019 10:00	19 Mar 2019 13:37	100
HS19030569-19	20190305-DGW-MW11-PV30mid-35T	05 Mar 2019 17:30		15 Mar 2019 10:00	18 Mar 2019 20:09	5
Batch ID 138729	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19030569-20	20190305-DGW-MW11-PV30mid-40T	05 Mar 2019 17:30		15 Mar 2019 10:00	19 Mar 2019 14:34	100
HS19030569-20	20190305-DGW-MW11-PV30mid-40T	05 Mar 2019 17:30		15 Mar 2019 10:00	19 Mar 2019 00:55	5
HS19030569-22	20190303-DGW-MW11-PV30out-30T-DUP	03 Mar 2019 14:50		15 Mar 2019 10:00	19 Mar 2019 14:43	100
HS19030569-22	20190303-DGW-MW11-PV30out-30T-DUP	03 Mar 2019 14:50		15 Mar 2019 10:00	19 Mar 2019 14:41	5
HS19030569-22	20190303-DGW-MW11-PV30out-30T-DUP	03 Mar 2019 14:50		15 Mar 2019 10:00	19 Mar 2019 01:11	5

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030569

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 138730	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS19030569-01	20190304-DGW-MW11-PV30out-controlD	04 Mar 2019 15:30		15 Mar 2019 10:00	18 Mar 2019 18:10	100
HS19030569-01	20190304-DGW-MW11-PV30out-controlD	04 Mar 2019 15:30		15 Mar 2019 10:00	18 Mar 2019 16:20	5
HS19030569-02	20190304-DGW-MW11-PV30out-30D	04 Mar 2019 15:30		15 Mar 2019 10:00	18 Mar 2019 18:13	100
HS19030569-02	20190304-DGW-MW11-PV30out-30D	04 Mar 2019 15:30		15 Mar 2019 10:00	18 Mar 2019 16:22	5
HS19030569-03	20190304-DGW-MW11-PV30out-35D	04 Mar 2019 15:30		15 Mar 2019 10:00	18 Mar 2019 18:27	100
HS19030569-03	20190304-DGW-MW11-PV30out-35D	04 Mar 2019 15:30		15 Mar 2019 10:00	18 Mar 2019 16:24	5
HS19030569-04	20190304-DGW-MW11-PV30out-40D	04 Mar 2019 15:30		15 Mar 2019 10:00	18 Mar 2019 18:29	100
HS19030569-04	20190304-DGW-MW11-PV30out-40D	04 Mar 2019 15:30		15 Mar 2019 10:00	18 Mar 2019 16:27	5
HS19030569-05	20190304-DGW-MW11-PV30inlet-controlD	04 Mar 2019 15:40		15 Mar 2019 10:00	18 Mar 2019 18:31	100
HS19030569-05	20190304-DGW-MW11-PV30inlet-controlD	04 Mar 2019 15:40		15 Mar 2019 10:00	18 Mar 2019 16:32	5
HS19030569-06	20190304-DGW-MW11-PV30inlet-30-35-40D	04 Mar 2019 15:40		15 Mar 2019 10:00	18 Mar 2019 18:34	100
HS19030569-06	20190304-DGW-MW11-PV30inlet-30-35-40D	04 Mar 2019 15:40		15 Mar 2019 10:00	18 Mar 2019 16:34	5
HS19030569-07	20190305-DGW-MW11-PV30mid-controlD	05 Mar 2019 17:30		15 Mar 2019 10:00	18 Mar 2019 18:36	100
HS19030569-07	20190305-DGW-MW11-PV30mid-controlD	05 Mar 2019 17:30		15 Mar 2019 10:00	18 Mar 2019 16:49	5
HS19030569-08	20190305-DGW-MW11-PV30mid-30D	05 Mar 2019 17:30		15 Mar 2019 10:00	18 Mar 2019 18:38	100
HS19030569-08	20190305-DGW-MW11-PV30mid-30D	05 Mar 2019 17:30		15 Mar 2019 10:00	18 Mar 2019 16:51	5
HS19030569-09	20190305-DGW-MW11-PV30mid-35D	05 Mar 2019 17:30		15 Mar 2019 10:00	18 Mar 2019 18:40	100
HS19030569-09	20190305-DGW-MW11-PV30mid-35D	05 Mar 2019 17:30		15 Mar 2019 10:00	18 Mar 2019 16:53	5
HS19030569-10	20190305-DGW-MW11-PV30mid-40D	05 Mar 2019 17:30		15 Mar 2019 10:00	18 Mar 2019 18:43	100
HS19030569-10	20190305-DGW-MW11-PV30mid-40D	05 Mar 2019 17:30		15 Mar 2019 10:00	18 Mar 2019 16:56	5
Batch ID 138731	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS19030569-21	20190303-DGW-MW11-PV30out-30D-DUP	03 Mar 2019 14:50		15 Mar 2019 10:00	19 Mar 2019 13:41	100
HS19030569-21	20190303-DGW-MW11-PV30out-30D-DUP	03 Mar 2019 14:50		15 Mar 2019 10:00	18 Mar 2019 17:02	5

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030569

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R334820	**Test Name :** HARDNESS, TOTAL AS CACO3 BY SM2340B				**Matrix:** Groundwater	
HS19030569-11	20190304-DGW-MW11-PV30out-controlT	04 Mar 2019 15:30			19 Mar 2019 17:18	1
HS19030569-12	20190304-DGW-MW11-PV30out-30T	04 Mar 2019 15:30			19 Mar 2019 17:18	1
HS19030569-13	20190304-DGW-MW11-PV30out-35T	04 Mar 2019 15:30			19 Mar 2019 17:18	1
HS19030569-14	20190304-DGW-MW11-PV30out-40T	04 Mar 2019 15:30			19 Mar 2019 17:18	1
HS19030569-15	20190304-DGW-MW11-PV30inlet-controlT	04 Mar 2019 15:40			19 Mar 2019 17:18	1
HS19030569-16	20190304-DGW-MW11-PV30inlet-30-35-40T	04 Mar 2019 15:40			19 Mar 2019 17:18	1
HS19030569-17	20190305-DGW-MW11-PV30mid-controlT	05 Mar 2019 17:30			19 Mar 2019 17:18	1
HS19030569-18	20190305-DGW-MW11-PV30mid-30T	05 Mar 2019 17:30			19 Mar 2019 17:18	1
HS19030569-19	20190305-DGW-MW11-PV30mid-35T	05 Mar 2019 17:30			19 Mar 2019 17:18	1
HS19030569-20	20190305-DGW-MW11-PV30mid-40T	05 Mar 2019 17:30			19 Mar 2019 17:18	1
Batch ID R334821	**Test Name :** HARDNESS, TOTAL AS CACO3 BY SM2340B				**Matrix:** Groundwater	
HS19030569-22	20190303-DGW-MW11-PV30out-30T-DUP	03 Mar 2019 14:50			19 Mar 2019 17:33	1

WorkOrder: HS19030569
InstrumentID: ICPMS04
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000521	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000340	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000553	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0523	0.0340	0.500
A	Iron	7439-89-6	0.0250	0.0205	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000916	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0700	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0418	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00274	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0556	0.0140	0.200

WorkOrder: HS19030569
InstrumentID: ICPMS05
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000555	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000460	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000554	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0537	0.0340	0.500
A	Iron	7439-89-6	0.0500	0.0549	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.00100	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0680	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0542	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00280	0.00110	0.00200

WorkOrder: HS19030569
InstrumentID: ICPMS04
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000521	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000340	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000553	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0523	0.0340	0.500
A	Iron	7439-89-6	0.0250	0.0205	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000916	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0700	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0418	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00274	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0556	0.0140	0.200

WorkOrder: HS19030569
InstrumentID: ICPMS05
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000555	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000460	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000554	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0537	0.0340	0.500
A	Iron	7439-89-6	0.0500	0.0549	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.00100	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0680	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0542	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00280	0.00110	0.00200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030569

QC BATCH REPORT NEW

Batch ID: 138728 (0) **Instrument: ICPMS04** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLK-138728** Units: **mg/L** Analysis Date: **18-Mar-2019 18:57**
Client ID: Run ID: **ICPMS04_334708** SeqNo: **4994841** PrepDate: **15-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	0.01542	0.200								J
Lead	U	0.00200								
Magnesium	0.01122	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	0.05078	0.200								J

LCS Sample ID: **LCS-138728** Units: **mg/L** Analysis Date: **18-Mar-2019 18:59**
Client ID: Run ID: **ICPMS04_334708** SeqNo: **4994842** PrepDate: **15-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05174	0.00200	0.05	0	103	80 - 120				
Arsenic	0.05132	0.00200	0.05	0	103	80 - 120				
Cadmium	0.05188	0.00200	0.05	0	104	80 - 120				
Calcium	5.31	0.500	5	0	106	80 - 120				
Iron	5.56	0.200	5	0	111	80 - 120				
Lead	0.05169	0.00200	0.05	0	103	80 - 120				
Magnesium	5.396	0.200	5	0	108	80 - 120				
Potassium	5.154	0.200	5	0	103	80 - 120				
Selenium	0.04842	0.00200	0.05	0	96.8	80 - 120				
Sodium	5.52	0.200	5	0	110	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030569

QC BATCH REPORT NEW

Batch ID: 138728 (0) **Instrument: ICPMS04** **Method: ICP-MS METALS BY SW6020A**

MS Sample ID: **HS19030568-11MS** Units: **mg/L** Analysis Date: **18-Mar-2019 19:10**
Client ID: Run ID: **ICPMS04_334708** SeqNo: **4994847** PrepDate: **15-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05068	0.00200	0.05	0.000219	101	80 - 120				
Arsenic	0.05481	0.00200	0.05	0.005114	99.4	80 - 120				
Cadmium	0.05028	0.00200	0.05	0.000009	101	80 - 120				
Calcium	126.2	0.500	5	123.9	45.8	80 - 120				SO
Iron	5.401	0.200	5	0.1305	105	80 - 120				
Lead	0.05056	0.00200	0.05	0.000079	101	80 - 120				
Magnesium	26.45	0.200	5	22.43	80.4	80 - 120				O
Potassium	7.277	0.200	5	2.176	102	80 - 120				
Selenium	0.04781	0.00200	0.05	0.001109	93.4	80 - 120				
Sodium	200.1	0.200	5	200	1.57	80 - 120				SEO

MSD Sample ID: **HS19030568-11MSD** Units: **mg/L** Analysis Date: **18-Mar-2019 19:13**
Client ID: Run ID: **ICPMS04_334708** SeqNo: **4994848** PrepDate: **15-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05159	0.00200	0.05	0.000219	103	80 - 120	0.05068	1.78	20	
Arsenic	0.05672	0.00200	0.05	0.005114	103	80 - 120	0.05481	3.43	20	
Cadmium	0.04931	0.00200	0.05	0.000009	98.6	80 - 120	0.05028	1.95	20	
Calcium	125.5	0.500	5	123.9	32.1	80 - 120	126.2	0.547	20	SO
Iron	5.242	0.200	5	0.1305	102	80 - 120	5.401	2.99	20	
Lead	0.04985	0.00200	0.05	0.000079	99.6	80 - 120	0.05056	1.41	20	
Magnesium	26.46	0.200	5	22.43	80.5	80 - 120	26.45	0.0132	20	O
Potassium	7.311	0.200	5	2.176	103	80 - 120	7.277	0.467	20	
Selenium	0.04981	0.00200	0.05	0.001109	97.4	80 - 120	0.04781	4.09	20	
Sodium	200.6	0.200	5	200	13.4	80 - 120	200.1	0.296	20	SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030569

QC BATCH REPORT NEW

Batch ID: 138728 (0) **Instrument: ICPMS04** **Method: ICP-MS METALS BY SW6020A**

PDS Sample ID: **HS19030568-11PDS** Units: **mg/L** Analysis Date: **18-Mar-2019 19:15**
Client ID: Run ID: **ICPMS04_334708** SeqNo: **4994849** PrepDate: **15-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09239	0.00200	0.1	0.000219	92.2	75 - 125				
Arsenic	0.1071	0.00200	0.1	0.005114	102	75 - 125				
Cadmium	0.1021	0.00200	0.1	0.000009	102	75 - 125				
Iron	10.72	0.200	10	0.1305	106	75 - 125				
Lead	0.1022	0.00200	0.1	0.000079	102	75 - 125				
Magnesium	30.04	0.200	10	22.43	76.1	75 - 125				
Potassium	12.27	0.200	10	2.176	101	75 - 125				
Selenium	0.09632	0.00200	0.1	0.001109	95.2	75 - 125				

PDS Sample ID: **HS19030568-11PDS** Units: **mg/L** Analysis Date: **19-Mar-2019 12:43**
Client ID: Run ID: **ICPMS04_334782** SeqNo: **4995880** PrepDate: **15-Mar-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	205.3	5.00	100	106.1	99.2	75 - 125				
Sodium	284.2	2.00	100	190.5	93.7	75 - 125				

SD Sample ID: **HS19030568-11SD** Units: **mg/L** Analysis Date: **18-Mar-2019 19:08**
Client ID: Run ID: **ICPMS04_334708** SeqNo: **4994846** PrepDate: **15-Mar-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000219	0	10	
Arsenic	0.004269	0.0100					0.005114	0	10	J
Cadmium	U	0.0100					0.000009	0	10	
Iron	0.339	1.00					0.1305	0	10	J
Lead	U	0.0100					0.000079	0	10	
Magnesium	20.34	1.00					22.43	9.33	10	
Potassium	2.076	1.00					2.176	4.6	10	
Selenium	U	0.0100					0.001109	0	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030569

QC BATCH REPORT NEW

Batch ID: 138728 (0) **Instrument: ICPMS04** **Method: ICP-MS METALS BY SW6020A**

SD Sample ID: **HS19030568-11SD** Units: **mg/L** Analysis Date: **19-Mar-2019 12:41**
Client ID: Run ID: **ICPMS04_334782** SeqNo: **4995879** PrepDate: **15-Mar-2019** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	111.5	25.0					106.1	5.12	10	
Sodium	204.1	10.0					190.5	7.13	10	

The following samples were analyzed in this batch: HS19030569-11 HS19030569-12 HS19030569-13 HS19030569-14 HS19030569-15 HS19030569-16 HS19030569-17 HS19030569-18 HS19030569-19

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030569

QC BATCH REPORT NEW

Batch ID: 138729 (0) **Instrument: ICPMS05** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLK-138729** Units: **mg/L** Analysis Date: **19-Mar-2019 00:50**
Client ID: Run ID: **ICPMS05_334713** SeqNo: **4995274** PrepDate: **15-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	U	0.200								
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	0.1303	0.200								J

LCS Sample ID: **LCS-138729** Units: **mg/L** Analysis Date: **19-Mar-2019 00:52**
Client ID: Run ID: **ICPMS05_334713** SeqNo: **4995275** PrepDate: **15-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04919	0.00200	0.05	0	98.4	80 - 120				
Arsenic	0.04804	0.00200	0.05	0	96.1	80 - 120				
Cadmium	0.04899	0.00200	0.05	0	98.0	80 - 120				
Calcium	4.979	0.500	5	0	99.6	80 - 120				
Iron	4.933	0.200	5	0	98.7	80 - 120				
Lead	0.04886	0.00200	0.05	0	97.7	80 - 120				
Magnesium	4.941	0.200	5	0	98.8	80 - 120				
Potassium	5.026	0.200	5	0	101	80 - 120				
Selenium	0.04539	0.00200	0.05	0	90.8	80 - 120				
Sodium	4.859	0.200	5	0	97.2	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030569

QC BATCH REPORT NEW

Batch ID: 138729 (0) **Instrument: ICPMS05** **Method: ICP-MS METALS BY SW6020A**

MS Sample ID: **HS19030569-20MS** Units: **mg/L** Analysis Date: **19-Mar-2019 00:59**
Client ID: **20190305-DGW-MW11-PV30mid-40T** Run ID: **ICPMS05_334713** SeqNo: **4995278** PrepDate: **15-Mar-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04765	0.0100	0.05	0.00057	94.2	80 - 120				
Arsenic	0.04779	0.0100	0.05	-0.000472	96.5	80 - 120				
Cadmium	0.04848	0.0100	0.05	-0.000076	97.1	80 - 120				
Calcium	335.5	2.50	5	314.9	412	80 - 120				SO
Iron	6.671	1.00	5	1.755	98.3	80 - 120				
Lead	0.04556	0.0100	0.05	0.000129	90.9	80 - 120				
Magnesium	286.6	1.00	5	265.9	414	80 - 120				SO
Potassium	23.61	1.00	5	18.46	103	80 - 120				
Selenium	0.04649	0.0100	0.05	0.003241	86.5	80 - 120				
Sodium	1606	1.00	5	1529	1540	80 - 120				SEO

MSD Sample ID: **HS19030569-20MSD** Units: **mg/L** Analysis Date: **19-Mar-2019 01:01**
Client ID: **20190305-DGW-MW11-PV30mid-40T** Run ID: **ICPMS05_334713** SeqNo: **4995279** PrepDate: **15-Mar-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04619	0.0100	0.05	0.00057	91.2	80 - 120	0.04765	3.11	20	
Arsenic	0.04631	0.0100	0.05	-0.000472	93.6	80 - 120	0.04779	3.15	20	
Cadmium	0.04982	0.0100	0.05	-0.000076	99.8	80 - 120	0.04848	2.74	20	
Calcium	321.5	2.50	5	314.9	131	80 - 120	335.5	4.28	20	SO
Iron	6.595	1.00	5	1.755	96.8	80 - 120	6.671	1.14	20	
Lead	0.0468	0.0100	0.05	0.000129	93.3	80 - 120	0.04556	2.69	20	
Magnesium	272.1	1.00	5	265.9	125	80 - 120	286.6	5.17	20	SO
Potassium	23.01	1.00	5	18.46	91.0	80 - 120	23.61	2.56	20	
Selenium	0.04687	0.0100	0.05	0.003241	87.3	80 - 120	0.04649	0.825	20	
Sodium	1535	1.00	5	1529	107	80 - 120	1606	4.55	20	EO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030569

QC BATCH REPORT NEW

Batch ID: 138729 (0) **Instrument: ICPMS05** **Method: ICP-MS METALS BY SW6020A**

PDS Sample ID: **HS19030569-20PDS** Units: **mg/L** Analysis Date: **19-Mar-2019 01:04**
Client ID: **20190305-DGW-MW11-PV30mid-40T** Run ID: **ICPMS05_334713** SeqNo: **4995280** PrepDate: **15-Mar-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.4437	0.0100	0.5	0	88.7	75 - 125				
Arsenic	0.475	0.0100	0.5	0	95.0	75 - 125				
Cadmium	0.4978	0.0100	0.5	0	99.6	75 - 125				
Calcium	356.5	2.50	50	314.9	83.2	75 - 125				O
Iron	49.43	1.00	50	1.755	95.4	75 - 125				
Lead	0.4703	0.0100	0.5	0	94.1	75 - 125				
Magnesium	316.6	1.00	50	265.9	102	75 - 125				O
Potassium	66.39	1.00	50	18.46	95.9	75 - 125				
Selenium	0.4495	0.0100	0.5	0	89.9	75 - 125				

PDS Sample ID: **HS19030569-20PDS** Units: **mg/L** Analysis Date: **19-Mar-2019 14:39**
Client ID: **20190305-DGW-MW11-PV30mid-40T** Run ID: **ICPMS04_334782** SeqNo: **4996033** PrepDate: **15-Mar-2019** DF: **100**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	2678	20.0	1000	1743	93.5	75 - 125				

SD Sample ID: **HS19030569-20SD** Units: **mg/L** Analysis Date: **19-Mar-2019 12:24**
Client ID: **20190305-DGW-MW11-PV30mid-40T** Run ID: **ICPMS05_334784** SeqNo: **4996071** PrepDate: **15-Mar-2019** DF: **25**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0500					0	0	10	
Arsenic	U	0.0500					0	0	10	
Cadmium	U	0.0500					0	0	10	
Calcium	333	12.5					338.8	1.72	10	
Iron	1.83	5.00					3.828	0	10	J
Lead	U	0.0500					0	0	10	
Magnesium	290.7	5.00					302	3.75	10	
Potassium	18.94	5.00					20.64	8.25	10	
Selenium	U	0.0500					0	0	10	
Sodium	1667	5.00					1743	4.39	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030569

QC BATCH REPORT NEW

Batch ID: 138729 (0) **Instrument:** ICPMS05 **Method:** ICP-MS METALS BY SW6020A

SD Sample ID: **HS19030569-20SD** Units: **mg/L** Analysis Date: **19-Mar-2019 14:37**
Client ID: **20190305-DGW-MW11-PV30mid-40T** Run ID: **ICPMS04_334782** SeqNo: **4996032** PrepDate: **15-Mar-2019** DF: **500**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Sodium	1783	100					1743	2.29	10	

The following samples were analyzed in this batch: HS19030569-20 HS19030569-22

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030569

QC BATCH REPORT NEW

Batch ID: 138730 (0) **Instrument: ICPMS04** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

MBLK Sample ID: **MBLK-138730** Units: **mg/L** Analysis Date: **18-Mar-2019 14:51**
Client ID: Run ID: **ICPMS04_334708** SeqNo: **4994332** PrepDate: **15-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01201	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	U	0.200								

LCS Sample ID: **LCS-138730** Units: **mg/L** Analysis Date: **18-Mar-2019 14:53**
Client ID: Run ID: **ICPMS04_334708** SeqNo: **4994333** PrepDate: **15-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05132	0.00200	0.05	0	103	80 - 120				
Arsenic	0.05029	0.00200	0.05	0	101	80 - 120				
Cadmium	0.05004	0.00200	0.05	0	100	80 - 120				
Calcium	5.168	0.500	5	0	103	80 - 120				
Iron	5.18	0.200	5	0	104	80 - 120				
Lead	0.04814	0.00200	0.05	0	96.3	80 - 120				
Magnesium	5.269	0.200	5	0	105	80 - 120				
Potassium	5.114	0.200	5	0	102	80 - 120				
Selenium	0.05073	0.00200	0.05	0	101	80 - 120				
Sodium	5.183	0.200	5	0	104	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030569

QC BATCH REPORT NEW

Batch ID: 138730 (0) **Instrument: ICPMS04** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

MS Sample ID: **HS19030568-01MS** Units: **mg/L** Analysis Date: **18-Mar-2019 18:01**
Client ID: Run ID: **ICPMS04_334708** SeqNo: **4994753** PrepDate: **15-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05148	0.00200	0.05	0.000266	102	75 - 125				
Arsenic	0.05659	0.00200	0.05	0.004841	103	75 - 125				
Cadmium	0.0495	0.00200	0.05	0.000013	99.0	75 - 125				
Iron	5.349	0.200	5	0.06769	106	75 - 125				
Lead	0.05	0.00200	0.05	0.000021	100.0	75 - 125				
Magnesium	27.01	0.200	5	21.22	116	75 - 125				O
Potassium	7.392	0.200	5	2.074	106	75 - 125				
Selenium	0.04888	0.00200	0.05	0.001273	95.2	75 - 125				

MS Sample ID: **HS19030568-01MS** Units: **mg/L** Analysis Date: **18-Mar-2019 15:00**
Client ID: Run ID: **ICPMS04_334708** SeqNo: **4994336** PrepDate: **15-Mar-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	117.6	5.00	5	113.2	88.7	75 - 125				O
Sodium	199.5	2.00	5	198.2	24.9	75 - 125				SO

MSD Sample ID: **HS19030568-01MSD** Units: **mg/L** Analysis Date: **18-Mar-2019 18:04**
Client ID: Run ID: **ICPMS04_334708** SeqNo: **4994754** PrepDate: **15-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05097	0.00200	0.05	0.000266	101	75 - 125	0.05148	0.992	20	
Arsenic	0.05556	0.00200	0.05	0.004841	101	75 - 125	0.05659	1.84	20	
Cadmium	0.04995	0.00200	0.05	0.000013	99.9	75 - 125	0.0495	0.911	20	
Iron	5.366	0.200	5	0.06769	106	75 - 125	5.349	0.322	20	
Lead	0.05083	0.00200	0.05	0.000021	102	75 - 125	0.05	1.65	20	
Magnesium	26.12	0.200	5	21.22	98.0	75 - 125	27.01	3.35	20	O
Potassium	7.328	0.200	5	2.074	105	75 - 125	7.392	0.874	20	
Selenium	0.04673	0.00200	0.05	0.001273	90.9	75 - 125	0.04888	4.5	20	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030569

QC BATCH REPORT NEW

Batch ID: 138730 (0) **Instrument: ICPMS04** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

MSD Sample ID: **HS19030568-01MSD** Units: **mg/L** Analysis Date: **18-Mar-2019 15:02**
Client ID: Run ID: **ICPMS04_334708** SeqNo: **4994337** PrepDate: **15-Mar-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	119.2	5.00	5	113.2	121	75 - 125	117.6	1.37	20	O
Sodium	204.5	2.00	5	198.2	126	75 - 125	199.5	2.49	20	SO

PDS Sample ID: **HS19030568-01PDS** Units: **mg/L** Analysis Date: **18-Mar-2019 18:06**
Client ID: Run ID: **ICPMS04_334708** SeqNo: **4994755** PrepDate: **15-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1029	0.00200	0.1	0.000266	103	75 - 125				
Arsenic	0.1183	0.00200	0.1	0.004841	113	75 - 125				
Cadmium	0.1143	0.00200	0.1	0.000013	114	75 - 125				
Iron	12.09	0.200	10	0.06769	120	75 - 125				
Lead	0.1149	0.00200	0.1	0.000021	115	75 - 125				
Magnesium	31.82	0.200	10	21.22	106	75 - 125				
Potassium	13.2	0.200	10	2.074	111	75 - 125				
Selenium	0.109	0.00200	0.1	0.001273	108	75 - 125				

PDS Sample ID: **HS19030568-01PDS** Units: **mg/L** Analysis Date: **18-Mar-2019 15:05**
Client ID: Run ID: **ICPMS04_334708** SeqNo: **4994338** PrepDate: **15-Mar-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	226.1	5.00	100	113.2	113	75 - 125				
Sodium	304.6	2.00	100	198.2	106	75 - 125				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030569

QC BATCH REPORT NEW

Batch ID: 138730 (0) **Instrument: ICPMS04** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

SD Sample ID: **HS19030568-01SD** Units: **mg/L** Analysis Date: **18-Mar-2019 17:59**
Client ID: Run ID: **ICPMS04_334708** SeqNo: **4994752** PrepDate: **15-Mar-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000266	0	10	
Arsenic	0.004525	0.0100					0.004841	0	10	J
Cadmium	U	0.0100					0.000013	0	10	
Iron	0.3402	1.00					0.06769	0	10	J
Lead	U	0.0100					0.000021	0	10	
Magnesium	20.9	1.00					21.22	1.53	10	
Potassium	2.083	1.00					2.074	0.449	10	
Selenium	U	0.0100					0.001273	0	10	

SD Sample ID: **HS19030568-01SD** Units: **mg/L** Analysis Date: **18-Mar-2019 14:58**
Client ID: Run ID: **ICPMS04_334708** SeqNo: **4994335** PrepDate: **15-Mar-2019** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	112.7	25.0					113.2	0.428	10	
Sodium	205.9	10.0					198.2	3.88	10	

The following samples were analyzed in this batch:

HS19030569-01	HS19030569-02	HS19030569-03	HS19030569-04
HS19030569-05	HS19030569-06	HS19030569-07	HS19030569-08
HS19030569-09	HS19030569-10		

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030569

QC BATCH REPORT NEW

Batch ID: 138731 (0) **Instrument: ICPMS05** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

MBLK Sample ID: **MBLK-138731** Units: **mg/L** Analysis Date: **18-Mar-2019 16:58**
Client ID: Run ID: **ICPMS05_334713** SeqNo: **4994734** PrepDate: **15-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01017	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	0.1598	0.200								J

LCS Sample ID: **LCS-138731** Units: **mg/L** Analysis Date: **18-Mar-2019 17:00**
Client ID: Run ID: **ICPMS05_334713** SeqNo: **4994735** PrepDate: **15-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04931	0.00200	0.05	0	98.6	80 - 120				
Arsenic	0.05093	0.00200	0.05	0	102	80 - 120				
Cadmium	0.0494	0.00200	0.05	0	98.8	80 - 120				
Calcium	4.992	0.500	5	0	99.8	80 - 120				
Iron	5.277	0.200	5	0	106	80 - 120				
Lead	0.04811	0.00200	0.05	0	96.2	80 - 120				
Magnesium	5.204	0.200	5	0	104	80 - 120				
Potassium	5.095	0.200	5	0	102	80 - 120				
Selenium	0.04781	0.00200	0.05	0	95.6	80 - 120				
Sodium	5.437	0.200	5	0	109	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030569

QC BATCH REPORT NEW

Batch ID: 138731 (0) **Instrument:** ICPMS05 **Method:** DISSOLVED METALS BY SW6020A (DISSOLVED)

MS Sample ID: **HS19030569-21MS** Units: **mg/L** Analysis Date: **18-Mar-2019 17:09**
Client ID: **20190303-DGW-MW11-PV30out-30D-DUP** Run ID: **ICPMS05_334713** SeqNo: **4994738** PrepDate: **15-Mar-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.0452	0.0100	0.05	-0.000744	91.9	75 - 125				
Arsenic	0.04765	0.0100	0.05	-0.001385	98.1	75 - 125				
Cadmium	0.0488	0.0100	0.05	0.000098	97.4	75 - 125				
Calcium	304.7	2.50	5	302.2	50.2	75 - 125				SO
Iron	4.99	1.00	5	0.0211	99.4	75 - 125				
Lead	0.04539	0.0100	0.05	0.000293	90.2	75 - 125				
Magnesium	300.6	1.00	5	283.7	336	75 - 125				SO
Potassium	23.69	1.00	5	17.92	115	75 - 125				
Selenium	0.04853	0.0100	0.05	0.003622	89.8	75 - 125				
Sodium	1755	1.00	5	1679	1530	75 - 125				SEO

MSD Sample ID: **HS19030569-21MSD** Units: **mg/L** Analysis Date: **18-Mar-2019 17:11**
Client ID: **20190303-DGW-MW11-PV30out-30D-DUP** Run ID: **ICPMS05_334713** SeqNo: **4994739** PrepDate: **15-Mar-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04548	0.0100	0.05	-0.000744	92.4	75 - 125	0.0452	0.607	20	
Arsenic	0.04775	0.0100	0.05	-0.001385	98.3	75 - 125	0.04765	0.208	20	
Cadmium	0.05061	0.0100	0.05	0.000098	101	75 - 125	0.0488	3.64	20	
Calcium	300.7	2.50	5	302.2	-30.6	75 - 125	304.7	1.33	20	SO
Iron	5.06	1.00	5	0.0211	101	75 - 125	4.99	1.4	20	
Lead	0.04805	0.0100	0.05	0.000293	95.5	75 - 125	0.04539	5.69	20	
Magnesium	298.8	1.00	5	283.7	302	75 - 125	300.6	0.578	20	SO
Potassium	22.55	1.00	5	17.92	92.7	75 - 125	23.69	4.93	20	
Selenium	0.04745	0.0100	0.05	0.003622	87.6	75 - 125	0.04853	2.25	20	
Sodium	1754	1.00	5	1679	1490	75 - 125	1755	0.0913	20	SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030569

QC BATCH REPORT NEW

Batch ID: 138731 (0) **Instrument:** ICPMS05 **Method:** DISSOLVED METALS BY SW6020A (DISSOLVED)

PDS Sample ID: **HS19030569-21PDS** Units: **mg/L** Analysis Date: **18-Mar-2019 17:13**
Client ID: **20190303-DGW-MW11-PV30out-30D-DUP** Run ID: **ICPMS05_334713** SeqNo: **4994740** PrepDate: **15-Mar-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.4584	0.0100	0.5	0	91.7	75 - 125				
Arsenic	0.5033	0.0100	0.5	0	101	75 - 125				
Cadmium	0.5258	0.0100	0.5	0	105	75 - 125				
Calcium	344.6	2.50	50	302.2	84.8	75 - 125				O
Iron	49.29	1.00	50	0	98.6	75 - 125				
Lead	0.4942	0.0100	0.5	0	98.8	75 - 125				
Magnesium	337.2	1.00	50	283.7	107	75 - 125				O
Potassium	68.23	1.00	50	17.92	101	75 - 125				
Selenium	0.4572	0.0100	0.5	0	91.4	75 - 125				

PDS Sample ID: **HS19030569-21PDS** Units: **mg/L** Analysis Date: **19-Mar-2019 13:46**
Client ID: **20190303-DGW-MW11-PV30out-30D-DUP** Run ID: **ICPMS04_334782** SeqNo: **4995962** PrepDate: **15-Mar-2019** DF: **100**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	1328	50.0	1000	330.3	99.8	75 - 125				
Sodium	2775	20.0	1000	1806	96.9	75 - 125				

SD Sample ID: **HS19030569-21SD** Units: **mg/L** Analysis Date: **18-Mar-2019 17:04**
Client ID: **20190303-DGW-MW11-PV30out-30D-DUP** Run ID: **ICPMS05_334713** SeqNo: **4994737** PrepDate: **15-Mar-2019** DF: **25**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0500					-0.000744	0	10	
Arsenic	U	0.0500					-0.001385	0	10	
Cadmium	U	0.0500					0.000098	0	10	
Calcium	311.1	12.5					302.2	2.94	10	
Iron	U	5.00					0.0211	0	10	
Lead	U	0.0500					0.000293	0	10	
Magnesium	304.4	5.00					283.7	7.28	10	
Potassium	19	5.00					17.92	6.05	10	
Selenium	U	0.0500					0.003622	0	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030569

QC BATCH REPORT NEW

Batch ID: 138731 (0) **Instrument:** ICPMS05 **Method:** DISSOLVED METALS BY SW6020A (DISSOLVED)

SD Sample ID: **HS19030569-21SD** Units: **mg/L** Analysis Date: **19-Mar-2019 13:43**
Client ID: **20190303-DGW-MW11-PV30out-30D-DUP** Run ID: **ICPMS04_334782** SeqNo: **4995961** PrepDate: **15-Mar-2019** DF: **500**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	324.8	250					330.3	1.67	10	
Sodium	1849	100					1806	2.38	10	

The following samples were analyzed in this batch: HS19030569-21

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19030569**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
California	2919, 2018-2019	30-Apr-2019
Maryland	343, 2018-2019	30-Jun-2019

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19030569

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19030569-01	20190304-DGW-MW11-PV30out-controlD	Login	3/12/2019 6:34:14 PM	JRM	MET088
HS19030569-02	20190304-DGW-MW11-PV30out-30D	Login	3/12/2019 6:34:14 PM	JRM	MET088
HS19030569-03	20190304-DGW-MW11-PV30out-35D	Login	3/12/2019 6:34:14 PM	JRM	MET088
HS19030569-04	20190304-DGW-MW11-PV30out-40D	Login	3/12/2019 6:34:14 PM	JRM	MET088
HS19030569-05	20190304-DGW-MW11-PV30inlet-controlD	Login	3/12/2019 6:34:14 PM	JRM	MET088
HS19030569-06	20190304-DGW-MW11-PV30inlet-30-35-40D	Login	3/12/2019 6:34:14 PM	JRM	MET088
HS19030569-07	20190305-DGW-MW11-PV30mid-controlD	Login	3/12/2019 6:34:14 PM	JRM	MET088
HS19030569-08	20190305-DGW-MW11-PV30mid-30D	Login	3/12/2019 6:34:14 PM	JRM	MET088
HS19030569-09	20190305-DGW-MW11-PV30mid-35D	Login	3/12/2019 6:34:14 PM	JRM	MET088
HS19030569-10	20190305-DGW-MW11-PV30mid-40D	Login	3/12/2019 6:34:14 PM	JRM	MET088
HS19030569-11	20190304-DGW-MW11-PV30out-controlT	Login	3/12/2019 6:34:14 PM	JRM	MET088
HS19030569-12	20190304-DGW-MW11-PV30out-30T	Login	3/12/2019 6:34:14 PM	JRM	MET088
HS19030569-13	20190304-DGW-MW11-PV30out-35T	Login	3/12/2019 6:34:14 PM	JRM	MET088
HS19030569-14	20190304-DGW-MW11-PV30out-40T	Login	3/12/2019 6:34:14 PM	JRM	MET088
HS19030569-15	20190304-DGW-MW11-PV30inlet-controlT	Login	3/12/2019 6:34:14 PM	JRM	MET088
HS19030569-16	20190304-DGW-MW11-PV30inlet-30-35-40T	Login	3/12/2019 6:34:14 PM	JRM	MET088
HS19030569-17	20190305-DGW-MW11-PV30mid-controlT	Login	3/12/2019 6:34:14 PM	JRM	MET088
HS19030569-18	20190305-DGW-MW11-PV30mid-30T	Login	3/12/2019 6:34:14 PM	JRM	MET088
HS19030569-19	20190305-DGW-MW11-PV30mid-35T	Login	3/12/2019 6:34:14 PM	JRM	MET088
HS19030569-20	20190305-DGW-MW11-PV30mid-40T	Login	3/12/2019 6:34:14 PM	JRM	MET088
HS19030569-21	20190303-DGW-MW11-PV30out-30D-DUP	Login	3/12/2019 6:34:14 PM	JRM	MET088
HS19030569-22	20190303-DGW-MW11-PV30out-30T-DUP	Login	3/12/2019 6:34:14 PM	JRM	MET088

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19030569
Date/Time Received: **12-Mar-2019 08:50**
Received by: **JRM**

Checklist completed by: *Jared R. Makan* eSignature 12-Mar-2019 Date
Reviewed by: *Bernadette A. Fini* eSignature 13-Mar-2019 Date

Matrices: **Water**
Carrier name: **FedEx International Priority**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	0.9c/0.9c UC/C	IR25	
Cooler(s)/Kit(s):	44478		
Date/Time sample(s) sent to storage:	03/12/2019 19:00		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

ALS Environmental

Chain of Custody Form

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HS19030569

Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086-01	Project Name	Exide column studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrette Parkway Drive, Suit	E	ICP TW (6020A total metals (6)+cations)
				F	ICP DISS (6020A diss metals (6)+cations-FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin Mo 63021	G	
Phone	314 984-8800	Phone	314 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190304-DGW-MW11-PV30out-controlD	03-04-19	3:30 PM	GW	2	1						x					
2	20190304-DGW-MW11-PV30out-30D	03-04-19	3:30 PM	GW	2	1						x					
3	20190304-DGW-MW11-PV30out-35D	03-04-19	3:30 PM	GW	2	1						x					
4	20190304-DGW-MW11-PV30out-40D	03-04-19	3:30 PM	GW	2	1						x					
5	20190304-DGW-MW11-PV30inlet-controlD	03-04-19	3:40 PM	GW	2	1						x					
6	20190304-DGW-MW11-PV30inlet-30-35-40D	03-04-19	3:40 PM	GW	2	1						x					
7	20190305-DGW-MW11-PV30mid-controlD	03-05-19	5:30 PM	GW	2	1						x					
8	20190305-DGW-MW11-PV30mid-30D	03-05-19	5:30 PM	GW	2	1						x					
9	20190305-DGW-MW11-PV30mid-35D	03-05-19	5:30 PM	GW	2	1						x					
10	20190305-DGW-MW11-PV30mid-40D	03-05-19	5:30 PM	GW	2	1						x					

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method:

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by: Giovanna Llamosas	Date: 2019/03/11	Time: 15:30	Received by:	Notes:
Relinquished by:	Date: 3/3/19	Time: 08:30	Received by (Laboratory):	Cooler Temp. 0.9
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	

QC Package: (Check Box Below)

	Level II: Standard QC	x	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other: _____		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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Chain of Custody Form

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Golder Associates
Exide Column Studies

Work Order #:

ALS Project Manager:

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086-01	Project Name	Exide column studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrette Parkway Drive, Suit	E	ICP TW (6020A total metals (6)+cations)
				F	ICP DISS (6020A diss metals (6)+cations-FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin Mo 63021	G	
Phone	314 984-8800	Phone	314 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190304-DGW-MW11-PV30out-controlT	03-04-19	3:30 PM	GW	2	1				x	x						
2	20190304-DGW-MW11-PV30out-30T	03-04-19	3:30 PM	GW	2	1				x	x						
3	20190304-DGW-MW11-PV30out-35T	03-04-19	3:30 PM	GW	2	1				x	x						
4	20190304-DGW-MW11-PV30out-40T	03-04-19	3:30 PM	GW	2	1				x	x						
5	20190304-DGW-MW11-PV30inlet-controlT	03-04-19	3:40 PM	GW	2	1				x	x						
6	20190304-DGW-MW11-PV30inlet-30-35-40T	03-04-19	3:40 PM	GW	2	1				x	x						
7	20190305-DGW-MW11-PV30mid-controlT	03-05-19	5:30 PM	GW	2	1				x	x						
8	20190305-DGW-MW11-PV30mid-30T	03-05-19	5:30 PM	GW	2	1				x	x						
9	20190305-DGW-MW11-PV30mid-35T	03-05-19	5:30 PM	GW	2	1				x	x						
10	20190305-DGW-MW11-PV30mid-40T	03-05-19	5:30 PM	GW	2	1				x	x						

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method:

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☑ Other _____

Results Due Date:

Relinquished by: Giovanna Llamosas	Date: 2019/03/11	Time: 15:30	Received by:	Notes:
Relinquished by:	Date: 3/12/19	Time: 08:50	Received by (Laboratory):	Cooler Temp. 4.6
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	0.9

QC Package: (Check Box Below)

	Level II: Standard QC	x	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other: _____		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

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HS19030569

Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086-01	Project Name	Exide column studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrette Parkway Drive, Suit	E	ICP TW (6020A total metals (6)+cations)
				F	ICP DISS (6020A diss metals (6)+cations-FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin Mo 63021	G	
Phone	314 984-8800	Phone	314 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190303-DGW-MW11-PV30out-30D-DUP	03-03-19	2:50 PM	GW	2	1						x					
2	20190303-DGW-MW11-PV30out-30T-DUP	03-03-19	2:50 PM	GW	2	1				x	x						
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method:

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by: Giovanna Llamosas	Date: 2019/03/11	Time: 15:30	Received by:	Notes:	
Relinquished by:	Date: 3/12/19	Time: 08:50	Received by (Laboratory): J. Nwaiwu	Cooler Temp. 4.6	QC Package: (Check Box Below)
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	0.9	☐ Level II: Standard QC ☒ TRRP-Checklist ☐ Level III: Std QC + Raw Data ☐ TRRP Level IV ☐ Level IV: SW846 CLP-Like ☐ Other:

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

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CONSULTEZ NOTRE TARIF, LE GUIDE DES SERVICES DE FEDEX APPLICABLE OU LES CONDITIONS STANDARD DE TRANSPORT POUR PLUS DE DÉTAILS. La Convention de Varsovie a établi des procédures de réclamation écrites délaissées pour les dommages, retards ou non-livraison des envois. En outre, l'interprétation et l'application des dispositions relatives aux réclamations telles qu'elles sont stipulées dans la Convention de Varsovie peuvent varier selon les pays. Veuillez vous reporter à la Convention afin de déterminer la période de réclamation qui se rapporte à votre envoi. Le réclamant ne pourra plus réclamer de dommages intérêts à FedEx si aucune poursuite n'est engagée dans un délai de deux ans, tel que stipulé dans la Convention. FedEx n'est pas tenue de répondre à quelconque réclamation que ce soit avant que tous les frais de transport aient été réglés. Le montant de la réclamation ne peut être déduit des frais de transport. Si le destinataire accepte l'envoi sans prendre note de dommages au registre de livraison, FedEx assumera que l'envoi a été livré en bon état. Afin de nous permettre de traiter les réclamations pour dommages, le contenu, les cartons et emballages d'expédition d'origine doivent être conservés pour nous permettre de les examiner. DISPOSITIONS IMPÉRATIVES. Dans la mesure où une des dispositions contenues ou indiquées dans la présente lettre de transport aérien est contraire à tout traité international, loi, réglementation, ordonnance ou exigence gouvernementale en vigueur, ladite disposition restera applicable en tant que partie de notre accord tant qu'elle ne sera pas rendue caduque. L'invalidité ou le caractère inexécutoire de toute disposition n'affectera aucunement toute partie de la présente lettre de transport aérien. À moins d'indications contraires, FEDERAL EXPRESS CORPORATION, 2005 Corporate Avenue, Memphis, TN 38132, USA, est le transporteur principal de l'envoi. Adresse de courriel sur le site www.fedex.com.

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March 20, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19030570**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 22 sample(s) on Mar 12, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DAYNA.FISHER
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19030570**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19030570**	

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 03/20/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19030570				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 138729, 138731, R334821				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?			X		
		Were analytical duplicates analyzed at the appropriate frequency?			X		
		Were RPDs or relative standard deviations within the laboratory QC limits?			X		
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 03/20/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19030570				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 138729, 138731, R334821				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			2
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports		
Laboratory Name: ALS Laboratory Group		LRC Date: 03/20/2019
Project Name: Exide Column Studies		Laboratory Job Number: HS19030570
Reviewer Name: Dane Wacasey		Prep Batch Number(s): 138729, 138731, R334821
ER#[5]	**Description**	
1	Batch 138729, Metals by Method SW6020, Sample HS19030569-20, MS and MSD are for an unrelated sample Batch 138731, Dissolved Metals by Method SW6020, Sample HS19030569-21, MS and MSD are for an unrelated sample	
2	See Run Log and CCB Exception Reports	

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030570
Start Date: 19-Mar-2019 End Date: 20-Mar-2019

Run ID:ICPMS04_334782
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
LLICV2	1	19-Mar-2019 12:14	024SMPL.d	CA NA
LLICV5	1	19-Mar-2019 12:16	025LICV.d	CA NA
ICB	1	19-Mar-2019 12:18	026_ICB.d	AS CA CD FE K MG NA PB SB SE
ICV	1	19-Mar-2019 12:21	027_ICV.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	19-Mar-2019 12:28	029ICSA.d	CA NA
ICSAB	1	19-Mar-2019 12:30	030ICSB.d	CA NA
CCV 1	1	19-Mar-2019 12:58	041_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	19-Mar-2019 13:01	042_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	19-Mar-2019 13:25	053_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	19-Mar-2019 13:28	054_CCB.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZSD	500	19-Mar-2019 13:43	061SMPL.d	CA NA
ZZZZZZPDS	100	19-Mar-2019 13:46	062SMPL.d	CA NA
20190227-FD-PV30out-controlD	20	19-Mar-2019 13:48	063SMPL.d	CA NA
CCV 3	1	19-Mar-2019 13:52	065_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	19-Mar-2019 13:54	066_CCB.d	AS CA CD FE K MG NA PB SB SE
20190227-FD-PV30out-30D	20	19-Mar-2019 13:57	067SMPL.d	CA NA
20190227-FD-PV30out-35D	20	19-Mar-2019 13:59	068SMPL.d	CA NA
20190227-FD-PV30out-40D	20	19-Mar-2019 14:01	069SMPL.d	CA NA
20190227-FD-PV30inlet-controlD	20	19-Mar-2019 14:04	070SMPL.d	CA NA
20190227-FD-PV30inlet-30-35-40D	20	19-Mar-2019 14:06	071SMPL.d	CA NA
20190228-FD-PV30mid-controlD	20	19-Mar-2019 14:08	072SMPL.d	CA NA
20190228-FD-PV30mid-30D	20	19-Mar-2019 14:10	073SMPL.d	CA NA
20190228-FD-PV30mid-35D	20	19-Mar-2019 14:13	074SMPL.d	CA NA
20190228-FD-PV30mid-40D	20	19-Mar-2019 14:15	075SMPL.d	CA NA
CCV 4	1	19-Mar-2019 14:19	077_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	19-Mar-2019 14:22	078_CCB.d	AS CA CD FE K MG NA PB SB SE
20190301-FD-PV30mid-35D-DUP	20	19-Mar-2019 14:30	079SMPL.d	CA NA
ZZZZZZSD	500	19-Mar-2019 14:37	082SMPL.d	NA
ZZZZZZPDS	100	19-Mar-2019 14:39	083SMPL.d	NA
20190227-FD-PV30out-controlT	20	19-Mar-2019 14:45	086SMPL.d	CA NA
20190227-FD-PV30out-30T	20	19-Mar-2019 14:48	087SMPL.d	CA NA
CCV 5	1	19-Mar-2019 14:52	089_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	19-Mar-2019 14:54	090_CCB.d	AS CA CD FE K MG NA PB SB SE
20190227-FD-PV30out-35T	20	19-Mar-2019 14:59	091SMPL.d	CA NA
20190227-FD-PV30out-40T	20	19-Mar-2019 15:01	092SMPL.d	CA NA
20190227-FD-PV30inlet-controlT	20	19-Mar-2019 15:03	093SMPL.d	CA NA
20190227-FD-PV30inlet-30-35-40T	20	19-Mar-2019 15:06	094SMPL.d	CA NA
20190228-FD-PV30mid-controlT	20	19-Mar-2019 15:08	095SMPL.d	CA NA
20190228-FD-PV30mid-30T	20	19-Mar-2019 15:10	096SMPL.d	CA NA
20190228-FD-PV30mid-35T	20	19-Mar-2019 15:12	097SMPL.d	CA NA
20190228-FD-PV30mid-40T	20	19-Mar-2019 15:14	098SMPL.d	CA NA
20190301-FD-PV30mid-35T-DUP	20	19-Mar-2019 15:17	099SMPL.d	CA NA
CCV 6	1	19-Mar-2019 15:21	101_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	19-Mar-2019 15:23	102_CCB.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	19-Mar-2019 16:21	119SMPL.d	CA NA
LLCCV5	1	19-Mar-2019 16:23	120LICV.d	CA NA
ICCB 7	1	19-Mar-2019 16:25	121_ICB.d	AS CA CD FE K MG NA PB SB SE
ICCV 7	1	19-Mar-2019 16:27	122_ICV.d	AS CA CD FE K MG NA PB SB SE
CCV 8	1	19-Mar-2019 17:08	133_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	19-Mar-2019 17:10	134_CCB.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030570

Run ID:ICPMS04_334782
Instrument:ICPMS04
Method:SW6020

CCB 1	Date: 19-Mar-2019 13:01	Seq: 4995888		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	21.44	14	200	
CCB 2	Date: 19-Mar-2019 13:28	Seq: 4995900		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	19.49	14	200	
CCB 3	Date: 19-Mar-2019 13:54	Seq: 4995966		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	19.37	14	200	
CCB 4	Date: 19-Mar-2019 14:22	Seq: 4995978		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	20.73	14	200	
CCB 5	Date: 19-Mar-2019 14:54	Seq: 4996040		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	35.51	14	200	
CCB 6	Date: 19-Mar-2019 15:23	Seq: 4996052		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	25.22	14	200	
CCB 11	Date: 19-Mar-2019 18:31	Seq: 4996676		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	52.73	14	200	
CCB 12	Date: 19-Mar-2019 18:35	Seq: 4996678		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	30.78	14	200	
CCB 13	Date: 19-Mar-2019 19:02	Seq: 4996690		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	140.8	14	200	
CCB 14	Date: 19-Mar-2019 19:29	Seq: 4996702		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	137.2	14	200	
CCB 16	Date: 19-Mar-2019 23:37	Seq: 4996865		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	19.47	14	200	
CCB 17	Date: 19-Mar-2019 23:57	Seq: 4996874		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	24.52	14	200	
CCB 18	Date: 20-Mar-2019 00:18	Seq: 4996896		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	116	14	200	
CCB 19	Date: 20-Mar-2019 00:38	Seq: 4996905		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	119.3	14	200	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030570
Start Date: 18-Mar-2019 End Date: 19-Mar-2019

Run ID:ICPMS05_334713
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	18-Mar-2019 12:51	020_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	18-Mar-2019 12:53	021SMPL.d	AS CD FE K MG PB SB SE
ICB	1	18-Mar-2019 12:58	023_ICB.d	AS CA CD FE K MG NA PB SB SE
LLICV5	1	18-Mar-2019 13:03	025LICV.d	AS CD FE K MG PB SB SE
ICSA	1	18-Mar-2019 13:16	026ICSA.d	AS CD FE K MG PB SB SE
ICSAB	1	18-Mar-2019 13:18	027ICSB.d	AS CD FE K MG PB SB SE
CCV 1	1	18-Mar-2019 13:47	036_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	18-Mar-2019 13:49	037_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	18-Mar-2019 14:13	045_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	18-Mar-2019 14:15	046_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	18-Mar-2019 14:49	058_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	18-Mar-2019 14:55	060_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	18-Mar-2019 15:19	070_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	18-Mar-2019 15:21	071_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	18-Mar-2019 15:50	083_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	18-Mar-2019 15:57	085_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	18-Mar-2019 16:20	095_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	18-Mar-2019 16:22	096_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	18-Mar-2019 16:46	106_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	18-Mar-2019 16:48	107_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-138731	1	18-Mar-2019 16:58	109SMPL.d	AS CA CD FE K MG NA PB SB SE
LCS-138731	1	18-Mar-2019 17:00	110SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZSD	25	18-Mar-2019 17:04	112SMPL.d	AS CA CD FE K MG PB SB SE
ZZZZZZMS	5	18-Mar-2019 17:09	113SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZMSD	5	18-Mar-2019 17:11	114SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZPDS	5	18-Mar-2019 17:13	115SMPL.d	AS CA CD FE K MG PB SB SE
CCV 8	1	18-Mar-2019 17:24	118_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	18-Mar-2019 17:26	119_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	18-Mar-2019 18:00	126_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	18-Mar-2019 18:02	127_CCB.d	AS CA CD FE K MG NA PB SB SE
20190227-FD-PV30out-controlD	1	18-Mar-2019 18:05	128SMPL.d	AS CD FE K MG PB SB SE
20190227-FD-PV30out-30D	1	18-Mar-2019 18:08	129SMPL.d	AS CD FE K MG PB SB SE
20190227-FD-PV30out-35D	1	18-Mar-2019 18:10	130SMPL.d	AS CD FE K MG PB SB SE
20190227-FD-PV30out-40D	1	18-Mar-2019 18:12	131SMPL.d	AS CD FE K MG PB SB SE
20190227-FD-PV30inlet-controlD	1	18-Mar-2019 18:14	132SMPL.d	AS CD FE K MG PB SB SE
20190227-FD-PV30inlet-30-35-40D	1	18-Mar-2019 18:17	133SMPL.d	AS CD FE K MG PB SB SE
20190228-FD-PV30mid-controlD	1	18-Mar-2019 18:27	135SMPL.d	AS CD FE K MG PB SB SE
20190228-FD-PV30mid-30D	1	18-Mar-2019 18:29	136SMPL.d	AS CD FE K MG PB SB SE
CCV 10	1	18-Mar-2019 18:38	138_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	18-Mar-2019 18:40	139_CCB.d	AS CA CD FE K MG NA PB SB SE
20190228-FD-PV30mid-35D	1	18-Mar-2019 18:45	140SMPL.d	AS CD FE K MG PB SB SE
20190228-FD-PV30mid-40D	1	18-Mar-2019 18:47	141SMPL.d	AS CD FE K MG PB SB SE
20190301-FD-PV30mid-35D-DUP	1	18-Mar-2019 18:49	142SMPL.d	AS CD FE K MG PB SB SE
CCB 11	1	18-Mar-2019 19:02	147_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 11	1	18-Mar-2019 19:04	148_CCV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	18-Mar-2019 22:07	190SMPL.d	AS CD FE K MG PB SB SE
LLCCV5	1	18-Mar-2019 22:09	191LICV.d	AS CD FE K MG PB SB SE
ICCV 12	1	18-Mar-2019 22:11	192_ICV.d	AS CA CD FE K MG NA PB SB SE
ICCB 12	1	18-Mar-2019 22:13	193_ICB.d	AS CA CD FE K MG NA PB SB SE
CCB 13	1	18-Mar-2019 22:36	203_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 13	1	18-Mar-2019 22:40	204_CCV.d	AS CA CD FE K MG NA PB SB SE

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030570
Start Date: 18-Mar-2019 End Date: 19-Mar-2019

Run ID:ICPMS05_334713
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICCV 14	1	18-Mar-2019 23:27	217_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	18-Mar-2019 23:29	218SMPL.d	AS CD FE K MG PB SB SE
LLCCV5	1	18-Mar-2019 23:31	219LICV.d	AS CD FE K MG PB SB SE
ICCB 14	1	18-Mar-2019 23:33	220_ICB.d	AS CA CD FE K MG NA PB SB SE
CCV 15	1	18-Mar-2019 23:56	230_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 15	1	18-Mar-2019 23:58	231_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 16	1	19-Mar-2019 00:18	240_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 16	1	19-Mar-2019 00:21	241_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 17	1	19-Mar-2019 00:46	252_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 17	1	19-Mar-2019 00:48	253_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-138729	1	19-Mar-2019 00:50	254SMPL.d	AS CA CD FE K MG NA PB SB SE
LCS-138729	1	19-Mar-2019 00:52	255SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZMS	5	19-Mar-2019 00:59	258SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZMSD	5	19-Mar-2019 01:01	259SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZPDS	5	19-Mar-2019 01:04	260SMPL.d	AS CA CD FE K MG PB SB SE
CCV 18	1	19-Mar-2019 01:06	261_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 18	1	19-Mar-2019 01:08	262_CCB.d	AS CA CD FE K MG NA PB SB SE
20190227-FD-PV30out-controlT	1	19-Mar-2019 01:13	264SMPL.d	AS CD FE K MG PB SB SE
20190227-FD-PV30out-30T	1	19-Mar-2019 01:15	265SMPL.d	AS CD FE K MG PB SB SE
20190227-FD-PV30out-35T	1	19-Mar-2019 01:17	266SMPL.d	AS CD FE K MG PB SB SE
20190227-FD-PV30out-40T	1	19-Mar-2019 01:20	267SMPL.d	AS CD FE K MG PB SB SE
20190227-FD-PV30inlet-controlT	1	19-Mar-2019 01:22	268SMPL.d	AS CD FE K MG PB SB SE
20190227-FD-PV30inlet-30-35-40T	1	19-Mar-2019 01:24	269SMPL.d	AS CD FE K MG PB SB SE
20190228-FD-PV30mid-controlT	1	19-Mar-2019 01:26	270SMPL.d	AS CD FE K MG PB SB SE
20190228-FD-PV30mid-30T	1	19-Mar-2019 01:29	271SMPL.d	AS CD FE K MG PB SB SE
20190228-FD-PV30mid-35T	1	19-Mar-2019 01:31	272SMPL.d	AS CD FE K MG PB SB SE
CCV 19	1	19-Mar-2019 01:33	273_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 19	1	19-Mar-2019 01:35	274_CCB.d	AS CA CD FE K MG NA PB SB SE
20190228-FD-PV30mid-40T	1	19-Mar-2019 01:38	275SMPL.d	AS CD FE K MG PB SB
20190301-FD-PV30mid-35T-DUP	1	19-Mar-2019 01:40	276SMPL.d	AS CD FE K MG PB SB
CCV 20	1	19-Mar-2019 02:00	285_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 20	1	19-Mar-2019 02:03	286_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 21	1	19-Mar-2019 02:27	297_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 21	1	19-Mar-2019 02:29	298_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 22	1	19-Mar-2019 02:54	309_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 22	1	19-Mar-2019 02:56	310_CCB.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030570

Run ID:ICPMS05_334713
Instrument:ICPMS05
Method:SW6020

CCB 3	Date: 18-Mar-2019 14:49	Seq: 4994305	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	115	14	200	

CCB 4	Date: 18-Mar-2019 15:21	Seq: 4994424	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	48.24	34	500	
Sodium	47.93	14	200	

CCB 5	Date: 18-Mar-2019 15:50	Seq: 4994578	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	16.14	12	200	
Sodium	82.36	14	200	

CCB 6	Date: 18-Mar-2019 16:22	Seq: 4994591	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	68.55	34	500	
Iron	12.84	12	200	
Magnesium	13.22	10	200	
Potassium	35.07	18	200	
Sodium	152.9	14	200	

CCB 7	Date: 18-Mar-2019 16:48	Seq: 4994624	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	36.22	34	500	
Sodium	26.15	14	200	

CCB 8	Date: 18-Mar-2019 17:26	Seq: 4994744	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Arsenic	-0.462	0.4	2	
Cadmium	0.201	0.2	2	
Calcium	63.72	34	500	
Iron	40.73	12	200	
Magnesium	13.13	10	200	
Sodium	64.82	14	200	

CCB 9	Date: 18-Mar-2019 18:02	Seq: 4994730	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	37.86	34	500	
Sodium	44.33	14	200	

CCB 10	Date: 18-Mar-2019 18:40	Seq: 4994808	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Arsenic	-0.511	0.4	2	
Sodium	124.9	14	200	

CCB 11	Date: 18-Mar-2019 19:02	Seq: 4994816	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Arsenic	-0.548	0.4	2	
Calcium	40.74	34	500	
Sodium	125.7	14	200	

CCB 13	Date: 18-Mar-2019 22:36	Seq: 4994898	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030570

Run ID:ICPMS05_334713
Instrument:ICPMS05
Method:SW6020

	Antimony	0.487	0.4	2	
	Calcium	39.57	34	500	
	Sodium	56.74	14	200	
CCB 15	Date: 18-Mar-2019 23:58	Seq: 4995088	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	606.2	14	200	
CCB 16	Date: 19-Mar-2019 00:21	Seq: 4995169	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.628	0.4	2	
	Sodium	145.7	14	200	
CCB 17	Date: 19-Mar-2019 00:48	Seq: 4995181	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	173.5	14	200	
CCB 18	Date: 19-Mar-2019 01:08	Seq: 4995282	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.477	0.4	2	
	Sodium	263.5	14	200	
CCB 19	Date: 19-Mar-2019 01:35	Seq: 4995294	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	318.6	14	200	
CCB 20	Date: 19-Mar-2019 02:03	Seq: 4995306	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Potassium	-37	18	200	
	Sodium	133.3	14	200	
CCB 21	Date: 19-Mar-2019 02:29	Seq: 4995519	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Calcium	45.96	34	500	
	Iron	13.4	12	200	
	Potassium	-51.53	18	200	
CCB 22	Date: 19-Mar-2019 02:56	Seq: 4995531	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	4.49	0.4	2	
	Sodium	-14.12	14	200	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19030570

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19030570-01	20190227-FD-PV30out-controlD	Groundwater		27-Feb-2019 11:30	12-Mar-2019 08:50	☐
HS19030570-02	20190227-FD-PV30out-30D	Groundwater		27-Feb-2019 11:30	12-Mar-2019 08:50	☐
HS19030570-03	20190227-FD-PV30out-35D	Groundwater		27-Feb-2019 11:30	12-Mar-2019 08:50	☐
HS19030570-04	20190227-FD-PV30out-40D	Groundwater		27-Feb-2019 11:30	12-Mar-2019 08:50	☐
HS19030570-05	20190227-FD-PV30inlet-controlD	Groundwater		27-Feb-2019 11:40	12-Mar-2019 08:50	☐
HS19030570-06	20190227-FD-PV30inlet-30-35-40D	Groundwater		27-Feb-2019 11:40	12-Mar-2019 08:50	☐
HS19030570-07	20190228-FD-PV30mid-controlD	Groundwater		28-Feb-2019 16:30	12-Mar-2019 08:50	☐
HS19030570-08	20190228-FD-PV30mid-30D	Groundwater		28-Feb-2019 16:30	12-Mar-2019 08:50	☐
HS19030570-09	20190228-FD-PV30mid-35D	Groundwater		28-Feb-2019 16:30	12-Mar-2019 08:50	☐
HS19030570-10	20190228-FD-PV30mid-40D	Groundwater		28-Feb-2019 16:30	12-Mar-2019 08:50	☐
HS19030570-11	20190227-FD-PV30out-controlT	Groundwater		27-Feb-2019 11:30	12-Mar-2019 08:50	☐
HS19030570-12	20190227-FD-PV30out-30T	Groundwater		27-Feb-2019 11:30	12-Mar-2019 08:50	☐
HS19030570-13	20190227-FD-PV30out-35T	Groundwater		27-Feb-2019 11:30	12-Mar-2019 08:50	☐
HS19030570-14	20190227-FD-PV30out-40T	Groundwater		27-Feb-2019 11:30	12-Mar-2019 08:50	☐
HS19030570-15	20190227-FD-PV30inlet-controlT	Groundwater		27-Feb-2019 11:40	12-Mar-2019 08:50	☐
HS19030570-16	20190227-FD-PV30inlet-30-35-40T	Groundwater		27-Feb-2019 11:40	12-Mar-2019 08:50	☐
HS19030570-17	20190228-FD-PV30mid-controlT	Groundwater		28-Feb-2019 16:30	12-Mar-2019 08:50	☐
HS19030570-18	20190228-FD-PV30mid-30T	Groundwater		28-Feb-2019 16:30	12-Mar-2019 08:50	☐
HS19030570-19	20190228-FD-PV30mid-35T	Groundwater		28-Feb-2019 16:30	12-Mar-2019 08:50	☐
HS19030570-20	20190228-FD-PV30mid-40T	Groundwater		28-Feb-2019 16:30	12-Mar-2019 08:50	☐
HS19030570-21	20190301-FD-PV30mid-35D-DUP	Groundwater		01-Mar-2019 07:30	12-Mar-2019 08:50	☐
HS19030570-22	20190301-FD-PV30mid-35T-DUP	Groundwater		01-Mar-2019 07:30	12-Mar-2019 08:50	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190227-FD-PV30out-controlD
Collection Date: 27-Feb-2019 11:30

ANALYTICAL REPORT
WorkOrder:HS19030570
Lab ID:HS19030570-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	**0.0336**		**0.000400**	**0.00200**	**mg/L**	1	18-Mar-2019 18:05
Arsenic	**0.000824**	J	**0.000400**	**0.00200**	**mg/L**	1	18-Mar-2019 18:05
Cadmium	U		0.000200	0.00200	mg/L	1	18-Mar-2019 18:05
Calcium	**215**		**0.680**	**10.0**	**mg/L**	20	19-Mar-2019 13:48
Iron	U		0.0120	0.200	mg/L	1	18-Mar-2019 18:05
Lead	U		0.000600	0.00200	mg/L	1	18-Mar-2019 18:05
Magnesium	**1.16**		**0.0100**	**0.200**	**mg/L**	1	18-Mar-2019 18:05
Potassium	**12.6**		**0.0180**	**0.200**	**mg/L**	1	18-Mar-2019 18:05
Selenium	**0.00650**		**0.00110**	**0.00200**	**mg/L**	1	18-Mar-2019 18:05
Sodium	**327**		**0.280**	**4.00**	**mg/L**	20	19-Mar-2019 13:48

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190227-FD-PV30out-30D
Collection Date: 27-Feb-2019 11:30

ANALYTICAL REPORT
WorkOrder:HS19030570
Lab ID:HS19030570-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	18-Mar-2019 18:08
Arsenic	U		0.000400	0.00200	mg/L	1	18-Mar-2019 18:08
Cadmium	U		0.000200	0.00200	mg/L	1	18-Mar-2019 18:08
Calcium	**194**		**0.680**	**10.0**	**mg/L**	20	19-Mar-2019 13:57
Iron	U		0.0120	0.200	mg/L	1	18-Mar-2019 18:08
Lead	U		0.000600	0.00200	mg/L	1	18-Mar-2019 18:08
Magnesium	**0.923**		**0.0100**	**0.200**	**mg/L**	1	18-Mar-2019 18:08
Potassium	**12.9**		**0.0180**	**0.200**	**mg/L**	1	18-Mar-2019 18:08
Selenium	U		0.00110	0.00200	mg/L	1	18-Mar-2019 18:08
Sodium	**268**		**0.280**	**4.00**	**mg/L**	20	19-Mar-2019 13:57

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190227-FD-PV30out-35D
Collection Date: 27-Feb-2019 11:30

ANALYTICAL REPORT
WorkOrder:HS19030570
Lab ID:HS19030570-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	18-Mar-2019 18:10
Arsenic	U		0.000400	0.00200	mg/L	1	18-Mar-2019 18:10
Cadmium	U		0.000200	0.00200	mg/L	1	18-Mar-2019 18:10
Calcium	**196**		**0.680**	**10.0**	**mg/L**	20	19-Mar-2019 13:59
Iron	**0.138**	J	**0.0120**	**0.200**	**mg/L**	1	18-Mar-2019 18:10
Lead	U		0.000600	0.00200	mg/L	1	18-Mar-2019 18:10
Magnesium	**1.00**		**0.0100**	**0.200**	**mg/L**	1	18-Mar-2019 18:10
Potassium	**12.9**		**0.0180**	**0.200**	**mg/L**	1	18-Mar-2019 18:10
Selenium	U		0.00110	0.00200	mg/L	1	18-Mar-2019 18:10
Sodium	**266**		**0.280**	**4.00**	**mg/L**	20	19-Mar-2019 13:59

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190227-FD-PV30out-40D
Collection Date: 27-Feb-2019 11:30

ANALYTICAL REPORT
WorkOrder:HS19030570
Lab ID:HS19030570-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	18-Mar-2019 18:12
Arsenic	U		0.000400	0.00200	mg/L	1	18-Mar-2019 18:12
Cadmium	U		0.000200	0.00200	mg/L	1	18-Mar-2019 18:12
Calcium	**193**		**0.680**	**10.0**	**mg/L**	20	19-Mar-2019 14:01
Iron	U		0.0120	0.200	mg/L	1	18-Mar-2019 18:12
Lead	U		0.000600	0.00200	mg/L	1	18-Mar-2019 18:12
Magnesium	**1.02**		**0.0100**	**0.200**	**mg/L**	1	18-Mar-2019 18:12
Potassium	**12.7**		**0.0180**	**0.200**	**mg/L**	1	18-Mar-2019 18:12
Selenium	U		0.00110	0.00200	mg/L	1	18-Mar-2019 18:12
Sodium	**266**		**0.280**	**4.00**	**mg/L**	20	19-Mar-2019 14:01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190227-FD-PV30inlet-controlD
Collection Date: 27-Feb-2019 11:40

ANALYTICAL REPORT
WorkOrder:HS19030570
Lab ID:HS19030570-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	**0.0338**		**0.000400**	**0.00200**	**mg/L**	1	18-Mar-2019 18:14
Arsenic	**0.000777**	J	**0.000400**	**0.00200**	**mg/L**	1	18-Mar-2019 18:14
Cadmium	U		0.000200	0.00200	mg/L	1	18-Mar-2019 18:14
Calcium	**201**		**0.680**	**10.0**	**mg/L**	20	19-Mar-2019 14:04
Iron	U		0.0120	0.200	mg/L	1	18-Mar-2019 18:14
Lead	U		0.000600	0.00200	mg/L	1	18-Mar-2019 18:14
Magnesium	**1.19**		**0.0100**	**0.200**	**mg/L**	1	18-Mar-2019 18:14
Potassium	**12.6**		**0.0180**	**0.200**	**mg/L**	1	18-Mar-2019 18:14
Selenium	**0.00674**		**0.00110**	**0.00200**	**mg/L**	1	18-Mar-2019 18:14
Sodium	**262**		**0.280**	**4.00**	**mg/L**	20	19-Mar-2019 14:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190227-FD-PV30inlet-30-35-40D
Collection Date: 27-Feb-2019 11:40

ANALYTICAL REPORT
WorkOrder:HS19030570
Lab ID:HS19030570-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	**0.0333**		**0.000400**	**0.00200**	**mg/L**	1	18-Mar-2019 18:17
Arsenic	**0.000761**	J	**0.000400**	**0.00200**	**mg/L**	1	18-Mar-2019 18:17
Cadmium	U		0.000200	0.00200	mg/L	1	18-Mar-2019 18:17
Calcium	**210**		**0.680**	**10.0**	**mg/L**	20	19-Mar-2019 14:06
Iron	U		0.0120	0.200	mg/L	1	18-Mar-2019 18:17
Lead	U		0.000600	0.00200	mg/L	1	18-Mar-2019 18:17
Magnesium	**1.17**		**0.0100**	**0.200**	**mg/L**	1	18-Mar-2019 18:17
Potassium	**12.9**		**0.0180**	**0.200**	**mg/L**	1	18-Mar-2019 18:17
Selenium	**0.00578**		**0.00110**	**0.00200**	**mg/L**	1	18-Mar-2019 18:17
Sodium	**273**		**0.280**	**4.00**	**mg/L**	20	19-Mar-2019 14:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190228-FD-PV30mid-controlD
Collection Date: 28-Feb-2019 16:30

ANALYTICAL REPORT
WorkOrder:HS19030570
Lab ID:HS19030570-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	**0.0328**		**0.000400**	**0.00200**	**mg/L**	1	18-Mar-2019 18:27
Arsenic	**0.000708**	J	**0.000400**	**0.00200**	**mg/L**	1	18-Mar-2019 18:27
Cadmium	U		0.000200	0.00200	mg/L	1	18-Mar-2019 18:27
Calcium	**200**		**0.680**	**10.0**	**mg/L**	20	19-Mar-2019 14:08
Iron	U		0.0120	0.200	mg/L	1	18-Mar-2019 18:27
Lead	U		0.000600	0.00200	mg/L	1	18-Mar-2019 18:27
Magnesium	**1.12**		**0.0100**	**0.200**	**mg/L**	1	18-Mar-2019 18:27
Potassium	**12.5**		**0.0180**	**0.200**	**mg/L**	1	18-Mar-2019 18:27
Selenium	**0.00571**		**0.00110**	**0.00200**	**mg/L**	1	18-Mar-2019 18:27
Sodium	**265**		**0.280**	**4.00**	**mg/L**	20	19-Mar-2019 14:08

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190228-FD-PV30mid-30D
Collection Date: 28-Feb-2019 16:30

ANALYTICAL REPORT
WorkOrder:HS19030570
Lab ID:HS19030570-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	18-Mar-2019 18:29
Arsenic	U		0.000400	0.00200	mg/L	1	18-Mar-2019 18:29
Cadmium	U		0.000200	0.00200	mg/L	1	18-Mar-2019 18:29
Calcium	**196**		**0.680**	**10.0**	**mg/L**	20	19-Mar-2019 14:10
Iron	**0.0478**	J	**0.0120**	**0.200**	**mg/L**	1	18-Mar-2019 18:29
Lead	U		0.000600	0.00200	mg/L	1	18-Mar-2019 18:29
Magnesium	**0.950**		**0.0100**	**0.200**	**mg/L**	1	18-Mar-2019 18:29
Potassium	**13.1**		**0.0180**	**0.200**	**mg/L**	1	18-Mar-2019 18:29
Selenium	U		0.00110	0.00200	mg/L	1	18-Mar-2019 18:29
Sodium	**269**		**0.280**	**4.00**	**mg/L**	20	19-Mar-2019 14:10

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190228-FD-PV30mid-35D
Collection Date: 28-Feb-2019 16:30

ANALYTICAL REPORT
WorkOrder:HS19030570
Lab ID:HS19030570-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	18-Mar-2019 18:45
Arsenic	U		0.000400	0.00200	mg/L	1	18-Mar-2019 18:45
Cadmium	U		0.000200	0.00200	mg/L	1	18-Mar-2019 18:45
Calcium	**194**		**0.680**	**10.0**	**mg/L**	20	19-Mar-2019 14:13
Iron	**0.125**	J	**0.0120**	**0.200**	**mg/L**	1	18-Mar-2019 18:45
Lead	U		0.000600	0.00200	mg/L	1	18-Mar-2019 18:45
Magnesium	**0.934**		**0.0100**	**0.200**	**mg/L**	1	18-Mar-2019 18:45
Potassium	**12.5**		**0.0180**	**0.200**	**mg/L**	1	18-Mar-2019 18:45
Selenium	U		0.00110	0.00200	mg/L	1	18-Mar-2019 18:45
Sodium	**261**		**0.280**	**4.00**	**mg/L**	20	19-Mar-2019 14:13

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190228-FD-PV30mid-40D
Collection Date: 28-Feb-2019 16:30

ANALYTICAL REPORT
WorkOrder:HS19030570
Lab ID:HS19030570-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	18-Mar-2019 18:47
Arsenic	U		0.000400	0.00200	mg/L	1	18-Mar-2019 18:47
Cadmium	U		0.000200	0.00200	mg/L	1	18-Mar-2019 18:47
Calcium	**203**		**0.680**	**10.0**	**mg/L**	20	19-Mar-2019 14:15
Iron	**0.0143**	J	**0.0120**	**0.200**	**mg/L**	1	18-Mar-2019 18:47
Lead	U		0.000600	0.00200	mg/L	1	18-Mar-2019 18:47
Magnesium	**1.05**		**0.0100**	**0.200**	**mg/L**	1	18-Mar-2019 18:47
Potassium	**12.7**		**0.0180**	**0.200**	**mg/L**	1	18-Mar-2019 18:47
Selenium	U		0.00110	0.00200	mg/L	1	18-Mar-2019 18:47
Sodium	**275**		**0.280**	**4.00**	**mg/L**	20	19-Mar-2019 14:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190227-FD-PV30out-controlT
Collection Date: 27-Feb-2019 11:30

ANALYTICAL REPORT
WorkOrder:HS19030570
Lab ID:HS19030570-11
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**509**		**2.00**	**2.00**	**mg/L**	1	19-Mar-2019 17:33
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	**0.0315**		**0.000400**	**0.00200**	**mg/L**	1	19-Mar-2019 01:13
Arsenic	**0.00101**	J	**0.000400**	**0.00200**	**mg/L**	1	19-Mar-2019 01:13
Cadmium	U		0.000200	0.00200	mg/L	1	19-Mar-2019 01:13
Calcium	**202**		**0.680**	**10.0**	**mg/L**	20	19-Mar-2019 14:45
Iron	U		0.0120	0.200	mg/L	1	19-Mar-2019 01:13
Lead	U		0.000600	0.00200	mg/L	1	19-Mar-2019 01:13
Magnesium	**1.14**		**0.0100**	**0.200**	**mg/L**	1	19-Mar-2019 01:13
Potassium	**11.6**		**0.0180**	**0.200**	**mg/L**	1	19-Mar-2019 01:13
Selenium	**0.00550**		**0.00110**	**0.00200**	**mg/L**	1	19-Mar-2019 01:13
Sodium	**261**		**0.280**	**4.00**	**mg/L**	20	19-Mar-2019 14:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190227-FD-PV30out-30T
Collection Date: 27-Feb-2019 11:30

ANALYTICAL REPORT
WorkOrder:HS19030570
Lab ID:HS19030570-12
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**481**		**2.00**	**2.00**	**mg/L**	1	19-Mar-2019 17:33
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	19-Mar-2019 01:15
Arsenic	U		0.000400	0.00200	mg/L	1	19-Mar-2019 01:15
Cadmium	U		0.000200	0.00200	mg/L	1	19-Mar-2019 01:15
Calcium	**191**		**0.680**	**10.0**	**mg/L**	20	19-Mar-2019 14:48
Iron	**0.0791**	J	**0.0120**	**0.200**	**mg/L**	1	19-Mar-2019 01:15
Lead	U		0.000600	0.00200	mg/L	1	19-Mar-2019 01:15
Magnesium	**0.925**		**0.0100**	**0.200**	**mg/L**	1	19-Mar-2019 01:15
Potassium	**12.2**		**0.0180**	**0.200**	**mg/L**	1	19-Mar-2019 01:15
Selenium	U		0.00110	0.00200	mg/L	1	19-Mar-2019 01:15
Sodium	**263**		**0.280**	**4.00**	**mg/L**	20	19-Mar-2019 14:48

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190227-FD-PV30out-35T
Collection Date: 27-Feb-2019 11:30

ANALYTICAL REPORT
WorkOrder:HS19030570
Lab ID:HS19030570-13
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**468**		**2.00**	**2.00**	**mg/L**	1	19-Mar-2019 17:33
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	19-Mar-2019 01:17
Arsenic	U		0.000400	0.00200	mg/L	1	19-Mar-2019 01:17
Cadmium	U		0.000200	0.00200	mg/L	1	19-Mar-2019 01:17
Calcium	**186**		**0.680**	**10.0**	**mg/L**	20	19-Mar-2019 14:59
Iron	**0.306**		**0.0120**	**0.200**	**mg/L**	1	19-Mar-2019 01:17
Lead	U		0.000600	0.00200	mg/L	1	19-Mar-2019 01:17
Magnesium	**0.967**		**0.0100**	**0.200**	**mg/L**	1	19-Mar-2019 01:17
Potassium	**12.0**		**0.0180**	**0.200**	**mg/L**	1	19-Mar-2019 01:17
Selenium	U		0.00110	0.00200	mg/L	1	19-Mar-2019 01:17
Sodium	**255**		**0.280**	**4.00**	**mg/L**	20	19-Mar-2019 14:59

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190227-FD-PV30out-40T
Collection Date: 27-Feb-2019 11:30

ANALYTICAL REPORT
WorkOrder:HS19030570
Lab ID:HS19030570-14
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**484**		**2.00**	**2.00**	**mg/L**	1	19-Mar-2019 17:33
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	19-Mar-2019 01:20
Arsenic	U		0.000400	0.00200	mg/L	1	19-Mar-2019 01:20
Cadmium	U		0.000200	0.00200	mg/L	1	19-Mar-2019 01:20
Calcium	**192**		**0.680**	**10.0**	**mg/L**	20	19-Mar-2019 15:01
Iron	**0.0769**	J	**0.0120**	**0.200**	**mg/L**	1	19-Mar-2019 01:20
Lead	U		0.000600	0.00200	mg/L	1	19-Mar-2019 01:20
Magnesium	**1.03**		**0.0100**	**0.200**	**mg/L**	1	19-Mar-2019 01:20
Potassium	**12.1**		**0.0180**	**0.200**	**mg/L**	1	19-Mar-2019 01:20
Selenium	U		0.00110	0.00200	mg/L	1	19-Mar-2019 01:20
Sodium	**260**		**0.280**	**4.00**	**mg/L**	20	19-Mar-2019 15:01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190227-FD-PV30inlet-controlT
Collection Date: 27-Feb-2019 11:40

ANALYTICAL REPORT
WorkOrder:HS19030570
Lab ID:HS19030570-15
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**504**		**2.00**	**2.00**	**mg/L**	1	19-Mar-2019 17:33
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	**0.0340**		**0.000400**	**0.00200**	**mg/L**	1	19-Mar-2019 01:22
Arsenic	**0.00122**	J	**0.000400**	**0.00200**	**mg/L**	1	19-Mar-2019 01:22
Cadmium	U		0.000200	0.00200	mg/L	1	19-Mar-2019 01:22
Calcium	**200**		**0.680**	**10.0**	**mg/L**	20	19-Mar-2019 15:03
Iron	U		0.0120	0.200	mg/L	1	19-Mar-2019 01:22
Lead	U		0.000600	0.00200	mg/L	1	19-Mar-2019 01:22
Magnesium	**1.16**		**0.0100**	**0.200**	**mg/L**	1	19-Mar-2019 01:22
Potassium	**12.1**		**0.0180**	**0.200**	**mg/L**	1	19-Mar-2019 01:22
Selenium	**0.00669**		**0.00110**	**0.00200**	**mg/L**	1	19-Mar-2019 01:22
Sodium	**261**		**0.280**	**4.00**	**mg/L**	20	19-Mar-2019 15:03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190227-FD-PV30inlet-30-35-40T
Collection Date: 27-Feb-2019 11:40

ANALYTICAL REPORT
WorkOrder:HS19030570
Lab ID:HS19030570-16
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**502**		**2.00**	**2.00**	**mg/L**	1	19-Mar-2019 17:33
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	**0.0329**		**0.000400**	**0.00200**	**mg/L**	1	19-Mar-2019 01:24
Arsenic	**0.00111**	J	**0.000400**	**0.00200**	**mg/L**	1	19-Mar-2019 01:24
Cadmium	U		0.000200	0.00200	mg/L	1	19-Mar-2019 01:24
Calcium	**199**		**0.680**	**10.0**	**mg/L**	20	19-Mar-2019 15:06
Iron	U		0.0120	0.200	mg/L	1	19-Mar-2019 01:24
Lead	U		0.000600	0.00200	mg/L	1	19-Mar-2019 01:24
Magnesium	**1.16**		**0.0100**	**0.200**	**mg/L**	1	19-Mar-2019 01:24
Potassium	**11.8**		**0.0180**	**0.200**	**mg/L**	1	19-Mar-2019 01:24
Selenium	**0.00561**		**0.00110**	**0.00200**	**mg/L**	1	19-Mar-2019 01:24
Sodium	**259**		**0.280**	**4.00**	**mg/L**	20	19-Mar-2019 15:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190228-FD-PV30mid-controlT
Collection Date: 28-Feb-2019 16:30

ANALYTICAL REPORT
WorkOrder:HS19030570
Lab ID:HS19030570-17
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**509**		**2.00**	**2.00**	**mg/L**	1	19-Mar-2019 17:33
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	**0.0336**		**0.000400**	**0.00200**	**mg/L**	1	19-Mar-2019 01:26
Arsenic	**0.00101**	J	**0.000400**	**0.00200**	**mg/L**	1	19-Mar-2019 01:26
Cadmium	U		0.000200	0.00200	mg/L	1	19-Mar-2019 01:26
Calcium	**202**		**0.680**	**10.0**	**mg/L**	20	19-Mar-2019 15:08
Iron	U		0.0120	0.200	mg/L	1	19-Mar-2019 01:26
Lead	U		0.000600	0.00200	mg/L	1	19-Mar-2019 01:26
Magnesium	**1.11**		**0.0100**	**0.200**	**mg/L**	1	19-Mar-2019 01:26
Potassium	**12.0**		**0.0180**	**0.200**	**mg/L**	1	19-Mar-2019 01:26
Selenium	**0.00554**		**0.00110**	**0.00200**	**mg/L**	1	19-Mar-2019 01:26
Sodium	**264**		**0.280**	**4.00**	**mg/L**	20	19-Mar-2019 15:08

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190228-FD-PV30mid-30T
Collection Date: 28-Feb-2019 16:30

ANALYTICAL REPORT
WorkOrder:HS19030570
Lab ID:HS19030570-18
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**491**		**2.00**	**2.00**	**mg/L**	1	19-Mar-2019 17:33
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	19-Mar-2019 01:29
Arsenic	U		0.000400	0.00200	mg/L	1	19-Mar-2019 01:29
Cadmium	U		0.000200	0.00200	mg/L	1	19-Mar-2019 01:29
Calcium	**195**		**0.680**	**10.0**	**mg/L**	20	19-Mar-2019 15:10
Iron	**0.398**		**0.0120**	**0.200**	**mg/L**	1	19-Mar-2019 01:29
Lead	U		0.000600	0.00200	mg/L	1	19-Mar-2019 01:29
Magnesium	**0.888**		**0.0100**	**0.200**	**mg/L**	1	19-Mar-2019 01:29
Potassium	**12.0**		**0.0180**	**0.200**	**mg/L**	1	19-Mar-2019 01:29
Selenium	U		0.00110	0.00200	mg/L	1	19-Mar-2019 01:29
Sodium	**262**		**0.280**	**4.00**	**mg/L**	20	19-Mar-2019 15:10

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190228-FD-PV30mid-35T
Collection Date: 28-Feb-2019 16:30

ANALYTICAL REPORT
WorkOrder:HS19030570
Lab ID:HS19030570-19
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**478**		**2.00**	**2.00**	**mg/L**	1	19-Mar-2019 17:33
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	19-Mar-2019 01:31
Arsenic	U		0.000400	0.00200	mg/L	1	19-Mar-2019 01:31
Cadmium	U		0.000200	0.00200	mg/L	1	19-Mar-2019 01:31
Calcium	**190**		**0.680**	**10.0**	**mg/L**	20	19-Mar-2019 15:12
Iron	**1.01**		**0.0120**	**0.200**	**mg/L**	1	19-Mar-2019 01:31
Lead	U		0.000600	0.00200	mg/L	1	19-Mar-2019 01:31
Magnesium	**0.915**		**0.0100**	**0.200**	**mg/L**	1	19-Mar-2019 01:31
Potassium	**11.6**		**0.0180**	**0.200**	**mg/L**	1	19-Mar-2019 01:31
Selenium	U		0.00110	0.00200	mg/L	1	19-Mar-2019 01:31
Sodium	**260**		**0.280**	**4.00**	**mg/L**	20	19-Mar-2019 15:12

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190228-FD-PV30mid-40T
Collection Date: 28-Feb-2019 16:30

ANALYTICAL REPORT
WorkOrder:HS19030570
Lab ID:HS19030570-20
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**504**		**2.00**	**2.00**	**mg/L**	1	19-Mar-2019 17:33
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	19-Mar-2019 01:38
Arsenic	U		0.000400	0.00200	mg/L	1	19-Mar-2019 01:38
Cadmium	U		0.000200	0.00200	mg/L	1	19-Mar-2019 01:38
Calcium	**200**		**0.680**	**10.0**	**mg/L**	20	19-Mar-2019 15:14
Iron	**0.513**		**0.0120**	**0.200**	**mg/L**	1	19-Mar-2019 01:38
Lead	U		0.000600	0.00200	mg/L	1	19-Mar-2019 01:38
Magnesium	**1.06**		**0.0100**	**0.200**	**mg/L**	1	19-Mar-2019 01:38
Potassium	**12.5**		**0.0180**	**0.200**	**mg/L**	1	19-Mar-2019 01:38
Selenium	U		0.00110	0.00200	mg/L	1	19-Mar-2019 12:55
Sodium	**269**		**0.280**	**4.00**	**mg/L**	20	19-Mar-2019 15:14

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190301-FD-PV30mid-35D-DUP
Collection Date: 01-Mar-2019 07:30

ANALYTICAL REPORT
WorkOrder:HS19030570
Lab ID:HS19030570-21
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	18-Mar-2019 18:49
Arsenic	U		0.000400	0.00200	mg/L	1	18-Mar-2019 18:49
Cadmium	U		0.000200	0.00200	mg/L	1	18-Mar-2019 18:49
Calcium	**197**		**0.680**	**10.0**	**mg/L**	20	19-Mar-2019 14:30
Iron	**0.249**		**0.0120**	**0.200**	**mg/L**	1	18-Mar-2019 18:49
Lead	U		0.000600	0.00200	mg/L	1	18-Mar-2019 18:49
Magnesium	**0.943**		**0.0100**	**0.200**	**mg/L**	1	18-Mar-2019 18:49
Potassium	**12.3**		**0.0180**	**0.200**	**mg/L**	1	18-Mar-2019 18:49
Selenium	U		0.00110	0.00200	mg/L	1	18-Mar-2019 18:49
Sodium	**261**		**0.280**	**4.00**	**mg/L**	20	19-Mar-2019 14:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190301-FD-PV30mid-35T-DUP
Collection Date: 01-Mar-2019 07:30

ANALYTICAL REPORT
WorkOrder:HS19030570
Lab ID:HS19030570-22
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**478**		**2.00**	**2.00**	**mg/L**	1	19-Mar-2019 17:33
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 15-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	19-Mar-2019 01:40
Arsenic	U		0.000400	0.00200	mg/L	1	19-Mar-2019 01:40
Cadmium	U		0.000200	0.00200	mg/L	1	19-Mar-2019 01:40
Calcium	**190**		**0.680**	**10.0**	**mg/L**	20	19-Mar-2019 15:17
Iron	**0.666**		**0.0120**	**0.200**	**mg/L**	1	19-Mar-2019 01:40
Lead	U		0.000600	0.00200	mg/L	1	19-Mar-2019 01:40
Magnesium	**0.934**		**0.0100**	**0.200**	**mg/L**	1	19-Mar-2019 01:40
Potassium	**11.7**		**0.0180**	**0.200**	**mg/L**	1	19-Mar-2019 01:40
Selenium	U		0.00110	0.00200	mg/L	1	19-Mar-2019 12:57
Sodium	**256**		**0.280**	**4.00**	**mg/L**	20	19-Mar-2019 15:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030570

Batch ID: 138729 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19030570-11	1	10	10 (mL)	1
HS19030570-12	1	10	10 (mL)	1
HS19030570-13	1	10	10 (mL)	1
HS19030570-14	1	10	10 (mL)	1
HS19030570-15	1	10	10 (mL)	1
HS19030570-16	1	10	10 (mL)	1
HS19030570-17	1	10	10 (mL)	1
HS19030570-18	1	10	10 (mL)	1
HS19030570-19	1	10	10 (mL)	1
HS19030570-20	1	10	10 (mL)	1
HS19030570-22	1	10	10 (mL)	1

Batch ID: 138731 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19030570-01	1	10	10 (mL)	1
HS19030570-02	1	10	10 (mL)	1
HS19030570-03	1	10	10 (mL)	1
HS19030570-04	1	10	10 (mL)	1
HS19030570-05	1	10	10 (mL)	1
HS19030570-06	1	10	10 (mL)	1
HS19030570-07	1	10	10 (mL)	1
HS19030570-08	1	10	10 (mL)	1
HS19030570-09	1	10	10 (mL)	1
HS19030570-10	1	10	10 (mL)	1
HS19030570-21	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030570

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 138729	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19030570-11	20190227-FD-PV30out-controlT	27 Feb 2019 11:30		15 Mar 2019 10:00	19 Mar 2019 14:45	20
HS19030570-11	20190227-FD-PV30out-controlT	27 Feb 2019 11:30		15 Mar 2019 10:00	19 Mar 2019 01:13	1
HS19030570-12	20190227-FD-PV30out-30T	27 Feb 2019 11:30		15 Mar 2019 10:00	19 Mar 2019 14:48	20
HS19030570-12	20190227-FD-PV30out-30T	27 Feb 2019 11:30		15 Mar 2019 10:00	19 Mar 2019 01:15	1
HS19030570-13	20190227-FD-PV30out-35T	27 Feb 2019 11:30		15 Mar 2019 10:00	19 Mar 2019 14:59	20
HS19030570-13	20190227-FD-PV30out-35T	27 Feb 2019 11:30		15 Mar 2019 10:00	19 Mar 2019 01:17	1
HS19030570-14	20190227-FD-PV30out-40T	27 Feb 2019 11:30		15 Mar 2019 10:00	19 Mar 2019 15:01	20
HS19030570-14	20190227-FD-PV30out-40T	27 Feb 2019 11:30		15 Mar 2019 10:00	19 Mar 2019 01:20	1
HS19030570-15	20190227-FD-PV30inlet-controlT	27 Feb 2019 11:40		15 Mar 2019 10:00	19 Mar 2019 15:03	20
HS19030570-15	20190227-FD-PV30inlet-controlT	27 Feb 2019 11:40		15 Mar 2019 10:00	19 Mar 2019 01:22	1
HS19030570-16	20190227-FD-PV30inlet-30-35-40T	27 Feb 2019 11:40		15 Mar 2019 10:00	19 Mar 2019 15:06	20
HS19030570-16	20190227-FD-PV30inlet-30-35-40T	27 Feb 2019 11:40		15 Mar 2019 10:00	19 Mar 2019 01:24	1
HS19030570-17	20190228-FD-PV30mid-controlT	28 Feb 2019 16:30		15 Mar 2019 10:00	19 Mar 2019 15:08	20
HS19030570-17	20190228-FD-PV30mid-controlT	28 Feb 2019 16:30		15 Mar 2019 10:00	19 Mar 2019 01:26	1
HS19030570-18	20190228-FD-PV30mid-30T	28 Feb 2019 16:30		15 Mar 2019 10:00	19 Mar 2019 15:10	20
HS19030570-18	20190228-FD-PV30mid-30T	28 Feb 2019 16:30		15 Mar 2019 10:00	19 Mar 2019 01:29	1
HS19030570-19	20190228-FD-PV30mid-35T	28 Feb 2019 16:30		15 Mar 2019 10:00	19 Mar 2019 15:12	20
HS19030570-19	20190228-FD-PV30mid-35T	28 Feb 2019 16:30		15 Mar 2019 10:00	19 Mar 2019 01:31	1
HS19030570-20	20190228-FD-PV30mid-40T	28 Feb 2019 16:30		15 Mar 2019 10:00	19 Mar 2019 15:14	20
HS19030570-20	20190228-FD-PV30mid-40T	28 Feb 2019 16:30		15 Mar 2019 10:00	19 Mar 2019 12:55	1
HS19030570-20	20190228-FD-PV30mid-40T	28 Feb 2019 16:30		15 Mar 2019 10:00	19 Mar 2019 01:38	1
HS19030570-22	20190301-FD-PV30mid-35T-DUP	01 Mar 2019 07:30		15 Mar 2019 10:00	19 Mar 2019 15:17	20
HS19030570-22	20190301-FD-PV30mid-35T-DUP	01 Mar 2019 07:30		15 Mar 2019 10:00	19 Mar 2019 12:57	1
HS19030570-22	20190301-FD-PV30mid-35T-DUP	01 Mar 2019 07:30		15 Mar 2019 10:00	19 Mar 2019 01:40	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030570

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 138731	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS19030570-01	20190227-FD-PV30out-controlD	27 Feb 2019 11:30		15 Mar 2019 10:00	19 Mar 2019 13:48	20
HS19030570-01	20190227-FD-PV30out-controlD	27 Feb 2019 11:30		15 Mar 2019 10:00	18 Mar 2019 18:05	1
HS19030570-02	20190227-FD-PV30out-30D	27 Feb 2019 11:30		15 Mar 2019 10:00	19 Mar 2019 13:57	20
HS19030570-02	20190227-FD-PV30out-30D	27 Feb 2019 11:30		15 Mar 2019 10:00	18 Mar 2019 18:08	1
HS19030570-03	20190227-FD-PV30out-35D	27 Feb 2019 11:30		15 Mar 2019 10:00	19 Mar 2019 13:59	20
HS19030570-03	20190227-FD-PV30out-35D	27 Feb 2019 11:30		15 Mar 2019 10:00	18 Mar 2019 18:10	1
HS19030570-04	20190227-FD-PV30out-40D	27 Feb 2019 11:30		15 Mar 2019 10:00	19 Mar 2019 14:01	20
HS19030570-04	20190227-FD-PV30out-40D	27 Feb 2019 11:30		15 Mar 2019 10:00	18 Mar 2019 18:12	1
HS19030570-05	20190227-FD-PV30inlet-controlD	27 Feb 2019 11:40		15 Mar 2019 10:00	19 Mar 2019 14:04	20
HS19030570-05	20190227-FD-PV30inlet-controlD	27 Feb 2019 11:40		15 Mar 2019 10:00	18 Mar 2019 18:14	1
HS19030570-06	20190227-FD-PV30inlet-30-35-40D	27 Feb 2019 11:40		15 Mar 2019 10:00	19 Mar 2019 14:06	20
HS19030570-06	20190227-FD-PV30inlet-30-35-40D	27 Feb 2019 11:40		15 Mar 2019 10:00	18 Mar 2019 18:17	1
HS19030570-07	20190228-FD-PV30mid-controlD	28 Feb 2019 16:30		15 Mar 2019 10:00	19 Mar 2019 14:08	20
HS19030570-07	20190228-FD-PV30mid-controlD	28 Feb 2019 16:30		15 Mar 2019 10:00	18 Mar 2019 18:27	1
HS19030570-08	20190228-FD-PV30mid-30D	28 Feb 2019 16:30		15 Mar 2019 10:00	19 Mar 2019 14:10	20
HS19030570-08	20190228-FD-PV30mid-30D	28 Feb 2019 16:30		15 Mar 2019 10:00	18 Mar 2019 18:29	1
HS19030570-09	20190228-FD-PV30mid-35D	28 Feb 2019 16:30		15 Mar 2019 10:00	19 Mar 2019 14:13	20
HS19030570-09	20190228-FD-PV30mid-35D	28 Feb 2019 16:30		15 Mar 2019 10:00	18 Mar 2019 18:45	1
HS19030570-10	20190228-FD-PV30mid-40D	28 Feb 2019 16:30		15 Mar 2019 10:00	19 Mar 2019 14:15	20
HS19030570-10	20190228-FD-PV30mid-40D	28 Feb 2019 16:30		15 Mar 2019 10:00	18 Mar 2019 18:47	1
HS19030570-21	20190301-FD-PV30mid-35D-DUP	01 Mar 2019 07:30		15 Mar 2019 10:00	19 Mar 2019 14:30	20
HS19030570-21	20190301-FD-PV30mid-35D-DUP	01 Mar 2019 07:30		15 Mar 2019 10:00	18 Mar 2019 18:49	1
Batch ID R334821	**Test Name :** HARDNESS, TOTAL AS CACO3 BY SM2340B			**Matrix:** Groundwater		
HS19030570-11	20190227-FD-PV30out-controlT	27 Feb 2019 11:30			19 Mar 2019 17:33	1
HS19030570-12	20190227-FD-PV30out-30T	27 Feb 2019 11:30			19 Mar 2019 17:33	1
HS19030570-13	20190227-FD-PV30out-35T	27 Feb 2019 11:30			19 Mar 2019 17:33	1
HS19030570-14	20190227-FD-PV30out-40T	27 Feb 2019 11:30			19 Mar 2019 17:33	1
HS19030570-15	20190227-FD-PV30inlet-controlT	27 Feb 2019 11:40			19 Mar 2019 17:33	1
HS19030570-16	20190227-FD-PV30inlet-30-35-40T	27 Feb 2019 11:40			19 Mar 2019 17:33	1
HS19030570-17	20190228-FD-PV30mid-controlT	28 Feb 2019 16:30			19 Mar 2019 17:33	1
HS19030570-18	20190228-FD-PV30mid-30T	28 Feb 2019 16:30			19 Mar 2019 17:33	1
HS19030570-19	20190228-FD-PV30mid-35T	28 Feb 2019 16:30			19 Mar 2019 17:33	1
HS19030570-20	20190228-FD-PV30mid-40T	28 Feb 2019 16:30			19 Mar 2019 17:33	1
HS19030570-22	20190301-FD-PV30mid-35T-DUP	01 Mar 2019 07:30			19 Mar 2019 17:33	1

WorkOrder: HS19030570
InstrumentID: ICPMS05
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000555	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000460	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000554	0.000200	0.00200
A	Iron	7439-89-6	0.0500	0.0549	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.00100	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0680	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0542	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00280	0.00110	0.00200

WorkOrder: HS19030570
InstrumentID: ICPMS04
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Calcium	7440-70-2	0.0500	0.0523	0.0340	0.500
A	Sodium	7440-23-5	0.0500	0.0556	0.0140	0.200

WorkOrder: HS19030570
InstrumentID: ICPMS05
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000555	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000460	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000554	0.000200	0.00200
A	Iron	7439-89-6	0.0500	0.0549	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.00100	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0680	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0542	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00280	0.00110	0.00200

WorkOrder: HS19030570
InstrumentID: ICPMS04
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Calcium	7440-70-2	0.0500	0.0523	0.0340	0.500
A	Sodium	7440-23-5	0.0500	0.0556	0.0140	0.200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030570

QC BATCH REPORT NEW

Batch ID: 138729 (0) **Instrument: ICPMS05** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLK-138729** Units: **mg/L** Analysis Date: **19-Mar-2019 00:50**
Client ID: Run ID: **ICPMS05_334713** SeqNo: **4995274** PrepDate: **15-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	U	0.200								
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	0.1303	0.200								J

LCS Sample ID: **LCS-138729** Units: **mg/L** Analysis Date: **19-Mar-2019 00:52**
Client ID: Run ID: **ICPMS05_334713** SeqNo: **4995275** PrepDate: **15-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04919	0.00200	0.05	0	98.4	80 - 120				
Arsenic	0.04804	0.00200	0.05	0	96.1	80 - 120				
Cadmium	0.04899	0.00200	0.05	0	98.0	80 - 120				
Calcium	4.979	0.500	5	0	99.6	80 - 120				
Iron	4.933	0.200	5	0	98.7	80 - 120				
Lead	0.04886	0.00200	0.05	0	97.7	80 - 120				
Magnesium	4.941	0.200	5	0	98.8	80 - 120				
Potassium	5.026	0.200	5	0	101	80 - 120				
Selenium	0.04539	0.00200	0.05	0	90.8	80 - 120				
Sodium	4.859	0.200	5	0	97.2	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030570

QC BATCH REPORT NEW

Batch ID: 138729 (0) **Instrument: ICPMS05** **Method: ICP-MS METALS BY SW6020A**

MS Sample ID: **HS19030569-20MS** Units: **mg/L** Analysis Date: **19-Mar-2019 00:59**
Client ID: Run ID: **ICPMS05_334713** SeqNo: **4995278** PrepDate: **15-Mar-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04765	0.0100	0.05	0.00057	94.2	80 - 120				
Arsenic	0.04779	0.0100	0.05	-0.000472	96.5	80 - 120				
Cadmium	0.04848	0.0100	0.05	-0.000076	97.1	80 - 120				
Calcium	335.5	2.50	5	314.9	412	80 - 120				SO
Iron	6.671	1.00	5	1.755	98.3	80 - 120				
Lead	0.04556	0.0100	0.05	0.000129	90.9	80 - 120				
Magnesium	286.6	1.00	5	265.9	414	80 - 120				SO
Potassium	23.61	1.00	5	18.46	103	80 - 120				
Selenium	0.04649	0.0100	0.05	0.003241	86.5	80 - 120				
Sodium	1606	1.00	5	1529	1540	80 - 120				SEO

MSD Sample ID: **HS19030569-20MSD** Units: **mg/L** Analysis Date: **19-Mar-2019 01:01**
Client ID: Run ID: **ICPMS05_334713** SeqNo: **4995279** PrepDate: **15-Mar-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04619	0.0100	0.05	0.00057	91.2	80 - 120	0.04765	3.11	20	
Arsenic	0.04631	0.0100	0.05	-0.000472	93.6	80 - 120	0.04779	3.15	20	
Cadmium	0.04982	0.0100	0.05	-0.000076	99.8	80 - 120	0.04848	2.74	20	
Calcium	321.5	2.50	5	314.9	131	80 - 120	335.5	4.28	20	SO
Iron	6.595	1.00	5	1.755	96.8	80 - 120	6.671	1.14	20	
Lead	0.0468	0.0100	0.05	0.000129	93.3	80 - 120	0.04556	2.69	20	
Magnesium	272.1	1.00	5	265.9	125	80 - 120	286.6	5.17	20	SO
Potassium	23.01	1.00	5	18.46	91.0	80 - 120	23.61	2.56	20	
Selenium	0.04687	0.0100	0.05	0.003241	87.3	80 - 120	0.04649	0.825	20	
Sodium	1535	1.00	5	1529	107	80 - 120	1606	4.55	20	EO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030570

QC BATCH REPORT NEW

Batch ID: 138729 (0) **Instrument: ICPMS05** **Method: ICP-MS METALS BY SW6020A**

PDS Sample ID: **HS19030569-20PDS** Units: **mg/L** Analysis Date: **19-Mar-2019 01:04**
Client ID: Run ID: **ICPMS05_334713** SeqNo: **4995280** PrepDate: **15-Mar-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.4437	0.0100	0.5	0	88.7	75 - 125				
Arsenic	0.475	0.0100	0.5	0	95.0	75 - 125				
Cadmium	0.4978	0.0100	0.5	0	99.6	75 - 125				
Calcium	356.5	2.50	50	314.9	83.2	75 - 125				O
Iron	49.43	1.00	50	1.755	95.4	75 - 125				
Lead	0.4703	0.0100	0.5	0	94.1	75 - 125				
Magnesium	316.6	1.00	50	265.9	102	75 - 125				O
Potassium	66.39	1.00	50	18.46	95.9	75 - 125				
Selenium	0.4495	0.0100	0.5	0	89.9	75 - 125				

PDS Sample ID: **HS19030569-20PDS** Units: **mg/L** Analysis Date: **19-Mar-2019 14:39**
Client ID: Run ID: **ICPMS04_334782** SeqNo: **4996033** PrepDate: **15-Mar-2019** DF: **100**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	2678	20.0	1000	1743	93.5	75 - 125				

SD Sample ID: **HS19030569-20SD** Units: **mg/L** Analysis Date: **19-Mar-2019 12:24**
Client ID: Run ID: **ICPMS05_334784** SeqNo: **4996071** PrepDate: **15-Mar-2019** DF: **25**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0500					0	0	10	
Arsenic	U	0.0500					0	0	10	
Cadmium	U	0.0500					0	0	10	
Calcium	333	12.5					338.8	1.72	10	
Iron	1.83	5.00					3.828	0	10	J
Lead	U	0.0500					0	0	10	
Magnesium	290.7	5.00					302	3.75	10	
Potassium	18.94	5.00					20.64	8.25	10	
Selenium	U	0.0500					0	0	10	
Sodium	1667	5.00					1743	4.39	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030570

QC BATCH REPORT NEW

Batch ID: 138729 (0) **Instrument: ICPMS05** **Method: ICP-MS METALS BY SW6020A**

SD Sample ID: **HS19030569-20SD** Units: **mg/L** Analysis Date: **19-Mar-2019 14:37**
Client ID: Run ID: **ICPMS04_334782** SeqNo: **4996032** PrepDate: **15-Mar-2019** DF: **500**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Sodium	1783	100					1743	2.29	10	

The following samples were analyzed in this batch:

HS19030570-11	HS19030570-12	HS19030570-13	HS19030570-14
HS19030570-15	HS19030570-16	HS19030570-17	HS19030570-18
HS19030570-19	HS19030570-20	HS19030570-22	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030570

QC BATCH REPORT NEW

Batch ID: 138731 (0) **Instrument: ICPMS05** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

MBLK Sample ID: **MBLK-138731** Units: **mg/L** Analysis Date: **18-Mar-2019 16:58**
Client ID: Run ID: **ICPMS05_334713** SeqNo: **4994734** PrepDate: **15-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01017	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	0.1598	0.200								J

LCS Sample ID: **LCS-138731** Units: **mg/L** Analysis Date: **18-Mar-2019 17:00**
Client ID: Run ID: **ICPMS05_334713** SeqNo: **4994735** PrepDate: **15-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04931	0.00200	0.05	0	98.6	80 - 120				
Arsenic	0.05093	0.00200	0.05	0	102	80 - 120				
Cadmium	0.0494	0.00200	0.05	0	98.8	80 - 120				
Calcium	4.992	0.500	5	0	99.8	80 - 120				
Iron	5.277	0.200	5	0	106	80 - 120				
Lead	0.04811	0.00200	0.05	0	96.2	80 - 120				
Magnesium	5.204	0.200	5	0	104	80 - 120				
Potassium	5.095	0.200	5	0	102	80 - 120				
Selenium	0.04781	0.00200	0.05	0	95.6	80 - 120				
Sodium	5.437	0.200	5	0	109	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030570

QC BATCH REPORT NEW

Batch ID: 138731 (0) **Instrument: ICPMS05** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

MS Sample ID: **HS19030569-21MS** Units: **mg/L** Analysis Date: **18-Mar-2019 17:09**
Client ID: Run ID: **ICPMS05_334713** SeqNo: **4994738** PrepDate: **15-Mar-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.0452	0.0100	0.05	-0.000744	91.9	75 - 125				
Arsenic	0.04765	0.0100	0.05	-0.001385	98.1	75 - 125				
Cadmium	0.0488	0.0100	0.05	0.000098	97.4	75 - 125				
Calcium	304.7	2.50	5	302.2	50.2	75 - 125				SO
Iron	4.99	1.00	5	0.0211	99.4	75 - 125				
Lead	0.04539	0.0100	0.05	0.000293	90.2	75 - 125				
Magnesium	300.6	1.00	5	283.7	336	75 - 125				SO
Potassium	23.69	1.00	5	17.92	115	75 - 125				
Selenium	0.04853	0.0100	0.05	0.003622	89.8	75 - 125				
Sodium	1755	1.00	5	1679	1530	75 - 125				SEO

MSD Sample ID: **HS19030569-21MSD** Units: **mg/L** Analysis Date: **18-Mar-2019 17:11**
Client ID: Run ID: **ICPMS05_334713** SeqNo: **4994739** PrepDate: **15-Mar-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04548	0.0100	0.05	-0.000744	92.4	75 - 125	0.0452	0.607	20	
Arsenic	0.04775	0.0100	0.05	-0.001385	98.3	75 - 125	0.04765	0.208	20	
Cadmium	0.05061	0.0100	0.05	0.000098	101	75 - 125	0.0488	3.64	20	
Calcium	300.7	2.50	5	302.2	-30.6	75 - 125	304.7	1.33	20	SO
Iron	5.06	1.00	5	0.0211	101	75 - 125	4.99	1.4	20	
Lead	0.04805	0.0100	0.05	0.000293	95.5	75 - 125	0.04539	5.69	20	
Magnesium	298.8	1.00	5	283.7	302	75 - 125	300.6	0.578	20	SO
Potassium	22.55	1.00	5	17.92	92.7	75 - 125	23.69	4.93	20	
Selenium	0.04745	0.0100	0.05	0.003622	87.6	75 - 125	0.04853	2.25	20	
Sodium	1754	1.00	5	1679	1490	75 - 125	1755	0.0913	20	SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030570

QC BATCH REPORT NEW

Batch ID: 138731 (0) **Instrument: ICPMS05** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

PDS Sample ID: **HS19030569-21PDS** Units: **mg/L** Analysis Date: **18-Mar-2019 17:13**
Client ID: Run ID: **ICPMS05_334713** SeqNo: **4994740** PrepDate: **15-Mar-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.4584	0.0100	0.5	0	91.7	75 - 125				
Arsenic	0.5033	0.0100	0.5	0	101	75 - 125				
Cadmium	0.5258	0.0100	0.5	0	105	75 - 125				
Calcium	344.6	2.50	50	302.2	84.8	75 - 125				O
Iron	49.29	1.00	50	0	98.6	75 - 125				
Lead	0.4942	0.0100	0.5	0	98.8	75 - 125				
Magnesium	337.2	1.00	50	283.7	107	75 - 125				O
Potassium	68.23	1.00	50	17.92	101	75 - 125				
Selenium	0.4572	0.0100	0.5	0	91.4	75 - 125				

PDS Sample ID: **HS19030569-21PDS** Units: **mg/L** Analysis Date: **19-Mar-2019 13:46**
Client ID: Run ID: **ICPMS04_334782** SeqNo: **4995962** PrepDate: **15-Mar-2019** DF: **100**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	1328	50.0	1000	330.3	99.8	75 - 125				
Sodium	2775	20.0	1000	1806	96.9	75 - 125				

SD Sample ID: **HS19030569-21SD** Units: **mg/L** Analysis Date: **18-Mar-2019 17:04**
Client ID: Run ID: **ICPMS05_334713** SeqNo: **4994737** PrepDate: **15-Mar-2019** DF: **25**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0500					-0.000744	0	10	
Arsenic	U	0.0500					-0.001385	0	10	
Cadmium	U	0.0500					0.000098	0	10	
Calcium	311.1	12.5					302.2	2.94	10	
Iron	U	5.00					0.0211	0	10	
Lead	U	0.0500					0.000293	0	10	
Magnesium	304.4	5.00					283.7	7.28	10	
Potassium	19	5.00					17.92	6.05	10	
Selenium	U	0.0500					0.003622	0	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030570

QC BATCH REPORT NEW

Batch ID: 138731 (0) **Instrument: ICPMS05** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

SD Sample ID: **HS19030569-21SD** Units: **mg/L** Analysis Date: **19-Mar-2019 13:43**
Client ID: Run ID: **ICPMS04_334782** SeqNo: **4995961** PrepDate: **15-Mar-2019** DF: **500**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	324.8	250					330.3	1.67	10	
Sodium	1849	100					1806	2.38	10	

The following samples were analyzed in this batch:

HS19030570-01	HS19030570-02	HS19030570-03	HS19030570-04
HS19030570-05	HS19030570-06	HS19030570-07	HS19030570-08
HS19030570-09	HS19030570-10	HS19030570-21	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19030570**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
California	2919, 2018-2019	30-Apr-2019
Maryland	343, 2018-2019	30-Jun-2019

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19030570

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19030570-01	20190227-FD-PV30out-controlD	Login	3/12/2019 6:35:11 PM	JRM	MET088
HS19030570-02	20190227-FD-PV30out-30D	Login	3/12/2019 6:35:11 PM	JRM	MET088
HS19030570-03	20190227-FD-PV30out-35D	Login	3/12/2019 6:35:11 PM	JRM	MET088
HS19030570-04	20190227-FD-PV30out-40D	Login	3/12/2019 6:35:11 PM	JRM	MET088
HS19030570-05	20190227-FD-PV30inlet-controlD	Login	3/12/2019 6:35:11 PM	JRM	MET088
HS19030570-06	20190227-FD-PV30inlet-30-35-40D	Login	3/12/2019 6:35:11 PM	JRM	MET088
HS19030570-07	20190228-FD-PV30mid-controlD	Login	3/12/2019 6:35:11 PM	JRM	MET088
HS19030570-08	20190228-FD-PV30mid-30D	Login	3/12/2019 6:35:11 PM	JRM	MET088
HS19030570-09	20190228-FD-PV30mid-35D	Login	3/12/2019 6:35:11 PM	JRM	MET088
HS19030570-10	20190228-FD-PV30mid-40D	Login	3/12/2019 6:35:11 PM	JRM	MET088
HS19030570-11	20190227-FD-PV30out-controlT	Login	3/12/2019 6:35:11 PM	JRM	MET088
HS19030570-12	20190227-FD-PV30out-30T	Login	3/12/2019 6:35:11 PM	JRM	MET088
HS19030570-13	20190227-FD-PV30out-35T	Login	3/12/2019 6:35:11 PM	JRM	MET088
HS19030570-14	20190227-FD-PV30out-40T	Login	3/12/2019 6:35:11 PM	JRM	MET088
HS19030570-15	20190227-FD-PV30inlet-controlT	Login	3/12/2019 6:35:11 PM	JRM	MET088
HS19030570-16	20190227-FD-PV30inlet-30-35-40T	Login	3/12/2019 6:35:11 PM	JRM	MET088
HS19030570-17	20190228-FD-PV30mid-controlT	Login	3/12/2019 6:35:11 PM	JRM	MET088
HS19030570-18	20190228-FD-PV30mid-30T	Login	3/12/2019 6:35:11 PM	JRM	MET088
HS19030570-19	20190228-FD-PV30mid-35T	Login	3/12/2019 6:35:11 PM	JRM	MET088
HS19030570-20	20190228-FD-PV30mid-40T	Login	3/12/2019 6:35:11 PM	JRM	MET088
HS19030570-21	20190301-FD-PV30mid-35D-DUP	Login	3/12/2019 6:35:11 PM	JRM	MET088
HS19030570-22	20190301-FD-PV30mid-35T-DUP	Login	3/12/2019 6:35:11 PM	JRM	MET088

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19030570
Date/Time Received: **12-Mar-2019 08:50**
Received by: **JRM**

Checklist completed by: *Jared R. Makan* eSignature 12-Mar-2019 Date
Reviewed by: *Bernadette A. Fini* eSignature 13-Mar-2019 Date

Matrices: **Water**
Carrier name: **ALS Courier**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	0.9c/0.9c UC/C	IR25	
Cooler(s)/Kit(s):	44478		
Date/Time sample(s) sent to storage:	03/12/2019 19:20		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

ALS Environmental

Chain of Custody Form

Page 1 of 3

HS19030570

Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086-01	Project Name	Exide column studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrette Parkway Drive, Suit	E	ICP TW (6020A total metals (6)+cations)
				F	ICP DISS (6020A diss metals (6)+cations-FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin Mo 63021	G	
Phone	314 984-8800	Phone	314 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190227-FD-PV30out-controlD	02-27-19	11:30 AM	GW	2	1						x					
2	20190227-FD-PV30out-30D	02-27-19	11:30 AM	GW	2	1						x					
3	20190227-FD-PV30out-35D	02-27-19	11:30 AM	GW	2	1						x					
4	20190227-FD-PV30out-40D	02-27-19	11:30 AM	GW	2	1						x					
5	20190227-FD-PV30inlet-controlD	02-27-19	11:40 AM	GW	2	1						x					
6	20190227-FD-PV30inlet-30-35-40D	02-27-19	11:40 AM	GW	2	1						x					
7	20190228-FD-PV30mid-controlD	02-28-19	4:30 PM	GW	2	1						x					
8	20190228-FD-PV30mid-30D	02-28-19	4:30 PM	GW	2	1						x					
9	20190228-FD-PV30mid-35D	02-28-19	4:30 PM	GW	2	1						x					
10	20190228-FD-PV30mid-40D	02-28-19	4:30 PM	GW	2	1						x					

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method:

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by: Giovanna Llamosas	Date: 2019/03/11	Time: 15:30	Received by:	Notes:	
Relinquished by:	Date: 3/12/19	Time: 08:30	Received by (Laboratory): J. Mauriun	Cooler Temp. 4C	QC Package: (Check Box Below)
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	0.9	☐ Level II: Standard QC ☒ TRRP-Checklist ☐ Level III: Std QC + Raw Data ☐ TRRP Level IV ☐ Level IV: SW846 CLP-Like ☐ Other: _____

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

Cooler – 44478
1223

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ALS Environmental

Chain of Custody Form

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HS19030570

Golder Associates
Exide Column Studies

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086-01	Project Name	Exide column studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrette Parkway Drive, Suit	E	ICP TW (6020A total metals (6)+cations)
				F	ICP DISS (6020A diss metals (6)+cations-FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin Mo 63021	G	
Phone	314 984-8800	Phone	314 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address		J	

ALS Project Manager:

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190227-FD-PV30out-controlT	02-27-19	11:30 AM	GW	2	1				x	x						
2	20190227-FD-PV30out-30T	02-27-19	11:30 AM	GW	2	1				x	x						
3	20190227-FD-PV30out-35T	02-27-19	11:30 AM	GW	2	1				x	x						
4	20190227-FD-PV30out-40T	02-27-19	11:30 AM	GW	2	1				x	x						
5	20190227-FD-PV30inlet-controlT	02-27-19	11:40 AM	GW	2	1				x	x						
6	20190227-FD-PV30inlet-30-35-40T	02-27-19	11:40 AM	GW	2	1				x	x						
7	20190228-FD-PV30mid-controlT	02-28-19	4:30 PM	GW	2	1				x	x						
8	20190228-FD-PV30mid-30T	02-28-19	4:30 PM	GW	2	1				x	x						
9	20190228-FD-PV30mid-35T	02-28-19	4:30 PM	GW	2	1				x	x						
10	20190228-FD-PV30mid-40T	02-28-19	4:30 PM	GW	2	1				x	x						

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method:

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by: Giovanna Llamosas	Date: 2019/03/11	Time: 15:30	Received by:	Notes:	
Relinquished by:	Date: 3/12/19	Time: 08:50	Received by (Laboratory): J. Williamson	Cooler Temp. uc	QC Package: (Check Box Below)
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	0.9	Level II: Standard QC x TRRP-Checklist; Level III: Std QC + Raw Data ☐ TRRP Level IV; Level IV: SW846 CLP-Like; Other: _____

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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ALS Environmental

Chain of Custody Form

Page 3 of 3

HS19030570

Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086-01	Project Name	Exide column studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suit	Address	13515 Barrette Parkway Drive, Suit	E	ICP TW (6020A total metals (6)+cations)
				F	ICP DISS (6020A diss metals (6)+cations-FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin Mo 63021	G	
Phone	314 984-8800	Phone	314 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190301-FD-PV30mid-35D-DUP	03-01-19	7:30 PM	GW	2	1						x					
2	20190301-FD-PV30mid-35T-DUP	03-01-19	7:30 PM	GW	2	1				x	x						
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method:

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by: Giovanna Llamosas	Date: 2019/03/11	Time: 15:30	Received by:	Notes:
Relinquished by:	Date: 3/12/19	Time: 08:50	Received by (Laboratory): J. WILLIAMS	Cooler Temp. UC
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	0.9

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

QC Package: (Check Box Below)

	Level II: Standard QC	x	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other: _____		

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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La Convention de Varsovie, telle que modifiée, peut s'appliquer à n'importe quel envoi à destination internationale acheminé par voie aérienne. Dans un tel cas, la Convention régit et, dans la plupart des cas, limite la responsabilité de FedEx en ce qui a trait à la perte, au retard ou à l'endommagement de votre envoi. La Convention de Varsovie, telle que modifiée, limite la responsabilité de FedEx. Par exemple, aux États-Unis, notre responsabilité se limite à 20 $ par kilogramme (9,07 $ par livre), à moins que vous ne déclariez une valeur supérieure, comme précisé ci-dessous, et que vous acquittiez tout supplément applicable. L'interprétation et l'application des limites de responsabilité prévues par la Convention de Varsovie peuvent varier selon le pays. Aucun arrêt spécifique n'est convenu à l'avance et FedEx se réserve le droit d'acheminer l'envoi de la manière qui lui semble la plus appropriée. NOTIFICATION DE TRANSPORT TERRESTRE. Les envois transportés exclusivement par voie terrestre, à partir ou vers un pays qui adhère à la Convention de Varsovie ou à la Convention relative au transport des marchandises par route (CMR), sont soumis aux modalités de la CMR, nonobstant toute disposition contraire dans la présente lettre de transport aérien. Pour les envois transportés uniquement par voie terrestre, en cas de conflit entre les dispositions de la CMR et celles de la présente lettre de transport aérien, les modalités de la CMR prévaudront. LIMITE DE RESPONSABILITÉ. Si elle n'est pas régie par la Convention de Varsovie, la CMR ou d'autres traités ou lois internationaux, réglementations gouvernementales, décrets ou exigences, la responsabilité maximale de FedEx pour les dommages, pertes, objets manquants, mauvaise livraison, non-livraison, renseignements erronés ou défaut de fournir des renseignements liés à votre envoi est limitée par la présente entente et les modalités et conditions du contrat de transport. Veuillez vous reporter au contrat de transport établi dans le Guide des services de FedEx applicable ou son équivalent, afin de déterminer les limites contractuelles. FedEx ne fournit pas d'assurance tous risques ou des marchandises, mais il vous est possible de payer une somme supplémentaire pour chaque 100 $US supplémentaire (ou devise locale équivalente pour le pays d'origine) de la valeur déclarée de transport. Si vous déclarez une valeur de transport plus élevée et que vous payez les frais additionnels, la responsabilité maximale de FedEx s'élèvera à la valeur déclarée pour le transport ou à la valeur des dommages réels, soit le moins élevé. RESPONSABILTÉS NON ASSUMÉES. FEDEX NE POURRA EN AUCUN CAS ÊTRE RESPONSABLE DES DOMMAGES DIRECTS, INDIRECTS, ACCESSOIRES, SPÉCIAUX OU CONSÉCUTIFS EN EXCÉDENT DE LA VALEUR DÉCLARÉE POUR LE TRANSPORT (Y COMPRIS, SANS S'Y LIMITER, CEUX RÉSULTANT DE PERTES DE REVENUS OU DE PROFITS) OU DE LA VALEUR RÉELLE DE L'ENVOI, SI ELLE EST INFÉRIEURE, QUE FEDEX SACHE OU AURAIT DÛ SAVOIR OU NON QUE DES DOMMAGES POUVAIENT ÊTRE ENCOURUS. FedEx ne sera pas responsable de vos actes ou omissions, y compris, mais sans s'y limiter, de toute déclaration de marchandises inexacte, d'emballage, de protection, de marquage ou d'indication d'adresse inadéquats ou insuffisants, ou encore des actes ou omissions du destinataire ou de toute personne ayant un intérêt dans l'envoi, ou si l'une ou l'autre partie manquait à toute condition de notre accord. 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CONSULTEZ NOTRE TARIF, LE GUIDE DES SERVICES DE FEDEX APPLICABLE OU LES CONDITIONS STANDARD DE TRANSPORT POUR PLUS DE DÉTAILS. La Convention de Varsovie a établi des procédures de réclamation écrites détaillées pour les dommages, retards ou non-livraison des envois. En outre, l'interprétation et l'application des dispositions relatives aux réclamations telles qu'elles sont stipulées dans la Convention de Varsovie peuvent varier selon les pays. Veuillez vous reporter à la Convention afin de déterminer la période de réclamation qui se rapporte à votre envoi. Le réclamant ne pourra plus réclamer de dommages-intérêts à FedEx si aucune poursuite n'est engagée dans un délai de deux ans, tel que stipulé dans la Convention. FedEx n'est pas tenue de répondre à quelque réclamation que ce soit avant que tous les frais de transport aient été réglés. Le montant de la réclamation ne peut être déduit des frais de transport. 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ORIGIN ID:YUXA (514) 383-0990
Tatiana Lopez (Natalie)
Golder Associates Ltd
7250 rue du Mile End
3e etage
MONTREAL, PQ H2R3A4
CANADA, CA

SHIP DATE: 11MAR19
ACTWGT: 36.00 LB
CAD: 108680724/INET4100

DIMS: 13x25x14 IN
BILL RECIPIENT
EIN/VAT:

TO Dane Wacasey
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

(281) 530-5656

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(US)

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X1 SGRA

PKG:CUSTOMER

8:00A
INTL FIRST

REF: Bettina Emile
DESC1:4 bottles of 250 ml each with samples for lab analysis64 bot
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 1.00 CAD

SIGN: Tatiana Lopez (Natal
T/C: R 967554812
D/T: S 167982832

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March 25, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19030882**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 22 sample(s) on Mar 18, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19030882**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS19030882**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data								
Laboratory Name: ALS Laboratory Group			LRC Date: 03/25/2019					
Project Name: Exide Column Studies			Laboratory Job Number: HS19030882					
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 138890,138938,R335228					
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]	
R1	OI	**Chain-of-custody (C-O-C)**						
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X					
		Were all departures from standard conditions described in an exception report?	X					
R2	OI	**Sample and quality control (QC) identification**						
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X					
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X					
R3	OI	**Test reports**						
		Were all samples prepared and analyzed within holding times?	X					
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X					
		Were calculations checked by a peer or supervisor?	X					
		Were all analyte identifications checked by a peer or supervisor?	X					
		Were sample detection limits reported for all analytes not detected?	X					
		Were all results for soil and sediment samples reported on a dry weight basis?			X			
		Were % moisture (or solids) reported for all soil and sediment samples?			X			
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X			
		If required for the project, TICs reported?			X			
R4	O	**Surrogate recovery data**						
		Were surrogates added prior to extraction?			X			
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X			
R5	OI	**Test reports/summary forms for blank samples**						
		Were appropriate type(s) of blanks analyzed?	X					
		Were blanks analyzed at the appropriate frequency?	X					
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X					
		Were blank concentrations < MQL?	X					
R6	OI	**Laboratory control samples (LCS):**						
		Were all COCs included in the LCS?	X					
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X					
		Were LCSs analyzed at the required frequency?	X					
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X					
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X					
		Was the LCSD RPD within QC limits?	X					
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**						
		Were the project/method specified analytes included in the MS and MSD?	X					
		Were MS/MSD analyzed at the appropriate frequency?	X					
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1	
		Were MS/MSD RPDs within laboratory QC limits?	X					
R8	OI	**Analytical duplicate data**						
		Were appropriate analytical duplicates analyzed for each matrix?			X			
		Were analytical duplicates analyzed at the appropriate frequency?			X			
		Were RPDs or relative standard deviations within the laboratory QC limits?			X			
R9	OI	**Method quantitation limits (MQLs):**						
		Are the MQLs for each method analyte included in the laboratory data package?	X					
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X					
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X					
R10	OI	**Other problems/anomalies**						
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X					
		Were all necessary corrective actions performed for the reported data?	X					
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X					
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X					

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 03/25/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19030882				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 138890,138938,R335228				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			2
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		X			3
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports	
Laboratory Name: ALS Laboratory Group	LRC Date: 03/25/2019
Project Name: Exide Column Studies	Laboratory Job Number: HS19030882
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 138890,138938,R335228

ER#[5]	Description
1	Batch 138890 Dissolved Metals Method SW6020, sample 20190312-DGW-MW3-PV40outcontrolT MSD recovered outside the control limits for Calcium, and Sodium, however, the result in the parent sample is greater than 4x the spike amount. Batch 1138938, Metals Method SW6020, sample HS19030918-01 MS and MSD were performed on unrelated sample.
2	See Run Log and CCB Exceptions Report.
3	Batch 138890 Dissolved Metals Method SW6020, sample 20190312-DGW-MW3-PV40outcontrolT PDS recovered outside the control limit for Calcium, however, the result in the parent sample is greater than 4x the spike amount. Batch 1138938, Metals Method SW6020, sample HS19030918-01, Serial Dilution was performed on unrelated sample.

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030882
Start Date: 21-Mar-2019 End Date: 22-Mar-2019

Run ID:ICPMS04_334969
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	21-Mar-2019 12:38	023_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	21-Mar-2019 12:40	024SMPL.d	NA
LLICV5	1	21-Mar-2019 12:42	025LICV.d	NA
ICB	1	21-Mar-2019 12:44	026_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	21-Mar-2019 12:51	027ICSA.d	NA
ICSAB	1	21-Mar-2019 12:54	028ICSB.d	NA
CCV 1	1	21-Mar-2019 13:29	039_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	21-Mar-2019 13:31	040_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	21-Mar-2019 13:36	042_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	21-Mar-2019 14:19	052_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	21-Mar-2019 14:22	053_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	21-Mar-2019 14:49	064_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	21-Mar-2019 14:51	065_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	21-Mar-2019 15:16	076_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	21-Mar-2019 15:18	077_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	21-Mar-2019 16:23	089_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	21-Mar-2019 16:29	091_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	21-Mar-2019 17:00	095_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	21-Mar-2019 17:06	097_CCV.d	AS CA CD FE K MG NA PB SB SE
MBLK-138890	1	21-Mar-2019 17:11	098SMPL.d	AS CA CD FE K MG NA PB
LCS-138890	1	21-Mar-2019 17:14	099SMPL.d	AS CA CD FE K MG NA PB
CCB 7	1	21-Mar-2019 17:44	108_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 8	1	21-Mar-2019 17:53	110_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	21-Mar-2019 18:17	119_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	21-Mar-2019 18:22	121_CCB.d	AS CA CD FE K MG NA PB SB SE
20190312-DGW-MW3-PV40out-controlT	5	21-Mar-2019 18:31	125SMPL.d	NA
20190312-DGW-MW3-PV40out-controlTSD	25	21-Mar-2019 18:33	126SMPL.d	NA
20190312-DGW-MW3-PV40out-controlTMS	5	21-Mar-2019 18:36	127SMPL.d	NA
20190312-DGW-MW3-PV40out-controlTMSD	5	21-Mar-2019 18:38	128SMPL.d	NA
20190312-DGW-MW3-PV40out-controlTPDS	5	21-Mar-2019 18:40	129SMPL.d	NA
20190312-DGW-MW3-PV40out-30T	5	21-Mar-2019 18:42	130SMPL.d	NA
CCV 10	1	21-Mar-2019 18:47	132_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	21-Mar-2019 18:49	133_CCB.d	AS CA CD FE K MG NA PB SB SE
20190312-DGW-MW3-PV40out-35T	5	21-Mar-2019 18:51	134SMPL.d	NA
20190312-DGW-MW3-PV40out-40T	5	21-Mar-2019 18:54	135SMPL.d	NA
20190313-DGW-MW3-PV40inlet-controlT	5	21-Mar-2019 18:56	136SMPL.d	NA
20190313-DGW-MW3-PV40inlet-30-35-40T	5	21-Mar-2019 18:58	137SMPL.d	NA
20190313-DGW-MW3-PV40mid-controlT	5	21-Mar-2019 19:01	138SMPL.d	NA
20190313-DGW-MW3-PV40mid-30T	5	21-Mar-2019 19:03	139SMPL.d	NA
20190313-DGW-MW3-PV40mid-35T	5	21-Mar-2019 19:05	140SMPL.d	NA
20190313-DGW-MW3-PV40mid-40T	5	21-Mar-2019 19:07	141SMPL.d	NA
20190313-DGW-MW3-PV40inlet-30-35-40T-DUP	5	21-Mar-2019 19:10	142SMPL.d	NA

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030882
Start Date: 21-Mar-2019 End Date: 22-Mar-2019

Run ID:ICPMS04_334969
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
CCV 11	1	21-Mar-2019 19:14	144_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	21-Mar-2019 19:16	145_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 12	1	21-Mar-2019 19:27	150_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	21-Mar-2019 19:30	151_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 13	1	21-Mar-2019 21:53	155_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 12	1	21-Mar-2019 21:56	156_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 14	1	21-Mar-2019 22:22	166_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 13	1	21-Mar-2019 22:24	167_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 15	1	21-Mar-2019 22:49	178_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 14	1	21-Mar-2019 22:51	179_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 16	1	21-Mar-2019 23:20	191_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	21-Mar-2019 23:23	192SMPL.d	NA
LLCCV5	1	21-Mar-2019 23:25	193LICV.d	NA
ICCB 15	1	21-Mar-2019 23:27	194_ICB.d	AS CA CD FE K MG NA PB SB SE
CCB 16	1	21-Mar-2019 23:43	201_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 17	1	21-Mar-2019 23:50	204_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 18	1	22-Mar-2019 00:04	210_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 17	1	22-Mar-2019 00:06	211_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 19	1	22-Mar-2019 00:31	222_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 18	1	22-Mar-2019 00:33	223_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 20	1	22-Mar-2019 00:51	231_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 19	1	22-Mar-2019 00:53	232_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 21	1	22-Mar-2019 01:18	243_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 20	1	22-Mar-2019 01:20	244_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 22	1	22-Mar-2019 01:44	255_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 21	1	22-Mar-2019 01:47	256_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 23	1	22-Mar-2019 01:51	258_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 22	1	22-Mar-2019 01:53	259_CCB.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	22-Mar-2019 01:55	260SMPL.d	NA
LLICV5	1	22-Mar-2019 01:58	261LICV.d	NA
ICSA	1	22-Mar-2019 02:00	262ICSA.d	NA
ICSAB	1	22-Mar-2019 02:02	263ICSB.d	NA

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030882

Run ID:ICPMS04_334969
Instrument:ICPMS04
Method:SW6020

CCB 1	Date: 21-Mar-2019 13:31	Seq: 4999993		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	15.46	14	200	
CCB 2	Date: 21-Mar-2019 14:22	Seq: 5000043		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	46.82	14	200	
CCB 3	Date: 21-Mar-2019 14:51	Seq: 5000144		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	21.49	14	200	
CCB 7	Date: 21-Mar-2019 17:44	Seq: 5000514		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Iron	15.74	12	200	
	Sodium	221	14	200	
CCB 8	Date: 21-Mar-2019 18:22	Seq: 5000740		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	43.99	14	200	
CCB 9	Date: 21-Mar-2019 18:49	Seq: 5000752		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	57.22	14	200	
CCB 10	Date: 21-Mar-2019 19:16	Seq: 5000764		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	39.99	14	200	
CCB 11	Date: 21-Mar-2019 19:30	Seq: 5000770		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	40.26	14	200	
CCB 12	Date: 21-Mar-2019 21:56	Seq: 5000918		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	22.92	14	200	
CCB 13	Date: 21-Mar-2019 22:24	Seq: 5000928		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	86.45	14	200	
CCB 14	Date: 21-Mar-2019 22:51	Seq: 5000940		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Iron	12.37	12	200	
	Sodium	47.15	14	200	
ICCB 15	Date: 21-Mar-2019 23:27	Seq: 5000951		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Iron	-12.88	12	200	
CCB 17	Date: 22-Mar-2019 00:06	Seq: 5000966		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	117.7	14	200	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030882
Start Date: 22-Mar-2019 End Date: 23-Mar-2019

Run ID:ICPMS04_335069
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	22-Mar-2019 13:41	036_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	22-Mar-2019 13:43	037SMPL.d	AS CA CD FE K MG NA PB SB SE
LLICV5	1	22-Mar-2019 13:45	038LICV.d	AS CA CD FE K MG NA PB SB SE
ICB	1	22-Mar-2019 13:47	039_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	22-Mar-2019 13:53	040ICSA.d	AS CA CD FE K MG NA PB SB SE
ICSAB	1	22-Mar-2019 13:55	041ICSB.d	AS CA CD FE K MG NA PB SB SE
MBLK-138890	1	22-Mar-2019 14:04	043SMPL.d	SB SE
LCS-138890	1	22-Mar-2019 14:07	044SMPL.d	SB SE
20190312-DGW-MW3-PV40out-controlTSD	50	22-Mar-2019 14:11	046SMPL.d	
20190312-DGW-MW3-PV40out-controlTMS	10	22-Mar-2019 14:13	047SMPL.d	
20190312-DGW-MW3-PV40out-controlTMSD	10	22-Mar-2019 14:15	048SMPL.d	
20190312-DGW-MW3-PV40out-controlTPDS	10	22-Mar-2019 14:18	049SMPL.d	
CCB 1	1	22-Mar-2019 14:24	052_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 1	1	22-Mar-2019 14:33	054_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	22-Mar-2019 14:33	054_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	22-Mar-2019 14:36	055_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	22-Mar-2019 14:36	055_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	22-Mar-2019 15:33	063SMPL.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	22-Mar-2019 15:35	064_CCV.d	AS CA CD FE K MG NA PB SB SE
20190312-DGW-MW3-PV40out-controlT	1	22-Mar-2019 15:37	065SMPL.d	AS CA CD FE K MG PB SB SE
20190312-DGW-MW3-PV40out-controlTSD	5	22-Mar-2019 15:40	066SMPL.d	AS CA CD FE K MG PB SB SE
20190312-DGW-MW3-PV40out-controlTMS	1	22-Mar-2019 15:42	067SMPL.d	AS CA CD FE K MG PB SB SE
20190312-DGW-MW3-PV40out-controlTMSD	1	22-Mar-2019 15:48	070SMPL.d	AS CA CD FE K MG PB SB SE
20190312-DGW-MW3-PV40out-controlTPDS	1	22-Mar-2019 15:51	071SMPL.d	AS CA CD FE K MG PB SB SE
CCB 5	1	22-Mar-2019 16:13	079_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	22-Mar-2019 16:15	080_CCV.d	AS CA CD FE K MG NA PB SB SE
20190312-DGW-MW3-PV40out-30T	1	22-Mar-2019 16:19	081SMPL.d	AS CA CD FE K MG PB SB SE
20190312-DGW-MW3-PV40out-35T	1	22-Mar-2019 16:21	082SMPL.d	AS CA CD FE K MG PB SB SE
20190312-DGW-MW3-PV40out-40T	1	22-Mar-2019 16:23	083SMPL.d	AS CA CD FE K MG PB SB SE
20190313-DGW-MW3-PV40inlet-controlT	1	22-Mar-2019 16:26	084SMPL.d	AS CA CD FE K MG PB SB SE
20190313-DGW-MW3-PV40inlet-30-35-40T	1	22-Mar-2019 16:28	085SMPL.d	AS CA CD FE K MG PB SB SE
20190313-DGW-MW3-PV40mid-controlT	1	22-Mar-2019 16:30	086SMPL.d	AS CA CD FE K MG PB SB SE
20190313-DGW-MW3-PV40mid-30T	1	22-Mar-2019 16:32	087SMPL.d	AS CA CD FE K MG PB SB SE
20190313-DGW-MW3-PV40mid-35T	1	22-Mar-2019 16:35	088SMPL.d	AS CA CD FE K MG PB SB SE
20190313-DGW-MW3-PV40mid-40T	1	22-Mar-2019 16:37	089SMPL.d	AS CA CD FE K MG PB SB SE
20190313-DGW-MW3-PV40inlet-30-35-40T-DUP	1	22-Mar-2019 16:39	090SMPL.d	AS CA CD FE K MG PB SB SE
CCB 6	1	22-Mar-2019 16:43	092_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	22-Mar-2019 16:48	094_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	22-Mar-2019 17:21	104_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	22-Mar-2019 17:23	105_CCB.d	AS CA CD FE K MG NA PB SB SE

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030882
Start Date: 22-Mar-2019 End Date: 23-Mar-2019

Run ID:ICPMS04_335069
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
CCV 7	1	22-Mar-2019 17:58	117_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	22-Mar-2019 18:00	118_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	22-Mar-2019 18:29	130_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 8	1	22-Mar-2019 18:35	132_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	22-Mar-2019 21:32	136_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	22-Mar-2019 21:34	137_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 10	1	22-Mar-2019 21:55	146_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	22-Mar-2019 21:57	147_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 11	1	22-Mar-2019 22:24	159_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	22-Mar-2019 22:26	160SMPL.d	AS CA CD FE K MG NA PB SB SE
LLCCV5	1	22-Mar-2019 22:28	161LICV.d	AS CA CD FE K MG NA PB SB SE
ICCB 12	1	22-Mar-2019 22:30	162_ICB.d	AS CA CD FE K MG NA PB SB SE
CCV 12	1	22-Mar-2019 22:41	167_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 13	1	22-Mar-2019 22:44	168_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-138938	1	22-Mar-2019 22:46	169SMPL.d	AS CA CD FE K MG NA PB SE
LCS-138938	1	22-Mar-2019 22:48	170SMPL.d	AS CA CD FE K MG NA PB SE
ZZZZZZSD	5	22-Mar-2019 22:53	172SMPL.d	AS CD FE PB SB SE
ZZZZZZMS	1	22-Mar-2019 22:55	173SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZMSD	1	22-Mar-2019 22:57	174SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZPDS	1	22-Mar-2019 22:59	175SMPL.d	AS CD FE K MG PB SB SE
CCV 13	1	22-Mar-2019 23:02	176_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 14	1	22-Mar-2019 23:04	177_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 14	1	22-Mar-2019 23:50	187_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 15	1	22-Mar-2019 23:59	191_CCB.d	AS CA CD FE K MG NA PB SB SE
20190312-DGW-MW3-PV40out-controlD	5	23-Mar-2019 00:02	192SMPL.d	NA
20190312-DGW-MW3-PV40out-30D	5	23-Mar-2019 00:04	193SMPL.d	NA
20190312-DGW-MW3-PV40out-35D	5	23-Mar-2019 00:06	194SMPL.d	NA
20190312-DGW-MW3-PV40out-40D	5	23-Mar-2019 00:09	195SMPL.d	NA
20190313-DGW-MW3-PV40inlet-controlD	5	23-Mar-2019 00:11	196SMPL.d	NA
20190313-DGW-MW3-PV40inlet-30-35-40D	5	23-Mar-2019 00:13	197SMPL.d	NA
20190313-DGW-MW3-PV40mid-controlD	5	23-Mar-2019 00:15	198SMPL.d	NA
CCV 15	1	23-Mar-2019 00:18	199_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 16	1	23-Mar-2019 00:20	200_CCB.d	AS CA CD FE K MG NA PB SB SE
20190313-DGW-MW3-PV40mid-30D	5	23-Mar-2019 00:22	201SMPL.d	NA
20190313-DGW-MW3-PV40mid-35D	5	23-Mar-2019 00:24	202SMPL.d	NA
20190313-DGW-MW3-PV40mid-40D	5	23-Mar-2019 00:27	203SMPL.d	NA
20190313-DGW-MW3-PV40inlet-30-35-40D-DUP	5	23-Mar-2019 00:29	204SMPL.d	NA
CCV 16	1	23-Mar-2019 00:36	207_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 17	1	23-Mar-2019 00:38	208_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 17	1	23-Mar-2019 00:56	216_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 18	1	23-Mar-2019 00:58	217_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 18	1	23-Mar-2019 01:23	228_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 19	1	23-Mar-2019 01:25	229_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 19	1	23-Mar-2019 01:50	240_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 20	1	23-Mar-2019 01:52	241_CCB.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030882

Run ID:ICPMS04_335069
Instrument:ICPMS04
Method:SW6020

CCB 1	Date: 22-Mar-2019 14:24	Seq: 5002094		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.267	0.4	2	
CCB 3	Date: 22-Mar-2019 14:36	Seq: 5002280		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.826	0.4	2	
CCB 2	Date: 22-Mar-2019 14:36	Seq: 5002097		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.826	0.4	2	
CCB 4	Date: 22-Mar-2019 15:33	Seq: 5002288		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.723	0.4	2	
	Sodium	15.32	14	200	
CCB 5	Date: 22-Mar-2019 16:13	Seq: 5002307		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Iron	13.47	12	200	
	Sodium	37.74	14	200	
CCB 6	Date: 22-Mar-2019 16:43	Seq: 5002516		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.122	0.4	2	
	Sodium	117.5	14	200	
CCB 7	Date: 22-Mar-2019 17:23	Seq: 5002620		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.888	0.4	2	
	Sodium	28.56	14	200	
CCB 8	Date: 22-Mar-2019 18:00	Seq: 5002696		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	3.253	0.4	2	
	Sodium	25.08	14	200	
CCB 9	Date: 22-Mar-2019 18:29	Seq: 5002742		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	36.31	14	200	
CCB 10	Date: 22-Mar-2019 21:34	Seq: 5002836		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	2.883	0.4	2	
	Sodium	20.39	14	200	
CCB 11	Date: 22-Mar-2019 21:57	Seq: 5002846		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	2.832	0.4	2	
	Sodium	28.03	14	200	
CCB 13	Date: 22-Mar-2019 22:44	Seq: 5002869		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.559	0.4	2	
	Sodium	32.03	14	200	

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030882

Run ID:ICPMS04_335069
Instrument:ICPMS04
Method:SW6020

CCB 14	Date: 22-Mar-2019 23:04	Seq: 5003278	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	2.117	0.4	2	
Sodium	39.77	14	200	

CCB 15	Date: 22-Mar-2019 23:59	Seq: 5003291	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	176.3	14	200	

CCB 16	Date: 23-Mar-2019 00:20	Seq: 5003300	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.019	0.4	2	
Sodium	82.72	14	200	

CCB 17	Date: 23-Mar-2019 00:38	Seq: 5003308	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.022	0.4	2	
Sodium	62.1	14	200	

CCB 18	Date: 23-Mar-2019 00:58	Seq: 5003317	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.646	0.4	2	
Sodium	77.38	14	200	

CCB 19	Date: 23-Mar-2019 01:25	Seq: 5003329	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.882	0.4	2	
Iron	20.49	12	200	
Magnesium	21.18	10	200	
Potassium	44.4	18	200	
Sodium	3224	14	200	

CCB 20	Date: 23-Mar-2019 01:52	Seq: 5003341	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.8	0.4	2	
Potassium	23.51	18	200	
Sodium	678.7	14	200	

CCB 21	Date: 23-Mar-2019 01:58	Seq: 5003344	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.99	0.4	2	
Potassium	19.57	18	200	
Sodium	520.5	14	200	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030882
Start Date: 25-Mar-2019 End Date: 25-Mar-2019

Run ID:ICPMS04_335170
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	25-Mar-2019 12:22	021_ICV.d	AS CA CD FE K MG NA P PB SB SE
LLICV2	1	25-Mar-2019 12:24	022SMPL.d	AS CA CD FE K MG P PB SB SE
LLICV5	1	25-Mar-2019 12:27	023LICV.d	AS CA CD FE K MG P PB SB SE
ICB	1	25-Mar-2019 12:29	024_ICB.d	AS CA CD FE K MG NA P PB SB SE
ICSA	1	25-Mar-2019 12:34	025ICSA.d	AS CA CD FE K MG P PB SB SE
ICSAB	1	25-Mar-2019 12:37	026ICSB.d	AS CA CD FE K MG P PB SB SE
MBLK-138938	1	25-Mar-2019 12:47	028SMPL.d	SB
LCS-138938	1	25-Mar-2019 12:49	029SMPL.d	SB
ZZZZZZSD	50	25-Mar-2019 12:58	033SMPL.d	CA K MG NA
ZZZZZZPDS	10	25-Mar-2019 13:00	034SMPL.d	CA NA
CCV 1	1	25-Mar-2019 13:05	036_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 1	1	25-Mar-2019 13:07	037_CCB.d	AS CA CD FE K MG NA P PB SB SE
20190312-DGW-MW3-PV40out-controlD	1	25-Mar-2019 13:09	038SMPL.d	AS CA CD FE K MG PB SB SE
20190312-DGW-MW3-PV40out-30D	1	25-Mar-2019 13:11	039SMPL.d	AS CA CD FE K MG PB SB SE
20190312-DGW-MW3-PV40out-35D	1	25-Mar-2019 13:14	040SMPL.d	AS CA CD FE K MG PB SB SE
20190312-DGW-MW3-PV40out-40D	1	25-Mar-2019 13:16	041SMPL.d	AS CA CD FE K MG PB SB SE
20190313-DGW-MW3-PV40inlet-controlD	1	25-Mar-2019 13:18	042SMPL.d	AS CA CD FE K MG PB SB SE
20190313-DGW-MW3-PV40inlet-30-35-40D	1	25-Mar-2019 13:20	043SMPL.d	AS CA CD FE K MG PB SB SE
20190313-DGW-MW3-PV40mid-controlD	1	25-Mar-2019 13:23	044SMPL.d	AS CA CD FE K MG PB SB SE
20190313-DGW-MW3-PV40mid-30D	1	25-Mar-2019 13:25	045SMPL.d	AS CA CD FE K MG PB SB SE
20190313-DGW-MW3-PV40mid-35D	1	25-Mar-2019 13:27	046SMPL.d	AS CA CD FE K MG PB SB SE
CCV 2	1	25-Mar-2019 13:32	048_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 2	1	25-Mar-2019 13:34	049_CCB.d	AS CA CD FE K MG NA P PB SB SE
20190313-DGW-MW3-PV40mid-40D	1	25-Mar-2019 13:47	050SMPL.d	AS CA CD FE K MG PB SB SE
20190313-DGW-MW3-PV40inlet-30-35-40D-DUP	1	25-Mar-2019 13:49	051SMPL.d	AS CA CD FE K MG P PB SB SE
CCB 3	1	25-Mar-2019 14:11	061_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 3	1	25-Mar-2019 14:16	063_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 4	1	25-Mar-2019 14:46	073_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 4	1	25-Mar-2019 15:00	075_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 5	1	25-Mar-2019 15:26	086SMPL.d	AS CA CD FE K MG NA P PB SB SE
CCV 5	1	25-Mar-2019 15:30	088_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCV 6	1	25-Mar-2019 16:03	098_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 6	1	25-Mar-2019 16:06	099_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 7	1	25-Mar-2019 16:31	110_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 7	1	25-Mar-2019 16:34	111_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 8	1	25-Mar-2019 16:59	122_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 8	1	25-Mar-2019 17:01	123_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 9	1	25-Mar-2019 17:26	134_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 9	1	25-Mar-2019 17:28	135_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 10	1	25-Mar-2019 17:54	145_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 10	1	25-Mar-2019 17:56	146_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCB 11	1	25-Mar-2019 18:12	153_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 11	1	25-Mar-2019 18:17	155_CCV.d	AS CA CD FE K MG NA P PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030882

Run ID:ICPMS04_335170
Instrument:ICPMS04
Method:SW6020

ICB	Date: 25-Mar-2019 12:29	Seq: 5004572		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.424	0.4	2	
CCB 1	Date: 25-Mar-2019 13:07	Seq: 5004759		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	2.261	0.4	2	
	Sodium	29.94	14	200	
CCB 2	Date: 25-Mar-2019 13:34	Seq: 5004771		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.93	0.4	2	
	Sodium	61.13	14	200	
CCB 3	Date: 25-Mar-2019 14:11	Seq: 5004924		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.574	0.4	2	
	Sodium	39.44	14	200	
CCB 4	Date: 25-Mar-2019 14:46	Seq: 5005013		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.49	0.4	2	
	Sodium	118.3	14	200	
CCB 5	Date: 25-Mar-2019 15:26	Seq: 5005126		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.648	0.4	2	
	Sodium	57.76	14	200	
CCB 6	Date: 25-Mar-2019 16:06	Seq: 5005563		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.655	0.4	2	
	Sodium	43.94	14	200	
CCB 7	Date: 25-Mar-2019 16:34	Seq: 5005575		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.934	0.4	2	
	Sodium	35.69	14	200	
CCB 8	Date: 25-Mar-2019 17:01	Seq: 5005701		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.203	0.4	2	
	Sodium	34.55	14	200	
CCB 9	Date: 25-Mar-2019 17:28	Seq: 5005713		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.961	0.4	2	
	Sodium	29.85	14	200	
CCB 10	Date: 25-Mar-2019 17:56	Seq: 5005724		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.122	0.4	2	
	Sodium	32.37	14	200	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19030882

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19030882-01	20190312-DGW-MW3-PV40out-controlD	Groundwater		12-Mar-2019 12:25	18-Mar-2019 09:15	☐
HS19030882-02	20190312-DGW-MW3-PV40out-30D	Groundwater		12-Mar-2019 12:25	18-Mar-2019 09:15	☐
HS19030882-03	20190312-DGW-MW3-PV40out-35D	Groundwater		12-Mar-2019 12:25	18-Mar-2019 09:15	☐
HS19030882-04	20190312-DGW-MW3-PV40out-40D	Groundwater		12-Mar-2019 12:25	18-Mar-2019 09:15	☐
HS19030882-05	20190313-DGW-MW3-PV40inlet-controlD	Groundwater		13-Mar-2019 14:00	18-Mar-2019 09:15	☐
HS19030882-06	20190313-DGW-MW3-PV40inlet-30-35-40D	Groundwater		13-Mar-2019 14:00	18-Mar-2019 09:15	☐
HS19030882-07	20190313-DGW-MW3-PV40mid-controlD	Groundwater		13-Mar-2019 13:20	18-Mar-2019 09:15	☐
HS19030882-08	20190313-DGW-MW3-PV40mid-30D	Groundwater		13-Mar-2019 13:20	18-Mar-2019 09:15	☐
HS19030882-09	20190313-DGW-MW3-PV40mid-35D	Groundwater		13-Mar-2019 13:20	18-Mar-2019 09:15	☐
HS19030882-10	20190313-DGW-MW3-PV40mid-40D	Groundwater		13-Mar-2019 13:20	18-Mar-2019 09:15	☐
HS19030882-11	20190312-DGW-MW3-PV40out-controlT	Groundwater		12-Mar-2019 12:25	18-Mar-2019 09:15	☐
HS19030882-12	20190312-DGW-MW3-PV40out-30T	Groundwater		12-Mar-2019 12:25	18-Mar-2019 09:15	☐
HS19030882-13	20190312-DGW-MW3-PV40out-35T	Groundwater		12-Mar-2019 12:25	18-Mar-2019 09:15	☐
HS19030882-14	20190312-DGW-MW3-PV40out-40T	Groundwater		12-Mar-2019 12:25	18-Mar-2019 09:15	☐
HS19030882-15	20190313-DGW-MW3-PV40inlet-controlT	Groundwater		13-Mar-2019 14:00	18-Mar-2019 09:15	☐
HS19030882-16	20190313-DGW-MW3-PV40inlet-30-35-40T	Groundwater		13-Mar-2019 14:00	18-Mar-2019 09:15	☐
HS19030882-17	20190313-DGW-MW3-PV40mid-controlT	Groundwater		13-Mar-2019 13:20	18-Mar-2019 09:15	☐
HS19030882-18	20190313-DGW-MW3-PV40mid-30T	Groundwater		13-Mar-2019 13:20	18-Mar-2019 09:15	☐
HS19030882-19	20190313-DGW-MW3-PV40mid-35T	Groundwater		13-Mar-2019 13:20	18-Mar-2019 09:15	☐
HS19030882-20	20190313-DGW-MW3-PV40mid-40T	Groundwater		13-Mar-2019 13:20	18-Mar-2019 09:15	☐
HS19030882-21	20190313-DGW-MW3-PV40inlet-30-35-40D-DUP	Groundwater		13-Mar-2019 14:00	18-Mar-2019 09:15	☐
HS19030882-22	20190313-DGW-MW3-PV40inlet-30-35-40T-DUP	Groundwater		13-Mar-2019 14:00	18-Mar-2019 09:15	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190312-DGW-MW3-PV40out-controlD
Collection Date: 12-Mar-2019 12:25

ANALYTICAL REPORT
WorkOrder:HS19030882
Lab ID:HS19030882-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 21-Mar-2019		Analyst: JCJ
Antimony	**0.000935**	J	**0.000400**	**0.00200**	**mg/L**	1	25-Mar-2019 13:09
Arsenic	**0.00280**		**0.000400**	**0.00200**	**mg/L**	1	25-Mar-2019 13:09
Cadmium	U		0.000200	0.00200	mg/L	1	25-Mar-2019 13:09
Calcium	**120**		**0.0340**	**0.500**	**mg/L**	1	25-Mar-2019 13:09
Iron	**0.0342**	J	**0.0120**	**0.200**	**mg/L**	1	25-Mar-2019 13:09
Lead	U		0.000600	0.00200	mg/L	1	25-Mar-2019 13:09
Magnesium	**21.4**		**0.0100**	**0.200**	**mg/L**	1	25-Mar-2019 13:09
Potassium	**2.09**		**0.0180**	**0.200**	**mg/L**	1	25-Mar-2019 13:09
Selenium	**0.00161**	J	**0.00110**	**0.00200**	**mg/L**	1	25-Mar-2019 13:09
Sodium	**187**		**0.0700**	**1.00**	**mg/L**	5	23-Mar-2019 00:02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190312-DGW-MW3-PV40out-30D
Collection Date: 12-Mar-2019 12:25

ANALYTICAL REPORT
WorkOrder:HS19030882
Lab ID:HS19030882-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 21-Mar-2019		Analyst: JCJ
Antimony	**0.000610**	J	**0.000400**	**0.00200**	**mg/L**	1	25-Mar-2019 13:11
Arsenic	U		0.000400	0.00200	mg/L	1	25-Mar-2019 13:11
Cadmium	U		0.000200	0.00200	mg/L	1	25-Mar-2019 13:11
Calcium	**7.17**		**0.0340**	**0.500**	**mg/L**	1	25-Mar-2019 13:11
Iron	**0.0315**	J	**0.0120**	**0.200**	**mg/L**	1	25-Mar-2019 13:11
Lead	U		0.000600	0.00200	mg/L	1	25-Mar-2019 13:11
Magnesium	**13.3**		**0.0100**	**0.200**	**mg/L**	1	25-Mar-2019 13:11
Potassium	**2.06**		**0.0180**	**0.200**	**mg/L**	1	25-Mar-2019 13:11
Selenium	U		0.00110	0.00200	mg/L	1	25-Mar-2019 13:11
Sodium	**187**		**0.0700**	**1.00**	**mg/L**	5	23-Mar-2019 00:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190312-DGW-MW3-PV40out-35D
Collection Date: 12-Mar-2019 12:25

ANALYTICAL REPORT
WorkOrder:HS19030882
Lab ID:HS19030882-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 21-Mar-2019		Analyst: JCJ
Antimony	**0.000412**	J	**0.000400**	**0.00200**	**mg/L**	1	25-Mar-2019 13:14
Arsenic	U		0.000400	0.00200	mg/L	1	25-Mar-2019 13:14
Cadmium	U		0.000200	0.00200	mg/L	1	25-Mar-2019 13:14
Calcium	**6.78**		**0.0340**	**0.500**	**mg/L**	1	25-Mar-2019 13:14
Iron	**0.0404**	J	**0.0120**	**0.200**	**mg/L**	1	25-Mar-2019 13:14
Lead	U		0.000600	0.00200	mg/L	1	25-Mar-2019 13:14
Magnesium	**10.9**		**0.0100**	**0.200**	**mg/L**	1	25-Mar-2019 13:14
Potassium	**2.13**		**0.0180**	**0.200**	**mg/L**	1	25-Mar-2019 13:14
Selenium	U		0.00110	0.00200	mg/L	1	25-Mar-2019 13:14
Sodium	**185**		**0.0700**	**1.00**	**mg/L**	5	23-Mar-2019 00:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190312-DGW-MW3-PV40out-40D
Collection Date: 12-Mar-2019 12:25

ANALYTICAL REPORT
WorkOrder:HS19030882
Lab ID:HS19030882-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 21-Mar-2019		Analyst: JCJ
Antimony	**0.000456**	J	**0.000400**	**0.00200**	**mg/L**	1	25-Mar-2019 13:16
Arsenic	U		0.000400	0.00200	mg/L	1	25-Mar-2019 13:16
Cadmium	U		0.000200	0.00200	mg/L	1	25-Mar-2019 13:16
Calcium	**6.44**		**0.0340**	**0.500**	**mg/L**	1	25-Mar-2019 13:16
Iron	**0.0404**	J	**0.0120**	**0.200**	**mg/L**	1	25-Mar-2019 13:16
Lead	U		0.000600	0.00200	mg/L	1	25-Mar-2019 13:16
Magnesium	**11.2**		**0.0100**	**0.200**	**mg/L**	1	25-Mar-2019 13:16
Potassium	**2.19**		**0.0180**	**0.200**	**mg/L**	1	25-Mar-2019 13:16
Selenium	U		0.00110	0.00200	mg/L	1	25-Mar-2019 13:16
Sodium	**188**		**0.0700**	**1.00**	**mg/L**	5	23-Mar-2019 00:09

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190313-DGW-MW3-PV40inlet-controlD
Collection Date: 13-Mar-2019 14:00

ANALYTICAL REPORT
WorkOrder:HS19030882
Lab ID:HS19030882-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 21-Mar-2019		Analyst: JCJ
Antimony	**0.000426**	J	**0.000400**	**0.00200**	**mg/L**	1	25-Mar-2019 13:18
Arsenic	**0.00501**		**0.000400**	**0.00200**	**mg/L**	1	25-Mar-2019 13:18
Cadmium	U		0.000200	0.00200	mg/L	1	25-Mar-2019 13:18
Calcium	**122**		**0.0340**	**0.500**	**mg/L**	1	25-Mar-2019 13:18
Iron	**0.0425**	J	**0.0120**	**0.200**	**mg/L**	1	25-Mar-2019 13:18
Lead	U		0.000600	0.00200	mg/L	1	25-Mar-2019 13:18
Magnesium	**21.9**		**0.0100**	**0.200**	**mg/L**	1	25-Mar-2019 13:18
Potassium	**2.13**		**0.0180**	**0.200**	**mg/L**	1	25-Mar-2019 13:18
Selenium	**0.00112**	J	**0.00110**	**0.00200**	**mg/L**	1	25-Mar-2019 13:18
Sodium	**185**		**0.0700**	**1.00**	**mg/L**	5	23-Mar-2019 00:11

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190313-DGW-MW3-PV40inlet-30-35-40D
Collection Date: 13-Mar-2019 14:00

ANALYTICAL REPORT
WorkOrder:HS19030882
Lab ID:HS19030882-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 21-Mar-2019		Analyst: JCJ
Antimony	**0.000402**	J	**0.000400**	**0.00200**	**mg/L**	1	25-Mar-2019 13:20
Arsenic	**0.00556**		**0.000400**	**0.00200**	**mg/L**	1	25-Mar-2019 13:20
Cadmium	U		0.000200	0.00200	mg/L	1	25-Mar-2019 13:20
Calcium	**120**		**0.0340**	**0.500**	**mg/L**	1	25-Mar-2019 13:20
Iron	**0.0305**	J	**0.0120**	**0.200**	**mg/L**	1	25-Mar-2019 13:20
Lead	U		0.000600	0.00200	mg/L	1	25-Mar-2019 13:20
Magnesium	**21.5**		**0.0100**	**0.200**	**mg/L**	1	25-Mar-2019 13:20
Potassium	**2.02**		**0.0180**	**0.200**	**mg/L**	1	25-Mar-2019 13:20
Selenium	**0.00138**	J	**0.00110**	**0.00200**	**mg/L**	1	25-Mar-2019 13:20
Sodium	**186**		**0.0700**	**1.00**	**mg/L**	5	23-Mar-2019 00:13

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190313-DGW-MW3-PV40mid-controlD
Collection Date: 13-Mar-2019 13:20

ANALYTICAL REPORT
WorkOrder:HS19030882
Lab ID:HS19030882-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 21-Mar-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	25-Mar-2019 13:23
Arsenic	**0.00499**		**0.000400**	**0.00200**	**mg/L**	1	25-Mar-2019 13:23
Cadmium	U		0.000200	0.00200	mg/L	1	25-Mar-2019 13:23
Calcium	**120**		**0.0340**	**0.500**	**mg/L**	1	25-Mar-2019 13:23
Iron	**0.0176**	J	**0.0120**	**0.200**	**mg/L**	1	25-Mar-2019 13:23
Lead	U		0.000600	0.00200	mg/L	1	25-Mar-2019 13:23
Magnesium	**22.0**		**0.0100**	**0.200**	**mg/L**	1	25-Mar-2019 13:23
Potassium	**2.12**		**0.0180**	**0.200**	**mg/L**	1	25-Mar-2019 13:23
Selenium	U		0.00110	0.00200	mg/L	1	25-Mar-2019 13:23
Sodium	**200**		**0.0700**	**1.00**	**mg/L**	5	23-Mar-2019 00:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190313-DGW-MW3-PV40mid-30D
Collection Date: 13-Mar-2019 13:20

ANALYTICAL REPORT
WorkOrder:HS19030882
Lab ID:HS19030882-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 21-Mar-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	25-Mar-2019 13:25
Arsenic	U		0.000400	0.00200	mg/L	1	25-Mar-2019 13:25
Cadmium	U		0.000200	0.00200	mg/L	1	25-Mar-2019 13:25
Calcium	**8.87**		**0.0340**	**0.500**	**mg/L**	1	25-Mar-2019 13:25
Iron	**0.0148**	J	**0.0120**	**0.200**	**mg/L**	1	25-Mar-2019 13:25
Lead	U		0.000600	0.00200	mg/L	1	25-Mar-2019 13:25
Magnesium	**14.7**		**0.0100**	**0.200**	**mg/L**	1	25-Mar-2019 13:25
Potassium	**1.97**		**0.0180**	**0.200**	**mg/L**	1	25-Mar-2019 13:25
Selenium	U		0.00110	0.00200	mg/L	1	25-Mar-2019 13:25
Sodium	**183**		**0.0700**	**1.00**	**mg/L**	5	23-Mar-2019 00:22

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190313-DGW-MW3-PV40mid-35D
Collection Date: 13-Mar-2019 13:20

ANALYTICAL REPORT
WorkOrder:HS19030882
Lab ID:HS19030882-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 21-Mar-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	25-Mar-2019 13:27
Arsenic	U		0.000400	0.00200	mg/L	1	25-Mar-2019 13:27
Cadmium	U		0.000200	0.00200	mg/L	1	25-Mar-2019 13:27
Calcium	**9.85**		**0.0340**	**0.500**	**mg/L**	1	25-Mar-2019 13:27
Iron	**0.0258**	J	**0.0120**	**0.200**	**mg/L**	1	25-Mar-2019 13:27
Lead	U		0.000600	0.00200	mg/L	1	25-Mar-2019 13:27
Magnesium	**14.8**		**0.0100**	**0.200**	**mg/L**	1	25-Mar-2019 13:27
Potassium	**1.98**		**0.0180**	**0.200**	**mg/L**	1	25-Mar-2019 13:27
Selenium	U		0.00110	0.00200	mg/L	1	25-Mar-2019 13:27
Sodium	**176**		**0.0700**	**1.00**	**mg/L**	5	23-Mar-2019 00:24

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190313-DGW-MW3-PV40mid-40D
Collection Date: 13-Mar-2019 13:20

ANALYTICAL REPORT
WorkOrder:HS19030882
Lab ID:HS19030882-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 21-Mar-2019		Analyst: JCJ
Antimony	**0.000832**	J	**0.000400**	**0.00200**	**mg/L**	1	25-Mar-2019 13:47
Arsenic	U		0.000400	0.00200	mg/L	1	25-Mar-2019 13:47
Cadmium	U		0.000200	0.00200	mg/L	1	25-Mar-2019 13:47
Calcium	**8.26**		**0.0340**	**0.500**	**mg/L**	1	25-Mar-2019 13:47
Iron	U		0.0120	0.200	mg/L	1	25-Mar-2019 13:47
Lead	U		0.000600	0.00200	mg/L	1	25-Mar-2019 13:47
Magnesium	**14.0**		**0.0100**	**0.200**	**mg/L**	1	25-Mar-2019 13:47
Potassium	**2.05**		**0.0180**	**0.200**	**mg/L**	1	25-Mar-2019 13:47
Selenium	U		0.00110	0.00200	mg/L	1	25-Mar-2019 13:47
Sodium	**180**		**0.0700**	**1.00**	**mg/L**	5	23-Mar-2019 00:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190312-DGW-MW3-PV40out-controlT
Collection Date: 12-Mar-2019 12:25

ANALYTICAL REPORT
WorkOrder:HS19030882
Lab ID:HS19030882-11
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JCJ
Hardness (As CaCO3)	**374**		**2.00**	**2.00**	**mg/L**	1	25-Mar-2019 17:06
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Mar-2019		Analyst: JCJ
Antimony	**0.000761**	J	**0.000400**	**0.00200**	**mg/L**	1	22-Mar-2019 15:37
Arsenic	**0.00298**		**0.000400**	**0.00200**	**mg/L**	1	22-Mar-2019 15:37
Cadmium	U		0.000200	0.00200	mg/L	1	22-Mar-2019 15:37
Calcium	**116**		**0.0340**	**0.500**	**mg/L**	1	22-Mar-2019 15:37
Iron	**0.0909**	J	**0.0120**	**0.200**	**mg/L**	1	22-Mar-2019 15:37
Lead	U		0.000600	0.00200	mg/L	1	22-Mar-2019 15:37
Magnesium	**20.6**		**0.0100**	**0.200**	**mg/L**	1	22-Mar-2019 15:37
Potassium	**2.05**		**0.0180**	**0.200**	**mg/L**	1	22-Mar-2019 15:37
Selenium	**0.00126**	J	**0.00110**	**0.00200**	**mg/L**	1	22-Mar-2019 15:37
Sodium	**188**		**0.0700**	**1.00**	**mg/L**	5	21-Mar-2019 18:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190312-DGW-MW3-PV40out-30T
Collection Date: 12-Mar-2019 12:25

ANALYTICAL REPORT
WorkOrder:HS19030882
Lab ID:HS19030882-12
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JCJ
Hardness (As CaCO3)	**73.3**		**2.00**	**2.00**	**mg/L**	1	25-Mar-2019 17:06
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Mar-2019		Analyst: JCJ
Antimony	**0.000648**	J	**0.000400**	**0.00200**	**mg/L**	1	22-Mar-2019 16:19
Arsenic	U		0.000400	0.00200	mg/L	1	22-Mar-2019 16:19
Cadmium	U		0.000200	0.00200	mg/L	1	22-Mar-2019 16:19
Calcium	**7.10**		**0.0340**	**0.500**	**mg/L**	1	22-Mar-2019 16:19
Iron	**0.124**	J	**0.0120**	**0.200**	**mg/L**	1	22-Mar-2019 16:19
Lead	U		0.000600	0.00200	mg/L	1	22-Mar-2019 16:19
Magnesium	**13.5**		**0.0100**	**0.200**	**mg/L**	1	22-Mar-2019 16:19
Potassium	**2.09**		**0.0180**	**0.200**	**mg/L**	1	22-Mar-2019 16:19
Selenium	U		0.00110	0.00200	mg/L	1	22-Mar-2019 16:19
Sodium	**183**		**0.0700**	**1.00**	**mg/L**	5	21-Mar-2019 18:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190312-DGW-MW3-PV40out-35T
Collection Date: 12-Mar-2019 12:25

ANALYTICAL REPORT
WorkOrder:HS19030882
Lab ID:HS19030882-13
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JCJ
Hardness (As CaCO3)	**60.5**		**2.00**	**2.00**	**mg/L**	1	25-Mar-2019 17:06
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Mar-2019		Analyst: JCJ
Antimony	**0.000455**	J	**0.000400**	**0.00200**	**mg/L**	1	22-Mar-2019 16:21
Arsenic	U		0.000400	0.00200	mg/L	1	22-Mar-2019 16:21
Cadmium	U		0.000200	0.00200	mg/L	1	22-Mar-2019 16:21
Calcium	**6.59**		**0.0340**	**0.500**	**mg/L**	1	22-Mar-2019 16:21
Iron	**0.0367**	J	**0.0120**	**0.200**	**mg/L**	1	22-Mar-2019 16:21
Lead	U		0.000600	0.00200	mg/L	1	22-Mar-2019 16:21
Magnesium	**10.7**		**0.0100**	**0.200**	**mg/L**	1	22-Mar-2019 16:21
Potassium	**2.15**		**0.0180**	**0.200**	**mg/L**	1	22-Mar-2019 16:21
Selenium	U		0.00110	0.00200	mg/L	1	22-Mar-2019 16:21
Sodium	**195**		**0.0700**	**1.00**	**mg/L**	5	21-Mar-2019 18:51

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190312-DGW-MW3-PV40out-40T
Collection Date: 12-Mar-2019 12:25

ANALYTICAL REPORT
WorkOrder:HS19030882
Lab ID:HS19030882-14
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JCJ
Hardness (As CaCO3)	**54.8**		**2.00**	**2.00**	**mg/L**	1	25-Mar-2019 17:06
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Mar-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	22-Mar-2019 16:23
Arsenic	U		0.000400	0.00200	mg/L	1	22-Mar-2019 16:23
Cadmium	U		0.000200	0.00200	mg/L	1	22-Mar-2019 16:23
Calcium	**5.67**		**0.0340**	**0.500**	**mg/L**	1	22-Mar-2019 16:23
Iron	**0.0350**	J	**0.0120**	**0.200**	**mg/L**	1	22-Mar-2019 16:23
Lead	U		0.000600	0.00200	mg/L	1	22-Mar-2019 16:23
Magnesium	**9.86**		**0.0100**	**0.200**	**mg/L**	1	22-Mar-2019 16:23
Potassium	**2.00**		**0.0180**	**0.200**	**mg/L**	1	22-Mar-2019 16:23
Selenium	U		0.00110	0.00200	mg/L	1	22-Mar-2019 16:23
Sodium	**184**		**0.0700**	**1.00**	**mg/L**	5	21-Mar-2019 18:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190313-DGW-MW3-PV40inlet-controlT
Collection Date: 13-Mar-2019 14:00

ANALYTICAL REPORT
WorkOrder:HS19030882
Lab ID:HS19030882-15
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JCJ
Hardness (As CaCO3)	**354**		**2.00**	**2.00**	**mg/L**	1	25-Mar-2019 17:06
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Mar-2019		Analyst: JCJ
Antimony	**0.000524**	J	**0.000400**	**0.00200**	**mg/L**	1	22-Mar-2019 16:26
Arsenic	**0.0248**		**0.000400**	**0.00200**	**mg/L**	1	22-Mar-2019 16:26
Cadmium	U		0.000200	0.00200	mg/L	1	22-Mar-2019 16:26
Calcium	**109**		**0.0340**	**0.500**	**mg/L**	1	22-Mar-2019 16:26
Iron	**2.17**		**0.0120**	**0.200**	**mg/L**	1	22-Mar-2019 16:26
Lead	U		0.000600	0.00200	mg/L	1	22-Mar-2019 16:26
Magnesium	**19.9**		**0.0100**	**0.200**	**mg/L**	1	22-Mar-2019 16:26
Potassium	**1.95**		**0.0180**	**0.200**	**mg/L**	1	22-Mar-2019 16:26
Selenium	**0.00179**	J	**0.00110**	**0.00200**	**mg/L**	1	22-Mar-2019 16:26
Sodium	**186**		**0.0700**	**1.00**	**mg/L**	5	21-Mar-2019 18:56

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190313-DGW-MW3-PV40inlet-30-35-40T
Collection Date: 13-Mar-2019 14:00

ANALYTICAL REPORT
WorkOrder:HS19030882
Lab ID:HS19030882-16
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JCJ
Hardness (As CaCO3)	**355**		**2.00**	**2.00**	**mg/L**	1	25-Mar-2019 17:06
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Mar-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	22-Mar-2019 16:28
Arsenic	**0.00905**		**0.000400**	**0.00200**	**mg/L**	1	22-Mar-2019 16:28
Cadmium	U		0.000200	0.00200	mg/L	1	22-Mar-2019 16:28
Calcium	**110**		**0.0340**	**0.500**	**mg/L**	1	22-Mar-2019 16:28
Iron	**0.475**		**0.0120**	**0.200**	**mg/L**	1	22-Mar-2019 16:28
Lead	U		0.000600	0.00200	mg/L	1	22-Mar-2019 16:28
Magnesium	**19.5**		**0.0100**	**0.200**	**mg/L**	1	22-Mar-2019 16:28
Potassium	**1.88**		**0.0180**	**0.200**	**mg/L**	1	22-Mar-2019 16:28
Selenium	**0.00160**	J	**0.00110**	**0.00200**	**mg/L**	1	22-Mar-2019 16:28
Sodium	**182**		**0.0700**	**1.00**	**mg/L**	5	21-Mar-2019 18:58

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190313-DGW-MW3-PV40mid-controlT
Collection Date: 13-Mar-2019 13:20

ANALYTICAL REPORT
WorkOrder:HS19030882
Lab ID:HS19030882-17
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JCJ
Hardness (As CaCO3)	**362**		**2.00**	**2.00**	**mg/L**	1	25-Mar-2019 17:06
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Mar-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	22-Mar-2019 16:30
Arsenic	**0.00514**		**0.000400**	**0.00200**	**mg/L**	1	22-Mar-2019 16:30
Cadmium	U		0.000200	0.00200	mg/L	1	22-Mar-2019 16:30
Calcium	**111**		**0.0340**	**0.500**	**mg/L**	1	22-Mar-2019 16:30
Iron	**0.0953**	J	**0.0120**	**0.200**	**mg/L**	1	22-Mar-2019 16:30
Lead	U		0.000600	0.00200	mg/L	1	22-Mar-2019 16:30
Magnesium	**20.5**		**0.0100**	**0.200**	**mg/L**	1	22-Mar-2019 16:30
Potassium	**1.99**		**0.0180**	**0.200**	**mg/L**	1	22-Mar-2019 16:30
Selenium	**0.00123**	J	**0.00110**	**0.00200**	**mg/L**	1	22-Mar-2019 16:30
Sodium	**194**		**0.0700**	**1.00**	**mg/L**	5	21-Mar-2019 19:01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190313-DGW-MW3-PV40mid-30T
Collection Date: 13-Mar-2019 13:20

ANALYTICAL REPORT
WorkOrder:HS19030882
Lab ID:HS19030882-18
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JCJ
Hardness (As CaCO3)	**80.6**		**2.00**	**2.00**	**mg/L**	1	25-Mar-2019 17:06
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Mar-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	22-Mar-2019 16:32
Arsenic	U		0.000400	0.00200	mg/L	1	22-Mar-2019 16:32
Cadmium	U		0.000200	0.00200	mg/L	1	22-Mar-2019 16:32
Calcium	**8.51**		**0.0340**	**0.500**	**mg/L**	1	22-Mar-2019 16:32
Iron	**0.0706**	J	**0.0120**	**0.200**	**mg/L**	1	22-Mar-2019 16:32
Lead	U		0.000600	0.00200	mg/L	1	22-Mar-2019 16:32
Magnesium	**14.4**		**0.0100**	**0.200**	**mg/L**	1	22-Mar-2019 16:32
Potassium	**1.91**		**0.0180**	**0.200**	**mg/L**	1	22-Mar-2019 16:32
Selenium	U		0.00110	0.00200	mg/L	1	22-Mar-2019 16:32
Sodium	**193**		**0.0700**	**1.00**	**mg/L**	5	21-Mar-2019 19:03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190313-DGW-MW3-PV40mid-35T
Collection Date: 13-Mar-2019 13:20

ANALYTICAL REPORT
WorkOrder:HS19030882
Lab ID:HS19030882-19
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JCJ
Hardness (As CaCO3)	**79.9**		**2.00**	**2.00**	**mg/L**	1	25-Mar-2019 17:06
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Mar-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	22-Mar-2019 16:35
Arsenic	U		0.000400	0.00200	mg/L	1	22-Mar-2019 16:35
Cadmium	U		0.000200	0.00200	mg/L	1	22-Mar-2019 16:35
Calcium	**9.24**		**0.0340**	**0.500**	**mg/L**	1	22-Mar-2019 16:35
Iron	**0.199**	J	**0.0120**	**0.200**	**mg/L**	1	22-Mar-2019 16:35
Lead	U		0.000600	0.00200	mg/L	1	22-Mar-2019 16:35
Magnesium	**13.8**		**0.0100**	**0.200**	**mg/L**	1	22-Mar-2019 16:35
Potassium	**1.88**		**0.0180**	**0.200**	**mg/L**	1	22-Mar-2019 16:35
Selenium	U		0.00110	0.00200	mg/L	1	22-Mar-2019 16:35
Sodium	**186**		**0.0700**	**1.00**	**mg/L**	5	21-Mar-2019 19:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190313-DGW-MW3-PV40mid-40T
Collection Date: 13-Mar-2019 13:20

ANALYTICAL REPORT
WorkOrder:HS19030882
Lab ID:HS19030882-20
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JCJ
Hardness (As CaCO3)	**78.5**		**2.00**	**2.00**	**mg/L**	1	25-Mar-2019 17:06
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Mar-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	22-Mar-2019 16:37
Arsenic	U		0.000400	0.00200	mg/L	1	22-Mar-2019 16:37
Cadmium	U		0.000200	0.00200	mg/L	1	22-Mar-2019 16:37
Calcium	**8.34**		**0.0340**	**0.500**	**mg/L**	1	22-Mar-2019 16:37
Iron	**0.120**	J	**0.0120**	**0.200**	**mg/L**	1	22-Mar-2019 16:37
Lead	U		0.000600	0.00200	mg/L	1	22-Mar-2019 16:37
Magnesium	**14.0**		**0.0100**	**0.200**	**mg/L**	1	22-Mar-2019 16:37
Potassium	**2.03**		**0.0180**	**0.200**	**mg/L**	1	22-Mar-2019 16:37
Selenium	U		0.00110	0.00200	mg/L	1	22-Mar-2019 16:37
Sodium	**183**		**0.0700**	**1.00**	**mg/L**	5	21-Mar-2019 19:07

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190313-DGW-MW3-PV40inlet-30-35-40D-DUP
Collection Date: 13-Mar-2019 14:00

ANALYTICAL REPORT
WorkOrder:HS19030882
Lab ID:HS19030882-21
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 21-Mar-2019		Analyst: JCJ
Antimony	**0.000616**	J	**0.000400**	**0.00200**	**mg/L**	1	25-Mar-2019 13:49
Arsenic	**0.00541**		**0.000400**	**0.00200**	**mg/L**	1	25-Mar-2019 13:49
Cadmium	U		0.000200	0.00200	mg/L	1	25-Mar-2019 13:49
Calcium	**123**		**0.0340**	**0.500**	**mg/L**	1	25-Mar-2019 13:49
Iron	**0.0227**	J	**0.0120**	**0.200**	**mg/L**	1	25-Mar-2019 13:49
Lead	U		0.000600	0.00200	mg/L	1	25-Mar-2019 13:49
Magnesium	**21.2**		**0.0100**	**0.200**	**mg/L**	1	25-Mar-2019 13:49
Potassium	**2.04**		**0.0180**	**0.200**	**mg/L**	1	25-Mar-2019 13:49
Selenium	**0.00152**	J	**0.00110**	**0.00200**	**mg/L**	1	25-Mar-2019 13:49
Sodium	**179**		**0.0700**	**1.00**	**mg/L**	5	23-Mar-2019 00:29

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190313-DGW-MW3-PV40inlet-30-35-40T-DUP
Collection Date: 13-Mar-2019 14:00

ANALYTICAL REPORT
WorkOrder:HS19030882
Lab ID:HS19030882-22
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JCJ
Hardness (As CaCO3)	**357**		**2.00**	**2.00**	**mg/L**	1	25-Mar-2019 17:06
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Mar-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	22-Mar-2019 16:39
Arsenic	**0.00923**		**0.000400**	**0.00200**	**mg/L**	1	22-Mar-2019 16:39
Cadmium	U		0.000200	0.00200	mg/L	1	22-Mar-2019 16:39
Calcium	**109**		**0.0340**	**0.500**	**mg/L**	1	22-Mar-2019 16:39
Iron	**0.461**		**0.0120**	**0.200**	**mg/L**	1	22-Mar-2019 16:39
Lead	U		0.000600	0.00200	mg/L	1	22-Mar-2019 16:39
Magnesium	**20.7**		**0.0100**	**0.200**	**mg/L**	1	22-Mar-2019 16:39
Potassium	**1.95**		**0.0180**	**0.200**	**mg/L**	1	22-Mar-2019 16:39
Selenium	**0.00116**	J	**0.00110**	**0.00200**	**mg/L**	1	22-Mar-2019 16:39
Sodium	**192**		**0.0700**	**1.00**	**mg/L**	5	21-Mar-2019 19:10

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030882

Batch ID: 138890 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19030882-11	1	10	10 (mL)	1
HS19030882-12	1	10	10 (mL)	1
HS19030882-13	1	10	10 (mL)	1
HS19030882-14	1	10	10 (mL)	1
HS19030882-15	1	10	10 (mL)	1
HS19030882-16	1	10	10 (mL)	1
HS19030882-17	1	10	10 (mL)	1
HS19030882-18	1	10	10 (mL)	1
HS19030882-19	1	10	10 (mL)	1
HS19030882-20	1	10	10 (mL)	1
HS19030882-22	1	10	10 (mL)	1

Batch ID: 138938 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19030882-01	1	10	10 (mL)	1
HS19030882-02	1	10	10 (mL)	1
HS19030882-03	1	10	10 (mL)	1
HS19030882-04	1	10	10 (mL)	1
HS19030882-05	1	10	10 (mL)	1
HS19030882-06	1	10	10 (mL)	1
HS19030882-07	1	10	10 (mL)	1
HS19030882-08	1	10	10 (mL)	1
HS19030882-09	1	10	10 (mL)	1
HS19030882-10	1	10	10 (mL)	1
HS19030882-21	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030882

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 138890	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19030882-11	20190312-DGW-MW3-PV40out-controlT	12 Mar 2019 12:25		20 Mar 2019 10:30	22 Mar 2019 15:37	1
HS19030882-11	20190312-DGW-MW3-PV40out-controlT	12 Mar 2019 12:25		20 Mar 2019 10:30	21 Mar 2019 18:31	5
HS19030882-12	20190312-DGW-MW3-PV40out-30T	12 Mar 2019 12:25		20 Mar 2019 10:30	22 Mar 2019 16:19	1
HS19030882-12	20190312-DGW-MW3-PV40out-30T	12 Mar 2019 12:25		20 Mar 2019 10:30	21 Mar 2019 18:42	5
HS19030882-13	20190312-DGW-MW3-PV40out-35T	12 Mar 2019 12:25		20 Mar 2019 10:30	22 Mar 2019 16:21	1
HS19030882-13	20190312-DGW-MW3-PV40out-35T	12 Mar 2019 12:25		20 Mar 2019 10:30	21 Mar 2019 18:51	5
HS19030882-14	20190312-DGW-MW3-PV40out-40T	12 Mar 2019 12:25		20 Mar 2019 10:30	22 Mar 2019 16:23	1
HS19030882-14	20190312-DGW-MW3-PV40out-40T	12 Mar 2019 12:25		20 Mar 2019 10:30	21 Mar 2019 18:54	5
HS19030882-15	20190313-DGW-MW3-PV40inlet-controlT	13 Mar 2019 14:00		20 Mar 2019 10:30	22 Mar 2019 16:26	1
HS19030882-15	20190313-DGW-MW3-PV40inlet-controlT	13 Mar 2019 14:00		20 Mar 2019 10:30	21 Mar 2019 18:56	5
HS19030882-16	20190313-DGW-MW3-PV40inlet-30-35-40T	13 Mar 2019 14:00		20 Mar 2019 10:30	22 Mar 2019 16:28	1
HS19030882-16	20190313-DGW-MW3-PV40inlet-30-35-40T	13 Mar 2019 14:00		20 Mar 2019 10:30	21 Mar 2019 18:58	5
HS19030882-17	20190313-DGW-MW3-PV40mid-controlT	13 Mar 2019 13:20		20 Mar 2019 10:30	22 Mar 2019 16:30	1
HS19030882-17	20190313-DGW-MW3-PV40mid-controlT	13 Mar 2019 13:20		20 Mar 2019 10:30	21 Mar 2019 19:01	5
HS19030882-18	20190313-DGW-MW3-PV40mid-30T	13 Mar 2019 13:20		20 Mar 2019 10:30	22 Mar 2019 16:32	1
HS19030882-18	20190313-DGW-MW3-PV40mid-30T	13 Mar 2019 13:20		20 Mar 2019 10:30	21 Mar 2019 19:03	5
HS19030882-19	20190313-DGW-MW3-PV40mid-35T	13 Mar 2019 13:20		20 Mar 2019 10:30	22 Mar 2019 16:35	1
HS19030882-19	20190313-DGW-MW3-PV40mid-35T	13 Mar 2019 13:20		20 Mar 2019 10:30	21 Mar 2019 19:05	5
HS19030882-20	20190313-DGW-MW3-PV40mid-40T	13 Mar 2019 13:20		20 Mar 2019 10:30	22 Mar 2019 16:37	1
HS19030882-20	20190313-DGW-MW3-PV40mid-40T	13 Mar 2019 13:20		20 Mar 2019 10:30	21 Mar 2019 19:07	5
HS19030882-22	20190313-DGW-MW3-PV40inlet-30-35-40T-DUP	13 Mar 2019 14:00		20 Mar 2019 10:30	22 Mar 2019 16:39	1
HS19030882-22	20190313-DGW-MW3-PV40inlet-30-35-40T-DUP	13 Mar 2019 14:00		20 Mar 2019 10:30	21 Mar 2019 19:10	5

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030882

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 138938	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS19030882-01	20190312-DGW-MW3-PV40out-controlD	12 Mar 2019 12:25		21 Mar 2019 10:00	25 Mar 2019 13:09	1
HS19030882-01	20190312-DGW-MW3-PV40out-controlD	12 Mar 2019 12:25		21 Mar 2019 10:00	23 Mar 2019 00:02	5
HS19030882-02	20190312-DGW-MW3-PV40out-30D	12 Mar 2019 12:25		21 Mar 2019 10:00	25 Mar 2019 13:11	1
HS19030882-02	20190312-DGW-MW3-PV40out-30D	12 Mar 2019 12:25		21 Mar 2019 10:00	23 Mar 2019 00:04	5
HS19030882-03	20190312-DGW-MW3-PV40out-35D	12 Mar 2019 12:25		21 Mar 2019 10:00	25 Mar 2019 13:14	1
HS19030882-03	20190312-DGW-MW3-PV40out-35D	12 Mar 2019 12:25		21 Mar 2019 10:00	23 Mar 2019 00:06	5
HS19030882-04	20190312-DGW-MW3-PV40out-40D	12 Mar 2019 12:25		21 Mar 2019 10:00	25 Mar 2019 13:16	1
HS19030882-04	20190312-DGW-MW3-PV40out-40D	12 Mar 2019 12:25		21 Mar 2019 10:00	23 Mar 2019 00:09	5
HS19030882-05	20190313-DGW-MW3-PV40inlet-controlD	13 Mar 2019 14:00		21 Mar 2019 10:00	25 Mar 2019 13:18	1
HS19030882-05	20190313-DGW-MW3-PV40inlet-controlD	13 Mar 2019 14:00		21 Mar 2019 10:00	23 Mar 2019 00:11	5
HS19030882-06	20190313-DGW-MW3-PV40inlet-30-35-40D	13 Mar 2019 14:00		21 Mar 2019 10:00	25 Mar 2019 13:20	1
HS19030882-06	20190313-DGW-MW3-PV40inlet-30-35-40D	13 Mar 2019 14:00		21 Mar 2019 10:00	23 Mar 2019 00:13	5
HS19030882-07	20190313-DGW-MW3-PV40mid-controlD	13 Mar 2019 13:20		21 Mar 2019 10:00	25 Mar 2019 13:23	1
HS19030882-07	20190313-DGW-MW3-PV40mid-controlD	13 Mar 2019 13:20		21 Mar 2019 10:00	23 Mar 2019 00:15	5
HS19030882-08	20190313-DGW-MW3-PV40mid-30D	13 Mar 2019 13:20		21 Mar 2019 10:00	25 Mar 2019 13:25	1
HS19030882-08	20190313-DGW-MW3-PV40mid-30D	13 Mar 2019 13:20		21 Mar 2019 10:00	23 Mar 2019 00:22	5
HS19030882-09	20190313-DGW-MW3-PV40mid-35D	13 Mar 2019 13:20		21 Mar 2019 10:00	25 Mar 2019 13:27	1
HS19030882-09	20190313-DGW-MW3-PV40mid-35D	13 Mar 2019 13:20		21 Mar 2019 10:00	23 Mar 2019 00:24	5
HS19030882-10	20190313-DGW-MW3-PV40mid-40D	13 Mar 2019 13:20		21 Mar 2019 10:00	25 Mar 2019 13:47	1
HS19030882-10	20190313-DGW-MW3-PV40mid-40D	13 Mar 2019 13:20		21 Mar 2019 10:00	23 Mar 2019 00:27	5
HS19030882-21	20190313-DGW-MW3-PV40inlet-30-35-40D-DUP	13 Mar 2019 14:00		21 Mar 2019 10:00	25 Mar 2019 13:49	1
HS19030882-21	20190313-DGW-MW3-PV40inlet-30-35-40D-DUP	13 Mar 2019 14:00		21 Mar 2019 10:00	23 Mar 2019 00:29	5

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030882

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R335228	**Test Name :** HARDNESS, TOTAL AS CACO3 BY SM2340B				**Matrix:** Groundwater	
HS19030882-11	20190312-DGW-MW3-PV40out-controlT	12 Mar 2019 12:25			25 Mar 2019 17:06	1
HS19030882-12	20190312-DGW-MW3-PV40out-30T	12 Mar 2019 12:25			25 Mar 2019 17:06	1
HS19030882-13	20190312-DGW-MW3-PV40out-35T	12 Mar 2019 12:25			25 Mar 2019 17:06	1
HS19030882-14	20190312-DGW-MW3-PV40out-40T	12 Mar 2019 12:25			25 Mar 2019 17:06	1
HS19030882-15	20190313-DGW-MW3-PV40inlet-controlT	13 Mar 2019 14:00			25 Mar 2019 17:06	1
HS19030882-16	20190313-DGW-MW3-PV40inlet-30-35-40T	13 Mar 2019 14:00			25 Mar 2019 17:06	1
HS19030882-17	20190313-DGW-MW3-PV40mid-controlT	13 Mar 2019 13:20			25 Mar 2019 17:06	1
HS19030882-18	20190313-DGW-MW3-PV40mid-30T	13 Mar 2019 13:20			25 Mar 2019 17:06	1
HS19030882-19	20190313-DGW-MW3-PV40mid-35T	13 Mar 2019 13:20			25 Mar 2019 17:06	1
HS19030882-20	20190313-DGW-MW3-PV40mid-40T	13 Mar 2019 13:20			25 Mar 2019 17:06	1
HS19030882-22	20190313-DGW-MW3-PV40inlet-30-35-40T-DUP	13 Mar 2019 14:00			25 Mar 2019 17:06	1

WorkOrder: HS19030882
InstrumentID: ICPMS04
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000521	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000340	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000553	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0523	0.0340	0.500
A	Iron	7439-89-6	0.0250	0.0205	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000916	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0700	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0418	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00274	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0556	0.0140	0.200

WorkOrder: HS19030882
InstrumentID: ICPMS04
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000521	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000340	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000553	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0523	0.0340	0.500
A	Iron	7439-89-6	0.0250	0.0205	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000916	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0700	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0418	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00274	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0556	0.0140	0.200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030882

QC BATCH REPORT NEW

Batch ID: 138890 (0) **Instrument: ICPMS04** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLK-138890** Units: **mg/L** Analysis Date: **22-Mar-2019 14:04**
Client ID: Run ID: **ICPMS04_335069** SeqNo: **5002085** PrepDate: **20-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Selenium	U	0.00200								

MBLK Sample ID: **MBLK-138890** Units: **mg/L** Analysis Date: **21-Mar-2019 17:11**
Client ID: Run ID: **ICPMS04_334969** SeqNo: **5000504** PrepDate: **20-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	U	0.200								
Potassium	U	0.200								
Sodium	U	0.200								

LCS Sample ID: **LCS-138890** Units: **mg/L** Analysis Date: **22-Mar-2019 14:07**
Client ID: Run ID: **ICPMS04_335069** SeqNo: **5002086** PrepDate: **20-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04894	0.00200	0.05	0	97.9	80 - 120				
Selenium	0.04908	0.00200	0.05	0	98.2	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030882

QC BATCH REPORT NEW

Batch ID: 138890 (0) **Instrument: ICPMS04** **Method: ICP-MS METALS BY SW6020A**

LCS Sample ID: **LCS-138890** Units: **mg/L** Analysis Date: **21-Mar-2019 17:14**
Client ID: Run ID: **ICPMS04_334969** SeqNo: **5000505** PrepDate: **20-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05079	0.00200	0.05	0	102	80 - 120				
Cadmium	0.04964	0.00200	0.05	0	99.3	80 - 120				
Calcium	5.355	0.500	5	0	107	80 - 120				
Iron	5.178	0.200	5	0	104	80 - 120				
Lead	0.04737	0.00200	0.05	0	94.7	80 - 120				
Magnesium	5.175	0.200	5	0	103	80 - 120				
Potassium	5.205	0.200	5	0	104	80 - 120				
Sodium	5.172	0.200	5	0	103	80 - 120				

MS Sample ID: **HS19030882-11MS** Units: **mg/L** Analysis Date: **22-Mar-2019 15:42**
Client ID: **20190312-DGW-MW3-PV40out-controlT** Run ID: **ICPMS04_335069** SeqNo: **5002292** PrepDate: **20-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.0517	0.00200	0.05	0.000761	102	80 - 120				
Arsenic	0.05532	0.00200	0.05	0.002979	105	80 - 120				
Cadmium	0.05064	0.00200	0.05	0.00003	101	80 - 120				
Calcium	120.8	0.500	5	116	97.4	80 - 120				O
Iron	5.294	0.200	5	0.09087	104	80 - 120				
Lead	0.05047	0.00200	0.05	0.000125	101	80 - 120				
Magnesium	25.52	0.200	5	20.6	98.3	80 - 120				O
Potassium	7.372	0.200	5	2.049	106	80 - 120				
Selenium	0.05111	0.00200	0.05	0.001263	99.7	80 - 120				

MS Sample ID: **HS19030882-11MS** Units: **mg/L** Analysis Date: **21-Mar-2019 18:36**
Client ID: **20190312-DGW-MW3-PV40out-controlT** Run ID: **ICPMS04_334969** SeqNo: **5000746** PrepDate: **20-Mar-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	188	1.00	5	188.3	-6.26	80 - 120				SO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030882

QC BATCH REPORT NEW

Batch ID: 138890 (0) **Instrument: ICPMS04** **Method: ICP-MS METALS BY SW6020A**

MSD Sample ID: **HS19030882-11MSD** Units: **mg/L** Analysis Date: **22-Mar-2019 15:48**
Client ID: **20190312-DGW-MW3-PV40out-controlT** Run ID: **ICPMS04_335069** SeqNo: **5002294** PrepDate: **20-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05066	0.00200	0.05	0.000761	99.8	80 - 120	0.0517	2.02	20	
Arsenic	0.0549	0.00200	0.05	0.002979	104	80 - 120	0.05532	0.748	20	
Cadmium	0.04969	0.00200	0.05	0.00003	99.3	80 - 120	0.05064	1.89	20	
Calcium	118.8	0.500	5	116	56.3	80 - 120	120.8	1.72	20	SO
Iron	5.017	0.200	5	0.09087	98.5	80 - 120	5.294	5.38	20	
Lead	0.0502	0.00200	0.05	0.000125	100	80 - 120	0.05047	0.536	20	
Magnesium	24.94	0.200	5	20.6	86.7	80 - 120	25.52	2.3	20	O
Potassium	7.237	0.200	5	2.049	104	80 - 120	7.372	1.85	20	
Selenium	0.05105	0.00200	0.05	0.001263	99.6	80 - 120	0.05111	0.11	20	

MSD Sample ID: **HS19030882-11MSD** Units: **mg/L** Analysis Date: **21-Mar-2019 18:38**
Client ID: **20190312-DGW-MW3-PV40out-controlT** Run ID: **ICPMS04_334969** SeqNo: **5000747** PrepDate: **20-Mar-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	187.9	1.00	5	188.3	-9.44	80 - 120	188	0.0845	20	SO

PDS Sample ID: **HS19030882-11PDS** Units: **mg/L** Analysis Date: **22-Mar-2019 15:51**
Client ID: **20190312-DGW-MW3-PV40out-controlT** Run ID: **ICPMS04_335069** SeqNo: **5002295** PrepDate: **20-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09422	0.00200	0.1	0.000761	93.5	75 - 125				
Arsenic	0.1072	0.00200	0.1	0.002979	104	75 - 125				
Cadmium	0.09896	0.00200	0.1	0.00003	98.9	75 - 125				
Calcium	120.7	0.500	10	116	47.3	75 - 125				SO
Iron	9.995	0.200	10	0.09087	99.0	75 - 125				
Lead	0.1014	0.00200	0.1	0.000125	101	75 - 125				
Magnesium	30.28	0.200	10	20.6	96.8	75 - 125				
Potassium	12.37	0.200	10	2.049	103	75 - 125				
Selenium	0.1055	0.00200	0.1	0.001263	104	75 - 125				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030882

QC BATCH REPORT NEW

Batch ID: 138890 (0) **Instrument: ICPMS04** **Method: ICP-MS METALS BY SW6020A**

PDS Sample ID: **HS19030882-11PDS** Units: **mg/L** Analysis Date: **21-Mar-2019 18:40**
Client ID: **20190312-DGW-MW3-PV40out-controlT** Run ID: **ICPMS04_334969** SeqNo: **5000748** PrepDate: **20-Mar-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	234.9	1.00	50	188.3	93.1	75 - 125				

SD Sample ID: **HS19030882-11SD** Units: **mg/L** Analysis Date: **22-Mar-2019 15:40**
Client ID: **20190312-DGW-MW3-PV40out-controlT** Run ID: **ICPMS04_335069** SeqNo: **5002291** PrepDate: **20-Mar-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	0.002119	0.0100					0.000761	0	10	J
Arsenic	0.002884	0.0100					0.002979	0	10	J
Cadmium	U	0.0100					0.00003	0	10	
Calcium	110.4	2.50					116	4.8	10	
Iron	0.2009	1.00					0.09087	0	10	J
Lead	U	0.0100					0.000125	0	10	
Magnesium	20.74	1.00					20.6	0.682	10	
Potassium	2.055	1.00					2.049	0.303	10	
Selenium	U	0.0100					0.001263	0	10	

SD Sample ID: **HS19030882-11SD** Units: **mg/L** Analysis Date: **21-Mar-2019 18:33**
Client ID: **20190312-DGW-MW3-PV40out-controlT** Run ID: **ICPMS04_334969** SeqNo: **5000745** PrepDate: **20-Mar-2019** DF: **25**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Sodium	197.3	5.00					188.3	4.75	10	

The following samples were analyzed in this batch:

HS19030882-11	HS19030882-12	HS19030882-13	HS19030882-14
HS19030882-15	HS19030882-16	HS19030882-17	HS19030882-18
HS19030882-19	HS19030882-20	HS19030882-22	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030882

QC BATCH REPORT NEW

Batch ID: 138938 (0) **Instrument: ICPMS04** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

MBLK Sample ID: **MBLK-138938** Units: **mg/L** Analysis Date: **25-Mar-2019 12:47**
Client ID: Run ID: **ICPMS04_335170** SeqNo: **5004750** PrepDate: **21-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								

MBLK Sample ID: **MBLK-138938** Units: **mg/L** Analysis Date: **22-Mar-2019 22:46**
Client ID: Run ID: **ICPMS04_335069** SeqNo: **5003270** PrepDate: **21-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01005	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	0.01569	0.200								J

LCS Sample ID: **LCS-138938** Units: **mg/L** Analysis Date: **25-Mar-2019 12:49**
Client ID: Run ID: **ICPMS04_335170** SeqNo: **5004751** PrepDate: **21-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05379	0.00200	0.05	0	108	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030882

QC BATCH REPORT NEW

Batch ID: 138938 (0) **Instrument: ICPMS04** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

LCS Sample ID: **LCS-138938** Units: **mg/L** Analysis Date: **22-Mar-2019 22:48**
Client ID: Run ID: **ICPMS04_335069** SeqNo: **5003271** PrepDate: **21-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05063	0.00200	0.05	0	101	80 - 120				
Cadmium	0.05099	0.00200	0.05	0	102	80 - 120				
Calcium	5.262	0.500	5	0	105	80 - 120				
Iron	4.96	0.200	5	0	99.2	80 - 120				
Lead	0.04816	0.00200	0.05	0	96.3	80 - 120				
Magnesium	5.112	0.200	5	0	102	80 - 120				
Potassium	4.928	0.200	5	0	98.6	80 - 120				
Selenium	0.05116	0.00200	0.05	0	102	80 - 120				
Sodium	5.247	0.200	5	0	105	80 - 120				

MS Sample ID: **HS19030918-01MS** Units: **mg/L** Analysis Date: **22-Mar-2019 22:55**
Client ID: Run ID: **ICPMS04_335069** SeqNo: **5003274** PrepDate: **21-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05455	0.00200	0.05	0.000231	109	75 - 125				
Arsenic	0.06519	0.00200	0.05	0.00992	111	75 - 125				
Cadmium	0.052	0.00200	0.05	0.000027	104	75 - 125				
Calcium	238	0.500	5	240.8	-57.6	75 - 125				SEO
Iron	15.21	0.200	5	10.39	96.4	75 - 125				
Lead	0.05052	0.00200	0.05	0.000067	101	75 - 125				
Magnesium	23.51	0.200	5	19.01	90.0	75 - 125				
Potassium	20.8	0.200	5	16.18	92.3	75 - 125				
Selenium	0.05578	0.00200	0.05	-0.000287	112	75 - 125				
Sodium	97.74	0.200	5	96.73	20.2	75 - 125				SO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030882

QC BATCH REPORT NEW

Batch ID: 138938 (0) **Instrument: ICPMS04** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

MSD Sample ID: **HS19030918-01MSD** Units: **mg/L** Analysis Date: **22-Mar-2019 22:57**
Client ID: Run ID: **ICPMS04_335069** SeqNo: **5003275** PrepDate: **21-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05467	0.00200	0.05	0.000231	109	75 - 125	0.05455	0.225	20	
Arsenic	0.06328	0.00200	0.05	0.00992	107	75 - 125	0.06519	2.97	20	
Cadmium	0.05229	0.00200	0.05	0.000027	105	75 - 125	0.052	0.543	20	
Calcium	242.3	0.500	5	240.8	28.5	75 - 125	238	1.79	20	SEO
Iron	15.04	0.200	5	10.39	93.0	75 - 125	15.21	1.13	20	
Lead	0.05128	0.00200	0.05	0.000067	102	75 - 125	0.05052	1.51	20	
Magnesium	23.64	0.200	5	19.01	92.5	75 - 125	23.51	0.546	20	
Potassium	20.82	0.200	5	16.18	92.8	75 - 125	20.8	0.111	20	
Selenium	0.05207	0.00200	0.05	-0.000287	105	75 - 125	0.05578	6.88	20	
Sodium	98.56	0.200	5	96.73	36.6	75 - 125	97.74	0.839	20	SO

PDS Sample ID: **HS19030918-01PDS** Units: **mg/L** Analysis Date: **22-Mar-2019 22:59**
Client ID: Run ID: **ICPMS04_335069** SeqNo: **5003276** PrepDate: **21-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.0963	0.00200	0.1	0.000231	96.1	75 - 125				
Arsenic	0.1162	0.00200	0.1	0.00992	106	75 - 125				
Cadmium	0.102	0.00200	0.1	0.000027	102	75 - 125				
Iron	19.41	0.200	10	10.39	90.2	75 - 125				
Lead	0.1017	0.00200	0.1	0.000067	102	75 - 125				
Magnesium	27.49	0.200	10	19.01	84.8	75 - 125				
Potassium	25.16	0.200	10	16.18	89.8	75 - 125				
Selenium	0.1047	0.00200	0.1	-0.000287	105	75 - 125				

PDS Sample ID: **HS19030918-01PDS** Units: **mg/L** Analysis Date: **25-Mar-2019 13:00**
Client ID: Run ID: **ICPMS04_335170** SeqNo: **5004756** PrepDate: **21-Mar-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	302.8	5.00	100	205	97.9	75 - 125				
Sodium	193.6	2.00	100	91.47	102	75 - 125				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030882

QC BATCH REPORT NEW

Batch ID: 138938 (0) **Instrument: ICPMS04** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

SD Sample ID: **HS19030918-01SD** Units: **mg/L** Analysis Date: **22-Mar-2019 22:53**
Client ID: Run ID: **ICPMS04_335069** SeqNo: **5003273** PrepDate: **21-Mar-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000231	0	10	
Arsenic	0.008651	0.0100					0.00992	0	10	J
Cadmium	U	0.0100					0.000027	0	10	
Iron	8.755	1.00					10.39	15.7	10	R
Lead	U	0.0100					0.000067	0	10	
Selenium	U	0.0100					-0.000287	0	10	

SD Sample ID: **HS19030918-01SD** Units: **mg/L** Analysis Date: **25-Mar-2019 12:58**
Client ID: Run ID: **ICPMS04_335170** SeqNo: **5004755** PrepDate: **21-Mar-2019** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	205.5	25.0					205	0.268	10	
Magnesium	17.73	10.0					17.44	1.67	10	
Potassium	14.68	10.0					14.64	0.235	10	
Sodium	95.16	10.0					91.47	4.03	10	

The following samples were analyzed in this batch:

HS19030882-01	HS19030882-02	HS19030882-03	HS19030882-04
HS19030882-05	HS19030882-06	HS19030882-07	HS19030882-08
HS19030882-09	HS19030882-10	HS19030882-21	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19030882**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
California	2919, 2018-2019	30-Apr-2019
Maryland	343, 2018-2019	30-Jun-2019

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19030882

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19030882-01	20190312-DGW-MW3-PV40out-controlD	Login	3/18/2019 12:09:28 PM	NDR	MET015
HS19030882-02	20190312-DGW-MW3-PV40out-30D	Login	3/18/2019 12:09:28 PM	NDR	MET015
HS19030882-03	20190312-DGW-MW3-PV40out-35D	Login	3/18/2019 12:09:28 PM	NDR	MET015
HS19030882-04	20190312-DGW-MW3-PV40out-40D	Login	3/18/2019 12:09:28 PM	NDR	MET015
HS19030882-05	20190313-DGW-MW3-PV40inlet-controlD	Login	3/18/2019 12:09:28 PM	NDR	MET015
HS19030882-06	20190313-DGW-MW3-PV40inlet-30-35-40D	Login	3/18/2019 12:09:28 PM	NDR	MET015
HS19030882-07	20190313-DGW-MW3-PV40mid-controlD	Login	3/18/2019 12:09:28 PM	NDR	MET015
HS19030882-08	20190313-DGW-MW3-PV40mid-30D	Login	3/18/2019 12:09:28 PM	NDR	MET015
HS19030882-09	20190313-DGW-MW3-PV40mid-35D	Login	3/18/2019 12:09:28 PM	NDR	MET015
HS19030882-10	20190313-DGW-MW3-PV40mid-40D	Login	3/18/2019 12:09:28 PM	NDR	MET015
HS19030882-11	20190312-DGW-MW3-PV40out-controlT	Login	3/18/2019 12:09:28 PM	NDR	MET015
HS19030882-12	20190312-DGW-MW3-PV40out-30T	Login	3/18/2019 12:09:28 PM	NDR	MET015
HS19030882-13	20190312-DGW-MW3-PV40out-35T	Login	3/18/2019 12:09:28 PM	NDR	MET015
HS19030882-14	20190312-DGW-MW3-PV40out-40T	Login	3/18/2019 12:09:28 PM	NDR	MET015
HS19030882-15	20190313-DGW-MW3-PV40inlet-controlT	Login	3/18/2019 12:09:28 PM	NDR	MET015
HS19030882-16	20190313-DGW-MW3-PV40inlet-30-35-40T	Login	3/18/2019 12:09:28 PM	NDR	MET015
HS19030882-17	20190313-DGW-MW3-PV40mid-controlT	Login	3/18/2019 12:09:28 PM	NDR	MET015
HS19030882-18	20190313-DGW-MW3-PV40mid-30T	Login	3/18/2019 12:09:28 PM	NDR	MET015
HS19030882-19	20190313-DGW-MW3-PV40mid-35T	Login	3/18/2019 12:09:28 PM	NDR	MET015
HS19030882-20	20190313-DGW-MW3-PV40mid-40T	Login	3/18/2019 12:09:28 PM	NDR	MET015

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19030882

Date/Time Received: **18-Mar-2019 09:15**
Received by: **NDR**

Checklist completed by: *Nilesh D. Ranchod* eSignature — 18-Mar-2019 Date

Reviewed by: *Dane J. Wacasey* eSignature — 25-Mar-2019 Date

Matrices: **Water**

Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	14.2C/14.2C UC/C	11	
Cooler(s)/Kit(s):	43656		
Date/Time sample(s) sent to storage:	03/18/2019 15:00		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

ALS Environmental

Chain of Custody Form

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HS19030882

Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information			
PO Number	130-2086-06	Project Name	Exide Column Studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086-06	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suite 260	Address	13515 Barrett Parkway Drive, Suite 260	E	ICP TW (6020A total metals (6)+cations)
				F	ICP DISS (6020A diss metals (6)+cations-FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	G	
Phone	314 984-8800	Phone	314 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190312-DGW-MW3-PV40out-controlD	03-12-19	12:25 PM	GW	2,8	1						x					
2	20190312-DGW-MW3-PV40out-30D	03-12-19	12:25 PM	GW	2,8	1						x					
3	20190312-DGW-MW3-PV40out-35D	03-12-19	12:25 PM	GW	2,8	1						x					
4	20190312-DGW-MW3-PV40out-40D	03-12-19	12:25 PM	GW	2,8	1						x					
5	20190313-DGW-MW3-PV40inlet-controlD	03-13-19	2:00 PM	GW	2,8	1						x					
6	20190313-DGW-MW3-PV40inlet-30-35-40D	03-13-19	2:00 PM	GW	2,8	1						x					
7	20190313-DGW-MW3-PV40mid-controlD	03-13-19	1:20 PM	GW	2,8	1						x					
8	20190313-DGW-MW3-PV40mid-30D	03-13-19	1:20 PM	GW	2,8	1						x					
9	20190313-DGW-MW3-PV40mid-35D	03-13-19	1:20 PM	GW	2,8	1						x					
10	20190313-DGW-MW3-PV40mid-40D	03-13-19	1:20 PM	GW	2,8	1						x					

Sampler(s): Please Print & Sign
Giovanna Llamosas/Bettina Emile Bettina Emile

Shipment Method:

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by:	Date:	Time:	Received by:	Notes:
Bettina Emile	2019/03/15	15:30		
Relinquished by:	Date: 3/18/19	Time: 09:15	Received by (Laboratory): NA	Cooler Temp. 4.2 °C
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	14.2

QC Package: (Check Box Below)

	Level II: Standard QC	x	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other: _____		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

43656 14.04

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Chain of Custody Form

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HS19030882

Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086-06	Project Name	Exide Column Studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086-06	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suite 260	Address	13515 Barrett Parkway Drive, Suite 260	E	ICP TW (6020A total metals (6)+cations)
				F	ICP DISS (6020A diss metals (6)+cations-FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	G	
Phone	314 984-8800	Phone	314 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190312-DGW-MW3-PV40out-controlT	03-12-19	12:25 PM	GW	2,8	1				x	x						
2	20190312-DGW-MW3-PV40out-30T	03-12-19	12:25 PM	GW	2,8	1				x	x						
3	20190312-DGW-MW3-PV40out-35T	03-12-19	12:25 PM	GW	2,8	1				x	x						
4	20190312-DGW-MW3-PV40out-40T	03-12-19	12:25 PM	GW	2,8	1				x	x						
5	20190313-DGW-MW3-PV40inlet-controlT	03-13-19	2:00 PM	GW	2,8	1				x	x						
6	20190313-DGW-MW3-PV40inlet-30-35-40T	03-13-19	2:00 PM	GW	2,8	1				x	x						
7	20190313-DGW-MW3-PV40mid-controlT	03-13-19	1:20 PM	GW	2,8	1				x	x						
8	20190313-DGW-MW3-PV40mid-30T	03-13-19	1:20 PM	GW	2,8	1				x	x						
9	20190313-DGW-MW3-PV40mid-35T	03-13-19	1:20 PM	GW	2,8	1				x	x						
10	20190313-DGW-MW3-PV40mid-40T	03-13-19	1:20 PM	GW	2,8	1				x	x						

Sampler(s): Please Print & Sign
Giovanna Llamosas/Bettina Emile Bettina Emile

Shipment Method:

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by:	Date:	Time:	Received by:	Notes:
Bettina Emile	2019/03/15	15:30		
Relinquished by:	Date: 3/18/19	Time: 09:15	Received by (Laboratory):	Cooler Temp. 4/C
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	14.2

QC Package: (Check Box Below)

	Level II: Standard QC	x	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other: _____		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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ALS Environmental

Chain of Custody Form

Page 3 of 3

HS19030882

Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information			
PO Number	130-2086-06	Project Name	Exide Column Studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086-06	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suite 260	Address	13515 Barrett Parkway Drive, Suite 260	E	ICP TW (6020A total metals (6)+cations)
				F	ICP DISS (6020A diss metals (6)+cations-FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	G	
Phone	314 984-8800	Phone	314 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190313-DGW-MW3-PV40inlet-30-35-40D-DUP	03-13-19	2:00 PM	GW	2,8	1						x					
2	20190313-DGW-MW3-PV40inlet-30-35-40T-DUP	03-13-19	2:00 PM	GW	2,8	1				x	x						
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s): Please Print & Sign
Giovanna Llamosas/Bettina Emile Bettina Emile

Shipment Method:

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by:	Date:	Time:	Received by:	Notes:
Bettina Emile	2019/03/15	15:30		
Relinquished by:	Date: 3/15/19	Time: 09.15	Received by (Laboratory):	Cooler Temp. 1.1 C
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	1.1 C

QC Package: (Check Box Below)

	Level II: Standard QC	x	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other: _____		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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ORIGIN ID:YUXA (514) 383-0990
AUDREY ETHEVES
GOLDER ASSOCIATES LTD
7250 RUE DU MILE END
3E ETAGE
MONTREAL, PQ H2R3A4
CANADA CA

SHIP DATE: 15MAR19
ACTWGT: 18.80 LB
CAD: 108660274/INET4102

BILL RECIPIENT

TO DANE WACASEY
ALS HOUSTON LABORATORY
10450 STANCLIFF RD
STE 210
HOUSTON TX 77099
(281) 530-5656
REF:
DEPT:
(US)

FedEx Express

E

TRK# 7747 1715 5120
0430

10:30A
INTL PRIORITY
77099
TX-US IAH

XH SGRA

Après l'impression de cette étiquette :
COPIE DU DESTINATAIRE - VEUILLEZ LA PLACER DEVANT LA POCHETTE
1. Pliez la page imprimée le long de la ligne horizontale.
2. Placez l'étiquette dans la pochette d'expédition et fixez-la à votre paquet.

CUSTODY SEAL

Bettina Emile Time: 8:30	Seal Broken By:
15 march 2019	Date: 2/18/
Company: Golder	

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

Date:
Name:
Company:

[illegible]

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

March 25, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19030883**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 20 sample(s) on Mar 18, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19030883**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19030883**	

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 03/25/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19030883				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 138836,138891,R335228				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?			X		
		Were analytical duplicates analyzed at the appropriate frequency?			X		
		Were RPDs or relative standard deviations within the laboratory QC limits?			X		
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				2
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 03/25/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19030883				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 138836,138891,R335228				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			3
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		X			4
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports	
Laboratory Name: ALS Laboratory Group	LRC Date: 03/25/2019
Project Name: Exide Column Studies	Laboratory Job Number: HS19030883
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 138836,138891,R335228

ER#[5]	Description
1	Batch 138836, Dissolved Metals Method SW6020, sample 20190314-DGW-MW11-PV35out-**C**ontrolD, MS and MSD recovered outside the control limits for Calcium, Magnesium and Sodium, however, the result in the parent sample is greater than 4x the spike amount. Batch 138891, Metals Method SW6020, sample 20190314-DGW-MW11-PV35outcontrolT, MS and MSD recovered outside the control limit for Calcium, Magnesium and Sodium, however, the result in the parent sample is greater than 4x the spike amount.
2	Batch 138836, Dissolved Metals Method SW6020, samples were diluted due to high sodium content.
3	See Run Log and CCB Exceptions Report.
4	Batch 138836, Dissolved Metals Method SW6020, sample 20190314-DGW-MW11-PV35out-controlD, PDS recovered outside the control limit for Calcium and Magnesium, however, the result in the parent sample is greater than 4x the spike amount

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030883
Start Date: 21-Mar-2019 End Date: 22-Mar-2019

Run ID:ICPMS05_334967
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	21-Mar-2019 12:08	023_ICV.d	AS CA CD FE K MG NA P PB SB SE
LLICV2	1	21-Mar-2019 12:10	024SMPL.d	AS CA CD FE K MG P PB SB SE
LLICV5	1	21-Mar-2019 12:12	025LICV.d	AS CA CD FE K MG P PB SB SE
ICB	1	21-Mar-2019 12:21	028_ICB.d	AS CA CD FE K MG NA P PB SB SE
ICSA	1	21-Mar-2019 12:23	029ICSA.d	AS CA CD FE K MG P PB SB SE
ICSAB	1	21-Mar-2019 12:26	030ICSB.d	AS CA CD FE K MG P PB SB SE
CCB 1	1	21-Mar-2019 13:12	045_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 1	1	21-Mar-2019 13:14	046_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCV 2	1	21-Mar-2019 13:40	057_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 2	1	21-Mar-2019 13:49	060_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 3	1	21-Mar-2019 14:14	071_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 3	1	21-Mar-2019 14:16	072_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 4	1	21-Mar-2019 16:45	083_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 4	1	21-Mar-2019 16:47	084_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 5	1	21-Mar-2019 17:21	095_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 5	1	21-Mar-2019 17:23	096_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCB 6	1	21-Mar-2019 17:53	106_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 6	1	21-Mar-2019 18:02	108_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCV 7	1	21-Mar-2019 18:20	116_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 7	1	21-Mar-2019 18:22	117_CCB.d	AS CA CD FE K MG NA P PB SB SE
LLCCV2	1	21-Mar-2019 23:15	132SMPL.d	AS CA CD FE K MG P PB SB SE
ICCV 8	1	21-Mar-2019 23:20	134_ICV.d	AS CA CD FE K MG NA P PB SB SE
LLCCV5	1	21-Mar-2019 23:22	135LICV.d	AS CA CD FE K MG P PB SB SE
ICCB 8	1	21-Mar-2019 23:24	136_ICB.d	AS CA CD FE K MG NA P PB SB SE
CCV 9	1	21-Mar-2019 23:42	144_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 9	1	21-Mar-2019 23:45	145_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 10	1	22-Mar-2019 00:09	156_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 10	1	22-Mar-2019 00:12	157_CCB.d	AS CA CD FE K MG NA P PB SB SE
MBLK-138836	1	22-Mar-2019 00:14	158SMPL.d	AS CA CD FE K MG NA PB SB SE
LCS-138836	1	22-Mar-2019 00:16	159SMPL.d	AS CA CD FE K MG NA PB SB SE
20190314-DGW-MW11-PV35out-controlD	5	22-Mar-2019 00:19	160SMPL.d	AS CA CD FE K MG P PB SB SE
20190314-DGW-MW11-PV35out-controlDSD	25	22-Mar-2019 00:21	161SMPL.d	AS CD FE PB SB SE
20190314-DGW-MW11-PV35out-controlDMS	5	22-Mar-2019 00:23	162SMPL.d	AS CA CD FE K MG NA PB SB SE
20190314-DGW-MW11-PV35out-controlDMSD	5	22-Mar-2019 00:25	163SMPL.d	AS CA CD FE K MG NA PB SB
20190314-DGW-MW11-PV35out-controlDPDS	5	22-Mar-2019 00:28	164SMPL.d	AS CA CD FE K MG PB SB SE
CCV 11	1	22-Mar-2019 00:30	165_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 11	1	22-Mar-2019 00:32	166_CCB.d	AS CA CD FE K MG NA P PB SB SE
20190314-DGW-MW11-PV35out-30D	5	22-Mar-2019 00:34	167SMPL.d	AS CA CD FE K MG P PB SB SE
20190314-DGW-MW11-PV35out-35D	5	22-Mar-2019 00:37	168SMPL.d	AS CA CD FE K MG P PB SB SE
20190314-DGW-MW11-PV35out-40D	5	22-Mar-2019 00:39	169SMPL.d	AS CA CD FE K MG P PB SB SE
20190314-DGW-MW11-PV35inlet-controlD	5	22-Mar-2019 00:41	170SMPL.d	AS CA CD FE K MG P PB SB SE
20190314-DGW-MW11-PV35inlet-30-35-40D	5	22-Mar-2019 00:44	171SMPL.d	AS CA CD FE K MG P PB SB SE
20190315-DGW-MW11-PV35mid-controlD	5	22-Mar-2019 00:46	172SMPL.d	AS CA CD FE K MG P PB SB SE
20190315-DGW-MW11-PV35mid-30D	5	22-Mar-2019 00:48	173SMPL.d	AS CA CD FE K MG P PB SB SE

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030883
Start Date: 21-Mar-2019 End Date: 22-Mar-2019

Run ID:ICPMS05_334967
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
20190315-DGW-MW11-PV35mid-35D	5	22-Mar-2019 00:50	174SMPL.d	AS CA CD FE K MG P PB SB SE
20190315-DGW-MW11-PV35mid-40D	5	22-Mar-2019 00:53	175SMPL.d	AS CA CD FE K MG P PB SB SE
CCV 12	1	22-Mar-2019 00:57	177_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 12	1	22-Mar-2019 01:00	178_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 13	1	22-Mar-2019 01:25	189_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 13	1	22-Mar-2019 01:27	190_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 14	1	22-Mar-2019 01:45	198_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 14	1	22-Mar-2019 01:47	199_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 15	1	22-Mar-2019 02:05	207_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 15	1	22-Mar-2019 02:07	208_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 16	1	22-Mar-2019 02:25	216_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 16	1	22-Mar-2019 02:28	217_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 17	1	22-Mar-2019 02:53	228_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 17	1	22-Mar-2019 02:55	229_CCB.d	AS CA CD FE K MG NA P PB SB SE
LLICV2	1	22-Mar-2019 03:04	233SMPL.d	AS CA CD FE K MG P PB SB SE
LLICV5	1	22-Mar-2019 03:06	234LICV.d	AS CA CD FE K MG P PB SB SE
ICSA	1	22-Mar-2019 03:08	235ICSA.d	AS CA CD FE K MG P PB SB SE
ICSAB	1	22-Mar-2019 03:11	236ICSB.d	AS CA CD FE K MG P PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030883

Run ID:ICPMS05_334967
Instrument:ICPMS05
Method:SW6020

CCB 2	Date: 21-Mar-2019 13:49	Seq: 5000194		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.444	0.4	2	
CCB 3	Date: 21-Mar-2019 14:16	Seq: 5000218		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.654	0.4	2	
CCB 4	Date: 21-Mar-2019 16:47	Seq: 5000782		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.684	0.4	2	
	Potassium	21.2	18	200	
	Sodium	272.3	14	200	
CCB 5	Date: 21-Mar-2019 17:23	Seq: 5000794		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Potassium	24.56	18	200	
	Sodium	255.7	14	200	
CCB 6	Date: 21-Mar-2019 17:53	Seq: 5000804		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.922	0.4	2	
	Potassium	18.72	18	200	
	Sodium	274.6	14	200	
CCB 7	Date: 21-Mar-2019 18:22	Seq: 5000815		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	102	14	200	
ICCB 8	Date: 21-Mar-2019 23:24	Seq: 5001045		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.652	0.4	2	
	Calcium	57.56	34	500	
CCB 9	Date: 21-Mar-2019 23:45	Seq: 5001054		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.462	0.4	2	
	Calcium	57.21	34	500	
CCB 10	Date: 22-Mar-2019 00:12	Seq: 5001066		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.17	0.4	2	
	Calcium	57.4	34	500	
	Sodium	62.23	14	200	
CCB 11	Date: 22-Mar-2019 00:32	Seq: 5001109		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.406	0.4	2	
	Calcium	63.96	34	500	
	Sodium	158.6	14	200	
CCB 12	Date: 22-Mar-2019 01:00	Seq: 5001121		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.052	0.4	2	
	Calcium	60.09	34	500	
	Sodium	176.3	14	200	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030883
Start Date: 22-Mar-2019 End Date: 23-Mar-2019

Run ID:ICPMS05_335065
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	22-Mar-2019 11:44	021_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	22-Mar-2019 11:47	022SMPL.d	AS CA CD FE K MG NA PB SB SE
LLICV5	1	22-Mar-2019 11:49	023LICV.d	AS CA CD FE K MG NA PB SB SE
ICB	1	22-Mar-2019 11:58	024_ICB.d	AS CA CD FE K MG NA PB SB SE
ICV	1	22-Mar-2019 12:05	026_ICV.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	22-Mar-2019 12:22	029ICSA.d	AS CA CD FE K MG NA PB SB SE
ICSAB	1	22-Mar-2019 12:25	030ICSB.d	AS CA CD FE K MG NA PB SB SE
CCV 1	1	22-Mar-2019 13:48	042_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	22-Mar-2019 13:50	043_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	22-Mar-2019 14:10	051_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	22-Mar-2019 14:12	052_CCB.d	AS CA CD FE K MG NA PB SB SE
20190314-DGW-MW11-PV35out-controlDSD	25	22-Mar-2019 14:39	059SMPL.d	CA K MG
20190314-DGW-MW11-PV35out-controlD	100	22-Mar-2019 14:41	060SMPL.d	NA
20190314-DGW-MW11-PV35out-controlDSD	500	22-Mar-2019 14:43	061SMPL.d	NA SE
20190314-DGW-MW11-PV35out-controlDPDS	100	22-Mar-2019 14:45	062SMPL.d	NA
CCV 3	1	22-Mar-2019 14:47	063_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	22-Mar-2019 14:49	064_CCB.d	AS CA CD FE K MG NA PB SB SE
20190314-DGW-MW11-PV35out-30D	100	22-Mar-2019 14:52	065SMPL.d	NA
20190314-DGW-MW11-PV35out-35D	100	22-Mar-2019 14:54	066SMPL.d	NA
20190314-DGW-MW11-PV35out-40D	100	22-Mar-2019 14:56	067SMPL.d	NA
20190314-DGW-MW11-PV35inlet-controlD	100	22-Mar-2019 14:59	068SMPL.d	NA
20190314-DGW-MW11-PV35inlet-30-35-40D	100	22-Mar-2019 15:01	069SMPL.d	NA
20190315-DGW-MW11-PV35mid-controlD	100	22-Mar-2019 15:03	070SMPL.d	NA
20190315-DGW-MW11-PV35mid-30D	100	22-Mar-2019 15:05	071SMPL.d	NA
20190315-DGW-MW11-PV35mid-35D	100	22-Mar-2019 15:07	072SMPL.d	NA
20190315-DGW-MW11-PV35mid-40D	100	22-Mar-2019 15:09	073SMPL.d	NA
CCV 4	1	22-Mar-2019 15:14	075_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	22-Mar-2019 15:16	076_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	22-Mar-2019 15:36	085_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	22-Mar-2019 15:44	088_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	22-Mar-2019 16:07	097_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	22-Mar-2019 16:09	098_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	22-Mar-2019 16:12	099_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 8	1	22-Mar-2019 16:35	109_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	22-Mar-2019 16:37	110_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	22-Mar-2019 17:03	121_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	22-Mar-2019 17:05	122_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 10	1	22-Mar-2019 17:31	133_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	22-Mar-2019 17:33	134_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	22-Mar-2019 18:30	146_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 11	1	22-Mar-2019 18:35	147_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 12	1	22-Mar-2019 21:52	155_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	22-Mar-2019 21:54	156_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 13	1	22-Mar-2019 22:16	166_CCV.d	AS CA CD FE K MG NA PB SB SE

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030883
Start Date: 22-Mar-2019 End Date: 23-Mar-2019

Run ID:ICPMS05_335065
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
CCB 12	1	22-Mar-2019 22:18	167_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 14	1	22-Mar-2019 22:40	177_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 13	1	22-Mar-2019 22:42	178_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 15	1	22-Mar-2019 22:59	186_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 14	1	22-Mar-2019 23:01	187_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 16	1	22-Mar-2019 23:25	198_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 15	1	22-Mar-2019 23:27	199_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-138891	1	22-Mar-2019 23:29	200SMPL.d	AS CA CD FE K MG NA PB SB SE
LCS-138891	1	22-Mar-2019 23:32	201SMPL.d	AS CA CD FE K MG NA PB SB SE
20190314-DGW-MW11-PV35out-controlT	5	22-Mar-2019 23:34	202SMPL.d	AS CA CD FE K MG PB SB SE
20190314-DGW-MW11-PV35out-controlTSD	25	22-Mar-2019 23:36	203SMPL.d	AS CA CD FE PB SB SE
20190314-DGW-MW11-PV35out-controlTMS	5	22-Mar-2019 23:38	204SMPL.d	AS CA CD FE K MG NA PB SB SE
20190314-DGW-MW11-PV35out-controlTMSD	5	22-Mar-2019 23:40	205SMPL.d	AS CA CD FE K MG NA PB SB SE
20190314-DGW-MW11-PV35out-controlTPDS	5	22-Mar-2019 23:42	206SMPL.d	AS CA CD FE K MG PB SB SE
CCV 17	1	22-Mar-2019 23:45	207_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 16	1	22-Mar-2019 23:47	208_CCB.d	AS CA CD FE K MG NA PB SB SE
20190314-DGW-MW11-PV35out-30T	5	22-Mar-2019 23:49	209SMPL.d	AS CA CD FE K MG PB SB SE
20190314-DGW-MW11-PV35out-35T	5	22-Mar-2019 23:51	210SMPL.d	AS CA CD FE K MG PB SB SE
20190314-DGW-MW11-PV35out-40T	5	22-Mar-2019 23:53	211SMPL.d	AS CA CD FE K MG PB SB SE
20190314-DGW-MW11-PV35inlet-controlT	5	22-Mar-2019 23:56	212SMPL.d	AS CA CD FE K MG PB SB SE
20190314-DGW-MW11-PV35inlet-30-35-40T	5	22-Mar-2019 23:58	213SMPL.d	AS CA CD FE K MG PB SB SE
20190315-DGW-MW11-PV35mid-controlT	5	23-Mar-2019 00:00	214SMPL.d	AS CA CD FE K MG PB SB SE
20190315-DGW-MW11-PV35mid-30T	5	23-Mar-2019 00:02	215SMPL.d	AS CA CD FE K MG PB SB SE
20190315-DGW-MW11-PV35mid-35T	5	23-Mar-2019 00:04	216SMPL.d	AS CA CD FE K MG PB SB SE
20190315-DGW-MW11-PV35mid-40T	5	23-Mar-2019 00:07	217SMPL.d	AS CA CD FE K MG PB SB SE
CCV 18	1	23-Mar-2019 00:11	219_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 17	1	23-Mar-2019 00:13	220_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 19	1	23-Mar-2019 00:37	231_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 18	1	23-Mar-2019 00:39	232_CCB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	23-Mar-2019 00:42	233ICSA.d	AS CA CD FE K MG NA PB SB SE
ICSAB	1	23-Mar-2019 00:44	234ICSB.d	AS CA CD FE K MG NA PB SB SE
CCV 20	1	23-Mar-2019 01:04	243_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 19	1	23-Mar-2019 01:06	244_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 21	1	23-Mar-2019 01:30	255_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 20	1	23-Mar-2019 01:32	256_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 22	1	23-Mar-2019 01:56	267_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 21	1	23-Mar-2019 01:58	268_CCB.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030883

Run ID:ICPMS05_335065
Instrument:ICPMS05
Method:SW6020

ICB	Date: 22-Mar-2019 11:58	Seq: 5001846	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	59.08	34	500	

CCB 1	Date: 22-Mar-2019 13:50	Seq: 5002320	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.559	0.4	2	
Calcium	78.76	34	500	
Sodium	142	14	200	

CCB 2	Date: 22-Mar-2019 14:12	Seq: 5002329	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.489	0.4	2	
Calcium	65.75	34	500	
Sodium	112.5	14	200	

CCB 3	Date: 22-Mar-2019 14:49	Seq: 5002369	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.17	0.4	2	
Calcium	58.58	34	500	
Sodium	45.72	14	200	

CCB 4	Date: 22-Mar-2019 15:16	Seq: 5002382	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.624	0.4	2	
Calcium	60.64	34	500	
Sodium	35.8	14	200	

CCB 5	Date: 22-Mar-2019 15:44	Seq: 5002411	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	78.39	34	500	
Sodium	16.23	14	200	

CCB 6	Date: 22-Mar-2019 16:09	Seq: 5002423	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.543	0.4	2	
Calcium	85.01	34	500	
Iron	16.54	12	200	

CCB 7	Date: 22-Mar-2019 16:37	Seq: 5002453	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	13.91	12	200	

CCB 8	Date: 22-Mar-2019 17:05	Seq: 5002524	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	14.73	12	200	

CCB 9	Date: 22-Mar-2019 17:33	Seq: 5002780	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	16.38	12	200	

CCB 10	Date: 22-Mar-2019 18:30	Seq: 5002792	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.664	0.4	2	

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030883

Run ID:ICPMS05_335065
Instrument:ICPMS05
Method:SW6020

CCB 11	Date: 22-Mar-2019 21:54	Seq: 5002872	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.579	0.4	2	

CCB 12	Date: 22-Mar-2019 22:18	Seq: 5002883	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.012	0.4	2	
Sodium	48.38	14	200	

CCB 13	Date: 22-Mar-2019 22:42	Seq: 5002894	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.46	0.4	2	
Sodium	156.6	14	200	

CCB 14	Date: 22-Mar-2019 23:01	Seq: 5002912	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.746	0.4	2	
Sodium	96.43	14	200	

CCB 15	Date: 22-Mar-2019 23:27	Seq: 5002924	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	73.35	14	200	

CCB 16	Date: 22-Mar-2019 23:47	Seq: 5003392	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.199	0.4	2	
Sodium	215.8	14	200	

CCB 17	Date: 23-Mar-2019 00:13	Seq: 5003404	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Magnesium	11.55	10	200	
Sodium	293.9	14	200	

CCB 18	Date: 23-Mar-2019 00:39	Seq: 5003416	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	157.3	14	200	

CCB 19	Date: 23-Mar-2019 01:06	Seq: 5003768	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	12.38	12	200	
Magnesium	10.97	10	200	
Sodium	93.81	14	200	

CCB 20	Date: 23-Mar-2019 01:32	Seq: 5003780	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	15.66	12	200	
Magnesium	13.15	10	200	
Sodium	80.73	14	200	

CCB 21	Date: 23-Mar-2019 01:58	Seq: 5003792	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	16.1	12	200	
Magnesium	15.45	10	200	
Sodium	78.14	14	200	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030883
Start Date: 25-Mar-2019 End Date: 25-Mar-2019

Run ID:ICPMS05_335168
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	25-Mar-2019 11:42	021_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	25-Mar-2019 11:44	022SMPL.d	NA
LLICV5	1	25-Mar-2019 11:46	023LICV.d	NA
ICB	1	25-Mar-2019 11:58	026_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	25-Mar-2019 12:02	027ICSA.d	NA
ICSAB	1	25-Mar-2019 12:04	028ICSB.d	NA
20190314-DGW-MW11-PV35out-controlTSD	25	25-Mar-2019 12:18	032SMPL.d	K MG
20190314-DGW-MW11-PV35out-controlT	20	25-Mar-2019 12:20	033SMPL.d	NA
20190314-DGW-MW11-PV35out-controlTSD	100	25-Mar-2019 12:23	034SMPL.d	NA
20190314-DGW-MW11-PV35out-controlTPDS	20	25-Mar-2019 12:25	035SMPL.d	NA
20190314-DGW-MW11-PV35out-30T	20	25-Mar-2019 12:27	036SMPL.d	NA
20190314-DGW-MW11-PV35out-35T	20	25-Mar-2019 12:29	037SMPL.d	NA
20190314-DGW-MW11-PV35out-40T	20	25-Mar-2019 12:31	038SMPL.d	NA
20190314-DGW-MW11-PV35inlet-controlT	20	25-Mar-2019 12:33	039SMPL.d	NA
CCV 1	1	25-Mar-2019 12:36	040_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	25-Mar-2019 12:38	041_CCB.d	AS CA CD FE K MG NA PB SB SE
20190314-DGW-MW11-PV35inlet-30-35-40T	20	25-Mar-2019 12:42	042SMPL.d	NA
20190315-DGW-MW11-PV35mid-controlT	20	25-Mar-2019 12:44	043SMPL.d	NA
20190315-DGW-MW11-PV35mid-30T	20	25-Mar-2019 12:46	044SMPL.d	NA
20190315-DGW-MW11-PV35mid-35T	20	25-Mar-2019 12:49	045SMPL.d	NA
20190315-DGW-MW11-PV35mid-40T	20	25-Mar-2019 12:51	046SMPL.d	NA
CCV 2	1	25-Mar-2019 13:04	052_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	25-Mar-2019 13:06	053_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	25-Mar-2019 13:39	064_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	25-Mar-2019 13:41	065_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	25-Mar-2019 14:00	073_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	25-Mar-2019 14:02	074_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	25-Mar-2019 14:10	076_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	25-Mar-2019 14:50	090_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	25-Mar-2019 14:52	091_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	25-Mar-2019 15:26	102_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	25-Mar-2019 15:28	103_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	25-Mar-2019 15:53	114_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	25-Mar-2019 15:55	115_CCB.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030883

Run ID:ICPMS05_335168
Instrument:ICPMS05
Method:SW6020

CCB 1	Date: 25-Mar-2019 12:38	Seq: 5004850		D/F: 1	Units: ug/L
	Analyte		**Result**	**MDL**	**Report Limit**
	Sodium		84.68	14	200
CCB 2	Date: 25-Mar-2019 13:06	Seq: 5004862		D/F: 1	Units: ug/L
	Analyte		**Result**	**MDL**	**Report Limit**
	Sodium		177.6	14	200
CCB 3	Date: 25-Mar-2019 13:41	Seq: 5004877		D/F: 1	Units: ug/L
	Analyte		**Result**	**MDL**	**Report Limit**
	Sodium		104.4	14	200
CCB 4	Date: 25-Mar-2019 14:02	Seq: 5005022		D/F: 1	Units: ug/L
	Analyte		**Result**	**MDL**	**Report Limit**
	Sodium		32.09	14	200
CCB 5	Date: 25-Mar-2019 14:10	Seq: 5005024		D/F: 1	Units: ug/L
	Analyte		**Result**	**MDL**	**Report Limit**
	Sodium		25.72	14	200
CCB 6	Date: 25-Mar-2019 14:50	Seq: 5005231		D/F: 1	Units: ug/L
	Analyte		**Result**	**MDL**	**Report Limit**
	Sodium		75.62	14	200
CCB 7	Date: 25-Mar-2019 15:28	Seq: 5005217		D/F: 1	Units: ug/L
	Analyte		**Result**	**MDL**	**Report Limit**
	Sodium		222.6	14	200
CCB 8	Date: 25-Mar-2019 15:55	Seq: 5005229		D/F: 1	Units: ug/L
	Analyte		**Result**	**MDL**	**Report Limit**
	Potassium		-18.61	18	200
	Sodium		87.62	14	200

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19030883

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19030883-01	20190314-DGW-MW11-PV35out-controlD	Groundwater		14-Mar-2019 09:45	18-Mar-2019 09:15	☐
HS19030883-02	20190314-DGW-MW11-PV35out-30D	Groundwater		14-Mar-2019 09:45	18-Mar-2019 09:15	☐
HS19030883-03	20190314-DGW-MW11-PV35out-35D	Groundwater		14-Mar-2019 09:45	18-Mar-2019 09:15	☐
HS19030883-04	20190314-DGW-MW11-PV35out-40D	Groundwater		14-Mar-2019 09:45	18-Mar-2019 09:15	☐
HS19030883-05	20190314-DGW-MW11-PV35inlet-controlD	Groundwater		14-Mar-2019 09:45	18-Mar-2019 09:15	☐
HS19030883-06	20190314-DGW-MW11-PV35inlet-30-35-40D	Groundwater		14-Mar-2019 09:45	18-Mar-2019 09:15	☐
HS19030883-07	20190315-DGW-MW11-PV35mid-controlD	Groundwater		15-Mar-2019 09:30	18-Mar-2019 09:15	☐
HS19030883-08	20190315-DGW-MW11-PV35mid-30D	Groundwater		15-Mar-2019 09:30	18-Mar-2019 09:15	☐
HS19030883-09	20190315-DGW-MW11-PV35mid-35D	Groundwater		15-Mar-2019 09:30	18-Mar-2019 09:15	☐
HS19030883-10	20190315-DGW-MW11-PV35mid-40D	Groundwater		15-Mar-2019 09:30	18-Mar-2019 09:15	☐
HS19030883-11	20190314-DGW-MW11-PV35out-controlT	Groundwater		14-Mar-2019 09:45	18-Mar-2019 09:15	☐
HS19030883-12	20190314-DGW-MW11-PV35out-30T	Groundwater		14-Mar-2019 09:45	18-Mar-2019 09:15	☐
HS19030883-13	20190314-DGW-MW11-PV35out-35T	Groundwater		14-Mar-2019 09:45	18-Mar-2019 09:15	☐
HS19030883-14	20190314-DGW-MW11-PV35out-40T	Groundwater		14-Mar-2019 09:45	18-Mar-2019 09:15	☐
HS19030883-15	20190314-DGW-MW11-PV35inlet-controlT	Groundwater		14-Mar-2019 09:45	18-Mar-2019 09:15	☐
HS19030883-16	20190314-DGW-MW11-PV35inlet-30-35-40T	Groundwater		14-Mar-2019 09:45	18-Mar-2019 09:15	☐
HS19030883-17	20190315-DGW-MW11-PV35mid-controlT	Groundwater		15-Mar-2019 09:30	18-Mar-2019 09:15	☐
HS19030883-18	20190315-DGW-MW11-PV35mid-30T	Groundwater		15-Mar-2019 09:30	18-Mar-2019 09:15	☐
HS19030883-19	20190315-DGW-MW11-PV35mid-35T	Groundwater		15-Mar-2019 09:30	18-Mar-2019 09:15	☐
HS19030883-20	20190315-DGW-MW11-PV35mid-40T	Groundwater		15-Mar-2019 09:30	18-Mar-2019 09:15	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190314-DGW-MW11-PV35out-controlD
Collection Date: 14-Mar-2019 09:45

ANALYTICAL REPORT
WorkOrder:HS19030883
Lab ID:HS19030883-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 19-Mar-2019		Analyst: JHD
Antimony	**0.00870**	J	**0.00200**	**0.0100**	**mg/L**	5	22-Mar-2019 00:19
Arsenic	U		0.00200	0.0100	mg/L	5	22-Mar-2019 00:19
Cadmium	**0.00738**	J	**0.00100**	**0.0100**	**mg/L**	5	22-Mar-2019 00:19
Calcium	**491**		**0.170**	**2.50**	**mg/L**	5	22-Mar-2019 00:19
Iron	U		0.0600	1.00	mg/L	5	22-Mar-2019 00:19
Lead	U		0.00300	0.0100	mg/L	5	22-Mar-2019 00:19
Magnesium	**274**		**0.0500**	**1.00**	**mg/L**	5	22-Mar-2019 00:19
Potassium	**16.3**		**0.0900**	**1.00**	**mg/L**	5	22-Mar-2019 00:19
Selenium	U		0.00550	0.0100	mg/L	5	22-Mar-2019 00:19
Sodium	**1,760**		**1.40**	**20.0**	**mg/L**	100	22-Mar-2019 14:41

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190314-DGW-MW11-PV35out-30D
Collection Date: 14-Mar-2019 09:45

ANALYTICAL REPORT
WorkOrder:HS19030883
Lab ID:HS19030883-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 19-Mar-2019		Analyst: JHD
Antimony	**0.00248**	J	**0.00200**	**0.0100**	**mg/L**	5	22-Mar-2019 00:34
Arsenic	U		0.00200	0.0100	mg/L	5	22-Mar-2019 00:34
Cadmium	U		0.00100	0.0100	mg/L	5	22-Mar-2019 00:34
Calcium	**312**		**0.170**	**2.50**	**mg/L**	5	22-Mar-2019 00:34
Iron	U		0.0600	1.00	mg/L	5	22-Mar-2019 00:34
Lead	U		0.00300	0.0100	mg/L	5	22-Mar-2019 00:34
Magnesium	**278**		**0.0500**	**1.00**	**mg/L**	5	22-Mar-2019 00:34
Potassium	**18.8**		**0.0900**	**1.00**	**mg/L**	5	22-Mar-2019 00:34
Selenium	U		0.00550	0.0100	mg/L	5	22-Mar-2019 00:34
Sodium	**1,740**		**1.40**	**20.0**	**mg/L**	100	22-Mar-2019 14:52

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190314-DGW-MW11-PV35out-35D
Collection Date: 14-Mar-2019 09:45

ANALYTICAL REPORT
WorkOrder:HS19030883
Lab ID:HS19030883-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 19-Mar-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	22-Mar-2019 00:37
Arsenic	U		0.00200	0.0100	mg/L	5	22-Mar-2019 00:37
Cadmium	U		0.00100	0.0100	mg/L	5	22-Mar-2019 00:37
Calcium	**294**		**0.170**	**2.50**	**mg/L**	5	22-Mar-2019 00:37
Iron	U		0.0600	1.00	mg/L	5	22-Mar-2019 00:37
Lead	U		0.00300	0.0100	mg/L	5	22-Mar-2019 00:37
Magnesium	**268**		**0.0500**	**1.00**	**mg/L**	5	22-Mar-2019 00:37
Potassium	**18.3**		**0.0900**	**1.00**	**mg/L**	5	22-Mar-2019 00:37
Selenium	U		0.00550	0.0100	mg/L	5	22-Mar-2019 00:37
Sodium	**1,730**		**1.40**	**20.0**	**mg/L**	100	22-Mar-2019 14:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190314-DGW-MW11-PV35out-40D
Collection Date: 14-Mar-2019 09:45

ANALYTICAL REPORT
WorkOrder:HS19030883
Lab ID:HS19030883-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 19-Mar-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	22-Mar-2019 00:39
Arsenic	U		0.00200	0.0100	mg/L	5	22-Mar-2019 00:39
Cadmium	U		0.00100	0.0100	mg/L	5	22-Mar-2019 00:39
Calcium	**286**		**0.170**	**2.50**	**mg/L**	5	22-Mar-2019 00:39
Iron	U		0.0600	1.00	mg/L	5	22-Mar-2019 00:39
Lead	U		0.00300	0.0100	mg/L	5	22-Mar-2019 00:39
Magnesium	**271**		**0.0500**	**1.00**	**mg/L**	5	22-Mar-2019 00:39
Potassium	**18.6**		**0.0900**	**1.00**	**mg/L**	5	22-Mar-2019 00:39
Selenium	U		0.00550	0.0100	mg/L	5	22-Mar-2019 00:39
Sodium	**1,810**		**1.40**	**20.0**	**mg/L**	100	22-Mar-2019 14:56

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190314-DGW-MW11-PV35inlet-controlD
Collection Date: 14-Mar-2019 09:45

ANALYTICAL REPORT
WorkOrder:HS19030883
Lab ID:HS19030883-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 19-Mar-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	22-Mar-2019 00:41
Arsenic	U		0.00200	0.0100	mg/L	5	22-Mar-2019 00:41
Cadmium	**0.00779**	J	**0.00100**	**0.0100**	**mg/L**	5	22-Mar-2019 00:41
Calcium	**482**		**0.170**	**2.50**	**mg/L**	5	22-Mar-2019 00:41
Iron	U		0.0600	1.00	mg/L	5	22-Mar-2019 00:41
Lead	U		0.00300	0.0100	mg/L	5	22-Mar-2019 00:41
Magnesium	**273**		**0.0500**	**1.00**	**mg/L**	5	22-Mar-2019 00:41
Potassium	**16.1**		**0.0900**	**1.00**	**mg/L**	5	22-Mar-2019 00:41
Selenium	U		0.00550	0.0100	mg/L	5	22-Mar-2019 00:41
Sodium	**1,770**		**1.40**	**20.0**	**mg/L**	100	22-Mar-2019 14:59

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190314-DGW-MW11-PV35inlet-30-35-40D
Collection Date: 14-Mar-2019 09:45

ANALYTICAL REPORT
WorkOrder:HS19030883
Lab ID:HS19030883-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 19-Mar-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	22-Mar-2019 00:44
Arsenic	U		0.00200	0.0100	mg/L	5	22-Mar-2019 00:44
Cadmium	**0.00521**	J	**0.00100**	**0.0100**	**mg/L**	5	22-Mar-2019 00:44
Calcium	**489**		**0.170**	**2.50**	**mg/L**	5	22-Mar-2019 00:44
Iron	**0.289**	J	**0.0600**	**1.00**	**mg/L**	5	22-Mar-2019 00:44
Lead	U		0.00300	0.0100	mg/L	5	22-Mar-2019 00:44
Magnesium	**282**		**0.0500**	**1.00**	**mg/L**	5	22-Mar-2019 00:44
Potassium	**17.9**		**0.0900**	**1.00**	**mg/L**	5	22-Mar-2019 00:44
Selenium	U		0.00550	0.0100	mg/L	5	22-Mar-2019 00:44
Sodium	**1,690**		**1.40**	**20.0**	**mg/L**	100	22-Mar-2019 15:01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190315-DGW-MW11-PV35mid-controlD
Collection Date: 15-Mar-2019 09:30

ANALYTICAL REPORT
WorkOrder:HS19030883
Lab ID:HS19030883-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 19-Mar-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	22-Mar-2019 00:46
Arsenic	U		0.00200	0.0100	mg/L	5	22-Mar-2019 00:46
Cadmium	**0.00767**	J	**0.00100**	**0.0100**	**mg/L**	5	22-Mar-2019 00:46
Calcium	**489**		**0.170**	**2.50**	**mg/L**	5	22-Mar-2019 00:46
Iron	U		0.0600	1.00	mg/L	5	22-Mar-2019 00:46
Lead	U		0.00300	0.0100	mg/L	5	22-Mar-2019 00:46
Magnesium	**276**		**0.0500**	**1.00**	**mg/L**	5	22-Mar-2019 00:46
Potassium	**16.1**		**0.0900**	**1.00**	**mg/L**	5	22-Mar-2019 00:46
Selenium	U		0.00550	0.0100	mg/L	5	22-Mar-2019 00:46
Sodium	**1,760**		**1.40**	**20.0**	**mg/L**	100	22-Mar-2019 15:03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190315-DGW-MW11-PV35mid-30D
Collection Date: 15-Mar-2019 09:30

ANALYTICAL REPORT
WorkOrder:HS19030883
Lab ID:HS19030883-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 19-Mar-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	22-Mar-2019 00:48
Arsenic	U		0.00200	0.0100	mg/L	5	22-Mar-2019 00:48
Cadmium	U		0.00100	0.0100	mg/L	5	22-Mar-2019 00:48
Calcium	**351**		**0.170**	**2.50**	**mg/L**	5	22-Mar-2019 00:48
Iron	**0.947**	J	**0.0600**	**1.00**	**mg/L**	5	22-Mar-2019 00:48
Lead	U		0.00300	0.0100	mg/L	5	22-Mar-2019 00:48
Magnesium	**262**		**0.0500**	**1.00**	**mg/L**	5	22-Mar-2019 00:48
Potassium	**17.0**		**0.0900**	**1.00**	**mg/L**	5	22-Mar-2019 00:48
Selenium	U		0.00550	0.0100	mg/L	5	22-Mar-2019 00:48
Sodium	**1,760**		**1.40**	**20.0**	**mg/L**	100	22-Mar-2019 15:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190315-DGW-MW11-PV35mid-35D
Collection Date: 15-Mar-2019 09:30

ANALYTICAL REPORT
WorkOrder:HS19030883
Lab ID:HS19030883-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 19-Mar-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	22-Mar-2019 00:50
Arsenic	U		0.00200	0.0100	mg/L	5	22-Mar-2019 00:50
Cadmium	U		0.00100	0.0100	mg/L	5	22-Mar-2019 00:50
Calcium	**346**		**0.170**	**2.50**	**mg/L**	5	22-Mar-2019 00:50
Iron	**0.482**	J	**0.0600**	**1.00**	**mg/L**	5	22-Mar-2019 00:50
Lead	U		0.00300	0.0100	mg/L	5	22-Mar-2019 00:50
Magnesium	**273**		**0.0500**	**1.00**	**mg/L**	5	22-Mar-2019 00:50
Potassium	**17.9**		**0.0900**	**1.00**	**mg/L**	5	22-Mar-2019 00:50
Selenium	U		0.00550	0.0100	mg/L	5	22-Mar-2019 00:50
Sodium	**1,810**		**1.40**	**20.0**	**mg/L**	100	22-Mar-2019 15:07

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190315-DGW-MW11-PV35mid-40D
Collection Date: 15-Mar-2019 09:30

ANALYTICAL REPORT
WorkOrder:HS19030883
Lab ID:HS19030883-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 19-Mar-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	22-Mar-2019 00:53
Arsenic	U		0.00200	0.0100	mg/L	5	22-Mar-2019 00:53
Cadmium	U		0.00100	0.0100	mg/L	5	22-Mar-2019 00:53
Calcium	**312**		**0.170**	**2.50**	**mg/L**	5	22-Mar-2019 00:53
Iron	**0.123**	J	**0.0600**	**1.00**	**mg/L**	5	22-Mar-2019 00:53
Lead	U		0.00300	0.0100	mg/L	5	22-Mar-2019 00:53
Magnesium	**278**		**0.0500**	**1.00**	**mg/L**	5	22-Mar-2019 00:53
Potassium	**18.1**		**0.0900**	**1.00**	**mg/L**	5	22-Mar-2019 00:53
Selenium	U		0.00550	0.0100	mg/L	5	22-Mar-2019 00:53
Sodium	**1,730**		**1.40**	**20.0**	**mg/L**	100	22-Mar-2019 15:09

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190314-DGW-MW11-PV35out-controlT
Collection Date: 14-Mar-2019 09:45

ANALYTICAL REPORT
WorkOrder:HS19030883
Lab ID:HS19030883-11
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JCJ
Hardness (As CaCO3)	**2,150**		**2.00**	**2.00**	**mg/L**	1	25-Mar-2019 17:06
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Mar-2019		Analyst: JHD
Antimony	**0.00288**	J	**0.00200**	**0.0100**	**mg/L**	5	22-Mar-2019 23:34
Arsenic	U		0.00200	0.0100	mg/L	5	22-Mar-2019 23:34
Cadmium	**0.00736**	J	**0.00100**	**0.0100**	**mg/L**	5	22-Mar-2019 23:34
Calcium	**438**		**0.170**	**2.50**	**mg/L**	5	22-Mar-2019 23:34
Iron	U		0.0600	1.00	mg/L	5	22-Mar-2019 23:34
Lead	U		0.00300	0.0100	mg/L	5	22-Mar-2019 23:34
Magnesium	**256**		**0.0500**	**1.00**	**mg/L**	5	22-Mar-2019 23:34
Potassium	**14.4**		**0.0900**	**1.00**	**mg/L**	5	22-Mar-2019 23:34
Selenium	U		0.00550	0.0100	mg/L	5	22-Mar-2019 23:34
Sodium	**1,710**		**0.280**	**4.00**	**mg/L**	20	25-Mar-2019 12:20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190314-DGW-MW11-PV35out-30T
Collection Date: 14-Mar-2019 09:45

ANALYTICAL REPORT
WorkOrder:HS19030883
Lab ID:HS19030883-12
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JCJ
Hardness (As CaCO3)	**1,790**		**2.00**	**2.00**	**mg/L**	1	25-Mar-2019 17:06
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Mar-2019		Analyst: JHD
Antimony	**0.00249**	J	**0.00200**	**0.0100**	**mg/L**	5	22-Mar-2019 23:49
Arsenic	U		0.00200	0.0100	mg/L	5	22-Mar-2019 23:49
Cadmium	U		0.00100	0.0100	mg/L	5	22-Mar-2019 23:49
Calcium	**282**		**0.170**	**2.50**	**mg/L**	5	22-Mar-2019 23:49
Iron	**1.69**		**0.0600**	**1.00**	**mg/L**	5	22-Mar-2019 23:49
Lead	U		0.00300	0.0100	mg/L	5	22-Mar-2019 23:49
Magnesium	**263**		**0.0500**	**1.00**	**mg/L**	5	22-Mar-2019 23:49
Potassium	**17.0**		**0.0900**	**1.00**	**mg/L**	5	22-Mar-2019 23:49
Selenium	U		0.00550	0.0100	mg/L	5	22-Mar-2019 23:49
Sodium	**1,650**		**0.280**	**4.00**	**mg/L**	20	25-Mar-2019 12:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190314-DGW-MW11-PV35out-35T
Collection Date: 14-Mar-2019 09:45

ANALYTICAL REPORT
WorkOrder:HS19030883
Lab ID:HS19030883-13
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JCJ
Hardness (As CaCO3)	**1,780**		**2.00**	**2.00**	**mg/L**	1	25-Mar-2019 17:06
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Mar-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	22-Mar-2019 23:51
Arsenic	U		0.00200	0.0100	mg/L	5	22-Mar-2019 23:51
Cadmium	U		0.00100	0.0100	mg/L	5	22-Mar-2019 23:51
Calcium	**282**		**0.170**	**2.50**	**mg/L**	5	22-Mar-2019 23:51
Iron	**2.07**		**0.0600**	**1.00**	**mg/L**	5	22-Mar-2019 23:51
Lead	U		0.00300	0.0100	mg/L	5	22-Mar-2019 23:51
Magnesium	**262**		**0.0500**	**1.00**	**mg/L**	5	22-Mar-2019 23:51
Potassium	**17.1**		**0.0900**	**1.00**	**mg/L**	5	22-Mar-2019 23:51
Selenium	U		0.00550	0.0100	mg/L	5	22-Mar-2019 23:51
Sodium	**1,720**		**0.280**	**4.00**	**mg/L**	20	25-Mar-2019 12:29

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190314-DGW-MW11-PV35out-40T
Collection Date: 14-Mar-2019 09:45

ANALYTICAL REPORT
WorkOrder:HS19030883
Lab ID:HS19030883-14
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JCJ
Hardness (As CaCO3)	**1,710**		**2.00**	**2.00**	**mg/L**	1	25-Mar-2019 17:06
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Mar-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	22-Mar-2019 23:53
Arsenic	U		0.00200	0.0100	mg/L	5	22-Mar-2019 23:53
Cadmium	U		0.00100	0.0100	mg/L	5	22-Mar-2019 23:53
Calcium	**260**		**0.170**	**2.50**	**mg/L**	5	22-Mar-2019 23:53
Iron	**1.00**		**0.0600**	**1.00**	**mg/L**	5	22-Mar-2019 23:53
Lead	U		0.00300	0.0100	mg/L	5	22-Mar-2019 23:53
Magnesium	**257**		**0.0500**	**1.00**	**mg/L**	5	22-Mar-2019 23:53
Potassium	**16.8**		**0.0900**	**1.00**	**mg/L**	5	22-Mar-2019 23:53
Selenium	U		0.00550	0.0100	mg/L	5	22-Mar-2019 23:53
Sodium	**1,740**		**0.280**	**4.00**	**mg/L**	20	25-Mar-2019 12:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190314-DGW-MW11-PV35inlet-controlT
Collection Date: 14-Mar-2019 09:45

ANALYTICAL REPORT
WorkOrder:HS19030883
Lab ID:HS19030883-15
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JCJ
Hardness (As CaCO3)	**2,200**		**2.00**	**2.00**	**mg/L**	1	25-Mar-2019 17:06
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Mar-2019		Analyst: JHD
Antimony	**0.00214**	J	**0.00200**	**0.0100**	**mg/L**	5	22-Mar-2019 23:56
Arsenic	U		0.00200	0.0100	mg/L	5	22-Mar-2019 23:56
Cadmium	**0.00800**	J	**0.00100**	**0.0100**	**mg/L**	5	22-Mar-2019 23:56
Calcium	**446**		**0.170**	**2.50**	**mg/L**	5	22-Mar-2019 23:56
Iron	**1.93**		**0.0600**	**1.00**	**mg/L**	5	22-Mar-2019 23:56
Lead	**0.00324**	J	**0.00300**	**0.0100**	**mg/L**	5	22-Mar-2019 23:56
Magnesium	**263**		**0.0500**	**1.00**	**mg/L**	5	22-Mar-2019 23:56
Potassium	**14.9**		**0.0900**	**1.00**	**mg/L**	5	22-Mar-2019 23:56
Selenium	U		0.00550	0.0100	mg/L	5	22-Mar-2019 23:56
Sodium	**1,680**		**0.280**	**4.00**	**mg/L**	20	25-Mar-2019 12:33

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190314-DGW-MW11-PV35inlet-30-35-40T
Collection Date: 14-Mar-2019 09:45

ANALYTICAL REPORT
WorkOrder:HS19030883
Lab ID:HS19030883-16
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JCJ
Hardness (As CaCO3)	**2,230**		**2.00**	**2.00**	**mg/L**	1	25-Mar-2019 17:06
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Mar-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	22-Mar-2019 23:58
Arsenic	U		0.00200	0.0100	mg/L	5	22-Mar-2019 23:58
Cadmium	**0.00614**	J	**0.00100**	**0.0100**	**mg/L**	5	22-Mar-2019 23:58
Calcium	**452**		**0.170**	**2.50**	**mg/L**	5	22-Mar-2019 23:58
Iron	**3.39**		**0.0600**	**1.00**	**mg/L**	5	22-Mar-2019 23:58
Lead	U		0.00300	0.0100	mg/L	5	22-Mar-2019 23:58
Magnesium	**268**		**0.0500**	**1.00**	**mg/L**	5	22-Mar-2019 23:58
Potassium	**16.6**		**0.0900**	**1.00**	**mg/L**	5	22-Mar-2019 23:58
Selenium	U		0.00550	0.0100	mg/L	5	22-Mar-2019 23:58
Sodium	**1,620**		**0.280**	**4.00**	**mg/L**	20	25-Mar-2019 12:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190315-DGW-MW11-PV35mid-controlT
Collection Date: 15-Mar-2019 09:30

ANALYTICAL REPORT
WorkOrder:HS19030883
Lab ID:HS19030883-17
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JCJ
Hardness (As CaCO3)	**2,230**		**2.00**	**2.00**	**mg/L**	1	25-Mar-2019 17:06
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Mar-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	23-Mar-2019 00:00
Arsenic	U		0.00200	0.0100	mg/L	5	23-Mar-2019 00:00
Cadmium	**0.00742**	J	**0.00100**	**0.0100**	**mg/L**	5	23-Mar-2019 00:00
Calcium	**450**		**0.170**	**2.50**	**mg/L**	5	23-Mar-2019 00:00
Iron	U		0.0600	1.00	mg/L	5	23-Mar-2019 00:00
Lead	U		0.00300	0.0100	mg/L	5	23-Mar-2019 00:00
Magnesium	**269**		**0.0500**	**1.00**	**mg/L**	5	23-Mar-2019 00:00
Potassium	**15.2**		**0.0900**	**1.00**	**mg/L**	5	23-Mar-2019 00:00
Selenium	U		0.00550	0.0100	mg/L	5	23-Mar-2019 00:00
Sodium	**1,830**		**0.280**	**4.00**	**mg/L**	20	25-Mar-2019 12:44

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190315-DGW-MW11-PV35mid-30T
Collection Date: 15-Mar-2019 09:30

ANALYTICAL REPORT
WorkOrder:HS19030883
Lab ID:HS19030883-18
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JCJ
Hardness (As CaCO3)	**2,000**		**2.00**	**2.00**	**mg/L**	1	25-Mar-2019 17:06
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Mar-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	23-Mar-2019 00:02
Arsenic	U		0.00200	0.0100	mg/L	5	23-Mar-2019 00:02
Cadmium	U		0.00100	0.0100	mg/L	5	23-Mar-2019 00:02
Calcium	**349**		**0.170**	**2.50**	**mg/L**	5	23-Mar-2019 00:02
Iron	**8.80**		**0.0600**	**1.00**	**mg/L**	5	23-Mar-2019 00:02
Lead	U		0.00300	0.0100	mg/L	5	23-Mar-2019 00:02
Magnesium	**273**		**0.0500**	**1.00**	**mg/L**	5	23-Mar-2019 00:02
Potassium	**16.8**		**0.0900**	**1.00**	**mg/L**	5	23-Mar-2019 00:02
Selenium	U		0.00550	0.0100	mg/L	5	23-Mar-2019 00:02
Sodium	**1,750**		**0.280**	**4.00**	**mg/L**	20	25-Mar-2019 12:46

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190315-DGW-MW11-PV35mid-35T
Collection Date: 15-Mar-2019 09:30

ANALYTICAL REPORT
WorkOrder:HS19030883
Lab ID:HS19030883-19
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JCJ
Hardness (As CaCO3)	**1,950**		**2.00**	**2.00**	**mg/L**	1	25-Mar-2019 17:06
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Mar-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	23-Mar-2019 00:04
Arsenic	U		0.00200	0.0100	mg/L	5	23-Mar-2019 00:04
Cadmium	U		0.00100	0.0100	mg/L	5	23-Mar-2019 00:04
Calcium	**331**		**0.170**	**2.50**	**mg/L**	5	23-Mar-2019 00:04
Iron	**4.54**		**0.0600**	**1.00**	**mg/L**	5	23-Mar-2019 00:04
Lead	U		0.00300	0.0100	mg/L	5	23-Mar-2019 00:04
Magnesium	**274**		**0.0500**	**1.00**	**mg/L**	5	23-Mar-2019 00:04
Potassium	**17.0**		**0.0900**	**1.00**	**mg/L**	5	23-Mar-2019 00:04
Selenium	**0.00555**	J	**0.00550**	**0.0100**	**mg/L**	5	23-Mar-2019 00:04
Sodium	**1,540**		**0.280**	**4.00**	**mg/L**	20	25-Mar-2019 12:49

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190315-DGW-MW11-PV35mid-40T
Collection Date: 15-Mar-2019 09:30

ANALYTICAL REPORT
WorkOrder:HS19030883
Lab ID:HS19030883-20
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JCJ
Hardness (As CaCO3)	**1,790**		**2.00**	**2.00**	**mg/L**	1	25-Mar-2019 17:06
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Mar-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	23-Mar-2019 00:07
Arsenic	U		0.00200	0.0100	mg/L	5	23-Mar-2019 00:07
Cadmium	U		0.00100	0.0100	mg/L	5	23-Mar-2019 00:07
Calcium	**286**		**0.170**	**2.50**	**mg/L**	5	23-Mar-2019 00:07
Iron	**1.02**		**0.0600**	**1.00**	**mg/L**	5	23-Mar-2019 00:07
Lead	U		0.00300	0.0100	mg/L	5	23-Mar-2019 00:07
Magnesium	**261**		**0.0500**	**1.00**	**mg/L**	5	23-Mar-2019 00:07
Potassium	**17.1**		**0.0900**	**1.00**	**mg/L**	5	23-Mar-2019 00:07
Selenium	U		0.00550	0.0100	mg/L	5	23-Mar-2019 00:07
Sodium	**1,690**		**0.280**	**4.00**	**mg/L**	20	25-Mar-2019 12:51

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030883

Batch ID: 138836 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19030883-01	1	10	10 (mL)	1
HS19030883-02	1	10	10 (mL)	1
HS19030883-03	1	10	10 (mL)	1
HS19030883-04	1	10	10 (mL)	1
HS19030883-05	1	10	10 (mL)	1
HS19030883-06	1	10	10 (mL)	1
HS19030883-07	1	10	10 (mL)	1
HS19030883-08	1	10	10 (mL)	1
HS19030883-09	1	10	10 (mL)	1
HS19030883-10	1	10	10 (mL)	1

Batch ID: 138891 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19030883-11	1	10	10 (mL)	1
HS19030883-12	1	10	10 (mL)	1
HS19030883-13	1	10	10 (mL)	1
HS19030883-14	1	10	10 (mL)	1
HS19030883-15	1	10	10 (mL)	1
HS19030883-16	1	10	10 (mL)	1
HS19030883-17	1	10	10 (mL)	1
HS19030883-18	1	10	10 (mL)	1
HS19030883-19	1	10	10 (mL)	1
HS19030883-20	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030883

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 138836	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS19030883-01	20190314-DGW-MW11-PV35out-controlD	14 Mar 2019 09:45		19 Mar 2019 10:30	22 Mar 2019 14:41	100
HS19030883-01	20190314-DGW-MW11-PV35out-controlD	14 Mar 2019 09:45		19 Mar 2019 10:30	22 Mar 2019 00:19	5
HS19030883-02	20190314-DGW-MW11-PV35out-30D	14 Mar 2019 09:45		19 Mar 2019 10:30	22 Mar 2019 14:52	100
HS19030883-02	20190314-DGW-MW11-PV35out-30D	14 Mar 2019 09:45		19 Mar 2019 10:30	22 Mar 2019 00:34	5
HS19030883-03	20190314-DGW-MW11-PV35out-35D	14 Mar 2019 09:45		19 Mar 2019 10:30	22 Mar 2019 14:54	100
HS19030883-03	20190314-DGW-MW11-PV35out-35D	14 Mar 2019 09:45		19 Mar 2019 10:30	22 Mar 2019 00:37	5
HS19030883-04	20190314-DGW-MW11-PV35out-40D	14 Mar 2019 09:45		19 Mar 2019 10:30	22 Mar 2019 14:56	100
HS19030883-04	20190314-DGW-MW11-PV35out-40D	14 Mar 2019 09:45		19 Mar 2019 10:30	22 Mar 2019 00:39	5
HS19030883-05	20190314-DGW-MW11-PV35inlet-controlD	14 Mar 2019 09:45		19 Mar 2019 10:30	22 Mar 2019 14:59	100
HS19030883-05	20190314-DGW-MW11-PV35inlet-controlD	14 Mar 2019 09:45		19 Mar 2019 10:30	22 Mar 2019 00:41	5
HS19030883-06	20190314-DGW-MW11-PV35inlet-30-35-40D	14 Mar 2019 09:45		19 Mar 2019 10:30	22 Mar 2019 15:01	100
HS19030883-06	20190314-DGW-MW11-PV35inlet-30-35-40D	14 Mar 2019 09:45		19 Mar 2019 10:30	22 Mar 2019 00:44	5
HS19030883-07	20190315-DGW-MW11-PV35mid-controlD	15 Mar 2019 09:30		19 Mar 2019 10:30	22 Mar 2019 15:03	100
HS19030883-07	20190315-DGW-MW11-PV35mid-controlD	15 Mar 2019 09:30		19 Mar 2019 10:30	22 Mar 2019 00:46	5
HS19030883-08	20190315-DGW-MW11-PV35mid-30D	15 Mar 2019 09:30		19 Mar 2019 10:30	22 Mar 2019 15:05	100
HS19030883-08	20190315-DGW-MW11-PV35mid-30D	15 Mar 2019 09:30		19 Mar 2019 10:30	22 Mar 2019 00:48	5
HS19030883-09	20190315-DGW-MW11-PV35mid-35D	15 Mar 2019 09:30		19 Mar 2019 10:30	22 Mar 2019 15:07	100
HS19030883-09	20190315-DGW-MW11-PV35mid-35D	15 Mar 2019 09:30		19 Mar 2019 10:30	22 Mar 2019 00:50	5
HS19030883-10	20190315-DGW-MW11-PV35mid-40D	15 Mar 2019 09:30		19 Mar 2019 10:30	22 Mar 2019 15:09	100
HS19030883-10	20190315-DGW-MW11-PV35mid-40D	15 Mar 2019 09:30		19 Mar 2019 10:30	22 Mar 2019 00:53	5

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030883

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 138891	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19030883-11	20190314-DGW-MW11-PV35out-controlT	14 Mar 2019 09:45		20 Mar 2019 10:30	25 Mar 2019 12:20	20
HS19030883-11	20190314-DGW-MW11-PV35out-controlT	14 Mar 2019 09:45		20 Mar 2019 10:30	22 Mar 2019 23:34	5
HS19030883-12	20190314-DGW-MW11-PV35out-30T	14 Mar 2019 09:45		20 Mar 2019 10:30	25 Mar 2019 12:27	20
HS19030883-12	20190314-DGW-MW11-PV35out-30T	14 Mar 2019 09:45		20 Mar 2019 10:30	22 Mar 2019 23:49	5
HS19030883-13	20190314-DGW-MW11-PV35out-35T	14 Mar 2019 09:45		20 Mar 2019 10:30	25 Mar 2019 12:29	20
HS19030883-13	20190314-DGW-MW11-PV35out-35T	14 Mar 2019 09:45		20 Mar 2019 10:30	22 Mar 2019 23:51	5
HS19030883-14	20190314-DGW-MW11-PV35out-40T	14 Mar 2019 09:45		20 Mar 2019 10:30	25 Mar 2019 12:31	20
HS19030883-14	20190314-DGW-MW11-PV35out-40T	14 Mar 2019 09:45		20 Mar 2019 10:30	22 Mar 2019 23:53	5
HS19030883-15	20190314-DGW-MW11-PV35inlet-controlT	14 Mar 2019 09:45		20 Mar 2019 10:30	25 Mar 2019 12:33	20
HS19030883-15	20190314-DGW-MW11-PV35inlet-controlT	14 Mar 2019 09:45		20 Mar 2019 10:30	22 Mar 2019 23:56	5
HS19030883-16	20190314-DGW-MW11-PV35inlet-30-35-40T	14 Mar 2019 09:45		20 Mar 2019 10:30	25 Mar 2019 12:42	20
HS19030883-16	20190314-DGW-MW11-PV35inlet-30-35-40T	14 Mar 2019 09:45		20 Mar 2019 10:30	22 Mar 2019 23:58	5
HS19030883-17	20190315-DGW-MW11-PV35mid-controlT	15 Mar 2019 09:30		20 Mar 2019 10:30	25 Mar 2019 12:44	20
HS19030883-17	20190315-DGW-MW11-PV35mid-controlT	15 Mar 2019 09:30		20 Mar 2019 10:30	23 Mar 2019 00:00	5
HS19030883-18	20190315-DGW-MW11-PV35mid-30T	15 Mar 2019 09:30		20 Mar 2019 10:30	25 Mar 2019 12:46	20
HS19030883-18	20190315-DGW-MW11-PV35mid-30T	15 Mar 2019 09:30		20 Mar 2019 10:30	23 Mar 2019 00:02	5
HS19030883-19	20190315-DGW-MW11-PV35mid-35T	15 Mar 2019 09:30		20 Mar 2019 10:30	25 Mar 2019 12:49	20
HS19030883-19	20190315-DGW-MW11-PV35mid-35T	15 Mar 2019 09:30		20 Mar 2019 10:30	23 Mar 2019 00:04	5
HS19030883-20	20190315-DGW-MW11-PV35mid-40T	15 Mar 2019 09:30		20 Mar 2019 10:30	25 Mar 2019 12:51	20
HS19030883-20	20190315-DGW-MW11-PV35mid-40T	15 Mar 2019 09:30		20 Mar 2019 10:30	23 Mar 2019 00:07	5

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030883

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R335228	**Test Name :** HARDNESS, TOTAL AS CACO3 BY SM2340B			**Matrix:** Groundwater		
HS19030883-11	20190314-DGW-MW11-PV35out-controlT	14 Mar 2019 09:45			25 Mar 2019 17:06	1
HS19030883-12	20190314-DGW-MW11-PV35out-30T	14 Mar 2019 09:45			25 Mar 2019 17:06	1
HS19030883-13	20190314-DGW-MW11-PV35out-35T	14 Mar 2019 09:45			25 Mar 2019 17:06	1
HS19030883-14	20190314-DGW-MW11-PV35out-40T	14 Mar 2019 09:45			25 Mar 2019 17:06	1
HS19030883-15	20190314-DGW-MW11-PV35inlet-controlT	14 Mar 2019 09:45			25 Mar 2019 17:06	1
HS19030883-16	20190314-DGW-MW11-PV35inlet-30-35-40T	14 Mar 2019 09:45			25 Mar 2019 17:06	1
HS19030883-17	20190315-DGW-MW11-PV35mid-controlT	15 Mar 2019 09:30			25 Mar 2019 17:06	1
HS19030883-18	20190315-DGW-MW11-PV35mid-30T	15 Mar 2019 09:30			25 Mar 2019 17:06	1
HS19030883-19	20190315-DGW-MW11-PV35mid-35T	15 Mar 2019 09:30			25 Mar 2019 17:06	1
HS19030883-20	20190315-DGW-MW11-PV35mid-40T	15 Mar 2019 09:30			25 Mar 2019 17:06	1

WorkOrder: HS19030883
InstrumentID: ICPMS05
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000555	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000460	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000554	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0537	0.0340	0.500
A	Iron	7439-89-6	0.0500	0.0549	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.00100	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0680	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0542	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00280	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0459	0.0140	0.200

WorkOrder: HS19030883
InstrumentID: ICPMS05
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000555	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000460	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000554	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0537	0.0340	0.500
A	Iron	7439-89-6	0.0500	0.0549	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.00100	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0680	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0542	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00280	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0459	0.0140	0.200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030883

QC BATCH REPORT NEW

Batch ID: 138836 (0) **Instrument: ICPMS05** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

MBLK Sample ID: **MBLK-138836** Units: **mg/L** Analysis Date: **22-Mar-2019 00:14**
Client ID: Run ID: **ICPMS05_334967** SeqNo: **5001101** PrepDate: **19-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	U	0.200								
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	0.04928	0.200								J

LCS Sample ID: **LCS-138836** Units: **mg/L** Analysis Date: **22-Mar-2019 00:16**
Client ID: Run ID: **ICPMS05_334967** SeqNo: **5001102** PrepDate: **19-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04502	0.00200	0.05	0	90.0	80 - 120				
Arsenic	0.05255	0.00200	0.05	0	105	80 - 120				
Cadmium	0.05264	0.00200	0.05	0	105	80 - 120				
Calcium	5.395	0.500	5	0	108	80 - 120				
Iron	5.254	0.200	5	0	105	80 - 120				
Lead	0.04875	0.00200	0.05	0	97.5	80 - 120				
Magnesium	4.979	0.200	5	0	99.6	80 - 120				
Potassium	5.221	0.200	5	0	104	80 - 120				
Selenium	0.05271	0.00200	0.05	0	105	80 - 120				
Sodium	5.422	0.200	5	0	108	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030883

QC BATCH REPORT NEW

Batch ID: 138836 (0) **Instrument:** ICPMS05 **Method:** DISSOLVED METALS BY SW6020A (DISSOLVED)

MS Sample ID: **HS19030883-01MS** Units: **mg/L** Analysis Date: **22-Mar-2019 00:23**
Client ID: **20190314-DGW-MW11-PV35out-controlD** Run ID: **ICPMS05_334967** SeqNo: **5001105** PrepDate: **19-Mar-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05296	0.0100	0.05	0.008697	88.5	75 - 125				
Arsenic	0.05084	0.0100	0.05	0.0005	101	75 - 125				
Cadmium	0.0601	0.0100	0.05	0.00738	105	75 - 125				
Calcium	505.5	2.50	5	491.4	281	75 - 125				SO
Iron	4.994	1.00	5	0.0312	99.3	75 - 125				
Lead	0.05388	0.0100	0.05	0.000685	106	75 - 125				
Magnesium	284.5	1.00	5	273.9	212	75 - 125				SO
Potassium	21.59	1.00	5	16.31	106	75 - 125				
Selenium	0.0353	0.0100	0.05	-0.00331	77.2	75 - 125				
Sodium	1757	1.00	5	1721	704	75 - 125				SEO

MSD Sample ID: **HS19030883-01MSD** Units: **mg/L** Analysis Date: **22-Mar-2019 00:25**
Client ID: **20190314-DGW-MW11-PV35out-controlD** Run ID: **ICPMS05_334967** SeqNo: **5001106** PrepDate: **19-Mar-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.0519	0.0100	0.05	0.008697	86.4	75 - 125	0.05296	2.02	20	
Arsenic	0.05196	0.0100	0.05	0.0005	103	75 - 125	0.05084	2.19	20	
Cadmium	0.05902	0.0100	0.05	0.00738	103	75 - 125	0.0601	1.8	20	
Calcium	503.5	2.50	5	491.4	242	75 - 125	505.5	0.392	20	SO
Iron	4.885	1.00	5	0.0312	97.1	75 - 125	4.994	2.21	20	
Lead	0.05213	0.0100	0.05	0.000685	103	75 - 125	0.05388	3.31	20	
Magnesium	285.1	1.00	5	273.9	223	75 - 125	284.5	0.192	20	SO
Potassium	21.4	1.00	5	16.31	102	75 - 125	21.59	0.858	20	
Sodium	1784	1.00	5	1721	1250	75 - 125	1757	1.53	20	SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030883

QC BATCH REPORT NEW

Batch ID: 138836 (0) **Instrument:** ICPMS05 **Method:** DISSOLVED METALS BY SW6020A (DISSOLVED)

PDS Sample ID: **HS19030883-01PDS** Units: **mg/L** Analysis Date: **22-Mar-2019 00:28**
Client ID: **20190314-DGW-MW11-PV35out-controlD** Run ID: **ICPMS05_334967** SeqNo: **5001107** PrepDate: **19-Mar-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.5158	0.0100	0.5	0.008697	101	75 - 125				
Arsenic	0.5589	0.0100	0.5	0	112	75 - 125				
Cadmium	0.5589	0.0100	0.5	0.00738	110	75 - 125				
Calcium	561.1	2.50	50	491.4	139	75 - 125				SO
Iron	54.42	1.00	50	0	109	75 - 125				
Lead	0.5622	0.0100	0.5	0	112	75 - 125				
Magnesium	339.3	1.00	50	273.9	131	75 - 125				SO
Potassium	71.52	1.00	50	16.31	110	75 - 125				
Selenium	0.5397	0.0100	0.5	0	108	75 - 125				

PDS Sample ID: **HS19030883-01PDS** Units: **mg/L** Analysis Date: **22-Mar-2019 14:45**
Client ID: **20190314-DGW-MW11-PV35out-controlD** Run ID: **ICPMS05_335065** SeqNo: **5002367** PrepDate: **19-Mar-2019** DF: **100**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	2710	20.0	1000	1759	95.1	75 - 125				

SD Sample ID: **HS19030883-01SD** Units: **mg/L** Analysis Date: **22-Mar-2019 00:21**
Client ID: **20190314-DGW-MW11-PV35out-controlD** Run ID: **ICPMS05_334967** SeqNo: **5001104** PrepDate: **19-Mar-2019** DF: **25**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	0.01238	0.0500					0.008697	0	10	J
Arsenic	U	0.0500					0.0005	0	10	
Cadmium	0.005978	0.0500					0.00738	0	10	J
Iron	U	5.00					0.0312	0	10	
Lead	U	0.0500					0.000685	0	10	
Selenium	U	0.0500					-0.00331	0	10	

SD Sample ID: **HS19030883-01SD** Units: **mg/L** Analysis Date: **22-Mar-2019 14:39**
Client ID: **20190314-DGW-MW11-PV35out-controlD** Run ID: **ICPMS05_335065** SeqNo: **5002364** PrepDate: **19-Mar-2019** DF: **25**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	490.4	12.5					491.4	0.202	10	
Magnesium	288.8	5.00					273.9	5.43	10	
Potassium	16.47	5.00					16.31	0.985	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030883

QC BATCH REPORT NEW

Batch ID: **138836 (0)** **Instrument:** **ICPMS05** **Method:** **DISSOLVED METALS BY SW6020A (DISSOLVED)**

SD Sample ID: **HS19030883-01SD** Units: **mg/L** Analysis Date: **22-Mar-2019 14:43**
Client ID: **20190314-DGW-MW11-PV35out-controlD** Run ID: **ICPMS05_335065** SeqNo: **5002366** PrepDate: **19-Mar-2019** DF: **500**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Selenium	U	1.00					0.06934	0	10	
Sodium	1800	100					1759	2.35	10	

The following samples were analyzed in this batch:

HS19030883-01	HS19030883-02	HS19030883-03	HS19030883-04
HS19030883-05	HS19030883-06	HS19030883-07	HS19030883-08
HS19030883-09	HS19030883-10		

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030883

QC BATCH REPORT NEW

Batch ID: 138891 (0) **Instrument: ICPMS05** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLK-138891** Units: **mg/L** Analysis Date: **22-Mar-2019 23:29**
Client ID: Run ID: **ICPMS05_335065** SeqNo: **5003384** PrepDate: **20-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01039	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	0.06281	0.200								J

LCS Sample ID: **LCS-138891** Units: **mg/L** Analysis Date: **22-Mar-2019 23:32**
Client ID: Run ID: **ICPMS05_335065** SeqNo: **5003385** PrepDate: **20-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05173	0.00200	0.05	0	103	80 - 120				
Arsenic	0.05177	0.00200	0.05	0	104	80 - 120				
Cadmium	0.05282	0.00200	0.05	0	106	80 - 120				
Calcium	4.89	0.500	5	0	97.8	80 - 120				
Iron	4.934	0.200	5	0	98.7	80 - 120				
Lead	0.05112	0.00200	0.05	0	102	80 - 120				
Magnesium	4.641	0.200	5	0	92.8	80 - 120				
Potassium	4.629	0.200	5	0	92.6	80 - 120				
Selenium	0.05029	0.00200	0.05	0	101	80 - 120				
Sodium	4.88	0.200	5	0	97.6	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030883

QC BATCH REPORT NEW

Batch ID: 138891 (0) **Instrument: ICPMS05** **Method: ICP-MS METALS BY SW6020A**

MS Sample ID: **HS19030883-11MS** Units: **mg/L** Analysis Date: **22-Mar-2019 23:38**
Client ID: **20190314-DGW-MW11-PV35out-controlT** Run ID: **ICPMS05_335065** SeqNo: **5003388** PrepDate: **20-Mar-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05239	0.0100	0.05	0.002883	99.0	80 - 120				
Arsenic	0.04923	0.0100	0.05	0.000988	96.5	80 - 120				
Cadmium	0.05706	0.0100	0.05	0.007358	99.4	80 - 120				
Calcium	464.2	2.50	5	437.5	534	80 - 120				SO
Iron	4.565	1.00	5	0.01948	90.9	80 - 120				
Lead	0.05004	0.0100	0.05	0.000192	99.7	80 - 120				
Magnesium	268.1	1.00	5	255.7	249	80 - 120				SO
Potassium	19.46	1.00	5	14.41	101	80 - 120				
Selenium	0.04861	0.0100	0.05	0.005167	86.9	80 - 120				
Sodium	1657	1.00	5	1586	1400	80 - 120				SEO

MSD Sample ID: **HS19030883-11MSD** Units: **mg/L** Analysis Date: **22-Mar-2019 23:40**
Client ID: **20190314-DGW-MW11-PV35out-controlT** Run ID: **ICPMS05_335065** SeqNo: **5003389** PrepDate: **20-Mar-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05355	0.0100	0.05	0.002883	101	80 - 120	0.05239	2.19	20	
Arsenic	0.05305	0.0100	0.05	0.000988	104	80 - 120	0.04923	7.47	20	
Cadmium	0.05927	0.0100	0.05	0.007358	104	80 - 120	0.05706	3.8	20	
Calcium	464.3	2.50	5	437.5	536	80 - 120	464.2	0.026	20	SO
Iron	4.649	1.00	5	0.01948	92.6	80 - 120	4.565	1.82	20	
Lead	0.04967	0.0100	0.05	0.000192	99.0	80 - 120	0.05004	0.752	20	
Magnesium	271	1.00	5	255.7	306	80 - 120	268.1	1.05	20	SO
Potassium	19.72	1.00	5	14.41	106	80 - 120	19.46	1.34	20	
Selenium	0.05536	0.0100	0.05	0.005167	100	80 - 120	0.04861	13	20	
Sodium	1641	1.00	5	1586	1090	80 - 120	1657	0.951	20	SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030883

QC BATCH REPORT NEW

Batch ID: 138891 (0) **Instrument: ICPMS05** **Method: ICP-MS METALS BY SW6020A**

PDS Sample ID: **HS19030883-11PDS** Units: **mg/L** Analysis Date: **22-Mar-2019 23:42**
Client ID: **20190314-DGW-MW11-PV35out-controlT** Run ID: **ICPMS05_335065** SeqNo: **5003390** PrepDate: **20-Mar-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	1.015	0.0100	1	0.002883	101	75 - 125				
Arsenic	1.06	0.0100	1	0	106	75 - 125				
Cadmium	1.068	0.0100	1	0.007358	106	75 - 125				
Calcium	546.1	2.50	100	437.5	109	75 - 125				O
Iron	97.15	1.00	100	0	97.1	75 - 125				
Lead	1.057	0.0100	1	0	106	75 - 125				
Magnesium	358.5	1.00	100	255.7	103	75 - 125				
Potassium	109.9	1.00	100	14.41	95.5	75 - 125				
Selenium	1.061	0.0100	1	0	106	75 - 125				

PDS Sample ID: **HS19030883-11PDS** Units: **mg/L** Analysis Date: **25-Mar-2019 12:25**
Client ID: **20190314-DGW-MW11-PV35out-controlT** Run ID: **ICPMS05_335168** SeqNo: **5004844** PrepDate: **20-Mar-2019** DF: **20**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	1912	4.00	200	1714	98.8	75 - 125				O

SD Sample ID: **HS19030883-11SD** Units: **mg/L** Analysis Date: **22-Mar-2019 23:36**
Client ID: **20190314-DGW-MW11-PV35out-controlT** Run ID: **ICPMS05_335065** SeqNo: **5003387** PrepDate: **20-Mar-2019** DF: **25**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0500					0.002883	0	10	
Arsenic	U	0.0500					0.000988	0	10	
Cadmium	0.00636	0.0500					0.007358	0	10	J
Calcium	478.8	12.5					437.5	9.43	10	
Iron	U	5.00					0.01948	0	10	
Lead	U	0.0500					0.000192	0	10	
Selenium	U	0.0500					0.005167	0	10	

SD Sample ID: **HS19030883-11SD** Units: **mg/L** Analysis Date: **25-Mar-2019 12:18**
Client ID: **20190314-DGW-MW11-PV35out-controlT** Run ID: **ICPMS05_335168** SeqNo: **5004841** PrepDate: **20-Mar-2019** DF: **25**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Magnesium	301.2	5.00					284.4	5.92	10	
Potassium	16.7	5.00					16.11	3.67	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030883

QC BATCH REPORT NEW

Batch ID: **138891 (0)** **Instrument:** **ICPMS05** **Method:** **ICP-MS METALS BY SW6020A**

SD Sample ID: **HS19030883-11SD** Units: **mg/L** Analysis Date: **25-Mar-2019 12:23**
Client ID: **20190314-DGW-MW11-PV35out-controlT** Run ID: **ICPMS05_335168** SeqNo: **5004843** PrepDate: **20-Mar-2019** DF: **100**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Sodium	1763	20.0					1714	2.89	10	

The following samples were analyzed in this batch:

HS19030883-11	HS19030883-12	HS19030883-13	HS19030883-14
HS19030883-15	HS19030883-16	HS19030883-17	HS19030883-18
HS19030883-19	HS19030883-20		

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19030883**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
California	2919, 2018-2019	30-Apr-2019
Maryland	343, 2018-2019	30-Jun-2019

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19030883

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19030883-01	20190314-DGW-MW11-PV35out-controlD	Login	3/18/2019 12:41:18 PM	NDR	MET079
HS19030883-02	20190314-DGW-MW11-PV35out-30D	Login	3/18/2019 12:41:18 PM	NDR	MET079
HS19030883-03	20190314-DGW-MW11-PV35out-35D	Login	3/18/2019 12:41:18 PM	NDR	MET079
HS19030883-04	20190314-DGW-MW11-PV35out-40D	Login	3/18/2019 12:41:18 PM	NDR	MET079
HS19030883-05	20190314-DGW-MW11-PV35inlet-controlD	Login	3/18/2019 12:41:18 PM	NDR	MET079
HS19030883-06	20190314-DGW-MW11-PV35inlet-30-35-40D	Login	3/18/2019 12:41:18 PM	NDR	MET079
HS19030883-07	20190315-DGW-MW11-PV35mid-controlD	Login	3/18/2019 12:41:18 PM	NDR	MET079
HS19030883-08	20190315-DGW-MW11-PV35mid-30D	Login	3/18/2019 12:41:18 PM	NDR	MET079
HS19030883-09	20190315-DGW-MW11-PV35mid-35D	Login	3/18/2019 12:41:18 PM	NDR	MET079
HS19030883-10	20190315-DGW-MW11-PV35mid-40D	Login	3/18/2019 12:41:18 PM	NDR	MET079
HS19030883-11	20190314-DGW-MW11-PV35out-controlT	Login	3/18/2019 12:41:18 PM	NDR	MET079
HS19030883-12	20190314-DGW-MW11-PV35out-30T	Login	3/18/2019 12:41:18 PM	NDR	MET079
HS19030883-13	20190314-DGW-MW11-PV35out-35T	Login	3/18/2019 12:41:18 PM	NDR	MET079
HS19030883-14	20190314-DGW-MW11-PV35out-40T	Login	3/18/2019 12:41:18 PM	NDR	MET079
HS19030883-15	20190314-DGW-MW11-PV35inlet-controlT	Login	3/18/2019 12:41:18 PM	NDR	MET079
HS19030883-16	20190314-DGW-MW11-PV35inlet-30-35-40T	Login	3/18/2019 12:41:18 PM	NDR	MET079
HS19030883-17	20190315-DGW-MW11-PV35mid-controlT	Login	3/18/2019 12:41:18 PM	NDR	MET079
HS19030883-18	20190315-DGW-MW11-PV35mid-30T	Login	3/18/2019 12:41:18 PM	NDR	MET079
HS19030883-19	20190315-DGW-MW11-PV35mid-35T	Login	3/18/2019 12:41:18 PM	NDR	MET079
HS19030883-20	20190315-DGW-MW11-PV35mid-40T	Login	3/18/2019 12:41:18 PM	NDR	MET079

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19030883

Date/Time Received: **18-Mar-2019 09:15**
Received by: **NDR**

Checklist completed by: *Nilesh D. Ranchod* eSignature — 18-Mar-2019 Date

Reviewed by: *Dane J. Wacasey* eSignature — 25-Mar-2019 Date

Matrices: **Water**

Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	14.2C/14.2C UC/C	11	
Cooler(s)/Kit(s):	43656		
Date/Time sample(s) sent to storage:	03/18/2019 15:00		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

ALS Environmental

Chain of Custody Form

Page 1 of 2

HS19030883

Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information			
PO Number	130-2086-06	Project Name	Exide Column Studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086-06	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suite 260	Address	13515 Barrett Parkway Drive, Suite 260	E	ICP TW (6020A total metals (6)+cations)
				F	ICP DISS (6020A diss metals (6)+cations-FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	G	
Phone	314 984-8800	Phone	314 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190314-DGW-MW11-PV35out-controlD	03-14-19	9:45 AM	GW	2,8	1						x					
2	20190314-DGW-MW11-PV35out-30D	03-14-19	9:45 AM	GW	2,8	1						x					
3	20190314-DGW-MW11-PV35out-35D	03-14-19	9:45 AM	GW	2,8	1						x					
4	20190314-DGW-MW11-PV35out-40D	03-14-19	9:45 AM	GW	2,8	1						x					
5	20190314-DGW-MW11-PV35inlet-controlD	03-14-19	9:45 AM	GW	2,8	1						x					
6	20190314-DGW-MW11-PV35inlet-30-35-40D	03-14-19	9:45 AM	GW	2,8	1						x					
7	20190315-DGW-MW11-PV35mid-controlD	03-15-19	9:30 AM	GW	2,8	1						x					
8	20190315-DGW-MW11-PV35mid-30D	03-15-19	9:30 AM	GW	2,8	1						x					
9	20190315-DGW-MW11-PV35mid-35D	03-15-19	9:30 AM	GW	2,8	1						x					
10	20190315-DGW-MW11-PV35mid-40D	03-15-19	9:30 AM	GW	2,8	1						x					

Sampler(s): Please Print & Sign
Giovanna Llamosas/Bettina Emile Bettina Emile

Shipment Method:

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by: Bettina Emile	Date: 2019/03/15	Time: 15:30	Received by:	Notes:
Relinquished by:	Date: 3/18/19	Time: 09:45	Received by (Laboratory):	Cooler Temp. 4°C
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	4.2

QC Package: (Check Box Below)

	Level II: Standard QC	x	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other: _____		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

IR # 11 4/F 0

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ALS Environmental

Chain of Custody Form

Page 2 of 2

HS19030883

Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086-06	Project Name	Exide Column Studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086-06	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suite 260	Address	13515 Barrett Parkway Drive, Suite 260	E	ICP TW (6020A total metals (6)+cations)
				F	ICP DISS (6020A diss metals (6)+cations-FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	G	
Phone	314 984-8800	Phone	314 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190314-DGW-MW11-PV35out-controlT	03-14-19	9:45 AM	GW	2,8	1				x	x						
2	20190314-DGW-MW11-PV35out-30T	03-14-19	9:45 AM	GW	2,8	1				x	x						
3	20190314-DGW-MW11-PV35out-35T	03-14-19	9:45 AM	GW	2,8	1				x	x						
4	20190314-DGW-MW11-PV35out-40T	03-14-19	9:45 AM	GW	2,8	1				x	x						
5	20190314-DGW-MW11-PV35inlet-controlT	03-14-19	9:45 AM	GW	2,8	1				x	x						
6	20190314-DGW-MW11-PV35inlet-30-35-40T	03-14-19	9:45 AM	GW	2,8	1				x	x						
7	20190315-DGW-MW11-PV35mid-controlT	03-15-19	9:30 AM	GW	2,8	1				x	x						
8	20190315-DGW-MW11-PV35mid-30T	03-15-19	9:30 AM	GW	2,8	1				x	x						
9	20190315-DGW-MW11-PV35mid-35T	03-15-19	9:30 AM	GW	2,8	1				x	x						
10	20190315-DGW-MW11-PV35mid-40T	03-15-19	9:30 AM	GW	2,8	1				x	x						

Sampler(s): Please Print & Sign
Giovanna Llamosas/Bettina Emile Bettina Emile

Shipment Method:

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other ____

Results Due Date:

Relinquished by: Bettina Emile	Date: 2019/03/15	Time: 15:30	Received by:	Notes:
Relinquished by:	Date: 3/18/19	Time: 04:15	Received by (Laboratory):	Cooler Temp. 2.1°C
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	4.2

QC Package: (Check Box Below)

	Level II: Standard QC	x	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other: ____		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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ORIGIN ID:YUXA (514) 383-0990
AUDREY ETHEVES
GOLDER ASSOCIATES LTD
7250 RUE DU MILE END
3E ETAGE
MONTREAL, PQ H2R3A4
CANADA CA

SHIP DATE: 15MAR19
ACTWGT: 18.80 LB
CAD: 108680724/INET4102

BILL RECIPIENT

TO **DANE WACASEY**
ALS HOUSTON LABORATORY
10450 STANCLIFF RD
STE 210
HOUSTON TX 77099 **(US)**
(281) 530-5656 REF:
INV:
PO: DEPT:

565J1/46D3/23AD

FedEx Express

E

J19101901270uv

10:30A
TRK# 7747 1715 5120 INTL PRIORITY
0430

XH SGRA 77099
TX-US IAH

Après l'impression de cette étiquette :
COPIE DU DESTINATAIRE - VEUILLEZ LA PLACER DEVANT LA POCHETTE
1. Pliez la page imprimée le long de la ligne horizontale.
2. Placez l'étiquette dans la pochette d'expédition et fixez-la à votre paquet.

CUSTODY SEAL

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

Date: 15 March 2019 Time: 5:30
Name: Bettina Emilo
Company: Golder

Seal Broken By:
Date: 2/19/

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

March 25, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19030885**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 20 sample(s) on Mar 18, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19030885**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS19030885**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 03/25/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19030885				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 138836,138891,R335229				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?			X		
		Were analytical duplicates analyzed at the appropriate frequency?			X		
		Were RPDs or relative standard deviations within the laboratory QC limits?			X		
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 03/25/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19030885				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 138836,138891,R335229				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			2
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		X			3
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports		
Laboratory Name: ALS Laboratory Group		LRC Date: 03/25/2019
Project Name: Exide Column Studies		Laboratory Job Number: HS19030885
Reviewer Name: Dane Wacasey		Prep Batch Number(s): 138836,138891,R335229
ER#[5]	**Description**	
1	Batch 138836, Dissolved Metals Method SW6020, sample 20190314-DGW-MW11-PV35out-**C**ontrolD, MS and MSD recovered outside the control limits for Calcium, Magnesium and Sodium, however, the result in the parent sample is greater than 4x the spike amount. Batch 138891, Metals Method SW6020, sample 20190314-DGW-MW11-PV35outcontrolT, MS and MSD recovered outside the control limit for Calcium, Magnesium and Sodium, however, the result in the parent sample is greater than 4x the spike amount.	
2	See Run Log and CCB Exceptions Report.	
3	Batch 138836, Dissolved Metals Method SW6020, sample 20190314-DGW-MW11-PV35out-controlD, PDS recovered outside the control limit for Calcium and Magnesium, however, the result in the parent sample is greater than 4x the spike amount.	

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030885
Start Date: 21-Mar-2019 End Date: 22-Mar-2019

Run ID:ICPMS05_334967
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	21-Mar-2019 12:08	023_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	21-Mar-2019 12:10	024SMPL.d	CA K NA
LLICV5	1	21-Mar-2019 12:12	025LICV.d	CA K NA
ICB	1	21-Mar-2019 12:21	028_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	21-Mar-2019 12:23	029ICSA.d	CA K NA
ICSAB	1	21-Mar-2019 12:26	030ICSB.d	CA K NA
CCB 1	1	21-Mar-2019 13:12	045_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 1	1	21-Mar-2019 13:14	046_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	21-Mar-2019 13:40	057_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	21-Mar-2019 13:49	060_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	21-Mar-2019 14:14	071_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	21-Mar-2019 14:16	072_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	21-Mar-2019 16:45	083_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	21-Mar-2019 16:47	084_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	21-Mar-2019 17:21	095_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	21-Mar-2019 17:23	096_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	21-Mar-2019 17:53	106_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	21-Mar-2019 18:02	108_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	21-Mar-2019 18:20	116_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	21-Mar-2019 18:22	117_CCB.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	21-Mar-2019 23:15	132SMPL.d	CA K NA
ICCV 8	1	21-Mar-2019 23:20	134_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV5	1	21-Mar-2019 23:22	135LICV.d	CA K NA
ICCB 8	1	21-Mar-2019 23:24	136_ICB.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	21-Mar-2019 23:42	144_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	21-Mar-2019 23:45	145_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 10	1	22-Mar-2019 00:09	156_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	22-Mar-2019 00:12	157_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-138836	1	22-Mar-2019 00:14	158SMPL.d	AS CA CD FE K MG NA PB SB SE
LCS-138836	1	22-Mar-2019 00:16	159SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZSD	25	22-Mar-2019 00:21	161SMPL.d	AS CD FE PB SB SE
ZZZZZZMS	5	22-Mar-2019 00:23	162SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZMSD	5	22-Mar-2019 00:25	163SMPL.d	AS CA CD FE K MG NA PB SB
ZZZZZZPDS	5	22-Mar-2019 00:28	164SMPL.d	AS CA CD FE K MG PB SB SE
CCV 11	1	22-Mar-2019 00:30	165_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	22-Mar-2019 00:32	166_CCB.d	AS CA CD FE K MG NA PB SB SE
20190311-FD-PV35out-controlD	5	22-Mar-2019 00:55	176SMPL.d	CA K NA
CCV 12	1	22-Mar-2019 00:57	177_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 12	1	22-Mar-2019 01:00	178_CCB.d	AS CA CD FE K MG NA PB SB SE
20190311-FD-PV35out-30D	5	22-Mar-2019 01:02	179SMPL.d	CA K NA
20190311-FD-PV35out-35D	5	22-Mar-2019 01:04	180SMPL.d	CA K NA
20190311-FD-PV35out-40D	5	22-Mar-2019 01:06	181SMPL.d	CA K NA
20190311-FD-PV35inlet-controlD	5	22-Mar-2019 01:09	182SMPL.d	CA K NA
20190311-FD-PV35inlet-30-35-40D	5	22-Mar-2019 01:11	183SMPL.d	CA K NA
20190312-FD-PV35mid-controlD	5	22-Mar-2019 01:13	184SMPL.d	CA K NA
20190312-FD-PV35mid-30D	5	22-Mar-2019 01:15	185SMPL.d	CA K NA
20190312-FD-PV35mid-35D	5	22-Mar-2019 01:18	186SMPL.d	CA K NA
20190312-FD-PV35mid-40D	5	22-Mar-2019 01:20	187SMPL.d	CA K NA
CCV 13	1	22-Mar-2019 01:25	189_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 13	1	22-Mar-2019 01:27	190_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 14	1	22-Mar-2019 01:45	198_CCV.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030885

Run ID:ICPMS05_334967
Instrument:ICPMS05
Method:SW6020

CCB 2	Date: 21-Mar-2019 13:49	Seq: 5000194		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.444	0.4	2	
CCB 3	Date: 21-Mar-2019 14:16	Seq: 5000218		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.654	0.4	2	
CCB 4	Date: 21-Mar-2019 16:47	Seq: 5000782		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.684	0.4	2	
	Potassium	21.2	18	200	
	Sodium	272.3	14	200	
CCB 5	Date: 21-Mar-2019 17:23	Seq: 5000794		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Potassium	24.56	18	200	
	Sodium	255.7	14	200	
CCB 6	Date: 21-Mar-2019 17:53	Seq: 5000804		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.922	0.4	2	
	Potassium	18.72	18	200	
	Sodium	274.6	14	200	
CCB 7	Date: 21-Mar-2019 18:22	Seq: 5000815		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	102	14	200	
ICCB 8	Date: 21-Mar-2019 23:24	Seq: 5001045		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.652	0.4	2	
	Calcium	57.56	34	500	
CCB 9	Date: 21-Mar-2019 23:45	Seq: 5001054		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.462	0.4	2	
	Calcium	57.21	34	500	
CCB 10	Date: 22-Mar-2019 00:12	Seq: 5001066		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.17	0.4	2	
	Calcium	57.4	34	500	
	Sodium	62.23	14	200	
CCB 11	Date: 22-Mar-2019 00:32	Seq: 5001109		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.406	0.4	2	
	Calcium	63.96	34	500	
	Sodium	158.6	14	200	
CCB 12	Date: 22-Mar-2019 01:00	Seq: 5001121		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.052	0.4	2	

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030885

Run ID:ICPMS05_334967
Instrument:ICPMS05
Method:SW6020

CCB 12	Calcium	60.09	34	500	
	Sodium	176.3	14	200	
CCB 13	Date: 22-Mar-2019 01:27	Seq: 5001133	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.135	0.4	2	
	Calcium	58.83	34	500	
	Sodium	85.31	14	200	
CCB 14	Date: 22-Mar-2019 01:47	Seq: 5001202	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.137	0.4	2	
	Calcium	533.8	34	500	
	Potassium	-31.69	18	200	
	Selenium	-1.633	1.1	2	
	Sodium	111.6	14	200	
CCB 15	Date: 22-Mar-2019 02:07	Seq: 5001211	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.178	0.4	2	
	Calcium	80.9	34	500	
	Iron	32.29	12	200	
	Magnesium	13.62	10	200	
	Potassium	-32.95	18	200	
	Selenium	-2.487	1.1	2	
	Sodium	33.64	14	200	
CCB 16	Date: 22-Mar-2019 02:28	Seq: 5001220	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.299	0.4	2	
	Calcium	66.09	34	500	
	Iron	59.62	12	200	
	Magnesium	18.73	10	200	
	Potassium	-45.65	18	200	
	Selenium	-2.447	1.1	2	
	Sodium	15.54	14	200	
CCB 17	Date: 22-Mar-2019 02:55	Seq: 5001232	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.518	0.4	2	
	Calcium	107.8	34	500	
	Iron	38.72	12	200	
	Magnesium	18.25	10	200	
	Potassium	-41.61	18	200	
	Selenium	-2.807	1.1	2	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030885
Start Date: 22-Mar-2019 End Date: 23-Mar-2019

Run ID:ICPMS05_335065
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	22-Mar-2019 11:44	021_ICV.d	AS CA CD FE K MG NA P PB SB SE
LLICV2	1	22-Mar-2019 11:47	022SMPL.d	AS CA CD FE K MG NA P PB SB SE
LLICV5	1	22-Mar-2019 11:49	023LICV.d	AS CA CD FE K MG NA P PB SB SE
ICB	1	22-Mar-2019 11:58	024_ICB.d	AS CA CD FE K MG NA P PB SB SE
ICV	1	22-Mar-2019 12:05	026_ICV.d	AS CA CD FE K MG NA P PB SB SE
ICSA	1	22-Mar-2019 12:22	029ICSA.d	AS CA CD FE K MG NA P PB SB SE
ICSAB	1	22-Mar-2019 12:25	030ICSB.d	AS CA CD FE K MG NA P PB SB SE
20190311-FD-PV35out-controlD	1	22-Mar-2019 13:35	036SMPL.d	AS CD FE MG P PB SB SE
20190311-FD-PV35out-30D	1	22-Mar-2019 13:37	037SMPL.d	AS CD FE MG P PB SB SE
20190311-FD-PV35out-35D	1	22-Mar-2019 13:40	038SMPL.d	AS CD FE MG P PB SB SE
20190311-FD-PV35out-40D	1	22-Mar-2019 13:42	039SMPL.d	AS CD FE MG P PB SB SE
20190311-FD-PV35inlet-controlD	1	22-Mar-2019 13:44	040SMPL.d	AS CD FE MG P PB SB SE
CCV 1	1	22-Mar-2019 13:48	042_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 1	1	22-Mar-2019 13:50	043_CCB.d	AS CA CD FE K MG NA P PB SB SE
20190311-FD-PV35inlet-30-35-40D	1	22-Mar-2019 13:54	044SMPL.d	AS CD FE MG P PB SB SE
20190312-FD-PV35mid-controlD	1	22-Mar-2019 13:57	045SMPL.d	AS CD FE MG P PB SB SE
20190312-FD-PV35mid-30D	1	22-Mar-2019 13:59	046SMPL.d	AS CD FE MG P PB SB SE
20190312-FD-PV35mid-35D	1	22-Mar-2019 14:01	047SMPL.d	AS CD FE MG P PB SB SE
20190312-FD-PV35mid-40D	1	22-Mar-2019 14:03	048SMPL.d	AS CD FE MG P PB SB SE
CCV 2	1	22-Mar-2019 14:10	051_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 2	1	22-Mar-2019 14:12	052_CCB.d	AS CA CD FE K MG NA P PB SB SE
ZZZZZZSD	25	22-Mar-2019 14:39	059SMPL.d	CA K MG
ZZZZZZSD	500	22-Mar-2019 14:43	061SMPL.d	NA SE
ZZZZZZPDS	100	22-Mar-2019 14:45	062SMPL.d	NA
CCV 3	1	22-Mar-2019 14:47	063_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 3	1	22-Mar-2019 14:49	064_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 4	1	22-Mar-2019 15:14	075_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 4	1	22-Mar-2019 15:16	076_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 5	1	22-Mar-2019 15:36	085_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 5	1	22-Mar-2019 15:44	088_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 6	1	22-Mar-2019 16:07	097_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 6	1	22-Mar-2019 16:09	098_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 7	1	22-Mar-2019 16:12	099_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCV 8	1	22-Mar-2019 16:35	109_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 7	1	22-Mar-2019 16:37	110_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 9	1	22-Mar-2019 17:03	121_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 8	1	22-Mar-2019 17:05	122_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 10	1	22-Mar-2019 17:31	133_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 9	1	22-Mar-2019 17:33	134_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCB 10	1	22-Mar-2019 18:30	146_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 11	1	22-Mar-2019 18:35	147_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCV 12	1	22-Mar-2019 21:52	155_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 11	1	22-Mar-2019 21:54	156_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 13	1	22-Mar-2019 22:16	166_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 12	1	22-Mar-2019 22:18	167_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 14	1	22-Mar-2019 22:40	177_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 13	1	22-Mar-2019 22:42	178_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 15	1	22-Mar-2019 22:59	186_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 14	1	22-Mar-2019 23:01	187_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 16	1	22-Mar-2019 23:25	198_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 15	1	22-Mar-2019 23:27	199_CCB.d	AS CA CD FE K MG NA P PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030885

Run ID:ICPMS05_335065
Instrument:ICPMS05
Method:SW6020

ICB	Date: 22-Mar-2019 11:58	Seq: 5001846		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Calcium	59.08	34	500	
CCB 1	Date: 22-Mar-2019 13:50	Seq: 5002320		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.559	0.4	2	
	Calcium	78.76	34	500	
	Sodium	142	14	200	
CCB 2	Date: 22-Mar-2019 14:12	Seq: 5002329		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.489	0.4	2	
	Calcium	65.75	34	500	
	Sodium	112.5	14	200	
CCB 3	Date: 22-Mar-2019 14:49	Seq: 5002369		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.17	0.4	2	
	Calcium	58.58	34	500	
	Sodium	45.72	14	200	
CCB 4	Date: 22-Mar-2019 15:16	Seq: 5002382		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.624	0.4	2	
	Calcium	60.64	34	500	
	Sodium	35.8	14	200	
CCB 5	Date: 22-Mar-2019 15:44	Seq: 5002411		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Calcium	78.39	34	500	
	Sodium	16.23	14	200	
CCB 6	Date: 22-Mar-2019 16:09	Seq: 5002423		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.543	0.4	2	
	Calcium	85.01	34	500	
	Iron	16.54	12	200	
CCB 7	Date: 22-Mar-2019 16:37	Seq: 5002453		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Iron	13.91	12	200	
CCB 8	Date: 22-Mar-2019 17:05	Seq: 5002524		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Iron	14.73	12	200	
CCB 9	Date: 22-Mar-2019 17:33	Seq: 5002780		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Iron	16.38	12	200	
CCB 10	Date: 22-Mar-2019 18:30	Seq: 5002792		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.664	0.4	2	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030885
Start Date: 22-Mar-2019 End Date: 23-Mar-2019

Run ID:ICPMS05_335065
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
MBLK-138891	1	22-Mar-2019 23:29	200SMPL.d	AS CA CD FE K MG NA PB SB SE
LCS-138891	1	22-Mar-2019 23:32	201SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZSD	25	22-Mar-2019 23:36	203SMPL.d	AS CA CD FE PB SB SE
ZZZZZZMS	5	22-Mar-2019 23:38	204SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZMSD	5	22-Mar-2019 23:40	205SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZPDS	5	22-Mar-2019 23:42	206SMPL.d	AS CA CD FE K MG PB SB SE
CCV 17	1	22-Mar-2019 23:45	207_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 16	1	22-Mar-2019 23:47	208_CCB.d	AS CA CD FE K MG NA P PB SB SE
20190311-FD-PV35out-controlT	5	23-Mar-2019 00:09	218SMPL.d	CA K NA
CCV 18	1	23-Mar-2019 00:11	219_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 17	1	23-Mar-2019 00:13	220_CCB.d	AS CA CD FE K MG NA P PB SB SE
20190311-FD-PV35out-30T	5	23-Mar-2019 00:15	221SMPL.d	CA K NA
20190311-FD-PV35out-35T	5	23-Mar-2019 00:18	222SMPL.d	CA K NA
20190311-FD-PV35out-40T	5	23-Mar-2019 00:20	223SMPL.d	CA K NA
20190311-FD-PV35inlet-controlT	5	23-Mar-2019 00:22	224SMPL.d	CA K NA
20190311-FD-PV35inlet-30-35-40T	5	23-Mar-2019 00:24	225SMPL.d	CA K NA
20190312-FD-PV35mid-controlT	5	23-Mar-2019 00:26	226SMPL.d	CA K NA
20190312-FD-PV35mid-30T	5	23-Mar-2019 00:29	227SMPL.d	CA K NA
20190312-FD-PV35mid-35T	5	23-Mar-2019 00:31	228SMPL.d	CA K NA
20190312-FD-PV35mid-40T	5	23-Mar-2019 00:33	229SMPL.d	CA K NA
CCV 19	1	23-Mar-2019 00:37	231_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 18	1	23-Mar-2019 00:39	232_CCB.d	AS CA CD FE K MG NA P PB SB SE
ICSA	1	23-Mar-2019 00:42	233ICSA.d	AS CA CD FE K MG NA P PB SB SE
ICSAB	1	23-Mar-2019 00:44	234ICSB.d	AS CA CD FE K MG NA P PB SB SE
CCV 20	1	23-Mar-2019 01:04	243_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 19	1	23-Mar-2019 01:06	244_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 21	1	23-Mar-2019 01:30	255_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 20	1	23-Mar-2019 01:32	256_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 22	1	23-Mar-2019 01:56	267_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 21	1	23-Mar-2019 01:58	268_CCB.d	AS CA CD FE K MG NA P PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030885

Run ID:ICPMS05_335065
Instrument:ICPMS05
Method:SW6020

CCB 11	Date: 22-Mar-2019 21:54	Seq: 5002872	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.579	0.4	2	

CCB 12	Date: 22-Mar-2019 22:18	Seq: 5002883	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.012	0.4	2	
Sodium	48.38	14	200	

CCB 13	Date: 22-Mar-2019 22:42	Seq: 5002894	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.46	0.4	2	
Sodium	156.6	14	200	

CCB 14	Date: 22-Mar-2019 23:01	Seq: 5002912	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.746	0.4	2	
Sodium	96.43	14	200	

CCB 15	Date: 22-Mar-2019 23:27	Seq: 5002924	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	73.35	14	200	

CCB 16	Date: 22-Mar-2019 23:47	Seq: 5003392	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.199	0.4	2	
Sodium	215.8	14	200	

CCB 17	Date: 23-Mar-2019 00:13	Seq: 5003404	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Magnesium	11.55	10	200	
Sodium	293.9	14	200	

CCB 18	Date: 23-Mar-2019 00:39	Seq: 5003416	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	157.3	14	200	

CCB 19	Date: 23-Mar-2019 01:06	Seq: 5003768	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	12.38	12	200	
Magnesium	10.97	10	200	
Sodium	93.81	14	200	

CCB 20	Date: 23-Mar-2019 01:32	Seq: 5003780	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	15.66	12	200	
Magnesium	13.15	10	200	
Sodium	80.73	14	200	

CCB 21	Date: 23-Mar-2019 01:58	Seq: 5003792	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	16.1	12	200	
Magnesium	15.45	10	200	
Sodium	78.14	14	200	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030885
Start Date: 25-Mar-2019 End Date: 25-Mar-2019

Run ID:ICPMS05_335168
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	25-Mar-2019 11:42	021_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	25-Mar-2019 11:44	022SMPL.d	AS CD FE MG PB SB SE
LLICV5	1	25-Mar-2019 11:46	023LICV.d	AS CD FE MG PB SB SE
ICB	1	25-Mar-2019 11:58	026_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	25-Mar-2019 12:02	027ICSA.d	AS CD FE MG PB SB SE
ICSAB	1	25-Mar-2019 12:04	028ICSB.d	AS CD FE MG PB SB SE
ZZZZZZSD	25	25-Mar-2019 12:18	032SMPL.d	K MG
ZZZZZZSD	100	25-Mar-2019 12:23	034SMPL.d	NA
ZZZZZZPDS	20	25-Mar-2019 12:25	035SMPL.d	NA
CCV 1	1	25-Mar-2019 12:36	040_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	25-Mar-2019 12:38	041_CCB.d	AS CA CD FE K MG NA PB SB SE
20190311-FD-PV35out-controlT	1	25-Mar-2019 12:53	047SMPL.d	AS CD FE MG PB SB SE
20190311-FD-PV35out-30T	1	25-Mar-2019 12:55	048SMPL.d	AS CD FE MG PB SB SE
20190311-FD-PV35out-35T	1	25-Mar-2019 12:57	049SMPL.d	AS CD FE MG PB SB SE
20190311-FD-PV35out-40T	1	25-Mar-2019 13:00	050SMPL.d	AS CD FE MG PB SB SE
CCV 2	1	25-Mar-2019 13:04	052_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	25-Mar-2019 13:06	053_CCB.d	AS CA CD FE K MG NA PB SB SE
20190311-FD-PV35inlet-controlT	1	25-Mar-2019 13:10	054SMPL.d	AS CD FE MG PB SB SE
20190311-FD-PV35inlet-30-35-40T	1	25-Mar-2019 13:12	055SMPL.d	AS CD FE MG PB SB SE
20190312-FD-PV35mid-controlT	1	25-Mar-2019 13:15	056SMPL.d	AS CD FE MG PB SB SE
20190312-FD-PV35mid-30T	1	25-Mar-2019 13:17	057SMPL.d	AS CD FE MG PB SB SE
20190312-FD-PV35mid-35T	1	25-Mar-2019 13:22	058SMPL.d	AS CD FE MG PB SB SE
20190312-FD-PV35mid-40T	1	25-Mar-2019 13:24	059SMPL.d	AS CD FE MG PB SB SE
CCV 3	1	25-Mar-2019 13:39	064_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	25-Mar-2019 13:41	065_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	25-Mar-2019 14:00	073_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	25-Mar-2019 14:02	074_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	25-Mar-2019 14:10	076_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	25-Mar-2019 14:50	090_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	25-Mar-2019 14:52	091_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	25-Mar-2019 15:26	102_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	25-Mar-2019 15:28	103_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	25-Mar-2019 15:53	114_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	25-Mar-2019 15:55	115_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 8	1	25-Mar-2019 16:35	126_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	25-Mar-2019 16:37	127_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	25-Mar-2019 17:32	137_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	25-Mar-2019 17:34	138_CCB.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030885

Run ID:ICPMS05_335168
Instrument:ICPMS05
Method:SW6020

CCB 1	Date: 25-Mar-2019 12:38	Seq: 5004850	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.878	0.4	2	
Sodium	84.68	14	200	

CCB 2	Date: 25-Mar-2019 13:06	Seq: 5004862	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.834	0.4	2	
Sodium	177.6	14	200	

CCB 3	Date: 25-Mar-2019 13:41	Seq: 5004877	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.452	0.4	2	
Sodium	104.4	14	200	

CCB 4	Date: 25-Mar-2019 14:02	Seq: 5005022	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.433	0.4	2	
Iron	55.96	12	200	
Lead	0.86	0.6	2	
Sodium	32.09	14	200	

CCB 5	Date: 25-Mar-2019 14:10	Seq: 5005024	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	13.81	12	200	
Sodium	25.72	14	200	

CCB 6	Date: 25-Mar-2019 14:50	Seq: 5005231	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.686	0.4	2	
Sodium	75.62	14	200	

CCB 7	Date: 25-Mar-2019 15:28	Seq: 5005217	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.117	0.4	2	
Selenium	1.588	1.1	2	
Sodium	222.6	14	200	

CCB 8	Date: 25-Mar-2019 15:55	Seq: 5005229	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.1	0.4	2	
Iron	18.85	12	200	
Potassium	-18.61	18	200	
Sodium	87.62	14	200	

CCB 9	Date: 25-Mar-2019 16:37	Seq: 5005627	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.496	0.4	2	
Sodium	103	14	200	

CCB 10	Date: 25-Mar-2019 17:34	Seq: 5005638	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Potassium	-18.28	18	200	
Sodium	56.77	14	200	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19030885

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19030885-01	20190311-FD-PV35out-controlD	Groundwater		11-Mar-2019 11:30	18-Mar-2019 09:15	☐
HS19030885-02	20190311-FD-PV35out-30D	Groundwater		11-Mar-2019 11:30	18-Mar-2019 09:15	☐
HS19030885-03	20190311-FD-PV35out-35D	Groundwater		11-Mar-2019 11:30	18-Mar-2019 09:15	☐
HS19030885-04	20190311-FD-PV35out-40D	Groundwater		11-Mar-2019 11:30	18-Mar-2019 09:15	☐
HS19030885-05	20190311-FD-PV35inlet-controlD	Groundwater		11-Mar-2019 11:30	18-Mar-2019 09:15	☐
HS19030885-06	20190311-FD-PV35inlet-30-35-40D	Groundwater		11-Mar-2019 11:30	18-Mar-2019 09:15	☐
HS19030885-07	20190312-FD-PV35mid-controlD	Groundwater		12-Mar-2019 18:20	18-Mar-2019 09:15	☐
HS19030885-08	20190312-FD-PV35mid-30D	Groundwater		12-Mar-2019 18:20	18-Mar-2019 09:15	☐
HS19030885-09	20190312-FD-PV35mid-35D	Groundwater		12-Mar-2019 18:20	18-Mar-2019 09:15	☐
HS19030885-10	20190312-FD-PV35mid-40D	Groundwater		12-Mar-2019 18:20	18-Mar-2019 09:15	☐
HS19030885-11	20190311-FD-PV35out-controlT	Groundwater		11-Mar-2019 11:30	18-Mar-2019 09:15	☐
HS19030885-12	20190311-FD-PV35out-30T	Groundwater		11-Mar-2019 11:30	18-Mar-2019 09:15	☐
HS19030885-13	20190311-FD-PV35out-35T	Groundwater		11-Mar-2019 11:30	18-Mar-2019 09:15	☐
HS19030885-14	20190311-FD-PV35out-40T	Groundwater		11-Mar-2019 11:30	18-Mar-2019 09:15	☐
HS19030885-15	20190311-FD-PV35inlet-controlT	Groundwater		11-Mar-2019 11:30	18-Mar-2019 09:15	☐
HS19030885-16	20190311-FD-PV35inlet-30-35-40T	Groundwater		11-Mar-2019 11:30	18-Mar-2019 09:15	☐
HS19030885-17	20190312-FD-PV35mid-controlT	Groundwater		12-Mar-2019 18:20	18-Mar-2019 09:15	☐
HS19030885-18	20190312-FD-PV35mid-30T	Groundwater		12-Mar-2019 18:20	18-Mar-2019 09:15	☐
HS19030885-19	20190312-FD-PV35mid-35T	Groundwater		12-Mar-2019 18:20	18-Mar-2019 09:15	☐
HS19030885-20	20190312-FD-PV35mid-40T	Groundwater		12-Mar-2019 18:20	18-Mar-2019 09:15	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190311-FD-PV35out-controlD
Collection Date: 11-Mar-2019 11:30

ANALYTICAL REPORT
WorkOrder:HS19030885
Lab ID:HS19030885-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 19-Mar-2019		Analyst: JHD
Antimony	**0.0337**		**0.000400**	**0.00200**	**mg/L**	1	22-Mar-2019 13:35
Arsenic	**0.00113**	J	**0.000400**	**0.00200**	**mg/L**	1	22-Mar-2019 13:35
Cadmium	U		0.000200	0.00200	mg/L	1	22-Mar-2019 13:35
Calcium	**197**		**0.170**	**2.50**	**mg/L**	5	22-Mar-2019 00:55
Iron	U		0.0120	0.200	mg/L	1	22-Mar-2019 13:35
Lead	U		0.000600	0.00200	mg/L	1	22-Mar-2019 13:35
Magnesium	**1.21**		**0.0100**	**0.200**	**mg/L**	1	22-Mar-2019 13:35
Potassium	**11.9**		**0.0900**	**1.00**	**mg/L**	5	22-Mar-2019 00:55
Selenium	**0.00676**		**0.00110**	**0.00200**	**mg/L**	1	22-Mar-2019 13:35
Sodium	**257**		**0.0700**	**1.00**	**mg/L**	5	22-Mar-2019 00:55

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190311-FD-PV35out-30D
Collection Date: 11-Mar-2019 11:30

ANALYTICAL REPORT
WorkOrder:HS19030885
Lab ID:HS19030885-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 19-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	22-Mar-2019 13:37
Arsenic	U		0.000400	0.00200	mg/L	1	22-Mar-2019 13:37
Cadmium	U		0.000200	0.00200	mg/L	1	22-Mar-2019 13:37
Calcium	**193**		**0.170**	**2.50**	**mg/L**	5	22-Mar-2019 01:02
Iron	**0.0196**	J	**0.0120**	**0.200**	**mg/L**	1	22-Mar-2019 13:37
Lead	U		0.000600	0.00200	mg/L	1	22-Mar-2019 13:37
Magnesium	**0.993**		**0.0100**	**0.200**	**mg/L**	1	22-Mar-2019 13:37
Potassium	**12.0**		**0.0900**	**1.00**	**mg/L**	5	22-Mar-2019 01:02
Selenium	U		0.00110	0.00200	mg/L	1	22-Mar-2019 13:37
Sodium	**255**		**0.0700**	**1.00**	**mg/L**	5	22-Mar-2019 01:02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190311-FD-PV35out-35D
Collection Date: 11-Mar-2019 11:30

ANALYTICAL REPORT
WorkOrder:HS19030885
Lab ID:HS19030885-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 19-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	22-Mar-2019 13:40
Arsenic	**0.000407**	J	**0.000400**	**0.00200**	**mg/L**	1	22-Mar-2019 13:40
Cadmium	U		0.000200	0.00200	mg/L	1	22-Mar-2019 13:40
Calcium	**198**		**0.170**	**2.50**	**mg/L**	5	22-Mar-2019 01:04
Iron	**0.148**	J	**0.0120**	**0.200**	**mg/L**	1	22-Mar-2019 13:40
Lead	U		0.000600	0.00200	mg/L	1	22-Mar-2019 13:40
Magnesium	**1.07**		**0.0100**	**0.200**	**mg/L**	1	22-Mar-2019 13:40
Potassium	**12.4**		**0.0900**	**1.00**	**mg/L**	5	22-Mar-2019 01:04
Selenium	U		0.00110	0.00200	mg/L	1	22-Mar-2019 13:40
Sodium	**264**		**0.0700**	**1.00**	**mg/L**	5	22-Mar-2019 01:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190311-FD-PV35out-40D
Collection Date: 11-Mar-2019 11:30

ANALYTICAL REPORT
WorkOrder:HS19030885
Lab ID:HS19030885-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 19-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	22-Mar-2019 13:42
Arsenic	**0.000442**	J	**0.000400**	**0.00200**	**mg/L**	1	22-Mar-2019 13:42
Cadmium	U		0.000200	0.00200	mg/L	1	22-Mar-2019 13:42
Calcium	**193**		**0.170**	**2.50**	**mg/L**	5	22-Mar-2019 01:06
Iron	**0.0201**	J	**0.0120**	**0.200**	**mg/L**	1	22-Mar-2019 13:42
Lead	U		0.000600	0.00200	mg/L	1	22-Mar-2019 13:42
Magnesium	**1.52**		**0.0100**	**0.200**	**mg/L**	1	22-Mar-2019 13:42
Potassium	**12.2**		**0.0900**	**1.00**	**mg/L**	5	22-Mar-2019 01:06
Selenium	**0.00112**	J	**0.00110**	**0.00200**	**mg/L**	1	22-Mar-2019 13:42
Sodium	**259**		**0.0700**	**1.00**	**mg/L**	5	22-Mar-2019 01:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190311-FD-PV35inlet-controlD
Collection Date: 11-Mar-2019 11:30

ANALYTICAL REPORT
WorkOrder:HS19030885
Lab ID:HS19030885-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 19-Mar-2019		Analyst: JHD
Antimony	**0.0350**		**0.000400**	**0.00200**	**mg/L**	1	22-Mar-2019 13:44
Arsenic	**0.00138**	J	**0.000400**	**0.00200**	**mg/L**	1	22-Mar-2019 13:44
Cadmium	U		0.000200	0.00200	mg/L	1	22-Mar-2019 13:44
Calcium	**204**		**0.170**	**2.50**	**mg/L**	5	22-Mar-2019 01:09
Iron	U		0.0120	0.200	mg/L	1	22-Mar-2019 13:44
Lead	U		0.000600	0.00200	mg/L	1	22-Mar-2019 13:44
Magnesium	**1.14**		**0.0100**	**0.200**	**mg/L**	1	22-Mar-2019 13:44
Potassium	**12.2**		**0.0900**	**1.00**	**mg/L**	5	22-Mar-2019 01:09
Selenium	**0.00710**		**0.00110**	**0.00200**	**mg/L**	1	22-Mar-2019 13:44
Sodium	**261**		**0.0700**	**1.00**	**mg/L**	5	22-Mar-2019 01:09

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190311-FD-PV35inlet-30-35-40D
Collection Date: 11-Mar-2019 11:30

ANALYTICAL REPORT
WorkOrder:HS19030885
Lab ID:HS19030885-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 19-Mar-2019		Analyst: JHD
Antimony	**0.0338**		**0.000400**	**0.00200**	**mg/L**	1	22-Mar-2019 13:54
Arsenic	**0.00151**	J	**0.000400**	**0.00200**	**mg/L**	1	22-Mar-2019 13:54
Cadmium	U		0.000200	0.00200	mg/L	1	22-Mar-2019 13:54
Calcium	**200**		**0.170**	**2.50**	**mg/L**	5	22-Mar-2019 01:11
Iron	U		0.0120	0.200	mg/L	1	22-Mar-2019 13:54
Lead	U		0.000600	0.00200	mg/L	1	22-Mar-2019 13:54
Magnesium	**1.11**		**0.0100**	**0.200**	**mg/L**	1	22-Mar-2019 13:54
Potassium	**12.2**		**0.0900**	**1.00**	**mg/L**	5	22-Mar-2019 01:11
Selenium	**0.00742**		**0.00110**	**0.00200**	**mg/L**	1	22-Mar-2019 13:54
Sodium	**258**		**0.0700**	**1.00**	**mg/L**	5	22-Mar-2019 01:11

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190312-FD-PV35mid-controlD
Collection Date: 12-Mar-2019 18:20

ANALYTICAL REPORT
WorkOrder:HS19030885
Lab ID:HS19030885-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 19-Mar-2019		Analyst: JHD
Antimony	**0.0339**		**0.000400**	**0.00200**	**mg/L**	1	22-Mar-2019 13:57
Arsenic	**0.00105**	J	**0.000400**	**0.00200**	**mg/L**	1	22-Mar-2019 13:57
Cadmium	U		0.000200	0.00200	mg/L	1	22-Mar-2019 13:57
Calcium	**199**		**0.170**	**2.50**	**mg/L**	5	22-Mar-2019 01:13
Iron	U		0.0120	0.200	mg/L	1	22-Mar-2019 13:57
Lead	U		0.000600	0.00200	mg/L	1	22-Mar-2019 13:57
Magnesium	**1.17**		**0.0100**	**0.200**	**mg/L**	1	22-Mar-2019 13:57
Potassium	**11.8**		**0.0900**	**1.00**	**mg/L**	5	22-Mar-2019 01:13
Selenium	**0.00642**		**0.00110**	**0.00200**	**mg/L**	1	22-Mar-2019 13:57
Sodium	**254**		**0.0700**	**1.00**	**mg/L**	5	22-Mar-2019 01:13

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190312-FD-PV35mid-30D
Collection Date: 12-Mar-2019 18:20

ANALYTICAL REPORT
WorkOrder:HS19030885
Lab ID:HS19030885-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 19-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	22-Mar-2019 13:59
Arsenic	**0.000551**	J	**0.000400**	**0.00200**	**mg/L**	1	22-Mar-2019 13:59
Cadmium	U		0.000200	0.00200	mg/L	1	22-Mar-2019 13:59
Calcium	**190**		**0.170**	**2.50**	**mg/L**	5	22-Mar-2019 01:15
Iron	**0.0860**	J	**0.0120**	**0.200**	**mg/L**	1	22-Mar-2019 13:59
Lead	U		0.000600	0.00200	mg/L	1	22-Mar-2019 13:59
Magnesium	**1.00**		**0.0100**	**0.200**	**mg/L**	1	22-Mar-2019 13:59
Potassium	**11.8**		**0.0900**	**1.00**	**mg/L**	5	22-Mar-2019 01:15
Selenium	U		0.00110	0.00200	mg/L	1	22-Mar-2019 13:59
Sodium	**250**		**0.0700**	**1.00**	**mg/L**	5	22-Mar-2019 01:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190312-FD-PV35mid-35D
Collection Date: 12-Mar-2019 18:20

ANALYTICAL REPORT
WorkOrder:HS19030885
Lab ID:HS19030885-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 19-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	22-Mar-2019 14:01
Arsenic	**0.000474**	J	**0.000400**	**0.00200**	**mg/L**	1	22-Mar-2019 14:01
Cadmium	U		0.000200	0.00200	mg/L	1	22-Mar-2019 14:01
Calcium	**199**		**0.170**	**2.50**	**mg/L**	5	22-Mar-2019 01:18
Iron	**0.152**	J	**0.0120**	**0.200**	**mg/L**	1	22-Mar-2019 14:01
Lead	U		0.000600	0.00200	mg/L	1	22-Mar-2019 14:01
Magnesium	**0.993**		**0.0100**	**0.200**	**mg/L**	1	22-Mar-2019 14:01
Potassium	**12.5**		**0.0900**	**1.00**	**mg/L**	5	22-Mar-2019 01:18
Selenium	U		0.00110	0.00200	mg/L	1	22-Mar-2019 14:01
Sodium	**267**		**0.0700**	**1.00**	**mg/L**	5	22-Mar-2019 01:18

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190312-FD-PV35mid-40D
Collection Date: 12-Mar-2019 18:20

ANALYTICAL REPORT
WorkOrder:HS19030885
Lab ID:HS19030885-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 19-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	22-Mar-2019 14:03
Arsenic	**0.000540**	J	**0.000400**	**0.00200**	**mg/L**	1	22-Mar-2019 14:03
Cadmium	U		0.000200	0.00200	mg/L	1	22-Mar-2019 14:03
Calcium	**198**		**0.170**	**2.50**	**mg/L**	5	22-Mar-2019 01:20
Iron	**0.0250**	J	**0.0120**	**0.200**	**mg/L**	1	22-Mar-2019 14:03
Lead	U		0.000600	0.00200	mg/L	1	22-Mar-2019 14:03
Magnesium	**1.58**		**0.0100**	**0.200**	**mg/L**	1	22-Mar-2019 14:03
Potassium	**12.3**		**0.0900**	**1.00**	**mg/L**	5	22-Mar-2019 01:20
Selenium	U		0.00110	0.00200	mg/L	1	22-Mar-2019 14:03
Sodium	**264**		**0.0700**	**1.00**	**mg/L**	5	22-Mar-2019 01:20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190311-FD-PV35out-controlT
Collection Date: 11-Mar-2019 11:30

ANALYTICAL REPORT
WorkOrder:HS19030885
Lab ID:HS19030885-11
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JCJ
Hardness (As CaCO3)	**462**		**2.00**	**2.00**	**mg/L**	1	25-Mar-2019 17:12
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Mar-2019		Analyst: JHD
Antimony	**0.0340**		**0.000400**	**0.00200**	**mg/L**	1	25-Mar-2019 12:53
Arsenic	**0.00107**	J	**0.000400**	**0.00200**	**mg/L**	1	25-Mar-2019 12:53
Cadmium	U		0.000200	0.00200	mg/L	1	25-Mar-2019 12:53
Calcium	**183**		**0.170**	**2.50**	**mg/L**	5	23-Mar-2019 00:09
Iron	U		0.0120	0.200	mg/L	1	25-Mar-2019 12:53
Lead	U		0.000600	0.00200	mg/L	1	25-Mar-2019 12:53
Magnesium	**1.19**		**0.0100**	**0.200**	**mg/L**	1	25-Mar-2019 12:53
Potassium	**11.4**		**0.0900**	**1.00**	**mg/L**	5	23-Mar-2019 00:09
Selenium	**0.00586**		**0.00110**	**0.00200**	**mg/L**	1	25-Mar-2019 12:53
Sodium	**252**		**0.0700**	**1.00**	**mg/L**	5	23-Mar-2019 00:09

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190311-FD-PV35out-30T
Collection Date: 11-Mar-2019 11:30

ANALYTICAL REPORT
WorkOrder:HS19030885
Lab ID:HS19030885-12
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JCJ
Hardness (As CaCO3)	**431**		**2.00**	**2.00**	**mg/L**	1	25-Mar-2019 17:12
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Mar-2019		Analyst: JHD
Antimony	**0.000414**	J	**0.000400**	**0.00200**	**mg/L**	1	25-Mar-2019 12:55
Arsenic	**0.000458**	J	**0.000400**	**0.00200**	**mg/L**	1	25-Mar-2019 12:55
Cadmium	U		0.000200	0.00200	mg/L	1	25-Mar-2019 12:55
Calcium	**171**		**0.170**	**2.50**	**mg/L**	5	23-Mar-2019 00:15
Iron	**0.0856**	J	**0.0120**	**0.200**	**mg/L**	1	25-Mar-2019 12:55
Lead	U		0.000600	0.00200	mg/L	1	25-Mar-2019 12:55
Magnesium	**0.983**		**0.0100**	**0.200**	**mg/L**	1	25-Mar-2019 12:55
Potassium	**11.0**		**0.0900**	**1.00**	**mg/L**	5	23-Mar-2019 00:15
Selenium	U		0.00110	0.00200	mg/L	1	25-Mar-2019 12:55
Sodium	**241**		**0.0700**	**1.00**	**mg/L**	5	23-Mar-2019 00:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190311-FD-PV35out-35T
Collection Date: 11-Mar-2019 11:30

ANALYTICAL REPORT
WorkOrder:HS19030885
Lab ID:HS19030885-13
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JCJ
Hardness (As CaCO3)	**449**		**2.00**	**2.00**	**mg/L**	1	25-Mar-2019 17:12
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	25-Mar-2019 12:57
Arsenic	U		0.000400	0.00200	mg/L	1	25-Mar-2019 12:57
Cadmium	U		0.000200	0.00200	mg/L	1	25-Mar-2019 12:57
Calcium	**178**		**0.170**	**2.50**	**mg/L**	5	23-Mar-2019 00:18
Iron	**0.416**		**0.0120**	**0.200**	**mg/L**	1	25-Mar-2019 12:57
Lead	U		0.000600	0.00200	mg/L	1	25-Mar-2019 12:57
Magnesium	**1.02**		**0.0100**	**0.200**	**mg/L**	1	25-Mar-2019 12:57
Potassium	**11.3**		**0.0900**	**1.00**	**mg/L**	5	23-Mar-2019 00:18
Selenium	U		0.00110	0.00200	mg/L	1	25-Mar-2019 12:57
Sodium	**253**		**0.0700**	**1.00**	**mg/L**	5	23-Mar-2019 00:18

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190311-FD-PV35out-40T
Collection Date: 11-Mar-2019 11:30

ANALYTICAL REPORT
WorkOrder:HS19030885
Lab ID:HS19030885-14
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JCJ
Hardness (As CaCO3)	**466**		**2.00**	**2.00**	**mg/L**	1	25-Mar-2019 17:12
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	25-Mar-2019 13:00
Arsenic	U		0.000400	0.00200	mg/L	1	25-Mar-2019 13:00
Cadmium	U		0.000200	0.00200	mg/L	1	25-Mar-2019 13:00
Calcium	**184**		**0.170**	**2.50**	**mg/L**	5	23-Mar-2019 00:20
Iron	**0.0940**	J	**0.0120**	**0.200**	**mg/L**	1	25-Mar-2019 13:00
Lead	U		0.000600	0.00200	mg/L	1	25-Mar-2019 13:00
Magnesium	**1.47**		**0.0100**	**0.200**	**mg/L**	1	25-Mar-2019 13:00
Potassium	**11.9**		**0.0900**	**1.00**	**mg/L**	5	23-Mar-2019 00:20
Selenium	U		0.00110	0.00200	mg/L	1	25-Mar-2019 13:00
Sodium	**264**		**0.0700**	**1.00**	**mg/L**	5	23-Mar-2019 00:20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190311-FD-PV35inlet-controlT
Collection Date: 11-Mar-2019 11:30

ANALYTICAL REPORT
WorkOrder:HS19030885
Lab ID:HS19030885-15
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JCJ
Hardness (As CaCO3)	**464**		**2.00**	**2.00**	**mg/L**	1	25-Mar-2019 17:12
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Mar-2019		Analyst: JHD
Antimony	**0.0345**		**0.000400**	**0.00200**	**mg/L**	1	25-Mar-2019 13:10
Arsenic	**0.00130**	J	**0.000400**	**0.00200**	**mg/L**	1	25-Mar-2019 13:10
Cadmium	U		0.000200	0.00200	mg/L	1	25-Mar-2019 13:10
Calcium	**184**		**0.170**	**2.50**	**mg/L**	5	23-Mar-2019 00:22
Iron	U		0.0120	0.200	mg/L	1	25-Mar-2019 13:10
Lead	U		0.000600	0.00200	mg/L	1	25-Mar-2019 13:10
Magnesium	**1.12**		**0.0100**	**0.200**	**mg/L**	1	25-Mar-2019 13:10
Potassium	**11.0**		**0.0900**	**1.00**	**mg/L**	5	23-Mar-2019 00:22
Selenium	**0.00694**		**0.00110**	**0.00200**	**mg/L**	1	25-Mar-2019 13:10
Sodium	**246**		**0.0700**	**1.00**	**mg/L**	5	23-Mar-2019 00:22

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190311-FD-PV35inlet-30-35-40T
Collection Date: 11-Mar-2019 11:30

ANALYTICAL REPORT
WorkOrder:HS19030885
Lab ID:HS19030885-16
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JCJ
Hardness (As CaCO3)	**487**		**2.00**	**2.00**	**mg/L**	1	25-Mar-2019 17:12
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Mar-2019		Analyst: JHD
Antimony	**0.0350**		**0.000400**	**0.00200**	**mg/L**	1	25-Mar-2019 13:12
Arsenic	**0.00144**	J	**0.000400**	**0.00200**	**mg/L**	1	25-Mar-2019 13:12
Cadmium	U		0.000200	0.00200	mg/L	1	25-Mar-2019 13:12
Calcium	**193**		**0.170**	**2.50**	**mg/L**	5	23-Mar-2019 00:24
Iron	U		0.0120	0.200	mg/L	1	25-Mar-2019 13:12
Lead	U		0.000600	0.00200	mg/L	1	25-Mar-2019 13:12
Magnesium	**1.12**		**0.0100**	**0.200**	**mg/L**	1	25-Mar-2019 13:12
Potassium	**11.5**		**0.0900**	**1.00**	**mg/L**	5	23-Mar-2019 00:24
Selenium	**0.00698**		**0.00110**	**0.00200**	**mg/L**	1	25-Mar-2019 13:12
Sodium	**253**		**0.0700**	**1.00**	**mg/L**	5	23-Mar-2019 00:24

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190312-FD-PV35mid-controlT
Collection Date: 12-Mar-2019 18:20

ANALYTICAL REPORT
WorkOrder:HS19030885
Lab ID:HS19030885-17
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JCJ
Hardness (As CaCO3)	**469**		**2.00**	**2.00**	**mg/L**	1	25-Mar-2019 17:12
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Mar-2019		Analyst: JHD
Antimony	**0.0344**		**0.000400**	**0.00200**	**mg/L**	1	25-Mar-2019 13:15
Arsenic	**0.00103**	J	**0.000400**	**0.00200**	**mg/L**	1	25-Mar-2019 13:15
Cadmium	U		0.000200	0.00200	mg/L	1	25-Mar-2019 13:15
Calcium	**186**		**0.170**	**2.50**	**mg/L**	5	23-Mar-2019 00:26
Iron	**0.0143**	J	**0.0120**	**0.200**	**mg/L**	1	25-Mar-2019 13:15
Lead	U		0.000600	0.00200	mg/L	1	25-Mar-2019 13:15
Magnesium	**1.16**		**0.0100**	**0.200**	**mg/L**	1	25-Mar-2019 13:15
Potassium	**11.4**		**0.0900**	**1.00**	**mg/L**	5	23-Mar-2019 00:26
Selenium	**0.00663**		**0.00110**	**0.00200**	**mg/L**	1	25-Mar-2019 13:15
Sodium	**252**		**0.0700**	**1.00**	**mg/L**	5	23-Mar-2019 00:26

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190312-FD-PV35mid-30T
Collection Date: 12-Mar-2019 18:20

ANALYTICAL REPORT
WorkOrder:HS19030885
Lab ID:HS19030885-18
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JCJ
Hardness (As CaCO3)	**466**		**2.00**	**2.00**	**mg/L**	1	25-Mar-2019 17:12
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Mar-2019		Analyst: JHD
Antimony	**0.000549**	J	**0.000400**	**0.00200**	**mg/L**	1	25-Mar-2019 13:17
Arsenic	**0.000500**	J	**0.000400**	**0.00200**	**mg/L**	1	25-Mar-2019 13:17
Cadmium	U		0.000200	0.00200	mg/L	1	25-Mar-2019 13:17
Calcium	**185**		**0.170**	**2.50**	**mg/L**	5	23-Mar-2019 00:29
Iron	**0.494**		**0.0120**	**0.200**	**mg/L**	1	25-Mar-2019 13:17
Lead	U		0.000600	0.00200	mg/L	1	25-Mar-2019 13:17
Magnesium	**0.984**		**0.0100**	**0.200**	**mg/L**	1	25-Mar-2019 13:17
Potassium	**11.4**		**0.0900**	**1.00**	**mg/L**	5	23-Mar-2019 00:29
Selenium	U		0.00110	0.00200	mg/L	1	25-Mar-2019 13:17
Sodium	**251**		**0.0700**	**1.00**	**mg/L**	5	23-Mar-2019 00:29

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190312-FD-PV35mid-35T
Collection Date: 12-Mar-2019 18:20

ANALYTICAL REPORT
WorkOrder:HS19030885
Lab ID:HS19030885-19
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JCJ
Hardness (As CaCO3)	**456**		**2.00**	**2.00**	**mg/L**	1	25-Mar-2019 17:12
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Mar-2019		Analyst: JHD
Antimony	**0.000441**	J	**0.000400**	**0.00200**	**mg/L**	1	25-Mar-2019 13:22
Arsenic	U		0.000400	0.00200	mg/L	1	25-Mar-2019 13:22
Cadmium	U		0.000200	0.00200	mg/L	1	25-Mar-2019 13:22
Calcium	**181**		**0.170**	**2.50**	**mg/L**	5	23-Mar-2019 00:31
Iron	**1.14**		**0.0120**	**0.200**	**mg/L**	1	25-Mar-2019 13:22
Lead	U		0.000600	0.00200	mg/L	1	25-Mar-2019 13:22
Magnesium	**0.986**		**0.0100**	**0.200**	**mg/L**	1	25-Mar-2019 13:22
Potassium	**11.4**		**0.0900**	**1.00**	**mg/L**	5	23-Mar-2019 00:31
Selenium	U		0.00110	0.00200	mg/L	1	25-Mar-2019 13:22
Sodium	**249**		**0.0700**	**1.00**	**mg/L**	5	23-Mar-2019 00:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190312-FD-PV35mid-40T
Collection Date: 12-Mar-2019 18:20

ANALYTICAL REPORT
WorkOrder:HS19030885
Lab ID:HS19030885-20
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JCJ
Hardness (As CaCO3)	**466**		**2.00**	**2.00**	**mg/L**	1	25-Mar-2019 17:12
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 20-Mar-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	25-Mar-2019 13:24
Arsenic	**0.000482**	J	**0.000400**	**0.00200**	**mg/L**	1	25-Mar-2019 13:24
Cadmium	U		0.000200	0.00200	mg/L	1	25-Mar-2019 13:24
Calcium	**184**		**0.170**	**2.50**	**mg/L**	5	23-Mar-2019 00:33
Iron	**0.311**		**0.0120**	**0.200**	**mg/L**	1	25-Mar-2019 13:24
Lead	U		0.000600	0.00200	mg/L	1	25-Mar-2019 13:24
Magnesium	**1.49**		**0.0100**	**0.200**	**mg/L**	1	25-Mar-2019 13:24
Potassium	**11.5**		**0.0900**	**1.00**	**mg/L**	5	23-Mar-2019 00:33
Selenium	U		0.00110	0.00200	mg/L	1	25-Mar-2019 13:24
Sodium	**256**		**0.0700**	**1.00**	**mg/L**	5	23-Mar-2019 00:33

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030885

Batch ID: 138836 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19030885-01	1	10	10 (mL)	1
HS19030885-02	1	10	10 (mL)	1
HS19030885-03	1	10	10 (mL)	1
HS19030885-04	1	10	10 (mL)	1
HS19030885-05	1	10	10 (mL)	1
HS19030885-06	1	10	10 (mL)	1
HS19030885-07	1	10	10 (mL)	1
HS19030885-08	1	10	10 (mL)	1
HS19030885-09	1	10	10 (mL)	1
HS19030885-10	1	10	10 (mL)	1

Batch ID: 138891 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19030885-11	1	10	10 (mL)	1
HS19030885-12	1	10	10 (mL)	1
HS19030885-13	1	10	10 (mL)	1
HS19030885-14	1	10	10 (mL)	1
HS19030885-15	1	10	10 (mL)	1
HS19030885-16	1	10	10 (mL)	1
HS19030885-17	1	10	10 (mL)	1
HS19030885-18	1	10	10 (mL)	1
HS19030885-19	1	10	10 (mL)	1
HS19030885-20	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030885

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 138836	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS19030885-01	20190311-FD-PV35out-controlID	11 Mar 2019 11:30		19 Mar 2019 10:30	22 Mar 2019 13:35	1
HS19030885-01	20190311-FD-PV35out-controlID	11 Mar 2019 11:30		19 Mar 2019 10:30	22 Mar 2019 00:55	5
HS19030885-02	20190311-FD-PV35out-30D	11 Mar 2019 11:30		19 Mar 2019 10:30	22 Mar 2019 13:37	1
HS19030885-02	20190311-FD-PV35out-30D	11 Mar 2019 11:30		19 Mar 2019 10:30	22 Mar 2019 01:02	5
HS19030885-03	20190311-FD-PV35out-35D	11 Mar 2019 11:30		19 Mar 2019 10:30	22 Mar 2019 13:40	1
HS19030885-03	20190311-FD-PV35out-35D	11 Mar 2019 11:30		19 Mar 2019 10:30	22 Mar 2019 01:04	5
HS19030885-04	20190311-FD-PV35out-40D	11 Mar 2019 11:30		19 Mar 2019 10:30	22 Mar 2019 13:42	1
HS19030885-04	20190311-FD-PV35out-40D	11 Mar 2019 11:30		19 Mar 2019 10:30	22 Mar 2019 01:06	5
HS19030885-05	20190311-FD-PV35inlet-controlID	11 Mar 2019 11:30		19 Mar 2019 10:30	22 Mar 2019 13:44	1
HS19030885-05	20190311-FD-PV35inlet-controlID	11 Mar 2019 11:30		19 Mar 2019 10:30	22 Mar 2019 01:09	5
HS19030885-06	20190311-FD-PV35inlet-30-35-40D	11 Mar 2019 11:30		19 Mar 2019 10:30	22 Mar 2019 13:54	1
HS19030885-06	20190311-FD-PV35inlet-30-35-40D	11 Mar 2019 11:30		19 Mar 2019 10:30	22 Mar 2019 01:11	5
HS19030885-07	20190312-FD-PV35mid-controlID	12 Mar 2019 18:20		19 Mar 2019 10:30	22 Mar 2019 13:57	1
HS19030885-07	20190312-FD-PV35mid-controlID	12 Mar 2019 18:20		19 Mar 2019 10:30	22 Mar 2019 01:13	5
HS19030885-08	20190312-FD-PV35mid-30D	12 Mar 2019 18:20		19 Mar 2019 10:30	22 Mar 2019 13:59	1
HS19030885-08	20190312-FD-PV35mid-30D	12 Mar 2019 18:20		19 Mar 2019 10:30	22 Mar 2019 01:15	5
HS19030885-09	20190312-FD-PV35mid-35D	12 Mar 2019 18:20		19 Mar 2019 10:30	22 Mar 2019 14:01	1
HS19030885-09	20190312-FD-PV35mid-35D	12 Mar 2019 18:20		19 Mar 2019 10:30	22 Mar 2019 01:18	5
HS19030885-10	20190312-FD-PV35mid-40D	12 Mar 2019 18:20		19 Mar 2019 10:30	22 Mar 2019 14:03	1
HS19030885-10	20190312-FD-PV35mid-40D	12 Mar 2019 18:20		19 Mar 2019 10:30	22 Mar 2019 01:20	5

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030885

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 138891	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19030885-11	20190311-FD-PV35out-controlT	11 Mar 2019 11:30		20 Mar 2019 10:30	25 Mar 2019 12:53	1
HS19030885-11	20190311-FD-PV35out-controlT	11 Mar 2019 11:30		20 Mar 2019 10:30	23 Mar 2019 00:09	5
HS19030885-12	20190311-FD-PV35out-30T	11 Mar 2019 11:30		20 Mar 2019 10:30	25 Mar 2019 12:55	1
HS19030885-12	20190311-FD-PV35out-30T	11 Mar 2019 11:30		20 Mar 2019 10:30	23 Mar 2019 00:15	5
HS19030885-13	20190311-FD-PV35out-35T	11 Mar 2019 11:30		20 Mar 2019 10:30	25 Mar 2019 12:57	1
HS19030885-13	20190311-FD-PV35out-35T	11 Mar 2019 11:30		20 Mar 2019 10:30	23 Mar 2019 00:18	5
HS19030885-14	20190311-FD-PV35out-40T	11 Mar 2019 11:30		20 Mar 2019 10:30	25 Mar 2019 13:00	1
HS19030885-14	20190311-FD-PV35out-40T	11 Mar 2019 11:30		20 Mar 2019 10:30	23 Mar 2019 00:20	5
HS19030885-15	20190311-FD-PV35inlet-controlT	11 Mar 2019 11:30		20 Mar 2019 10:30	25 Mar 2019 13:10	1
HS19030885-15	20190311-FD-PV35inlet-controlT	11 Mar 2019 11:30		20 Mar 2019 10:30	23 Mar 2019 00:22	5
HS19030885-16	20190311-FD-PV35inlet-30-35-40T	11 Mar 2019 11:30		20 Mar 2019 10:30	25 Mar 2019 13:12	1
HS19030885-16	20190311-FD-PV35inlet-30-35-40T	11 Mar 2019 11:30		20 Mar 2019 10:30	23 Mar 2019 00:24	5
HS19030885-17	20190312-FD-PV35mid-controlT	12 Mar 2019 18:20		20 Mar 2019 10:30	25 Mar 2019 13:15	1
HS19030885-17	20190312-FD-PV35mid-controlT	12 Mar 2019 18:20		20 Mar 2019 10:30	23 Mar 2019 00:26	5
HS19030885-18	20190312-FD-PV35mid-30T	12 Mar 2019 18:20		20 Mar 2019 10:30	25 Mar 2019 13:17	1
HS19030885-18	20190312-FD-PV35mid-30T	12 Mar 2019 18:20		20 Mar 2019 10:30	23 Mar 2019 00:29	5
HS19030885-19	20190312-FD-PV35mid-35T	12 Mar 2019 18:20		20 Mar 2019 10:30	25 Mar 2019 13:22	1
HS19030885-19	20190312-FD-PV35mid-35T	12 Mar 2019 18:20		20 Mar 2019 10:30	23 Mar 2019 00:31	5
HS19030885-20	20190312-FD-PV35mid-40T	12 Mar 2019 18:20		20 Mar 2019 10:30	25 Mar 2019 13:24	1
HS19030885-20	20190312-FD-PV35mid-40T	12 Mar 2019 18:20		20 Mar 2019 10:30	23 Mar 2019 00:33	5
Batch ID R335229	**Test Name :** HARDNESS, TOTAL AS CACO3 BY SM2340B			**Matrix:** Groundwater		
HS19030885-11	20190311-FD-PV35out-controlT	11 Mar 2019 11:30			25 Mar 2019 17:12	1
HS19030885-12	20190311-FD-PV35out-30T	11 Mar 2019 11:30			25 Mar 2019 17:12	1
HS19030885-13	20190311-FD-PV35out-35T	11 Mar 2019 11:30			25 Mar 2019 17:12	1
HS19030885-14	20190311-FD-PV35out-40T	11 Mar 2019 11:30			25 Mar 2019 17:12	1
HS19030885-15	20190311-FD-PV35inlet-controlT	11 Mar 2019 11:30			25 Mar 2019 17:12	1
HS19030885-16	20190311-FD-PV35inlet-30-35-40T	11 Mar 2019 11:30			25 Mar 2019 17:12	1
HS19030885-17	20190312-FD-PV35mid-controlT	12 Mar 2019 18:20			25 Mar 2019 17:12	1
HS19030885-18	20190312-FD-PV35mid-30T	12 Mar 2019 18:20			25 Mar 2019 17:12	1
HS19030885-19	20190312-FD-PV35mid-35T	12 Mar 2019 18:20			25 Mar 2019 17:12	1
HS19030885-20	20190312-FD-PV35mid-40T	12 Mar 2019 18:20			25 Mar 2019 17:12	1

WorkOrder: HS19030885
InstrumentID: ICPMS05
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000555	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000460	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000554	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0537	0.0340	0.500
A	Iron	7439-89-6	0.0500	0.0549	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.00100	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0680	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0542	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00280	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0459	0.0140	0.200

WorkOrder: HS19030885
InstrumentID: ICPMS05
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000555	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000460	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000554	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0537	0.0340	0.500
A	Iron	7439-89-6	0.0500	0.0549	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.00100	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0680	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0542	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00280	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0459	0.0140	0.200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030885

QC BATCH REPORT NEW

Batch ID: 138836 (0) **Instrument: ICPMS05** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

MBLK Sample ID: **MBLK-138836** Units: **mg/L** Analysis Date: **22-Mar-2019 00:14**
Client ID: Run ID: **ICPMS05_334967** SeqNo: **5001101** PrepDate: **19-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	U	0.200								
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	0.04928	0.200								J

LCS Sample ID: **LCS-138836** Units: **mg/L** Analysis Date: **22-Mar-2019 00:16**
Client ID: Run ID: **ICPMS05_334967** SeqNo: **5001102** PrepDate: **19-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04502	0.00200	0.05	0	90.0	80 - 120				
Arsenic	0.05255	0.00200	0.05	0	105	80 - 120				
Cadmium	0.05264	0.00200	0.05	0	105	80 - 120				
Calcium	5.395	0.500	5	0	108	80 - 120				
Iron	5.254	0.200	5	0	105	80 - 120				
Lead	0.04875	0.00200	0.05	0	97.5	80 - 120				
Magnesium	4.979	0.200	5	0	99.6	80 - 120				
Potassium	5.221	0.200	5	0	104	80 - 120				
Selenium	0.05271	0.00200	0.05	0	105	80 - 120				
Sodium	5.422	0.200	5	0	108	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030885

QC BATCH REPORT NEW

Batch ID: 138836 (0) **Instrument: ICPMS05** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

MS Sample ID: **HS19030883-01MS** Units: **mg/L** Analysis Date: **22-Mar-2019 00:23**
Client ID: Run ID: **ICPMS05_334967** SeqNo: **5001105** PrepDate: **19-Mar-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05296	0.0100	0.05	0.008697	88.5	75 - 125				
Arsenic	0.05084	0.0100	0.05	0.0005	101	75 - 125				
Cadmium	0.0601	0.0100	0.05	0.00738	105	75 - 125				
Calcium	505.5	2.50	5	491.4	281	75 - 125				SO
Iron	4.994	1.00	5	0.0312	99.3	75 - 125				
Lead	0.05388	0.0100	0.05	0.000685	106	75 - 125				
Magnesium	284.5	1.00	5	273.9	212	75 - 125				SO
Potassium	21.59	1.00	5	16.31	106	75 - 125				
Selenium	0.0353	0.0100	0.05	-0.00331	77.2	75 - 125				
Sodium	1757	1.00	5	1721	704	75 - 125				SEO

MSD Sample ID: **HS19030883-01MSD** Units: **mg/L** Analysis Date: **22-Mar-2019 00:25**
Client ID: Run ID: **ICPMS05_334967** SeqNo: **5001106** PrepDate: **19-Mar-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.0519	0.0100	0.05	0.008697	86.4	75 - 125	0.05296	2.02	20	
Arsenic	0.05196	0.0100	0.05	0.0005	103	75 - 125	0.05084	2.19	20	
Cadmium	0.05902	0.0100	0.05	0.00738	103	75 - 125	0.0601	1.8	20	
Calcium	503.5	2.50	5	491.4	242	75 - 125	505.5	0.392	20	SO
Iron	4.885	1.00	5	0.0312	97.1	75 - 125	4.994	2.21	20	
Lead	0.05213	0.0100	0.05	0.000685	103	75 - 125	0.05388	3.31	20	
Magnesium	285.1	1.00	5	273.9	223	75 - 125	284.5	0.192	20	SO
Potassium	21.4	1.00	5	16.31	102	75 - 125	21.59	0.858	20	
Sodium	1784	1.00	5	1721	1250	75 - 125	1757	1.53	20	SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030885

QC BATCH REPORT NEW

Batch ID: 138836 (0) **Instrument: ICPMS05** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

PDS Sample ID: **HS19030883-01PDS** Units: **mg/L** Analysis Date: **22-Mar-2019 00:28**
Client ID: Run ID: **ICPMS05_334967** SeqNo: **5001107** PrepDate: **19-Mar-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.5158	0.0100	0.5	0.008697	101	75 - 125				
Arsenic	0.5589	0.0100	0.5	0	112	75 - 125				
Cadmium	0.5589	0.0100	0.5	0.00738	110	75 - 125				
Calcium	561.1	2.50	50	491.4	139	75 - 125				SO
Iron	54.42	1.00	50	0	109	75 - 125				
Lead	0.5622	0.0100	0.5	0	112	75 - 125				
Magnesium	339.3	1.00	50	273.9	131	75 - 125				SO
Potassium	71.52	1.00	50	16.31	110	75 - 125				
Selenium	0.5397	0.0100	0.5	0	108	75 - 125				

PDS Sample ID: **HS19030883-01PDS** Units: **mg/L** Analysis Date: **22-Mar-2019 14:45**
Client ID: Run ID: **ICPMS05_335065** SeqNo: **5002367** PrepDate: **19-Mar-2019** DF: **100**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	2710	20.0	1000	1759	95.1	75 - 125				

SD Sample ID: **HS19030883-01SD** Units: **mg/L** Analysis Date: **22-Mar-2019 00:21**
Client ID: Run ID: **ICPMS05_334967** SeqNo: **5001104** PrepDate: **19-Mar-2019** DF: **25**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	0.01238	0.0500					0.008697	0	10	J
Arsenic	U	0.0500					0.0005	0	10	
Cadmium	0.005978	0.0500					0.00738	0	10	J
Iron	U	5.00					0.0312	0	10	
Lead	U	0.0500					0.000685	0	10	
Selenium	U	0.0500					-0.00331	0	10	

SD Sample ID: **HS19030883-01SD** Units: **mg/L** Analysis Date: **22-Mar-2019 14:39**
Client ID: Run ID: **ICPMS05_335065** SeqNo: **5002364** PrepDate: **19-Mar-2019** DF: **25**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	490.4	12.5					491.4	0.202	10	
Magnesium	288.8	5.00					273.9	5.43	10	
Potassium	16.47	5.00					16.31	0.985	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030885

QC BATCH REPORT NEW

Batch ID: **138836 (0)** **Instrument:** **ICPMS05** **Method:** **DISSOLVED METALS BY SW6020A (DISSOLVED)**

SD Sample ID: **HS19030883-01SD** Units: **mg/L** Analysis Date: **22-Mar-2019 14:43**
Client ID: Run ID: **ICPMS05_335065** SeqNo: **5002366** PrepDate: **19-Mar-2019** DF: **500**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Selenium	U	1.00					0.06934	0	10	
Sodium	1800	100					1759	2.35	10	

The following samples were analyzed in this batch:

HS19030885-01	HS19030885-02	HS19030885-03	HS19030885-04
HS19030885-05	HS19030885-06	HS19030885-07	HS19030885-08
HS19030885-09	HS19030885-10		

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030885

QC BATCH REPORT NEW

Batch ID: 138891 (0) **Instrument: ICPMS05** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLK-138891** Units: **mg/L** Analysis Date: **22-Mar-2019 23:29**
Client ID: Run ID: **ICPMS05_335065** SeqNo: **5003384** PrepDate: **20-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01039	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	0.06281	0.200								J

LCS Sample ID: **LCS-138891** Units: **mg/L** Analysis Date: **22-Mar-2019 23:32**
Client ID: Run ID: **ICPMS05_335065** SeqNo: **5003385** PrepDate: **20-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05173	0.00200	0.05	0	103	80 - 120				
Arsenic	0.05177	0.00200	0.05	0	104	80 - 120				
Cadmium	0.05282	0.00200	0.05	0	106	80 - 120				
Calcium	4.89	0.500	5	0	97.8	80 - 120				
Iron	4.934	0.200	5	0	98.7	80 - 120				
Lead	0.05112	0.00200	0.05	0	102	80 - 120				
Magnesium	4.641	0.200	5	0	92.8	80 - 120				
Potassium	4.629	0.200	5	0	92.6	80 - 120				
Selenium	0.05029	0.00200	0.05	0	101	80 - 120				
Sodium	4.88	0.200	5	0	97.6	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030885

QC BATCH REPORT NEW

Batch ID: 138891 (0) **Instrument: ICPMS05** **Method: ICP-MS METALS BY SW6020A**

MS Sample ID: **HS19030883-11MS** Units: **mg/L** Analysis Date: **22-Mar-2019 23:38**
Client ID: Run ID: **ICPMS05_335065** SeqNo: **5003388** PrepDate: **20-Mar-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05239	0.0100	0.05	0.002883	99.0	80 - 120				
Arsenic	0.04923	0.0100	0.05	0.000988	96.5	80 - 120				
Cadmium	0.05706	0.0100	0.05	0.007358	99.4	80 - 120				
Calcium	464.2	2.50	5	437.5	534	80 - 120				SO
Iron	4.565	1.00	5	0.01948	90.9	80 - 120				
Lead	0.05004	0.0100	0.05	0.000192	99.7	80 - 120				
Magnesium	268.1	1.00	5	255.7	249	80 - 120				SO
Potassium	19.46	1.00	5	14.41	101	80 - 120				
Selenium	0.04861	0.0100	0.05	0.005167	86.9	80 - 120				
Sodium	1657	1.00	5	1586	1400	80 - 120				SEO

MSD Sample ID: **HS19030883-11MSD** Units: **mg/L** Analysis Date: **22-Mar-2019 23:40**
Client ID: Run ID: **ICPMS05_335065** SeqNo: **5003389** PrepDate: **20-Mar-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05355	0.0100	0.05	0.002883	101	80 - 120	0.05239	2.19	20	
Arsenic	0.05305	0.0100	0.05	0.000988	104	80 - 120	0.04923	7.47	20	
Cadmium	0.05927	0.0100	0.05	0.007358	104	80 - 120	0.05706	3.8	20	
Calcium	464.3	2.50	5	437.5	536	80 - 120	464.2	0.026	20	SO
Iron	4.649	1.00	5	0.01948	92.6	80 - 120	4.565	1.82	20	
Lead	0.04967	0.0100	0.05	0.000192	99.0	80 - 120	0.05004	0.752	20	
Magnesium	271	1.00	5	255.7	306	80 - 120	268.1	1.05	20	SO
Potassium	19.72	1.00	5	14.41	106	80 - 120	19.46	1.34	20	
Selenium	0.05536	0.0100	0.05	0.005167	100	80 - 120	0.04861	13	20	
Sodium	1641	1.00	5	1586	1090	80 - 120	1657	0.951	20	SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030885

QC BATCH REPORT NEW

Batch ID: 138891 (0) **Instrument: ICPMS05** **Method: ICP-MS METALS BY SW6020A**

PDS Sample ID: **HS19030883-11PDS** Units: **mg/L** Analysis Date: **22-Mar-2019 23:42**
Client ID: Run ID: **ICPMS05_335065** SeqNo: **5003390** PrepDate: **20-Mar-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	1.015	0.0100	1	0.002883	101	75 - 125				
Arsenic	1.06	0.0100	1	0	106	75 - 125				
Cadmium	1.068	0.0100	1	0.007358	106	75 - 125				
Calcium	546.1	2.50	100	437.5	109	75 - 125				O
Iron	97.15	1.00	100	0	97.1	75 - 125				
Lead	1.057	0.0100	1	0	106	75 - 125				
Magnesium	358.5	1.00	100	255.7	103	75 - 125				
Potassium	109.9	1.00	100	14.41	95.5	75 - 125				
Selenium	1.061	0.0100	1	0	106	75 - 125				

PDS Sample ID: **HS19030883-11PDS** Units: **mg/L** Analysis Date: **25-Mar-2019 12:25**
Client ID: Run ID: **ICPMS05_335168** SeqNo: **5004844** PrepDate: **20-Mar-2019** DF: **20**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	1912	4.00	200	1714	98.8	75 - 125				O

SD Sample ID: **HS19030883-11SD** Units: **mg/L** Analysis Date: **22-Mar-2019 23:36**
Client ID: Run ID: **ICPMS05_335065** SeqNo: **5003387** PrepDate: **20-Mar-2019** DF: **25**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0500					0.002883	0	10	
Arsenic	U	0.0500					0.000988	0	10	
Cadmium	0.00636	0.0500					0.007358	0	10	J
Calcium	478.8	12.5					437.5	9.43	10	
Iron	U	5.00					0.01948	0	10	
Lead	U	0.0500					0.000192	0	10	
Selenium	U	0.0500					0.005167	0	10	

SD Sample ID: **HS19030883-11SD** Units: **mg/L** Analysis Date: **25-Mar-2019 12:18**
Client ID: Run ID: **ICPMS05_335168** SeqNo: **5004841** PrepDate: **20-Mar-2019** DF: **25**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Magnesium	301.2	5.00					284.4	5.92	10	
Potassium	16.7	5.00					16.11	3.67	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030885

QC BATCH REPORT NEW

Batch ID: 138891 (0) **Instrument: ICPMS05** **Method: ICP-MS METALS BY SW6020A**

SD Sample ID: **HS19030883-11SD** Units: **mg/L** Analysis Date: **25-Mar-2019 12:23**
Client ID: Run ID: **ICPMS05_335168** SeqNo: **5004843** PrepDate: **20-Mar-2019** DF: **100**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Sodium	1763	20.0					1714	2.89	10	

The following samples were analyzed in this batch:

HS19030885-11	HS19030885-12	HS19030885-13	HS19030885-14
HS19030885-15	HS19030885-16	HS19030885-17	HS19030885-18
HS19030885-19	HS19030885-20		

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19030885**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
California	2919, 2018-2019	30-Apr-2019
Maryland	343, 2018-2019	30-Jun-2019

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19030885

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19030885-01	20190311-FD-PV35out-controlD	Login	3/18/2019 1:23:48 PM	NDR	MET079
HS19030885-02	20190311-FD-PV35out-30D	Login	3/18/2019 1:23:48 PM	NDR	MET079
HS19030885-03	20190311-FD-PV35out-35D	Login	3/18/2019 1:23:48 PM	NDR	MET079
HS19030885-04	20190311-FD-PV35out-40D	Login	3/18/2019 1:23:48 PM	NDR	MET079
HS19030885-05	20190311-FD-PV35inlet-controlD	Login	3/18/2019 1:23:48 PM	NDR	MET079
HS19030885-06	20190311-FD-PV35inlet-30-35-40D	Login	3/18/2019 1:23:48 PM	NDR	MET079
HS19030885-07	20190312-FD-PV35mid-controlD	Login	3/18/2019 1:23:48 PM	NDR	MET079
HS19030885-08	20190312-FD-PV35mid-30D	Login	3/18/2019 1:23:48 PM	NDR	MET079
HS19030885-09	20190312-FD-PV35mid-35D	Login	3/18/2019 1:23:48 PM	NDR	MET079
HS19030885-10	20190312-FD-PV35mid-40D	Login	3/18/2019 1:23:48 PM	NDR	MET079
HS19030885-11	20190311-FD-PV35out-controlT	Login	3/18/2019 1:23:48 PM	NDR	MET079
HS19030885-12	20190311-FD-PV35out-30T	Login	3/18/2019 1:23:48 PM	NDR	MET079
HS19030885-13	20190311-FD-PV35out-35T	Login	3/18/2019 1:23:48 PM	NDR	MET079
HS19030885-14	20190311-FD-PV35out-40T	Login	3/18/2019 1:23:48 PM	NDR	MET079
HS19030885-15	20190311-FD-PV35inlet-controlT	Login	3/18/2019 1:23:48 PM	NDR	MET079
HS19030885-16	20190311-FD-PV35inlet-30-35-40T	Login	3/18/2019 1:23:48 PM	NDR	MET079
HS19030885-17	20190312-FD-PV35mid-controlT	Login	3/18/2019 1:23:48 PM	NDR	MET079
HS19030885-18	20190312-FD-PV35mid-30T	Login	3/18/2019 1:23:48 PM	NDR	MET079
HS19030885-19	20190312-FD-PV35mid-35T	Login	3/18/2019 1:23:48 PM	NDR	MET079
HS19030885-20	20190312-FD-PV35mid-40T	Login	3/18/2019 1:23:48 PM	NDR	MET079

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19030885

Date/Time Received: **18-Mar-2019 09:15**
Received by: **NDR**

Checklist completed by: *Nilesh D. Ranchod* 18-Mar-2019
eSignature | Date

Reviewed by: _____
eSignature | Date

Matrices: **Water**

Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	14.2C/14.2C UC/C	11
Cooler(s)/Kit(s):	43656	
Date/Time sample(s) sent to storage:	03/18/2019 15:00	

Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

ALS Environmental

Chain of Custody Form

Page 1 of 2

HS19030885

Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086-06	Project Name	Exide Column Studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086-06	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suite 260	Address	13515 Barrett Parkway Drive, Suite 260	E	ICP TW (6020A total metals (6)+cations)
				F	ICP DISS (6020A diss metals (6)+cations-FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	G	
Phone	314 984-8800	Phone	314 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190311-FD-PV35out-controlD	03-11-19	11:30 AM	GW	2,8	1						x					
2	20190311-FD-PV35out-30D	03-11-19	11:30 AM	GW	2,8	1						x					
3	20190311-FD-PV35out-35D	03-11-19	11:30 AM	GW	2,8	1						x					
4	20190311-FD-PV35out-40D	03-11-19	11:30 AM	GW	2,8	1						x					
5	20190311-FD-PV35inlet-controlD	03-11-19	11:30 AM	GW	2,8	1						x					
6	20190311-FD-PV35inlet-30-35-40D	03-11-19	11:30 AM	GW	2,8	1						x					
7	20190312-FD-PV35mid-controlD	03-12-19	6:20 PM	GW	2,8	1						x					
8	20190312-FD-PV35mid-30D	03-12-19	6:20 PM	GW	2,8	1						x					
9	20190312-FD-PV35mid-35D	03-12-19	6:20 PM	GW	2,8	1						x					
10	20190312-FD-PV35mid-40D	03-12-19	6:20 PM	GW	2,8	1						x					

Sampler(s): Please Print & Sign
Giovanna Llamosas/Bettina Emile Bettina Emile

Shipment Method:

Required Turnaround Time:
☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by: Bettina Emile	Date: 2019/03/15	Time: 15:30	Received by:	Notes:	
Relinquished by:	Date: 3/18/19	Time: 09.15	Received by (Laboratory):	Cooler Temp. 4°C	QC Package: (Check Box Below)
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	14.2	☐ Level II: Standard QC ☒ TRRP-Checklist
					☐ Level III: Std QC + Raw Data ☐ TRRP Level IV
					☐ Level IV: SW846 CLP-Like
					☐ Other: _____

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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4 8656 14.2

ALS Environmental

Chain of Custody Form

Page 2 of 2

HS19030885

Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information	
PO Number	130-2086-06	Project Name	Exide Column Studies
Work Order		Project Number	130-2086-06
Company Name	Golder Associates	Bill To Company	Golder Associates
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P
Address	13515 Barrett Parkway Drive, Suite 260	Address	13515 Barrett Parkway Drive, Suite 260
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021
Phone	314 984-8800	Phone	314 984-8800
Fax		Fax	
e-Mail Address	ewhite@golder.com	e-Mail Address	

Analysis Request

A	300 W (300Cl, SO4, NO3-48h HT)
B	TDS W 2540C (2540C TDS)
C	ALK W 2320B (2320B alkalinity)
D	HARD (2340B hardness (calc))
E	ICP TW (6020A total metals (6)+cations)
F	ICP DISS (6020A diss metals (6)+cations-FldFltr)
G	
H	
I	
J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190311-FD-PV35out-controlT	03-11-19	11:30 AM	GW	2	1				x	x						
2	20190311-FD-PV35out-30T	03-11-19	11:30 AM	GW	2	1				x	x						
3	20190311-FD-PV35out-35T	03-11-19	11:30 AM	GW	2	1				x	x						
4	20190311-FD-PV35out-40T	03-11-19	11:30 AM	GW	2	1				x	x						
5	20190311-FD-PV35inlet-controlT	03-11-19	11:30 AM	GW	2	1				x	x						
6	20190311-FD-PV35inlet-30-35-40T	03-11-19	11:30 AM	GW	2	1				x	x						
7	20190312-FD-PV35mid-controlT	03-12-19	6:20 PM	GW	2	1				x	x						
8	20190312-FD-PV35mid-30T	03-12-19	6:20 PM	GW	2	1				x	x						
9	20190312-FD-PV35mid-35T	03-12-19	6:20 PM	GW	2	1				x	x						
10	20190312-FD-PV35mid-40T	03-12-19	6:20 PM	GW	2	1				x	x						

Sampler(s): Please Print & Sign
Giovanna Llamosas/Bettina Emile Bettina Emile

Shipment Method:

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by: Bettina Emile	Date: 2019/03/15	Time: 15:30	Received by:	Notes:	
Relinquished by:	Date: 3/18/19	Time: 09.15	Received by (Laboratory): NN	Cooler Temp. 4/C	QC Package: (Check Box Below)
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	14.2	☐ Level II: Standard QC ☒ TRRP-Checklist ☐ Level III: Std QC + Raw Data ☐ TRRP Level IV ☐ Level IV: SW846 CLP-Like ☐ Other: _____

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental. 43656

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ORIGIN ID:YUXA (514) 383-0990
AUDREY ETHEVES
GOLDER ASSOCIATES LTD
7250 RUE DU MILE END
3E ETAGE
MONTREAL, PQ H2R3A4
CANADA CA

SHIP DATE: 15MAR19
ACTWGT: 18.80 LB
CAD: 108680724/INET4102

BILL RECIPIENT

TO **DANE WACASEY**
ALS HOUSTON LABORATORY
10450 STANCLIFF RD
STE 210
HOUSTON TX 77099 (US)
(281) 530-5656 REF:
INV:
PO: DEPT:

565J1/46D3/23AD

FedEx Express

J1510190702uv

TRK# 0430 **7747 1715 5120**

10:30A
INTL PRIORITY

XH SGRA

77099
TX-US IAH

Après l'impression de cette étiquette :
COPIE DU DESTINATAIRE - VEUILLEZ LA PLACER DEVANT LA POCHETTE
1. Pliez la page imprimée le long de la ligne horizontale.
2. Placez l'étiquette dans la pochette d'expédition et fixez-la à votre paquet.

CUSTODY SEAL

Seal Broken By:

Date:

Time:

Name

Company:

Date:

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

March 25, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19030897**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 6 sample(s) on Mar 16, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19030897**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS19030897**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 03/25/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19030897				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 138830,138938,R335229				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?			X		
		Were analytical duplicates analyzed at the appropriate frequency?			X		
		Were RPDs or relative standard deviations within the laboratory QC limits?			X		
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 03/25/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19030897				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 138830,138938,R335229				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			2
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		X			3
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports		
Laboratory Name: ALS Laboratory Group		LRC Date: 03/25/2019
Project Name: Exide Column Studies		Laboratory Job Number: HS19030897
Reviewer Name: Dane Wacasey		Prep Batch Number(s): 138830,138938,R335229
ER#[5]	**Description**	
1	Batch 138830, Metals Method SW6020, sample HS19030797-01, MS and MSD were performed on unrelated sample. Batch 138938, Metals Method SW6020, sample HS19030918-01, MS and MSD were performed on unrelated sample.	
2	See Run Log and CCB Exceptions Report.	
3	Batch 138830, Metals Method SW6020, sample HS19030797-01, PDS was performed on unrelated sample. Batch 138830, Metals Method SW6020, sample HS19030797-01, Serial Dilution was performed on unrelated sample. Batch 138938, Metals Method SW6020, sample HS19030918-01, Serial Dilution was performed on unrelated sample.	

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030897
Start Date: 20-Mar-2019 End Date: 21-Mar-2019

Run ID:ICPMS04_334870
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	20-Mar-2019 12:09	022_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	20-Mar-2019 12:11	023SMPL.d	AS CA CD FE K MG NA PB SB SE
LLICV5	1	20-Mar-2019 12:13	024LICV.d	AS CA CD FE K MG NA PB SB SE
ICB	1	20-Mar-2019 12:16	025_ICB.d	AS CA CD FE K MG NA PB SB SE
ICV	1	20-Mar-2019 12:24	027_ICV.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	20-Mar-2019 12:33	029ICSA.d	AS CA CD FE K MG NA PB SB SE
ICSAB	1	20-Mar-2019 12:35	030ICSB.d	AS CA CD FE K MG NA PB SB SE
CCV 1	1	20-Mar-2019 13:01	040_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	20-Mar-2019 13:03	041_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	20-Mar-2019 13:38	052_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	20-Mar-2019 13:40	053_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	20-Mar-2019 14:14	064_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	20-Mar-2019 14:16	065_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	20-Mar-2019 14:49	077_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	20-Mar-2019 14:55	079_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	20-Mar-2019 16:00	089_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	20-Mar-2019 16:02	090_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	20-Mar-2019 16:05	091_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	20-Mar-2019 16:07	092_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	20-Mar-2019 16:33	102_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	20-Mar-2019 16:35	103_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 8	1	20-Mar-2019 17:15	112_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	20-Mar-2019 17:17	113_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	20-Mar-2019 18:07	121_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	20-Mar-2019 18:09	122_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 10	1	20-Mar-2019 18:34	133_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	20-Mar-2019 18:36	134_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 11	1	20-Mar-2019 23:23	159_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	20-Mar-2019 23:25	160SMPL.d	AS CA CD FE K MG NA PB SB SE
LLCCV5	1	20-Mar-2019 23:27	161LICV.d	AS CA CD FE K MG NA PB SB SE
ICCB 11	1	20-Mar-2019 23:29	162_ICB.d	AS CA CD FE K MG NA PB SB SE
CCV 12	1	20-Mar-2019 23:50	170_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 12	1	20-Mar-2019 23:52	171_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 13	1	21-Mar-2019 00:17	182_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 13	1	21-Mar-2019 00:19	183_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 14	1	21-Mar-2019 00:44	194_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 14	1	21-Mar-2019 00:46	195_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-138830	1	21-Mar-2019 00:48	196SMPL.d	AS CA CD FE MG PB SB SE
LCS-138830	1	21-Mar-2019 00:50	197SMPL.d	AS CA CD FE MG PB SB SE
ZZZZZZSD	5	21-Mar-2019 00:55	199SMPL.d	AS CA CD FE MG PB SB SE
ZZZZZZMS	1	21-Mar-2019 00:57	200SMPL.d	AS CA CD FE MG PB SB SE
ZZZZZZMSD	1	21-Mar-2019 00:59	201SMPL.d	AS CA CD FE MG PB SB SE
ZZZZZZPDS	1	21-Mar-2019 01:01	202SMPL.d	AS CA CD FE MG PB SB SE
CCV 15	1	21-Mar-2019 01:03	203_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 15	1	21-Mar-2019 01:06	204_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 16	1	21-Mar-2019 01:30	215_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 16	1	21-Mar-2019 01:32	216_CCB.d	AS CA CD FE K MG NA PB SB SE
20190315-DGW-MW3-T0-controlT	1	21-Mar-2019 01:46	222SMPL.d	AS CA CD FE K MG NA PB SB SE
20190315-DGW-MW3-T0-30-35-40T	1	21-Mar-2019 01:48	223SMPL.d	AS CA CD FE K MG NA PB SB SE
CCV 17	1	21-Mar-2019 01:57	227_CCV.d	AS CA CD FE K MG NA PB SB SE

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030897
Start Date: 20-Mar-2019 End Date: 21-Mar-2019

Run ID:ICPMS04_334870
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
CCB 17	1	21-Mar-2019 01:59	228_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 18	1	21-Mar-2019 02:10	233_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 18	1	21-Mar-2019 02:12	234_CCB.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	21-Mar-2019 02:14	235SMPL.d	AS CA CD FE K MG NA PB SB SE
LLICV5	1	21-Mar-2019 02:17	236LICV.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	21-Mar-2019 02:19	237ICSA.d	AS CA CD FE K MG NA PB SB SE
ICSAB	1	21-Mar-2019 02:21	238ICSB.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030897

Run ID:ICPMS04_334870
Instrument:ICPMS04
Method:SW6020

ICCB 11	Date: 20-Mar-2019 23:29	Seq: 4998942		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Iron	-20.67	12	200	
CCB 12	Date: 20-Mar-2019 23:52	Seq: 4998951		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.087	0.4	2	
	Iron	-18.09	12	200	
CCB 13	Date: 21-Mar-2019 00:19	Seq: 4998963		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Iron	19.73	12	200	
	Magnesium	15.13	10	200	
	Potassium	18.15	18	200	
	Sodium	26.26	14	200	
CCB 14	Date: 21-Mar-2019 00:46	Seq: 4998975		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Magnesium	10.5	10	200	
	Potassium	19.26	18	200	
	Sodium	109.4	14	200	
CCB 15	Date: 21-Mar-2019 01:06	Seq: 4998984		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.593	0.4	2	
	Iron	14.28	12	200	
	Magnesium	14.77	10	200	
	Potassium	26.97	18	200	
	Sodium	475.7	14	200	
CCB 16	Date: 21-Mar-2019 01:32	Seq: 4998996		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Potassium	32.45	18	200	
	Sodium	197.7	14	200	
CCB 17	Date: 21-Mar-2019 01:59	Seq: 4999008		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	142.7	14	200	
CCB 18	Date: 21-Mar-2019 02:12	Seq: 4999011		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	74.04	14	200	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030897
Start Date: 22-Mar-2019 End Date: 23-Mar-2019

Run ID:ICPMS04_335069
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	22-Mar-2019 13:41	036_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	22-Mar-2019 13:43	037SMPL.d	NA
LLICV5	1	22-Mar-2019 13:45	038LICV.d	NA
ICB	1	22-Mar-2019 13:47	039_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	22-Mar-2019 13:53	040ICSA.d	NA
ICSAB	1	22-Mar-2019 13:55	041ICSB.d	NA
CCB 1	1	22-Mar-2019 14:24	052_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 1	1	22-Mar-2019 14:33	054_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	22-Mar-2019 14:33	054_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	22-Mar-2019 14:36	055_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	22-Mar-2019 14:36	055_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	22-Mar-2019 15:33	063SMPL.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	22-Mar-2019 15:35	064_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	22-Mar-2019 16:13	079_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	22-Mar-2019 16:15	080_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	22-Mar-2019 16:43	092_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	22-Mar-2019 16:48	094_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	22-Mar-2019 17:21	104_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	22-Mar-2019 17:23	105_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	22-Mar-2019 17:58	117_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	22-Mar-2019 18:00	118_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	22-Mar-2019 18:29	130_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 8	1	22-Mar-2019 18:35	132_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	22-Mar-2019 21:32	136_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	22-Mar-2019 21:34	137_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 10	1	22-Mar-2019 21:55	146_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	22-Mar-2019 21:57	147_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 11	1	22-Mar-2019 22:24	159_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	22-Mar-2019 22:26	160SMPL.d	NA
LLCCV5	1	22-Mar-2019 22:28	161LICV.d	NA
ICCB 12	1	22-Mar-2019 22:30	162_ICB.d	AS CA CD FE K MG NA PB SB SE
CCV 12	1	22-Mar-2019 22:41	167_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 13	1	22-Mar-2019 22:44	168_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-138938	1	22-Mar-2019 22:46	169SMPL.d	AS CA CD FE K MG NA PB SE
LCS-138938	1	22-Mar-2019 22:48	170SMPL.d	AS CA CD FE K MG NA PB SE
ZZZZZZSD	5	22-Mar-2019 22:53	172SMPL.d	AS CD FE PB SB SE
ZZZZZZMS	1	22-Mar-2019 22:55	173SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZMSD	1	22-Mar-2019 22:57	174SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZPDS	1	22-Mar-2019 22:59	175SMPL.d	AS CD FE K MG PB SB SE
CCV 13	1	22-Mar-2019 23:02	176_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 14	1	22-Mar-2019 23:04	177_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 14	1	22-Mar-2019 23:50	187_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 15	1	22-Mar-2019 23:59	191_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 15	1	23-Mar-2019 00:18	199_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 16	1	23-Mar-2019 00:20	200_CCB.d	AS CA CD FE K MG NA PB SB SE
20190315-DGW-MW3-T0-controlD	5	23-Mar-2019 00:31	205SMPL.d	NA
20190315-DGW-MW3-T0-30-35-40D	5	23-Mar-2019 00:33	206SMPL.d	NA
CCV 16	1	23-Mar-2019 00:36	207_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 17	1	23-Mar-2019 00:38	208_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 17	1	23-Mar-2019 00:56	216_CCV.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030897

Run ID:ICPMS04_335069
Instrument:ICPMS04
Method:SW6020

CCB 14	Date: 22-Mar-2019 23:04	Seq: 5003278	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	2.117	0.4	2	
Sodium	39.77	14	200	

CCB 15	Date: 22-Mar-2019 23:59	Seq: 5003291	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	176.3	14	200	

CCB 16	Date: 23-Mar-2019 00:20	Seq: 5003300	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.019	0.4	2	
Sodium	82.72	14	200	

CCB 17	Date: 23-Mar-2019 00:38	Seq: 5003308	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.022	0.4	2	
Sodium	62.1	14	200	

CCB 18	Date: 23-Mar-2019 00:58	Seq: 5003317	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.646	0.4	2	
Sodium	77.38	14	200	

CCB 19	Date: 23-Mar-2019 01:25	Seq: 5003329	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.882	0.4	2	
Iron	20.49	12	200	
Magnesium	21.18	10	200	
Potassium	44.4	18	200	
Sodium	3224	14	200	

CCB 20	Date: 23-Mar-2019 01:52	Seq: 5003341	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.8	0.4	2	
Potassium	23.51	18	200	
Sodium	678.7	14	200	

CCB 21	Date: 23-Mar-2019 01:58	Seq: 5003344	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.99	0.4	2	
Potassium	19.57	18	200	
Sodium	520.5	14	200	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030897
Start Date: 25-Mar-2019 End Date: 25-Mar-2019

Run ID:ICPMS04_335170
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	25-Mar-2019 12:22	021_ICV.d	AS CA CD FE K MG NA P PB SB SE
LLICV2	1	25-Mar-2019 12:24	022SMPL.d	AS CA CD FE K MG P PB SB SE
LLICV5	1	25-Mar-2019 12:27	023LICV.d	AS CA CD FE K MG P PB SB SE
ICB	1	25-Mar-2019 12:29	024_ICB.d	AS CA CD FE K MG NA P PB SB SE
ICSA	1	25-Mar-2019 12:34	025ICSA.d	AS CA CD FE K MG P PB SB SE
ICSAB	1	25-Mar-2019 12:37	026ICSB.d	AS CA CD FE K MG P PB SB SE
MBLK-138938	1	25-Mar-2019 12:47	028SMPL.d	SB
LCS-138938	1	25-Mar-2019 12:49	029SMPL.d	SB
ZZZZZZSD	50	25-Mar-2019 12:58	033SMPL.d	CA K MG NA
ZZZZZZPDS	10	25-Mar-2019 13:00	034SMPL.d	CA NA
CCV 1	1	25-Mar-2019 13:05	036_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 1	1	25-Mar-2019 13:07	037_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 2	1	25-Mar-2019 13:32	048_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 2	1	25-Mar-2019 13:34	049_CCB.d	AS CA CD FE K MG NA P PB SB SE
20190315-DGW-MW3-T0-controlD	1	25-Mar-2019 13:51	052SMPL.d	AS CA CD FE K MG P PB SB SE
20190315-DGW-MW3-T0-30-35-40D	1	25-Mar-2019 13:54	053SMPL.d	AS CA CD FE K MG P PB SB SE
CCB 3	1	25-Mar-2019 14:11	061_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 3	1	25-Mar-2019 14:16	063_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 4	1	25-Mar-2019 14:46	073_CCB.d	AS CA CD FE K MG NA P PB SB SE
CCV 4	1	25-Mar-2019 15:00	075_CCV.d	AS CA CD FE K MG NA P PB SB SE
CCB 5	1	25-Mar-2019 15:26	086SMPL.d	AS CA CD FE K MG NA P PB SB SE
CCV 5	1	25-Mar-2019 15:30	088_CCV.d	AS CA CD FE K MG NA P PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030897

Run ID:ICPMS04_335170
Instrument:ICPMS04
Method:SW6020

ICB	Date: 25-Mar-2019 12:29	Seq: 5004572		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.424	0.4	2	
CCB 1	Date: 25-Mar-2019 13:07	Seq: 5004759		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	2.261	0.4	2	
	Sodium	29.94	14	200	
CCB 2	Date: 25-Mar-2019 13:34	Seq: 5004771		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.93	0.4	2	
	Sodium	61.13	14	200	
CCB 3	Date: 25-Mar-2019 14:11	Seq: 5004924		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.574	0.4	2	
	Sodium	39.44	14	200	
CCB 4	Date: 25-Mar-2019 14:46	Seq: 5005013		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.49	0.4	2	
	Sodium	118.3	14	200	
CCB 5	Date: 25-Mar-2019 15:26	Seq: 5005126		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.648	0.4	2	
	Sodium	57.76	14	200	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19030897

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19030897-01	20190315-DGW-MW3-T0-control	Groundwater		15-Mar-2019 10:40	16-Mar-2019 09:38	☑
HS19030897-02	20190315-DGW-MW3-T0-controlD	Groundwater		15-Mar-2019 10:20	16-Mar-2019 09:38	☐
HS19030897-03	20190315-DGW-MW3-T0-controlT	Groundwater		15-Mar-2019 10:20	16-Mar-2019 09:38	☐
HS19030897-04	20190315-DGW-MW3-T0-30-35-40	Groundwater		15-Mar-2019 10:40	16-Mar-2019 09:38	☑
HS19030897-05	20190315-DGW-MW3-T0-30-35-40D	Groundwater		15-Mar-2019 10:20	16-Mar-2019 09:38	☐
HS19030897-06	20190315-DGW-MW3-T0-30-35-40T	Groundwater		15-Mar-2019 10:20	16-Mar-2019 09:38	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190315-DGW-MW3-T0-controlD
Collection Date: 15-Mar-2019 10:20

ANALYTICAL REPORT
WorkOrder:HS19030897
Lab ID:HS19030897-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 21-Mar-2019		Analyst: JCJ
Antimony	**0.000487**	J	**0.000400**	**0.00200**	**mg/L**	1	25-Mar-2019 13:51
Arsenic	**0.0418**		**0.000400**	**0.00200**	**mg/L**	1	25-Mar-2019 13:51
Cadmium	U		0.000200	0.00200	mg/L	1	25-Mar-2019 13:51
Calcium	**120**		**0.0340**	**0.500**	**mg/L**	1	25-Mar-2019 13:51
Iron	**3.17**		**0.0120**	**0.200**	**mg/L**	1	25-Mar-2019 13:51
Lead	U		0.000600	0.00200	mg/L	1	25-Mar-2019 13:51
Magnesium	**14.8**		**0.0100**	**0.200**	**mg/L**	1	25-Mar-2019 13:51
Potassium	**1.54**		**0.0180**	**0.200**	**mg/L**	1	25-Mar-2019 13:51
Selenium	U		0.00110	0.00200	mg/L	1	25-Mar-2019 13:51
Sodium	**172**		**0.0700**	**1.00**	**mg/L**	5	23-Mar-2019 00:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190315-DGW-MW3-T0-controlT
Collection Date: 15-Mar-2019 10:20

ANALYTICAL REPORT
WorkOrder:HS19030897
Lab ID:HS19030897-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JCJ
Hardness (As CaCO3)	**340**		**2.00**	**2.00**	**mg/L**	1	25-Mar-2019 17:12
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 19-Mar-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	21-Mar-2019 01:46
Arsenic	**0.0853**		**0.000400**	**0.00200**	**mg/L**	1	21-Mar-2019 01:46
Cadmium	U		0.000200	0.00200	mg/L	1	21-Mar-2019 01:46
Calcium	**113**		**0.0340**	**0.500**	**mg/L**	1	21-Mar-2019 01:46
Iron	**7.72**		**0.0120**	**0.200**	**mg/L**	1	21-Mar-2019 01:46
Lead	U		0.000600	0.00200	mg/L	1	21-Mar-2019 01:46
Magnesium	**14.1**		**0.0100**	**0.200**	**mg/L**	1	21-Mar-2019 01:46
Potassium	**1.53**		**0.0180**	**0.200**	**mg/L**	1	21-Mar-2019 01:46
Selenium	U		0.00110	0.00200	mg/L	1	21-Mar-2019 01:46
Sodium	**177**		**0.0140**	**0.200**	**mg/L**	1	21-Mar-2019 01:46

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190315-DGW-MW3-T0-30-35-40D
Collection Date: 15-Mar-2019 10:20

ANALYTICAL REPORT
WorkOrder:HS19030897
Lab ID:HS19030897-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 21-Mar-2019		Analyst: JCJ
Antimony	**0.000432**	J	**0.000400**	**0.00200**	**mg/L**	1	25-Mar-2019 13:54
Arsenic	**0.0390**		**0.000400**	**0.00200**	**mg/L**	1	25-Mar-2019 13:54
Cadmium	U		0.000200	0.00200	mg/L	1	25-Mar-2019 13:54
Calcium	**118**		**0.0340**	**0.500**	**mg/L**	1	25-Mar-2019 13:54
Iron	**3.04**		**0.0120**	**0.200**	**mg/L**	1	25-Mar-2019 13:54
Lead	U		0.000600	0.00200	mg/L	1	25-Mar-2019 13:54
Magnesium	**14.9**		**0.0100**	**0.200**	**mg/L**	1	25-Mar-2019 13:54
Potassium	**1.48**		**0.0180**	**0.200**	**mg/L**	1	25-Mar-2019 13:54
Selenium	U		0.00110	0.00200	mg/L	1	25-Mar-2019 13:54
Sodium	**168**		**0.0700**	**1.00**	**mg/L**	5	23-Mar-2019 00:33

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190315-DGW-MW3-T0-30-35-40T
Collection Date: 15-Mar-2019 10:20

ANALYTICAL REPORT
WorkOrder:HS19030897
Lab ID:HS19030897-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JCJ
Hardness (As CaCO3)	**330**		**2.00**	**2.00**	**mg/L**	1	25-Mar-2019 17:12
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 19-Mar-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	21-Mar-2019 01:48
Arsenic	**0.0768**		**0.000400**	**0.00200**	**mg/L**	1	21-Mar-2019 01:48
Cadmium	U		0.000200	0.00200	mg/L	1	21-Mar-2019 01:48
Calcium	**109**		**0.0340**	**0.500**	**mg/L**	1	21-Mar-2019 01:48
Iron	**7.07**		**0.0120**	**0.200**	**mg/L**	1	21-Mar-2019 01:48
Lead	U		0.000600	0.00200	mg/L	1	21-Mar-2019 01:48
Magnesium	**14.0**		**0.0100**	**0.200**	**mg/L**	1	21-Mar-2019 01:48
Potassium	**1.47**		**0.0180**	**0.200**	**mg/L**	1	21-Mar-2019 01:48
Selenium	U		0.00110	0.00200	mg/L	1	21-Mar-2019 01:48
Sodium	**176**		**0.0140**	**0.200**	**mg/L**	1	21-Mar-2019 01:48

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030897

Batch ID: 138830 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19030897-03	1	10	10 (mL)	1
HS19030897-06	1	10	10 (mL)	1

Batch ID: 138938 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19030897-02	1	10	10 (mL)	1
HS19030897-05	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030897

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 138830	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19030897-03	20190315-DGW-MW3-T0-controlT	15 Mar 2019 10:20		19 Mar 2019 10:30	21 Mar 2019 01:46	1
HS19030897-06	20190315-DGW-MW3-T0-30-35-40T	15 Mar 2019 10:20		19 Mar 2019 10:30	21 Mar 2019 01:48	1
Batch ID 138938	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS19030897-02	20190315-DGW-MW3-T0-controlD	15 Mar 2019 10:20		21 Mar 2019 10:00	25 Mar 2019 13:51	1
HS19030897-02	20190315-DGW-MW3-T0-controlD	15 Mar 2019 10:20		21 Mar 2019 10:00	23 Mar 2019 00:31	5
HS19030897-05	20190315-DGW-MW3-T0-30-35-40D	15 Mar 2019 10:20		21 Mar 2019 10:00	25 Mar 2019 13:54	1
HS19030897-05	20190315-DGW-MW3-T0-30-35-40D	15 Mar 2019 10:20		21 Mar 2019 10:00	23 Mar 2019 00:33	5
Batch ID R335229	**Test Name :** HARDNESS, TOTAL AS CACO3 BY SM2340B			**Matrix:** Groundwater		
HS19030897-03	20190315-DGW-MW3-T0-controlT	15 Mar 2019 10:20			25 Mar 2019 17:12	1
HS19030897-06	20190315-DGW-MW3-T0-30-35-40T	15 Mar 2019 10:20			25 Mar 2019 17:12	1

WorkOrder: HS19030897
InstrumentID: ICPMS04
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000521	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000340	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000553	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0523	0.0340	0.500
A	Iron	7439-89-6	0.0250	0.0205	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000916	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0700	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0418	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00274	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0556	0.0140	0.200

WorkOrder: HS19030897
InstrumentID: ICPMS04
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000521	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000340	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000553	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0523	0.0340	0.500
A	Iron	7439-89-6	0.0250	0.0205	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000916	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0700	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0418	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00274	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0556	0.0140	0.200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030897

QC BATCH REPORT NEW

Batch ID: 138830 (0) **Instrument: ICPMS04** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLK-138830** Units: **mg/L** Analysis Date: **21-Mar-2019 00:48**
Client ID: Run ID: **ICPMS04_334870** SeqNo: **4998976** PrepDate: **19-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01649	0.200								J
Selenium	U	0.00200								

MBLK Sample ID: **MBLK-138830** Units: **mg/L** Analysis Date: **21-Mar-2019 13:57**
Client ID: Run ID: **ICPMS04_334969** SeqNo: **5000038** PrepDate: **19-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Potassium	U	0.200								
Sodium	0.02564	0.200								J

LCS Sample ID: **LCS-138830** Units: **mg/L** Analysis Date: **21-Mar-2019 00:50**
Client ID: Run ID: **ICPMS04_334870** SeqNo: **4998977** PrepDate: **19-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04749	0.00200	0.05	0	95.0	80 - 120				
Arsenic	0.04833	0.00200	0.05	0	96.7	80 - 120				
Cadmium	0.04676	0.00200	0.05	0	93.5	80 - 120				
Calcium	5.147	0.500	5	0	103	80 - 120				
Iron	4.562	0.200	5	0	91.2	80 - 120				
Lead	0.04477	0.00200	0.05	0	89.5	80 - 120				
Magnesium	5.104	0.200	5	0	102	80 - 120				
Selenium	0.05123	0.00200	0.05	0	102	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030897

QC BATCH REPORT NEW

Batch ID: 138830 (0) **Instrument: ICPMS04** **Method: ICP-MS METALS BY SW6020A**

LCS Sample ID: **LCS-138830** Units: **mg/L** Analysis Date: **21-Mar-2019 13:59**
Client ID: Run ID: **ICPMS04_334969** SeqNo: **5000039** PrepDate: **19-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Potassium	4.929	0.200	5	0	98.6	80 - 120				
Sodium	5.034	0.200	5	0	101	80 - 120				

MS Sample ID: **HS19030797-01MS** Units: **mg/L** Analysis Date: **21-Mar-2019 00:57**
Client ID: Run ID: **ICPMS04_334870** SeqNo: **4998980** PrepDate: **19-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04905	0.00200	0.05	0.00019	97.7	80 - 120				
Arsenic	0.05182	0.00200	0.05	0.000772	102	80 - 120				
Cadmium	0.04783	0.00200	0.05	0.000036	95.6	80 - 120				
Calcium	97.24	0.500	5	93.82	68.4	80 - 120				SO
Iron	29.19	0.200	5	24.97	84.3	80 - 120				O
Lead	0.04727	0.00200	0.05	0.000111	94.3	80 - 120				
Magnesium	99.74	0.200	5	95.85	77.9	80 - 120				SO
Selenium	0.05425	0.00200	0.05	0.000735	107	80 - 120				

MS Sample ID: **HS19030797-01MS** Units: **mg/L** Analysis Date: **21-Mar-2019 14:31**
Client ID: Run ID: **ICPMS04_334969** SeqNo: **5000103** PrepDate: **19-Mar-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Potassium	30.61	2.00	5	25.9	94.2	80 - 120				O
Sodium	1099	2.00	5	1109	-195	80 - 120				SO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030897

QC BATCH REPORT NEW

Batch ID: 138830 (0) **Instrument: ICPMS04** **Method: ICP-MS METALS BY SW6020A**

MSD Sample ID: **HS19030797-01MSD** Units: **mg/L** Analysis Date: **21-Mar-2019 00:59**
Client ID: Run ID: **ICPMS04_334870** SeqNo: **4998981** PrepDate: **19-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04908	0.00200	0.05	0	98.2	80 - 120	0.0462	6.05	20	
Arsenic	0.05194	0.00200	0.05	0.000772	102	80 - 120	0.05024	3.33	20	
Cadmium	0.04805	0.00200	0.05	0	96.1	80 - 120	0.04532	5.85	20	
Calcium	102.3	0.500	5	93.82	170	80 - 120	91.46	11.2	20	SO
Iron	30.87	0.200	5	24.97	118	80 - 120	31.34	1.51	20	O
Lead	0.04696	0.00200	0.05	0	93.9	80 - 120	0.04625	1.5	20	
Magnesium	102.5	0.200	5	95.85	133	80 - 120	95.32	7.28	20	SO
Selenium	0.05499	0.00200	0.05	0	110	80 - 120	0.05004	9.43	20	

MSD Sample ID: **HS19030797-01MSD** Units: **mg/L** Analysis Date: **21-Mar-2019 14:33**
Client ID: Run ID: **ICPMS04_334969** SeqNo: **5000104** PrepDate: **19-Mar-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Potassium	30.99	2.00	5	25.9	102	80 - 120	30.61	1.22	20	O
Sodium	1126	2.00	5	1109	343	80 - 120	1099	2.42	20	SO

PDS Sample ID: **HS19030797-01PDS** Units: **mg/L** Analysis Date: **21-Mar-2019 01:01**
Client ID: Run ID: **ICPMS04_334870** SeqNo: **4998982** PrepDate: **19-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.08993	0.00200	0.1	0.00019	89.7	75 - 125				
Arsenic	0.09979	0.00200	0.1	0.000772	99.0	75 - 125				
Cadmium	0.09366	0.00200	0.1	0.000036	93.6	75 - 125				
Calcium	100	0.500	10	93.82	61.9	75 - 125				SO
Iron	32.32	0.200	10	24.97	73.5	75 - 125				S
Lead	0.09	0.00200	0.1	0.000111	89.9	75 - 125				
Magnesium	99.69	0.200	10	95.85	38.5	75 - 125				SO
Selenium	0.1071	0.00200	0.1	0.000735	106	75 - 125				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030897

QC BATCH REPORT NEW

Batch ID: 138830 (0) **Instrument: ICPMS04** **Method: ICP-MS METALS BY SW6020A**

PDS Sample ID: **HS19030797-01PDS** Units: **mg/L** Analysis Date: **21-Mar-2019 14:35**
Client ID: Run ID: **ICPMS04_334969** SeqNo: **5000105** PrepDate: **19-Mar-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Potassium	126.8	2.00	100	25.9	101	75 - 125				
Sodium	1139	2.00	100	1109	29.8	75 - 125				SO

SD Sample ID: **HS19030797-01SD** Units: **mg/L** Analysis Date: **21-Mar-2019 00:55**
Client ID: Run ID: **ICPMS04_334870** SeqNo: **4998979** PrepDate: **19-Mar-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.00019	0	10	
Arsenic	U	0.0100					0.000772	0	10	
Cadmium	U	0.0100					0.000036	0	10	
Calcium	82.7	2.50					93.82	11.9	10	R
Iron	23.03	1.00					24.97	7.78	10	
Lead	U	0.0100					0.000111	0	10	
Magnesium	87.08	1.00					95.85	9.14	10	
Selenium	U	0.0100					0.000735	0	10	

SD Sample ID: **HS19030797-01SD** Units: **mg/L** Analysis Date: **21-Mar-2019 14:29**
Client ID: Run ID: **ICPMS04_334969** SeqNo: **5000102** PrepDate: **19-Mar-2019** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Potassium	25.89	10.0					25.9	0.0158	10	
Sodium	1144	10.0					1109	3.19	10	

The following samples were analyzed in this batch: HS19030897-03 HS19030897-06

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030897

QC BATCH REPORT NEW

Batch ID: 138938 (0) **Instrument: ICPMS04** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

MBLK Sample ID: **MBLK-138938** Units: **mg/L** Analysis Date: **25-Mar-2019 12:47**
Client ID: Run ID: **ICPMS04_335170** SeqNo: **5004750** PrepDate: **21-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								

MBLK Sample ID: **MBLK-138938** Units: **mg/L** Analysis Date: **22-Mar-2019 22:46**
Client ID: Run ID: **ICPMS04_335069** SeqNo: **5003270** PrepDate: **21-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01005	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	0.01569	0.200								J

LCS Sample ID: **LCS-138938** Units: **mg/L** Analysis Date: **25-Mar-2019 12:49**
Client ID: Run ID: **ICPMS04_335170** SeqNo: **5004751** PrepDate: **21-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05379	0.00200	0.05	0	108	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030897

QC BATCH REPORT NEW

Batch ID: 138938 (0) **Instrument: ICPMS04** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

LCS Sample ID: **LCS-138938** Units: **mg/L** Analysis Date: **22-Mar-2019 22:48**
Client ID: Run ID: **ICPMS04_335069** SeqNo: **5003271** PrepDate: **21-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05063	0.00200	0.05	0	101	80 - 120				
Cadmium	0.05099	0.00200	0.05	0	102	80 - 120				
Calcium	5.262	0.500	5	0	105	80 - 120				
Iron	4.96	0.200	5	0	99.2	80 - 120				
Lead	0.04816	0.00200	0.05	0	96.3	80 - 120				
Magnesium	5.112	0.200	5	0	102	80 - 120				
Potassium	4.928	0.200	5	0	98.6	80 - 120				
Selenium	0.05116	0.00200	0.05	0	102	80 - 120				
Sodium	5.247	0.200	5	0	105	80 - 120				

MS Sample ID: **HS19030918-01MS** Units: **mg/L** Analysis Date: **22-Mar-2019 22:55**
Client ID: Run ID: **ICPMS04_335069** SeqNo: **5003274** PrepDate: **21-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05455	0.00200	0.05	0.000231	109	75 - 125				
Arsenic	0.06519	0.00200	0.05	0.00992	111	75 - 125				
Cadmium	0.052	0.00200	0.05	0.000027	104	75 - 125				
Calcium	238	0.500	5	240.8	-57.6	75 - 125				SEO
Iron	15.21	0.200	5	10.39	96.4	75 - 125				
Lead	0.05052	0.00200	0.05	0.000067	101	75 - 125				
Magnesium	23.51	0.200	5	19.01	90.0	75 - 125				
Potassium	20.8	0.200	5	16.18	92.3	75 - 125				
Selenium	0.05578	0.00200	0.05	-0.000287	112	75 - 125				
Sodium	97.74	0.200	5	96.73	20.2	75 - 125				SO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030897

QC BATCH REPORT NEW

Batch ID: 138938 (0) **Instrument: ICPMS04** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

MSD Sample ID: **HS19030918-01MSD** Units: **mg/L** Analysis Date: **22-Mar-2019 22:57**
Client ID: Run ID: **ICPMS04_335069** SeqNo: **5003275** PrepDate: **21-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05467	0.00200	0.05	0.000231	109	75 - 125	0.05455	0.225	20	
Arsenic	0.06328	0.00200	0.05	0.00992	107	75 - 125	0.06519	2.97	20	
Cadmium	0.05229	0.00200	0.05	0.000027	105	75 - 125	0.052	0.543	20	
Calcium	242.3	0.500	5	240.8	28.5	75 - 125	238	1.79	20	SEO
Iron	15.04	0.200	5	10.39	93.0	75 - 125	15.21	1.13	20	
Lead	0.05128	0.00200	0.05	0.000067	102	75 - 125	0.05052	1.51	20	
Magnesium	23.64	0.200	5	19.01	92.5	75 - 125	23.51	0.546	20	
Potassium	20.82	0.200	5	16.18	92.8	75 - 125	20.8	0.111	20	
Selenium	0.05207	0.00200	0.05	-0.000287	105	75 - 125	0.05578	6.88	20	
Sodium	98.56	0.200	5	96.73	36.6	75 - 125	97.74	0.839	20	SO

PDS Sample ID: **HS19030918-01PDS** Units: **mg/L** Analysis Date: **22-Mar-2019 22:59**
Client ID: Run ID: **ICPMS04_335069** SeqNo: **5003276** PrepDate: **21-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.0963	0.00200	0.1	0.000231	96.1	75 - 125				
Arsenic	0.1162	0.00200	0.1	0.00992	106	75 - 125				
Cadmium	0.102	0.00200	0.1	0.000027	102	75 - 125				
Iron	19.41	0.200	10	10.39	90.2	75 - 125				
Lead	0.1017	0.00200	0.1	0.000067	102	75 - 125				
Magnesium	27.49	0.200	10	19.01	84.8	75 - 125				
Potassium	25.16	0.200	10	16.18	89.8	75 - 125				
Selenium	0.1047	0.00200	0.1	-0.000287	105	75 - 125				

PDS Sample ID: **HS19030918-01PDS** Units: **mg/L** Analysis Date: **25-Mar-2019 13:00**
Client ID: Run ID: **ICPMS04_335170** SeqNo: **5004756** PrepDate: **21-Mar-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	302.8	5.00	100	205	97.9	75 - 125				
Sodium	193.6	2.00	100	91.47	102	75 - 125				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19030897

QC BATCH REPORT NEW

Batch ID: 138938 (0) **Instrument: ICPMS04** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

SD Sample ID: **HS19030918-01SD** Units: **mg/L** Analysis Date: **22-Mar-2019 22:53**
Client ID: Run ID: **ICPMS04_335069** SeqNo: **5003273** PrepDate: **21-Mar-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000231	0	10	
Arsenic	0.008651	0.0100					0.00992	0	10	J
Cadmium	U	0.0100					0.000027	0	10	
Iron	8.755	1.00					10.39	15.7	10	R
Lead	U	0.0100					0.000067	0	10	
Selenium	U	0.0100					-0.000287	0	10	

SD Sample ID: **HS19030918-01SD** Units: **mg/L** Analysis Date: **25-Mar-2019 12:58**
Client ID: Run ID: **ICPMS04_335170** SeqNo: **5004755** PrepDate: **21-Mar-2019** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	205.5	25.0					205	0.268	10	
Magnesium	17.73	10.0					17.44	1.67	10	
Potassium	14.68	10.0					14.64	0.235	10	
Sodium	95.16	10.0					91.47	4.03	10	

The following samples were analyzed in this batch: HS19030897-02 HS19030897-05

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19030897**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
California	2919, 2018-2019	30-Apr-2019
Maryland	343, 2018-2019	30-Jun-2019

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19030897

Date/Time Received: **16-Mar-2019 09:38**
Received by: **PMG**

Checklist completed by: *Nilesh D. Ranchod* eSignature — 18-Mar-2019 Date

Reviewed by: *Dane J. Wacasey* eSignature — 19-Mar-2019 Date

Matrices: **Water**

Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	2.1C/2.1C UC/C	IR # 11
Cooler(s)/Kit(s):	44437	
Date/Time sample(s) sent to storage:	03/16/2019 15:00	

Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

ALS Environmental

Chain of Custody Form

Page 1 of 1

HS19030897

Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information	
PO Number	130-2086-06	Project Name	Exide Column Studies
Work Order		Project Number	130-2086-06
Company Name	Golder Associates	Bill To Company	Golder Associates
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P
Address	13515 Barrett Parkway Drive, Suite 260	Address	13515 Barrett Parkway Drive, Suite 260
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021
Phone	314 984-8800	Phone	314 984-8800
Fax		Fax	
e-Mail Address	ewhite@golder.com	e-Mail Address	

Parameter/Method Request for Analysis

A	300 W (300Cl, SO4, NO3-48h HT)
B	TDS W 2540C (2540C TDS)
C	ALK W 2320B (2320B alkalinity)
D	HARD (2340B hardness (calc))
E	ICP TW (6020A total metals (6)+cations)
F	ICP DISS (6020A diss metals (6)+cations-FldFltr)
G	
H	
I	
J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190315-DGW-MW3-T0-control	03-15-19	10:40 AM	GW	8	1	x	x	x								
2	20190315-DGW-MW3-T0-controlD	03-15-19	10:20 AM	GW	2,8	1						x					
3	20190315-DGW-MW3-T0-controlT	03-15-19	10:20 AM	GW	2,8	1				x	x						
4	20190315-DGW-MW3-T0-30-35-40	03-15-19	10:40 AM	GW	8	1	x	x	x								
5	20190315-DGW-MW3-T0-30-35-40D	03-15-19	10:20 AM	GW	2,8	1						x					
6	20190315-DGW-MW3-T0-30-35-40T	03-15-19	10:20 AM	GW	2,8	1				x	x						
7																	
8																	
9																	
10																	

Sampler(s): Please Print & Sign
Giovanna Llamosas/Bettina Emile *Bettina Emile*

Shipment Method:

Required Turnaround Time:
☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by: Bettina Emile	Date: 2019/03/15	Time: 15:30	Received by:	Notes:
Relinquished by:	Date:	Time:	Received by (Laboratory):	Cooler Temp.
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	

QC Package: (Check Box Below)

	Level II: Standard QC	x	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other: _____		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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ORIGIN ID:YUXA (514) 383-0990
Audrey Etheves
Golder Associates Ltd
7250 rue du Mile End
3e etage
MONTREAL, PQ H2R3A4
CANADA, CA

SHIP DATE: 15MAR19
ACTWGT: 46.50 LB
CAD: 108680724/INET4102

BILL RECIPIENT
EIN/VAT:

TO Dane Wacasey (281) 530-5656
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

FedEx Express
(US)
AWB
J19010901072Ouv

X0 SGRA

PKG:YOUR PKG

TRK# 7747 1720 1648

Form 0430

SATURDAY 12:00P
INTL PRIORITY

REF:
DESC1:Échantillon d'eau
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: Audrey Etheves
T/C: R 967554812
D/T: R 967554812

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2. Placez l'étiquette dans la pochette d'expédition et fixez-la à votre paquet.

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

April 03, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19031331**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 8 sample(s) on Mar 27, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19031331**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS19031331**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 04/03/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19031331				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): R335413,R335651,R335807,R335877				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?		X			1
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			2
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?	X				
		Were analytical duplicates analyzed at the appropriate frequency?	X				
		Were RPDs or relative standard deviations within the laboratory QC limits?	X				
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				3
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 04/03/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19031331				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): R335413,R335651,R335807,R335877				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			4
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?			X		
		Were ion abundance data within the method-required QC limits?			X		
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?			X		
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?			X		
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports	
Laboratory Name: ALS Laboratory Group	LRC Date: 04/03/2019
Project Name: Exide Column Studies	Laboratory Job Number: HS19031331
Reviewer Name: Dane Wacasey	Prep Batch Number(s): R335413,R335651,R335807,R335877

ER#[5]	Description
1	Nitrogen, Nitrate (As N) Method E300, samples 20190325-FD-PV40out-Control, 20190325-FD-PV40out-30, 20190325-FD-PV40out-35, 20190325-FD-PV40out-40, 20190325-DGW-MW11-PV40out-control, 20190325-DGW-MW11-PV40out-30, 20190325-DGW-MW11-PV40out-35, 20190325-DGW-MW11-PV40out-40 were received with limited holding time. Samples were analyzed outside of the holding time. Results should be considered estimated.
2	Batch R335413, Anions Method E300, sample 20190325-FD-PV40out-Control, MS and MSD recovered outside the control limits for Sulfate, however, the result in the parent sample is greater than 4x the spike amount. Batch R335877, Anions Method E300, sample HS19040063-01, MS and MSD were performed on unrelated sample.
3	Batch R335877, Anions Method E300, sample 20190325-DGW-MW11-PV40out-control: the reporting limit is elevated for Nitrate as N due to peak co-eluding with sulfate peak at 5x and 10x. Batch R335413, Anions Method E300, sample 20190325-DGW-MW11-PV40out-control: the reporting limit is elevated for Nitrate as N due to peak co-eluding with sulfate peak at 5x and 10x.
4	See Run Log and CCB Exceptions Report.

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19031331
Start Date: 27-Mar-2019 End Date: 27-Mar-2019

Run ID:ICS2100_335413
Instrument:ICS2100
Method:E300

Sample No.	D/F	Time	FileID	Analytes
CCB 1	1	27-Mar-2019 09:30		CL NO3N SO4
WBLKW-032719	1	27-Mar-2019 09:52		CL NO3N SO4
WLCSW-032719	1	27-Mar-2019 10:07		CL NO3N SO4
WLCSDW-032719	1	27-Mar-2019 10:22		CL NO3N SO4
CCV 1	1	27-Mar-2019 12:43		CL NO3N SO4
CCB 2	1	27-Mar-2019 12:58		CL NO3N SO4
ZZZZZZMS	50	27-Mar-2019 13:42		CL NO3N SO4
ZZZZZZMSD	50	27-Mar-2019 13:57		CL NO3N SO4
ZZZZZZMS	1	27-Mar-2019 14:56		CL NO3N SO4
ZZZZZZMSD	1	27-Mar-2019 15:10		CL NO3N SO4
CCB 3	1	27-Mar-2019 15:55		CL NO3N SO4
20190325-FD-PV40out-Control	2	27-Mar-2019 16:24		CL NO3N
20190325-FD-PV40out-ControlMS	2	27-Mar-2019 16:39		CL NO3N SO4
20190325-FD-PV40out-ControlMSD	2	27-Mar-2019 16:54		CL NO3N SO4
20190325-FD-PV40out-Control	20	27-Mar-2019 17:08		SO4
20190325-FD-PV40out-30	5	27-Mar-2019 17:55		CL NO3N
20190325-FD-PV40out-35	5	27-Mar-2019 18:10		CL NO3N
20190325-FD-PV40out-40	5	27-Mar-2019 18:24		CL NO3N
20190325-FD-PV40out-30	25	27-Mar-2019 18:39		SO4
20190325-FD-PV40out-35	25	27-Mar-2019 18:54		SO4
CCV 2	1	27-Mar-2019 19:09		CL NO3N SO4
CCB 4	1	27-Mar-2019 19:23		CL NO3N SO4
20190325-DGW-MW11-PV40out-control	5	27-Mar-2019 20:58		CL
20190325-DGW-MW11-PV40out-30	5	27-Mar-2019 21:13		CL NO3N
20190325-DGW-MW11-PV40out-35	5	27-Mar-2019 21:27		CL NO3N
20190325-DGW-MW11-PV40out-40	5	27-Mar-2019 21:42		CL NO3N
CCB 5	1	27-Mar-2019 22:26		CL NO3N SO4

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19031331

Run ID:ICS2100_335413
Instrument:ICS2100
Method:E300

CCB 1	Date: 27-Mar-2019 09:30	Seq: 5009411	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	232	200	500	

CCB 5	Date: 27-Mar-2019 22:26	Seq: 5010857	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	228	200	500	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19031331
Start Date: 02-Apr-2019 End Date: 03-Apr-2019

Run ID:ICS2100_335877
Instrument:ICS2100
Method:E300

Sample No.	D/F	Time	FileID	Analytes
CCV 1	1	02-Apr-2019 13:32		CL NO3N SO4
CCB 1	1	02-Apr-2019 13:47		CL NO3N SO4
WBLKW-040219	1	02-Apr-2019 14:01		CL NO3N SO4
WLCSW-040219	1	02-Apr-2019 14:22		CL NO3N SO4
WLCSDW-040219	1	02-Apr-2019 14:37		CL NO3N SO4
CCB 2	1	02-Apr-2019 16:50		CL NO3N SO4
CCB 3	1	02-Apr-2019 17:54		CL NO3N SO4
ZZZZZZMS	500	02-Apr-2019 18:38		CL NO3N SO4
ZZZZZZMSD	500	02-Apr-2019 18:53		CL NO3N SO4
ZZZZZZMS	1	02-Apr-2019 20:07		CL NO3N SO4
ZZZZZZMSD	1	02-Apr-2019 20:21		CL NO3N SO4
CCV 2	1	02-Apr-2019 20:36		CL NO3N SO4
CCB 4	1	02-Apr-2019 20:51		CL NO3N SO4
20190325-FD-PV40out-40	20	02-Apr-2019 21:50		SO4
20190325-DGW-MW11-PV40out-control	100	02-Apr-2019 22:19		NO3N SO4
20190325-DGW-MW11-PV40out-30	100	02-Apr-2019 22:34		SO4
20190325-DGW-MW11-PV40out-35	100	02-Apr-2019 22:49		SO4
20190325-DGW-MW11-PV40out-40	100	02-Apr-2019 23:04		SO4
CCB 5	1	02-Apr-2019 23:33		CL NO3N SO4
CCV 3	1	03-Apr-2019 00:47		CL NO3N SO4
CCB 6	1	03-Apr-2019 01:02		CL NO3N SO4

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19031331

Run ID:ICS2100_335877
Instrument:ICS2100
Method:E300

CCB 1	Date: 02-Apr-2019 13:47	Seq: 5020487	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	239	200	500	

CCB 2	Date: 02-Apr-2019 16:50	Seq: 5020497	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	282	200	500	
Nitrogen, Nitrate (As N)	81	30	100	
Sulfate	254	200	500	

CCB 3	Date: 02-Apr-2019 17:54	Seq: 5020500	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	237	200	500	

CCB 4	Date: 02-Apr-2019 20:51	Seq: 5020512	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Chloride	236	200	500	
Sulfate	232	200	500	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19031331

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19031331-01	20190325-FD-PV40out-Control	Groundwater		25-Mar-2019 10:31	27-Mar-2019 08:50	☐
HS19031331-02	20190325-FD-PV40out-30	Groundwater		25-Mar-2019 10:31	27-Mar-2019 08:50	☐
HS19031331-03	20190325-FD-PV40out-35	Groundwater		25-Mar-2019 10:31	27-Mar-2019 08:50	☐
HS19031331-04	20190325-FD-PV40out-40	Groundwater		25-Mar-2019 10:31	27-Mar-2019 08:50	☐
HS19031331-05	20190325-DGW-MW11-PV40out-control	Groundwater		25-Mar-2019 10:37	27-Mar-2019 08:50	☐
HS19031331-06	20190325-DGW-MW11-PV40out-30	Groundwater		25-Mar-2019 10:37	27-Mar-2019 08:50	☐
HS19031331-07	20190325-DGW-MW11-PV40out-35	Groundwater		25-Mar-2019 10:37	27-Mar-2019 08:50	☐
HS19031331-08	20190325-DGW-MW11-PV40out-40	Groundwater		25-Mar-2019 10:37	27-Mar-2019 08:50	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190325-FD-PV40out-Control
Collection Date: 25-Mar-2019 10:31

ANALYTICAL REPORT
WorkOrder:HS19031331
Lab ID:HS19031331-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**27.8**		**0.400**	**1.00**	**mg/L**	2	27-Mar-2019 16:24
Nitrogen, Nitrate (As N)	**1.15**	H	**0.0600**	**0.200**	**mg/L**	2	27-Mar-2019 16:24
Sulfate	**941**		**4.00**	**10.0**	**mg/L**	20	27-Mar-2019 17:08
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	**1,430**		**5.00**	**10.0**	**mg/L**	1	01-Apr-2019 17:50
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**26.0**		**5.00**	**5.00**	**mg/L**	1	30-Mar-2019 12:56
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	30-Mar-2019 12:56
Alkalinity, Total (As CaCO3)	**26.0**		**5.00**	**5.00**	**mg/L**	1	30-Mar-2019 12:56

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190325-FD-PV40out-30
Collection Date: 25-Mar-2019 10:31

ANALYTICAL REPORT
WorkOrder:HS19031331
Lab ID:HS19031331-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**25.9**		**1.00**	**2.50**	**mg/L**	5	27-Mar-2019 17:55
Nitrogen, Nitrate (As N)	U	H	0.150	0.500	mg/L	5	27-Mar-2019 17:55
Sulfate	**931**		**5.00**	**12.5**	**mg/L**	25	27-Mar-2019 18:39
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	**1,430**		**5.00**	**10.0**	**mg/L**	1	01-Apr-2019 17:50
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**14.5**		**5.00**	**5.00**	**mg/L**	1	30-Mar-2019 13:04
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	30-Mar-2019 13:04
Alkalinity, Total (As CaCO3)	**14.5**		**5.00**	**5.00**	**mg/L**	1	30-Mar-2019 13:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190325-FD-PV40out-35
Collection Date: 25-Mar-2019 10:31

ANALYTICAL REPORT
WorkOrder:HS19031331
Lab ID:HS19031331-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**26.5**		**1.00**	**2.50**	**mg/L**	5	27-Mar-2019 18:10
Nitrogen, Nitrate (As N)	U	H	0.150	0.500	mg/L	5	27-Mar-2019 18:10
Sulfate	**969**		**5.00**	**12.5**	**mg/L**	25	27-Mar-2019 18:54
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	**1,410**		**5.00**	**10.0**	**mg/L**	1	01-Apr-2019 17:50
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**12.3**		**5.00**	**5.00**	**mg/L**	1	30-Mar-2019 13:12
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	30-Mar-2019 13:12
Alkalinity, Total (As CaCO3)	**12.3**		**5.00**	**5.00**	**mg/L**	1	30-Mar-2019 13:12

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190325-FD-PV40out-40
Collection Date: 25-Mar-2019 10:31

ANALYTICAL REPORT
WorkOrder:HS19031331
Lab ID:HS19031331-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**26.1**		**1.00**	**2.50**	**mg/L**	5	27-Mar-2019 18:24
Nitrogen, Nitrate (As N)	U	H	0.150	0.500	mg/L	5	27-Mar-2019 18:24
Sulfate	**917**		**4.00**	**10.0**	**mg/L**	20	02-Apr-2019 21:50
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	**1,430**		**5.00**	**10.0**	**mg/L**	1	01-Apr-2019 17:50
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**13.2**		**5.00**	**5.00**	**mg/L**	1	30-Mar-2019 13:19
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	30-Mar-2019 13:19
Alkalinity, Total (As CaCO3)	**13.2**		**5.00**	**5.00**	**mg/L**	1	30-Mar-2019 13:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190325-DGW-MW11-PV40out-control
Collection Date: 25-Mar-2019 10:37

ANALYTICAL REPORT
WorkOrder:HS19031331
Lab ID:HS19031331-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**230**		**1.00**	**2.50**	**mg/L**	5	27-Mar-2019 20:58
Nitrogen, Nitrate (As N)	U	H	3.00	10.0	mg/L	100	02-Apr-2019 22:19
Sulfate	**5,010**		**20.0**	**50.0**	**mg/L**	100	02-Apr-2019 22:19
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	**8,080**		**5.00**	**10.0**	**mg/L**	1	01-Apr-2019 17:50
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**566**		**5.00**	**5.00**	**mg/L**	1	30-Mar-2019 13:27
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	30-Mar-2019 13:27
Alkalinity, Total (As CaCO3)	**566**		**5.00**	**5.00**	**mg/L**	1	30-Mar-2019 13:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190325-DGW-MW11-PV40out-30
Collection Date: 25-Mar-2019 10:37

ANALYTICAL REPORT
WorkOrder:HS19031331
Lab ID:HS19031331-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**230**		**1.00**	**2.50**	**mg/L**	5	27-Mar-2019 21:13
Nitrogen, Nitrate (As N)	U	H	0.150	0.500	mg/L	5	27-Mar-2019 21:13
Sulfate	**5,210**		**20.0**	**50.0**	**mg/L**	100	02-Apr-2019 22:34
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	**7,240**		**5.00**	**10.0**	**mg/L**	1	01-Apr-2019 17:50
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**77.2**		**5.00**	**5.00**	**mg/L**	1	30-Mar-2019 13:49
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	30-Mar-2019 13:49
Alkalinity, Total (As CaCO3)	**77.2**		**5.00**	**5.00**	**mg/L**	1	30-Mar-2019 13:49

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190325-DGW-MW11-PV40out-35
Collection Date: 25-Mar-2019 10:37

ANALYTICAL REPORT
WorkOrder:HS19031331
Lab ID:HS19031331-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**227**		**1.00**	**2.50**	**mg/L**	5	27-Mar-2019 21:27
Nitrogen, Nitrate (As N)	U	H	0.150	0.500	mg/L	5	27-Mar-2019 21:27
Sulfate	**4,990**		**20.0**	**50.0**	**mg/L**	100	02-Apr-2019 22:49
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	**7,310**		**5.00**	**10.0**	**mg/L**	1	01-Apr-2019 17:50
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**68.9**		**5.00**	**5.00**	**mg/L**	1	30-Mar-2019 13:57
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	30-Mar-2019 13:57
Alkalinity, Total (As CaCO3)	**68.9**		**5.00**	**5.00**	**mg/L**	1	30-Mar-2019 13:57

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190325-DGW-MW11-PV40out-40
Collection Date: 25-Mar-2019 10:37

ANALYTICAL REPORT
WorkOrder:HS19031331
Lab ID:HS19031331-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0		**Method:E300**					Analyst: KMU
Chloride	**215**		**1.00**	**2.50**	**mg/L**	5	27-Mar-2019 21:42
Nitrogen, Nitrate (As N)	U	H	0.150	0.500	mg/L	5	27-Mar-2019 21:42
Sulfate	**5,110**		**20.0**	**50.0**	**mg/L**	100	02-Apr-2019 23:04
TOTAL DISSOLVED SOLIDS BY SM2540C		**Method:M2540C**					Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	**4,430**		**5.00**	**10.0**	**mg/L**	1	01-Apr-2019 17:50
ALKALINITY BY SM2320B		**Method:SM2320B**					Analyst: AJH
Alkalinity, Bicarbonate (As CaCO3)	**66.0**		**5.00**	**5.00**	**mg/L**	1	30-Mar-2019 14:04
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	30-Mar-2019 14:04
Alkalinity, Total (As CaCO3)	**66.0**		**5.00**	**5.00**	**mg/L**	1	30-Mar-2019 14:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19031331

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R335413	**Test Name :** ANIONS BY E300.0			**Matrix:** Groundwater		
HS19031331-01	20190325-FD-PV40out-Control	25 Mar 2019 10:31			27 Mar 2019 17:08	20
HS19031331-01	20190325-FD-PV40out-Control	25 Mar 2019 10:31			27 Mar 2019 16:24	2
HS19031331-02	20190325-FD-PV40out-30	25 Mar 2019 10:31			27 Mar 2019 18:39	25
HS19031331-02	20190325-FD-PV40out-30	25 Mar 2019 10:31			27 Mar 2019 17:55	5
HS19031331-03	20190325-FD-PV40out-35	25 Mar 2019 10:31			27 Mar 2019 18:54	25
HS19031331-03	20190325-FD-PV40out-35	25 Mar 2019 10:31			27 Mar 2019 18:10	5
HS19031331-04	20190325-FD-PV40out-40	25 Mar 2019 10:31			27 Mar 2019 18:24	5
HS19031331-05	20190325-DGW-MW11-PV40out-control	25 Mar 2019 10:37			27 Mar 2019 20:58	5
HS19031331-06	20190325-DGW-MW11-PV40out-30	25 Mar 2019 10:37			27 Mar 2019 21:13	5
HS19031331-07	20190325-DGW-MW11-PV40out-35	25 Mar 2019 10:37			27 Mar 2019 21:27	5
HS19031331-08	20190325-DGW-MW11-PV40out-40	25 Mar 2019 10:37			27 Mar 2019 21:42	5
Batch ID R335651	**Test Name :** ALKALINITY BY SM2320B			**Matrix:** Groundwater		
HS19031331-01	20190325-FD-PV40out-Control	25 Mar 2019 10:31			30 Mar 2019 12:56	1
HS19031331-02	20190325-FD-PV40out-30	25 Mar 2019 10:31			30 Mar 2019 13:04	1
HS19031331-03	20190325-FD-PV40out-35	25 Mar 2019 10:31			30 Mar 2019 13:12	1
HS19031331-04	20190325-FD-PV40out-40	25 Mar 2019 10:31			30 Mar 2019 13:19	1
HS19031331-05	20190325-DGW-MW11-PV40out-control	25 Mar 2019 10:37			30 Mar 2019 13:27	1
HS19031331-06	20190325-DGW-MW11-PV40out-30	25 Mar 2019 10:37			30 Mar 2019 13:49	1
HS19031331-07	20190325-DGW-MW11-PV40out-35	25 Mar 2019 10:37			30 Mar 2019 13:57	1
HS19031331-08	20190325-DGW-MW11-PV40out-40	25 Mar 2019 10:37			30 Mar 2019 14:04	1
Batch ID R335807	**Test Name :** TOTAL DISSOLVED SOLIDS BY SM2540C			**Matrix:** Groundwater		
HS19031331-01	20190325-FD-PV40out-Control	25 Mar 2019 10:31			01 Apr 2019 17:50	1
HS19031331-02	20190325-FD-PV40out-30	25 Mar 2019 10:31			01 Apr 2019 17:50	1
HS19031331-03	20190325-FD-PV40out-35	25 Mar 2019 10:31			01 Apr 2019 17:50	1
HS19031331-04	20190325-FD-PV40out-40	25 Mar 2019 10:31			01 Apr 2019 17:50	1
HS19031331-05	20190325-DGW-MW11-PV40out-control	25 Mar 2019 10:37			01 Apr 2019 17:50	1
HS19031331-06	20190325-DGW-MW11-PV40out-30	25 Mar 2019 10:37			01 Apr 2019 17:50	1
HS19031331-07	20190325-DGW-MW11-PV40out-35	25 Mar 2019 10:37			01 Apr 2019 17:50	1
HS19031331-08	20190325-DGW-MW11-PV40out-40	25 Mar 2019 10:37			01 Apr 2019 17:50	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19031331

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R335877	**Test Name :** ANIONS BY E300.0				**Matrix:** Groundwater	
HS19031331-04	20190325-FD-PV40out-40	25 Mar 2019 10:31			02 Apr 2019 21:50	20
HS19031331-05	20190325-DGW-MW11-PV40out-control	25 Mar 2019 10:37			02 Apr 2019 22:19	100
HS19031331-06	20190325-DGW-MW11-PV40out-30	25 Mar 2019 10:37			02 Apr 2019 22:34	100
HS19031331-07	20190325-DGW-MW11-PV40out-35	25 Mar 2019 10:37			02 Apr 2019 22:49	100
HS19031331-08	20190325-DGW-MW11-PV40out-40	25 Mar 2019 10:37			02 Apr 2019 23:04	100

WorkOrder: HS19031331
InstrumentID: ICS2100
Test Code: 300_W
Test Number: E300
Test Name: Anions by E300.0

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Chloride	16887-00-6	0.500	0.581	0.200	0.500
A	Nitrogen, Nitrate (As N)	14797-55-8	0.100	0.107	0.0300	0.100
A	Sulfate	14808-79-8	0.500	0.626	0.200	0.500

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19031331

QC BATCH REPORT NEW

Batch ID: R335413 (0) **Instrument: ICS2100** **Method: ANIONS BY E300.0**

MBLK Sample ID: **WBLKW-032719** Units: **mg/L** Analysis Date: **27-Mar-2019 09:52**
Client ID: Run ID: **ICS2100_335413** SeqNo: **5009412** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	0.500								
Nitrogen, Nitrate (As N)	U	0.100								
Sulfate	U	0.500								

LCS Sample ID: **WLCSW-032719** Units: **mg/L** Analysis Date: **27-Mar-2019 10:07**
Client ID: Run ID: **ICS2100_335413** SeqNo: **5009413** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.36	0.500	20	0	102	90 - 110				
Nitrogen, Nitrate (As N)	3.957	0.100	4	0	98.9	90 - 110				
Sulfate	20	0.500	20	0	100	90 - 110				

LCSD Sample ID: **WLCSDW-032719** Units: **mg/L** Analysis Date: **27-Mar-2019 10:22**
Client ID: Run ID: **ICS2100_335413** SeqNo: **5009414** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.77	0.500	20	0	104	90 - 110	20.36	2	20	
Nitrogen, Nitrate (As N)	4.041	0.100	4	0	101	90 - 110	3.957	2.1	20	
Sulfate	20.48	0.500	20	0	102	90 - 110	20	2.36	20	

MS Sample ID: **HS19031331-01MS** Units: **mg/L** Analysis Date: **27-Mar-2019 16:39**
Client ID: **20190325-FD-PV40out-Control** Run ID: **ICS2100_335413** SeqNo: **5010838** PrepDate: DF: **2**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	46.61	1.00	20	27.83	93.9	80 - 120				
Nitrogen, Nitrate (As N)	4.89	0.200	4	1.15	93.5	80 - 120				
Sulfate	949.2	1.00	20	969	-99.3	80 - 120				SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19031331

QC BATCH REPORT NEW

Batch ID: R335413 (0) **Instrument: ICS2100** **Method: ANIONS BY E300.0**

MS Sample ID: **HS19031306-09MS** Units: **mg/L** Analysis Date: **27-Mar-2019 14:56**
Client ID: Run ID: **ICS2100_335413** SeqNo: **5009426** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	38.93	0.500	10	29.58	93.5	80 - 120				
Nitrogen, Nitrate (As N)	1.823	0.100	2	0.105	85.9	80 - 120				
Sulfate	29.04	0.500	10	19.46	95.8	80 - 120				

MS Sample ID: **HS19030850-04MS** Units: **mg/L** Analysis Date: **27-Mar-2019 13:42**
Client ID: Run ID: **ICS2100_335413** SeqNo: **5009421** PrepDate: DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	1149	25.0	500	689.9	91.8	80 - 120				
Nitrogen, Nitrate (As N)	93.33	5.00	100	0	93.3	80 - 120				
Sulfate	2942	25.0	500	2481	92.2	80 - 120				O

MSD Sample ID: **HS19031331-01MSD** Units: **mg/L** Analysis Date: **27-Mar-2019 16:54**
Client ID: **20190325-FD-PV40out-Control** Run ID: **ICS2100_335413** SeqNo: **5010839** PrepDate: DF: **2**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	46.55	1.00	20	27.83	93.6	80 - 120	46.61	0.125	20	
Nitrogen, Nitrate (As N)	4.938	0.200	4	1.15	94.7	80 - 120	4.89	0.977	20	
Sulfate	959.3	1.00	20	969	-48.8	80 - 120	949.2	1.06	20	SEO

MSD Sample ID: **HS19031306-09MSD** Units: **mg/L** Analysis Date: **27-Mar-2019 15:10**
Client ID: Run ID: **ICS2100_335413** SeqNo: **5009427** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	39.1	0.500	10	29.58	95.2	80 - 120	38.93	0.431	20	
Nitrogen, Nitrate (As N)	1.833	0.100	2	0.105	86.4	80 - 120	1.823	0.547	20	
Sulfate	29.2	0.500	10	19.46	97.4	80 - 120	29.04	0.567	20	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19031331

QC BATCH REPORT NEW

Batch ID: R335413 (0) **Instrument: ICS2100** **Method: ANIONS BY E300.0**

MSD Sample ID: **HS19030850-04MSD** Units: **mg/L** Analysis Date: **27-Mar-2019 13:57**
Client ID: Run ID: **ICS2100_335413** SeqNo: **5009422** PrepDate: DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	1146	25.0	500	689.9	91.3	80 - 120	1149	0.226	20	
Nitrogen, Nitrate (As N)	93.56	5.00	100	0	93.6	80 - 120	93.33	0.251	20	
Sulfate	2930	25.0	500	2481	89.9	80 - 120	2942	0.394	20	O

The following samples were analyzed in this batch:

HS19031331-01	HS19031331-02	HS19031331-03	HS19031331-04
HS19031331-05	HS19031331-06	HS19031331-07	HS19031331-08

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19031331

QC BATCH REPORT NEW

Batch ID: R335651 (0) **Instrument: ManTech01** **Method: ALKALINITY BY SM2320B**

MBLK Sample ID: **WBLKW1-190330** Units: **mg/L** Analysis Date: **30-Mar-2019 10:40**
Client ID: Run ID: **ManTech01_335651** SeqNo: **5014573** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	U	5.00								
Alkalinity, Carbonate (As CaCO3)	U	5.00								
Alkalinity, Total (As CaCO3)	U	5.00								

LCS Sample ID: **WLCS1-190330** Units: **mg/L** Analysis Date: **30-Mar-2019 10:48**
Client ID: Run ID: **ManTech01_335651** SeqNo: **5014574** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1041	5.00	1000	0	104	85 - 115				
Alkalinity, Total (As CaCO3)	1060	5.00	1000	0	106	85 - 115				

LCSD Sample ID: **WLCSD1-190330** Units: **mg/L** Analysis Date: **30-Mar-2019 10:57**
Client ID: Run ID: **ManTech01_335651** SeqNo: **5014575** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1041	5.00	1000	0	104	85 - 115	1041	0.0528	20	
Alkalinity, Total (As CaCO3)	1059	5.00	1000	0	106	85 - 115	1060	0.113	20	

DUP Sample ID: **HS19031383-01DUP** Units: **mg/L** Analysis Date: **30-Mar-2019 12:40**
Client ID: Run ID: **ManTech01_335651** SeqNo: **5014586** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	772	5.00					772.4	0.0596	20	
Alkalinity, Carbonate (As CaCO3)	247.4	5.00					246.9	0.223	20	
Alkalinity, Total (As CaCO3)	1019	5.00					1019	0.00981	20	

The following samples were analyzed in this batch:

HS19031331-01	HS19031331-02	HS19031331-03	HS19031331-04
HS19031331-05	HS19031331-06	HS19031331-07	HS19031331-08

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19031331

QC BATCH REPORT NEW

Batch ID: R335807 (0) **Instrument: Balance1** **Method: TOTAL DISSOLVED SOLIDS BY SM2540C**

MBLK Sample ID: **WBLK-040119** Units: **mg/L** Analysis Date: **01-Apr-2019 17:50**
Client ID: Run ID: **Balance1_335807** SeqNo: **5018843** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	U	10.0								

LCS Sample ID: **WLCS-040119** Units: **mg/L** Analysis Date: **01-Apr-2019 17:50**
Client ID: Run ID: **Balance1_335807** SeqNo: **5018844** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	1036	10.0	1000	0	104	85 - 115				

DUP Sample ID: **HS19031507-01DUP** Units: **mg/L** Analysis Date: **01-Apr-2019 17:50**
Client ID: Run ID: **Balance1_335807** SeqNo: **5018841** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	978	10.0					944	3.54	5	

DUP Sample ID: **HS19031320-04DUP** Units: **mg/L** Analysis Date: **01-Apr-2019 17:50**
Client ID: Run ID: **Balance1_335807** SeqNo: **5018823** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	9520	10.0					9540	0.21	5	

The following samples were analyzed in this batch:

HS19031331-01	HS19031331-02	HS19031331-03	HS19031331-04
HS19031331-05	HS19031331-06	HS19031331-07	HS19031331-08

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19031331

QC BATCH REPORT NEW

Batch ID: R335877 (0) **Instrument: ICS2100** **Method: ANIONS BY E300.0**

MBLK Sample ID: **WBLKW-040219** Units: **mg/L** Analysis Date: **02-Apr-2019 14:01**
Client ID: Run ID: **ICS2100_335877** SeqNo: **5020488** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate (As N)	U	0.100								
Sulfate	U	0.500								

LCS Sample ID: **WLCSW-040219** Units: **mg/L** Analysis Date: **02-Apr-2019 14:22**
Client ID: Run ID: **ICS2100_335877** SeqNo: **5020489** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate (As N)	3.995	0.100	4	0	99.9	90 - 110				
Sulfate	20.2	0.500	20	0	101	90 - 110				

LCSD Sample ID: **WLCSDW-040219** Units: **mg/L** Analysis Date: **02-Apr-2019 14:37**
Client ID: Run ID: **ICS2100_335877** SeqNo: **5020490** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate (As N)	4.021	0.100	4	0	101	90 - 110	3.995	0.649	20	
Sulfate	20.28	0.500	20	0	101	90 - 110	20.2	0.375	20	

MS Sample ID: **HS19040063-01MS** Units: **mg/L** Analysis Date: **02-Apr-2019 20:07**
Client ID: Run ID: **ICS2100_335877** SeqNo: **5020509** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate (As N)	3.167	0.100	2	1.346	91.0	80 - 120				
Sulfate	279.8	0.500	10	273.2	65.5	80 - 120				SEO

MS Sample ID: **HS19031172-01MS** Units: **mg/L** Analysis Date: **02-Apr-2019 18:38**
Client ID: Run ID: **ICS2100_335877** SeqNo: **5020503** PrepDate: DF: **500**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate (As N)	889	50.0	1000	0	88.9	80 - 120				
Sulfate	4568	250	5000	151.6	88.3	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19031331

QC BATCH REPORT NEW

Batch ID: R335877 (0) **Instrument: ICS2100** **Method: ANIONS BY E300.0**

MSD Sample ID: **HS19040063-01MSD** Units: **mg/L** Analysis Date: **02-Apr-2019 20:21**
Client ID: Run ID: **ICS2100_335877** SeqNo: **5020510** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate (As N)	3.191	0.100	2	1.346	92.2	80 - 120	3.167	0.755	20	
Sulfate	282.6	0.500	10	273.2	93.9	80 - 120	279.8	1.01	20	EO

MSD Sample ID: **HS19031172-01MSD** Units: **mg/L** Analysis Date: **02-Apr-2019 18:53**
Client ID: Run ID: **ICS2100_335877** SeqNo: **5020504** PrepDate: DF: **500**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate (As N)	894.6	50.0	1000	0	89.5	80 - 120	889	0.628	20	
Sulfate	4594	250	5000	151.6	88.8	80 - 120	4568	0.558	20	

The following samples were analyzed in this batch: HS19031331-04 HS19031331-05 HS19031331-06 HS19031331-07 HS19031331-08

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19031331**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
California	2919, 2018-2019	30-Apr-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19031331

Date/Time Received: **27-Mar-2019 08:50**
Received by: **NDR**

Checklist completed by: *Nilesh D. Ranchod* eSignature — 27-Mar-2019 Date

Reviewed by: *Dane J. Wacasey* eSignature — 30-Mar-2019 Date

Matrices: **Water**

Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	3.7C/3.7C UC/C	IR 11
Cooler(s)/Kit(s):	25363	
Date/Time sample(s) sent to storage:	03/27/2019 10:15am	

Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

ALS Environmental

Chain of Custody Form

Page 1 of 1

HS19031331

Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086-06	Project Name	Exide Column Studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086-06	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suite 260	Address	13515 Barrett Parkway Drive, Suite 260	E	ICP TW (6020A total metals (6)+cations)
				F	ICP DISS (6020A diss metals (6)+cations-FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	G	
Phone	314 984-8800	Phone	314 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190325-FD-PV40out-control	03-25-19	10:31 AM	GW	8	1	x	x	x								
2	20190325-FD-PV40out-30	03-25-19	10:31 AM	GW	8	1	x	x	x								
3	20190325-FD-PV40out-35	03-25-19	10:31 AM	GW	8	1	x	x	x								
4	20190325-FD-PV40out-40	03-25-19	10:31 AM	GW	8	1	x	x	x								
5	20190325-DGW-MW11-PV40out-control	03-25-19	10:37 AM	GW	8	1	x	x	x								
6	20190325-DGW-MW11-PV40out-30	03-25-19	10:37 AM	GW	8	1	x	x	x								
7	20190325-DGW-MW11-PV40out-35	03-25-19	10:37 AM	GW	8	1	x	x	x								
8	20190325-DGW-MW11-PV40out-40	03-25-19	10:37 AM	GW	8	1	x	x	x								
9																	
10																	

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method:

Required Turnaround Time:
☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
Giovanna Llamosas	2019/03/25	15:30	
Relinquished by:	Date: 3/27/19	Time: 05:50	Received by (Laboratory): NA
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes:

Cooler Temp. 4.1C 3.7

QC Package: (Check Box Below)

	Level II: Standard QC	x	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other: _____		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

Copyright 2013 by ALS Environmental

25363

ORIGIN ID:YUXA (514) 383-0990
AUDREY ETHEVES
GOLDER ASSOCIATES LTD
7250 RUE DU MILE END
3E ETAGE
MONTREAL, PQ H2R3A4
CANADA CA

SHIP DATE: 25MAR19
ACTWGT: 28.00 LB
CAD: 106680724/INET4102

BILL RECIPIENT

TO DANE WACASEY
ALS HOUSTON LABORATORY
10450 STANCLIFF RD
STE 210
HOUSTON TX 77099 (US)
(281) 530-5656 REF:
INV:
PO: DEPT:

FedEx Express

E

TRK# 0430 7747 8976 5803

10:30A
INTL PRIORITY

NH SGRA

77099
TX-US IAH

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

Date:
Name:
Compa

2. Place...

CUSTODY SEAL

Time:

Seal Broken By:

Date:

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

Date:
Name:
Compan

CUSTODY SEAL

Time:

Seal Broken By:

Date:

ORIGIN ID:YUXA (514) 383-0990
audrey etheves
Golder Associates Ltd
7250 rue du Mile End
3e etage
MONTREAL, PQ H2R3A4
CANADA, CA

SHIP DATE: 25MAR19
ACTWGT: 28.00 LB
CAD: 108680724/INET4102

BILL RECIPIENT
EIN/VAT:

TO Dane Wacasey
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

(281) 530-5656

FedEx Express

(US)

E

J191019010720uv

AWB

NH SGRA

PKG:CUSTOMER

TRK# 7747 8976 5803 Form 0430

10:30A
INTL PRIORITY

REF:
DESC1:Échantillon d'eau
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: audrey etheves
T/C: R 967554812
D/T: R 967554812

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10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

March 29, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19031391**

Laboratory Results for: **Exide Column Studies NSF**

Dear Emily,

ALS Environmental received 2 sample(s) on Mar 28, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies NSF	
WorkOrder:	**HS19031391**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies NSF	
WorkOrder:	**HS19031391**	

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 03/29/2019				
Project Name: Exide Column Studies NSF			Laboratory Job Number: HS19031391				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 139202,139204				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	X				
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?			X		
		Were analytical duplicates analyzed at the appropriate frequency?			X		
		Were RPDs or relative standard deviations within the laboratory QC limits?			X		
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 03/29/2019				
Project Name: Exide Column Studies NSF			Laboratory Job Number: HS19031391				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 139202,139204				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			1
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		X			2
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports		
Laboratory Name: ALS Laboratory Group		LRC Date: 03/29/2019
Project Name: Exide Column Studies NSF		Laboratory Job Number: HS19031391
Reviewer Name: Dane Wacasey		Prep Batch Number(s): 139202,139204
ER#[5]	**Description**	
1	See Run Log and CCB Exceptions Report.	
2	Batch 139204, Metals Method SW6020, sample 20190326-NSF-T, the percent difference between the results of the sample and the serial dilution were greater than 10%. Antimony, Arsenic.	

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies NSF
WorkOrder: HS19031391
Start Date: 28-Mar-2019 End Date: 29-Mar-2019

Run ID:ICPMS04_335460
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	28-Mar-2019 12:27	021_ICV.d	AS CD FE P PB SB SE
LLICV2	1	28-Mar-2019 12:30	022SMPL.d	AS CD FE P PB SB SE
LLICV5	1	28-Mar-2019 12:32	023LICV.d	AS CD FE P PB SB SE
ICB	1	28-Mar-2019 12:34	024_ICB.d	AS CD FE P PB SB SE
ICV	1	28-Mar-2019 12:36	025_ICV.d	AS CD FE P PB SB SE
ICSA	1	28-Mar-2019 12:46	026ICSA.d	AS CD FE P PB SB SE
ICSAB	1	28-Mar-2019 12:48	027ICSB.d	AS CD FE P PB SB SE
CCV 1	1	28-Mar-2019 13:19	037_CCV.d	AS CD FE P PB SB SE
CCB 1	1	28-Mar-2019 13:30	040_CCB.d	AS CD FE P PB SB SE
CCV 2	1	28-Mar-2019 14:01	051_CCV.d	AS CD FE P PB SB SE
CCB 2	1	28-Mar-2019 14:03	052_CCB.d	AS CD FE P PB SB SE
CCV 3	1	28-Mar-2019 14:37	063_CCV.d	AS CD FE P PB SB SE
CCB 3	1	28-Mar-2019 14:39	064_CCB.d	AS CD FE P PB SB SE
CCB 4	1	28-Mar-2019 15:08	072_CCB.d	AS CD FE P PB SB SE
CCV 4	1	28-Mar-2019 15:13	074_CCV.d	AS CD FE P PB SB SE
CCV 5	1	28-Mar-2019 15:32	082_CCV.d	AS CD FE P PB SB SE
CCB 5	1	28-Mar-2019 15:34	083_CCB.d	AS CD FE P PB SB SE
CCV 6	1	28-Mar-2019 16:06	092_CCV.d	AS CD FE P PB SB SE
CCB 6	1	28-Mar-2019 16:08	093_CCB.d	AS CD FE P PB SB SE
CCB 7	1	28-Mar-2019 16:55	105_CCB.d	AS CD FE P PB SB SE
CCV 7	1	28-Mar-2019 17:04	107_CCV.d	AS CD FE P PB SB SE
CCV 8	1	28-Mar-2019 17:28	117_CCV.d	AS CD FE P PB SB SE
CCB 8	1	28-Mar-2019 17:31	118_CCB.d	AS CD FE P PB SB SE
CCV 9	1	28-Mar-2019 17:51	126_CCV.d	AS CD FE P PB SB SE
CCB 9	1	28-Mar-2019 17:53	127_CCB.d	AS CD FE P PB SB SE
MBLK-139202	1	28-Mar-2019 18:03	129SMPL.d	AS CD FE PB SB SE
LCS-139202	1	28-Mar-2019 18:05	130SMPL.d	AS CD FE PB SB SE
20190326-NSF-D	1	28-Mar-2019 18:07	131SMPL.d	AS CD FE P PB SB SE
20190326-NSF-DSD	5	28-Mar-2019 18:09	132SMPL.d	AS CD FE PB SB SE
20190326-NSF-DMS	1	28-Mar-2019 18:12	133SMPL.d	AS CD FE PB SB SE
20190326-NSF-DMSD	1	28-Mar-2019 18:14	134SMPL.d	AS CD FE PB SB SE
20190326-NSF-DPDS	1	28-Mar-2019 18:16	135SMPL.d	AS CD FE PB SB SE
CCV 10	1	28-Mar-2019 18:24	137_CCV.d	AS CD FE P PB SB SE
CCB 10	1	28-Mar-2019 18:26	138_CCB.d	AS CD FE P PB SB SE
CCV 11	1	28-Mar-2019 18:58	149_CCV.d	AS CD FE P PB SB SE
CCB 11	1	28-Mar-2019 19:00	150_CCB.d	AS CD FE P PB SB SE
CCV 12	1	28-Mar-2019 19:22	160_CCV.d	AS CD FE P PB SB SE
CCB 12	1	28-Mar-2019 19:25	161_CCB.d	AS CD FE P PB SB SE
ICCV 13	1	29-Mar-2019 00:05	177_ICV.d	AS CD FE P PB SB SE
LLCCV2	1	29-Mar-2019 00:07	178SMPL.d	AS CD FE P PB SB SE
LLCCV5	1	29-Mar-2019 00:10	179LICV.d	AS CD FE P PB SB SE
ICB	1	29-Mar-2019 00:12	180_ICB.d	AS CD FE P PB SB SE
MBLK-139204	1	29-Mar-2019 00:16	182SMPL.d	AS CD FE PB SB SE
LCS-139204	1	29-Mar-2019 00:19	183SMPL.d	AS CD FE PB SB SE
20190326-NSF-T	1	29-Mar-2019 00:21	184SMPL.d	AS CD FE PB SB SE
20190326-NSF-TSD	5	29-Mar-2019 00:23	185SMPL.d	AS CD FE PB SB SE
20190326-NSF-TMS	1	29-Mar-2019 00:25	186SMPL.d	AS CD FE PB SB SE
20190326-NSF-TMSD	1	29-Mar-2019 00:28	187SMPL.d	AS CD FE PB SB SE
20190326-NSF-TPDS	1	29-Mar-2019 00:30	188SMPL.d	AS CD FE PB SB SE
CCV 14	1	29-Mar-2019 00:34	190_CCV.d	AS CD FE P PB SB SE
CCB 13	1	29-Mar-2019 00:37	191_CCB.d	AS CD FE P PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies NSF
WorkOrder: HS19031391

Run ID:ICPMS04_335460
Instrument:ICPMS04
Method:SW6020

ICB	Date: 28-Mar-2019 12:34	Seq: 5010689		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.563	0.4	2	
	Iron	-13.9	12	200	
CCB 1	Date: 28-Mar-2019 13:30	Seq: 5010803		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.441	0.4	2	
CCB 2	Date: 28-Mar-2019 14:03	Seq: 5011001		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.519	0.4	2	
CCB 3	Date: 28-Mar-2019 14:39	Seq: 5011075		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.299	0.4	2	
CCB 4	Date: 28-Mar-2019 15:08	Seq: 5011086		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.226	0.4	2	
CCB 5	Date: 28-Mar-2019 15:34	Seq: 5011121		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.869	0.4	2	
CCB 6	Date: 28-Mar-2019 16:08	Seq: 5011202		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.435	0.4	2	
CCB 7	Date: 28-Mar-2019 16:55	Seq: 5011337		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.535	0.4	2	
CCB 8	Date: 28-Mar-2019 17:31	Seq: 5011474		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.477	0.4	2	
	Selenium	1.389	1.1	2	
CCB 9	Date: 28-Mar-2019 17:53	Seq: 5011532		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.819	0.4	2	
CCB 10	Date: 28-Mar-2019 18:26	Seq: 5011668		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.098	0.4	2	
CCB 11	Date: 28-Mar-2019 19:00	Seq: 5011870		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.669	0.4	2	
CCB 12	Date: 28-Mar-2019 19:25	Seq: 5011881		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.766	0.4	2	

Client: Golder Associates
Project: Exide Column Studies NSF
Work Order: HS19031391

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19031391-01	20190326-NSF-D	Water		26-Mar-2019 16:50	28-Mar-2019 08:30	☐
HS19031391-02	20190326-NSF-T	Water		26-Mar-2019 16:50	28-Mar-2019 08:30	☐

Client: Golder Associates
Project: Exide Column Studies NSF
Sample ID: 20190326-NSF-D
Collection Date: 26-Mar-2019 16:50

ANALYTICAL REPORT
WorkOrder:HS19031391
Lab ID:HS19031391-01
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 28-Mar-2019		Analyst: JCJ
Antimony	**0.0156**		**0.000400**	**0.00200**	**mg/L**	1	28-Mar-2019 18:07
Arsenic	**0.0184**		**0.000400**	**0.00200**	**mg/L**	1	28-Mar-2019 18:07
Cadmium	**0.00165**	J	**0.000200**	**0.00200**	**mg/L**	1	28-Mar-2019 18:07
Iron	**1.84**		**0.0120**	**0.200**	**mg/L**	1	28-Mar-2019 18:07
Lead	U		0.000600	0.00200	mg/L	1	28-Mar-2019 18:07
Selenium	**0.00527**		**0.00110**	**0.00200**	**mg/L**	1	28-Mar-2019 18:07

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies NSF
Sample ID: 20190326-NSF-T
Collection Date: 26-Mar-2019 16:50

ANALYTICAL REPORT
WorkOrder:HS19031391
Lab ID:HS19031391-02
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 28-Mar-2019		Analyst: JCJ
Antimony	**0.0143**		**0.000400**	**0.00200**	**mg/L**	1	29-Mar-2019 00:21
Arsenic	**0.0318**		**0.000400**	**0.00200**	**mg/L**	1	29-Mar-2019 00:21
Cadmium	**0.00184**	J	**0.000200**	**0.00200**	**mg/L**	1	29-Mar-2019 00:21
Iron	**2.88**		**0.0120**	**0.200**	**mg/L**	1	29-Mar-2019 00:21
Lead	**0.000983**	J	**0.000600**	**0.00200**	**mg/L**	1	29-Mar-2019 00:21
Selenium	**0.00360**		**0.00110**	**0.00200**	**mg/L**	1	29-Mar-2019 00:21

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies NSF
WorkOrder: HS19031391

Batch ID: 139202 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19031391-01	1	10	10 (mL)	1

Batch ID: 139204 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19031391-02	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies NSF
WorkOrder: HS19031391

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 139202	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Water		
HS19031391-01	20190326-NSF-D	26 Mar 2019 16:50		28 Mar 2019 11:00	28 Mar 2019 18:07	1
Batch ID 139204	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Water		
HS19031391-02	20190326-NSF-T	26 Mar 2019 16:50		28 Mar 2019 11:00	29 Mar 2019 00:21	1

WorkOrder: HS19031391
InstrumentID: ICPMS04
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000521	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000340	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000553	0.000200	0.00200
A	Iron	7439-89-6	0.0250	0.0205	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000916	0.000600	0.00200
A	Selenium	7782-49-2	0.00250	0.00274	0.00110	0.00200

WorkOrder: HS19031391
InstrumentID: ICPMS04
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000521	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000340	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000553	0.000200	0.00200
A	Iron	7439-89-6	0.0250	0.0205	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000916	0.000600	0.00200
A	Selenium	7782-49-2	0.00250	0.00274	0.00110	0.00200

Client: Golder Associates
Project: Exide Column Studies NSF
WorkOrder: HS19031391

QC BATCH REPORT NEW

Batch ID: 139202 (0) **Instrument:** ICPMS04 **Method:** DISSOLVED METALS BY SW6020A (DISSOLVED)

MBLK Sample ID: **MBLK-139202** Units: **mg/L** Analysis Date: **28-Mar-2019 18:03**
Client ID: Run ID: **ICPMS04_335460** SeqNo: **5011635** PrepDate: **28-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.000415	0.00200								J
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Iron	U	0.200								
Lead	U	0.00200								
Selenium	U	0.00200								

LCS Sample ID: **LCS-139202** Units: **mg/L** Analysis Date: **28-Mar-2019 18:05**
Client ID: Run ID: **ICPMS04_335460** SeqNo: **5011636** PrepDate: **28-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05241	0.00200	0.05	0	105	80 - 120				
Arsenic	0.05189	0.00200	0.05	0	104	80 - 120				
Cadmium	0.05131	0.00200	0.05	0	103	80 - 120				
Iron	4.984	0.200	5	0	99.7	80 - 120				
Lead	0.04741	0.00200	0.05	0	94.8	80 - 120				
Selenium	0.05185	0.00200	0.05	0	104	80 - 120				

MS Sample ID: **HS19031391-01MS** Units: **mg/L** Analysis Date: **28-Mar-2019 18:12**
Client ID: **20190326-NSF-D** Run ID: **ICPMS04_335460** SeqNo: **5011639** PrepDate: **28-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.06691	0.00200	0.05	0.01556	103	75 - 125				
Arsenic	0.07015	0.00200	0.05	0.01837	104	75 - 125				
Cadmium	0.05233	0.00200	0.05	0.001646	101	75 - 125				
Iron	6.719	0.200	5	1.844	97.5	75 - 125				
Lead	0.0491	0.00200	0.05	0.000099	98.0	75 - 125				
Selenium	0.05747	0.00200	0.05	0.005272	104	75 - 125				

Client: Golder Associates
Project: Exide Column Studies NSF
WorkOrder: HS19031391

QC BATCH REPORT NEW

Batch ID: 139202 (0) **Instrument:** ICPMS04 **Method:** DISSOLVED METALS BY SW6020A (DISSOLVED)

MSD Sample ID: **HS19031391-01MSD** Units: **mg/L** Analysis Date: **28-Mar-2019 18:14**
Client ID: **20190326-NSF-D** Run ID: **ICPMS04_335460** SeqNo: **5011640** PrepDate: **28-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.06319	0.00200	0.05	0.01556	95.3	75 - 125	0.06691	5.71	20	
Arsenic	0.06673	0.00200	0.05	0.01837	96.7	75 - 125	0.07015	5	20	
Cadmium	0.05124	0.00200	0.05	0.001646	99.2	75 - 125	0.05233	2.1	20	
Iron	6.545	0.200	5	1.844	94.0	75 - 125	6.719	2.63	20	
Lead	0.04745	0.00200	0.05	0.000099	94.7	75 - 125	0.0491	3.42	20	
Selenium	0.056	0.00200	0.05	0.005272	101	75 - 125	0.05747	2.6	20	

PDS Sample ID: **HS19031391-01PDS** Units: **mg/L** Analysis Date: **28-Mar-2019 18:16**
Client ID: **20190326-NSF-D** Run ID: **ICPMS04_335460** SeqNo: **5011641** PrepDate: **28-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1012	0.00200	0.1	0.01556	85.7	75 - 125				
Arsenic	0.1186	0.00200	0.1	0.01837	100	75 - 125				
Cadmium	0.09884	0.00200	0.1	0.001646	97.2	75 - 125				
Iron	11.42	0.200	10	1.844	95.8	75 - 125				
Lead	0.0973	0.00200	0.1	0.000099	97.2	75 - 125				
Selenium	0.1061	0.00200	0.1	0.005272	101	75 - 125				

SD Sample ID: **HS19031391-01SD** Units: **mg/L** Analysis Date: **28-Mar-2019 18:09**
Client ID: **20190326-NSF-D** Run ID: **ICPMS04_335460** SeqNo: **5011638** PrepDate: **28-Mar-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	0.01587	0.0100					0.01556	2	10	
Arsenic	0.01754	0.0100					0.01837	4.54	10	
Cadmium	0.001552	0.0100					0.001646	0	10	J
Iron	1.848	1.00					1.844	0.189	10	
Lead	U	0.0100					0.000099	0	10	
Selenium	0.007244	0.0100					0.005272	0	10	J

The following samples were analyzed in this batch: HS19031391-01

Client: Golder Associates
Project: Exide Column Studies NSF
WorkOrder: HS19031391

QC BATCH REPORT NEW

Batch ID: 139204 (0) **Instrument: ICPMS04** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLK-139204** Units: **mg/L** Analysis Date: **29-Mar-2019 00:16**
Client ID: Run ID: **ICPMS04_335460** SeqNo: **5012127** PrepDate: **28-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Iron	U	0.200								
Lead	U	0.00200								
Selenium	U	0.00200								

LCS Sample ID: **LCS-139204** Units: **mg/L** Analysis Date: **29-Mar-2019 00:19**
Client ID: Run ID: **ICPMS04_335460** SeqNo: **5012128** PrepDate: **28-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05172	0.00200	0.05	0	103	80 - 120				
Arsenic	0.05412	0.00200	0.05	0	108	80 - 120				
Cadmium	0.05481	0.00200	0.05	0	110	80 - 120				
Iron	5.278	0.200	5	0	106	80 - 120				
Lead	0.05013	0.00200	0.05	0	100	80 - 120				
Selenium	0.05694	0.00200	0.05	0	114	80 - 120				

MS Sample ID: **HS19031391-02MS** Units: **mg/L** Analysis Date: **29-Mar-2019 00:25**
Client ID: **20190326-NSF-T** Run ID: **ICPMS04_335460** SeqNo: **5012131** PrepDate: **28-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.06205	0.00200	0.05	0.01426	95.6	80 - 120				
Arsenic	0.08467	0.00200	0.05	0.03181	106	80 - 120				
Cadmium	0.05221	0.00200	0.05	0.00184	101	80 - 120				
Iron	7.849	0.200	5	2.876	99.5	80 - 120				
Lead	0.05049	0.00200	0.05	0.000983	99.0	80 - 120				
Selenium	0.05808	0.00200	0.05	0.0036	109	80 - 120				

Client: Golder Associates
Project: Exide Column Studies NSF
WorkOrder: HS19031391

QC BATCH REPORT NEW

Batch ID: 139204 (0) **Instrument: ICPMS04** **Method: ICP-MS METALS BY SW6020A**

MSD Sample ID: **HS19031391-02MSD** Units: **mg/L** Analysis Date: **29-Mar-2019 00:28**
Client ID: **20190326-NSF-T** Run ID: **ICPMS04_335460** SeqNo: **5012132** PrepDate: **28-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.06176	0.00200	0.05	0.01426	95.0	80 - 120	0.06205	0.475	20	
Arsenic	0.08215	0.00200	0.05	0.03181	101	80 - 120	0.08467	3.02	20	
Cadmium	0.0516	0.00200	0.05	0.00184	99.5	80 - 120	0.05221	1.18	20	
Iron	7.91	0.200	5	2.876	101	80 - 120	7.849	0.765	20	
Lead	0.04994	0.00200	0.05	0.000983	97.9	80 - 120	0.05049	1.09	20	
Selenium	0.05645	0.00200	0.05	0.0036	106	80 - 120	0.05808	2.84	20	

PDS Sample ID: **HS19031391-02PDS** Units: **mg/L** Analysis Date: **29-Mar-2019 00:30**
Client ID: **20190326-NSF-T** Run ID: **ICPMS04_335460** SeqNo: **5012196** PrepDate: **28-Mar-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09771	0.00200	0.1	0.01426	83.4	75 - 125				
Arsenic	0.1276	0.00200	0.1	0.03181	95.8	75 - 125				
Cadmium	0.09905	0.00200	0.1	0.00184	97.2	75 - 125				
Iron	12.37	0.200	10	2.876	95.0	75 - 125				
Lead	0.09584	0.00200	0.1	0.000983	94.9	75 - 125				
Selenium	0.1035	0.00200	0.1	0.0036	99.9	75 - 125				

SD Sample ID: **HS19031391-02SD** Units: **mg/L** Analysis Date: **29-Mar-2019 00:23**
Client ID: **20190326-NSF-T** Run ID: **ICPMS04_335460** SeqNo: **5012130** PrepDate: **28-Mar-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	0.01153	0.0100					0.01426	19.2	10	R
Arsenic	0.02834	0.0100					0.03181	10.9	10	R
Cadmium	0.001913	0.0100					0.00184	0	10	J
Iron	2.853	1.00					2.876	0.817	10	
Lead	U	0.0100					0.000983	0	10	
Selenium	U	0.0100					0.0036	0	10	

The following samples were analyzed in this batch: HS19031391-02

Client: Golder Associates
Project: Exide Column Studies NSF
WorkOrder: **HS19031391**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
California	2919, 2018-2019	30-Apr-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19031391

Date/Time Received: **28-Mar-2019 08:30**
Received by: **NDR**

Checklist completed by: *Nilesh D. Ranchod* eSignature — 28-Mar-2019 Date

Reviewed by: *Dane J. Wacasey* eSignature — 28-Mar-2019 Date

Matrices: **water**

Carrier name: **FedEx International Priority**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	18.1C UC/C	IR # 25
Cooler(s)/Kit(s):	43437	
Date/Time sample(s) sent to storage:	03/28/2019 9:15am	

Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

ALS Environmental

Chain of Custody Form

Page 1 of 1

HS19031391

Golder Associates

Exide Column Studies NSF

ALS Project Manager:

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086-06	Project Name	Exide Column Studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086-06	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suite 260	Address	13515 Barrett Parkway Drive, Suite 260	E	ICP TW (6020A total metals (6)): Pb, Cd, Sb, Se, As, Fe
				F	ICP DISS (6020A diss metals (6)-FldFltr): Pb, Cd, Sb, Se, As, Fe
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	G	
Phone	314 984-8800	Phone	314 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190326-NSF-D	03-26-19	4:50 PM	GW	2	1						X					
2	20190326-NSF-T	03-26-19	4:50 PM	GW	2	1					X						
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method:

Required Turnaround Time: ☐ STD 10 Wk Days ☐ 5 Wk Days ☐ 2 Wk Days ☐ Other ☑ 24 Hour

Results Due Date: True 24 Hr TAT

Relinquished by: Giovanna Llamosas	Date: 2019/03/26	10:30:00	Received by:	Notes:	
Relinquished by:	Date: 3/25/19	Time: 07:30	Received by (Laboratory): NR.	Cooler Temp. 4°C	QC Package: (Check Box Below)
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	18.1	Level II: Standard QC [x] TRRP-Checklist
					Level III: Std QC + Raw Data [ ] TRRP Level IV
					Level IV: SW846 CLP-Like
					Other:

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

43457

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10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

April 10, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19040233**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 22 sample(s) on Apr 04, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19040233**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS19040233**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data								
Laboratory Name: ALS Laboratory Group			LRC Date: 04/10/2019					
Project Name: Exide Column Studies			Laboratory Job Number: HS19040233					
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 139517,139518,R336341					
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]	
R1	OI	**Chain-of-custody (C-O-C)**						
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X					
		Were all departures from standard conditions described in an exception report?	X					
R2	OI	**Sample and quality control (QC) identification**						
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X					
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X					
R3	OI	**Test reports**						
		Were all samples prepared and analyzed within holding times?	X					
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X					
		Were calculations checked by a peer or supervisor?	X					
		Were all analyte identifications checked by a peer or supervisor?	X					
		Were sample detection limits reported for all analytes not detected?	X					
		Were all results for soil and sediment samples reported on a dry weight basis?			X			
		Were % moisture (or solids) reported for all soil and sediment samples?			X			
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X			
		If required for the project, TICs reported?			X			
R4	O	**Surrogate recovery data**						
		Were surrogates added prior to extraction?			X			
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X			
R5	OI	**Test reports/summary forms for blank samples**						
		Were appropriate type(s) of blanks analyzed?	X					
		Were blanks analyzed at the appropriate frequency?	X					
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X					
		Were blank concentrations < MQL?	X					
R6	OI	**Laboratory control samples (LCS):**						
		Were all COCs included in the LCS?	X					
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X					
		Were LCSs analyzed at the required frequency?	X					
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X					
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X					
		Was the LCSD RPD within QC limits?	X					
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**						
		Were the project/method specified analytes included in the MS and MSD?	X					
		Were MS/MSD analyzed at the appropriate frequency?	X					
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1	
		Were MS/MSD RPDs within laboratory QC limits?	X					
R8	OI	**Analytical duplicate data**						
		Were appropriate analytical duplicates analyzed for each matrix?			X			
		Were analytical duplicates analyzed at the appropriate frequency?			X			
		Were RPDs or relative standard deviations within the laboratory QC limits?			X			
R9	OI	**Method quantitation limits (MQLs):**						
		Are the MQLs for each method analyte included in the laboratory data package?	X					
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X					
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X					
R10	OI	**Other problems/anomalies**						
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X					
		Were all necessary corrective actions performed for the reported data?	X					
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X					
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X					

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 04/10/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19040233				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 139517,139518,R336341				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			2
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports		
Laboratory Name: ALS Laboratory Group		LRC Date: 04/10/2019
Project Name: Exide Column Studies		Laboratory Job Number: HS19040233
Reviewer Name: Dane Wacasey		Prep Batch Number(s): 139517,139518,R336341
ER#[5]	**Description**	
1	Batch 139517, Metals Method SW6020, sample 20190326-FD-PV40out-control-T, MS and or MSD recovered outside the control limit for Selenium due to suspect matrix effect. For Calcium and Sodium the result in the parent sample is greater than 4x the spike amount. Batch 139517, Metals Method SW6020, sample 20190326-FD-PV40out-control-D, MS and or MSD recovered outside the control limits for Calcium and Sodium due to suspect matrix effect, however, the result in the parent sample is greater than 4x the spike amount.	
2	See Run Log and CCB Exceptions Report.	

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040233
Start Date: 05-Apr-2019 End Date: 06-Apr-2019

Run ID:ICPMS04_336009
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	05-Apr-2019 11:54	017_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	05-Apr-2019 11:57	018SMPL.d	AS CD FE K MG PB SB SE
ICB	1	05-Apr-2019 12:01	020_ICB.d	AS CA CD FE K MG NA PB SB SE
LLICV5	1	05-Apr-2019 12:09	022LICV.d	AS CD FE K MG PB SB SE
ICSA	1	05-Apr-2019 12:18	024ICSA.d	AS CD FE K MG PB SB SE
ICSAB	1	05-Apr-2019 12:21	025ICSB.d	AS CD FE K MG PB SB SE
CCV 1	1	05-Apr-2019 12:44	032_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	05-Apr-2019 12:47	033_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	05-Apr-2019 14:00	045_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	05-Apr-2019 14:10	047_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	05-Apr-2019 14:36	057_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	05-Apr-2019 14:38	058_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	05-Apr-2019 15:22	068_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	05-Apr-2019 15:24	069_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	05-Apr-2019 16:05	080_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	05-Apr-2019 16:08	081_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	05-Apr-2019 16:37	086_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	05-Apr-2019 16:39	087_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	05-Apr-2019 17:09	098_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	05-Apr-2019 17:11	099_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 8	1	05-Apr-2019 17:47	110_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	05-Apr-2019 17:49	111_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	05-Apr-2019 18:14	122_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	05-Apr-2019 18:16	123_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 10	1	05-Apr-2019 18:41	134_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	05-Apr-2019 18:43	135_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 11	1	05-Apr-2019 18:59	142_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	05-Apr-2019 19:01	143_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 12	1	05-Apr-2019 22:37	147_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 12	1	05-Apr-2019 22:40	148_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 13	1	05-Apr-2019 22:48	151_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 13	1	05-Apr-2019 22:50	152_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLKF1-139518	1	05-Apr-2019 22:52	153SMPL.d	AS CA CD FE K MG NA PB SB SE
MBLKF2-139518	1	05-Apr-2019 22:55	154SMPL.d	AS CA CD FE K MG NA PB SB SE
LCS-139518	1	05-Apr-2019 22:59	156SMPL.d	AS CA CD FE K MG NA PB SB SE
CCV 14	1	05-Apr-2019 23:15	163_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 14	1	05-Apr-2019 23:17	164_CCB.d	AS CA CD FE K MG NA PB SB SE
20190326-FD-PV40out-control-D	1	05-Apr-2019 23:19	165SMPL.d	AS CD FE K MG PB SB SE
20190326-FD-PV40out-control-DSD	5	05-Apr-2019 23:22	166SMPL.d	AS CD FE MG PB SE
20190326-FD-PV40out-control-DMS	1	05-Apr-2019 23:24	167SMPL.d	AS CA CD FE K MG NA PB SB SE
20190326-FD-PV40out-control-DMSD	1	05-Apr-2019 23:26	168SMPL.d	AS CA CD FE K MG NA PB SB SE
20190326-FD-PV40out-control-DPDS	1	05-Apr-2019 23:28	169SMPL.d	AS CD FE K MG PB SB SE
CCV 15	1	05-Apr-2019 23:31	170_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 15	1	05-Apr-2019 23:33	171_CCB.d	AS CA CD FE K MG NA PB SB SE
20190326-FD-PV40out-30-D	1	05-Apr-2019 23:35	172SMPL.d	AS CD FE K MG PB SB SE
20190326-FD-PV40out-35-D	1	05-Apr-2019 23:37	173SMPL.d	AS CD FE K MG PB SB SE
20190326-FD-PV40out-40-D	1	05-Apr-2019 23:40	174SMPL.d	AS CD FE K MG PB SB SE
20190327-FD-PV40inlet-control-D	1	05-Apr-2019 23:42	175SMPL.d	AS CD FE K MG PB SB SE

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040233
Start Date: 05-Apr-2019 End Date: 06-Apr-2019

Run ID:ICPMS04_336009
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
20190327-FD-PV40inlet-30-35-40-D	1	05-Apr-2019 23:44	176SMPL.d	AS CD FE K MG PB SB SE
20190327-FD-PV40mid-control-D	1	05-Apr-2019 23:46	177SMPL.d	AS CD FE K MG PB SB SE
20190327-FD-PV40mid-30-D	1	05-Apr-2019 23:49	178SMPL.d	AS CD FE K MG PB SB SE
CCV 16	1	05-Apr-2019 23:53	180_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 16	1	05-Apr-2019 23:55	181_CCB.d	AS CA CD FE K MG NA PB SB SE
20190327-FD-PV40mid-35-D	1	05-Apr-2019 23:58	182SMPL.d	AS CD FE K MG PB SB SE
20190327-FD-PV40mid-40-D	1	06-Apr-2019 00:00	183SMPL.d	AS CD FE K MG PB SB SE
20190327-FD-PV40inlet-control-DUP-D	1	06-Apr-2019 00:02	184SMPL.d	AS CD FE K MG PB SB SE
CCV 17	1	06-Apr-2019 00:09	187_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 17	1	06-Apr-2019 00:11	188_CCB.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	06-Apr-2019 00:14	189SMPL.d	AS CA CD FE K MG NA PB SB SE
LLICV5	1	06-Apr-2019 00:16	190LICV.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	06-Apr-2019 00:18	191ICSA.d	AS CD FE K MG PB SB SE
ICSAB	1	06-Apr-2019 00:20	192ICSB.d	AS CD FE K MG PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040233

Run ID:ICPMS04_336009
Instrument:ICPMS04
Method:SW6020

CCB 11	Date: 05-Apr-2019 19:01	Seq: 5024857	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	-0.718	0.4	2	
Calcium	34.66	34	500	
Selenium	1.44	1.1	2	
Sodium	103.6	14	200	

CCB 12	Date: 05-Apr-2019 22:40	Seq: 5025316	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	-0.643	0.4	2	
Selenium	3.274	1.1	2	
Sodium	46.66	14	200	

CCB 13	Date: 05-Apr-2019 22:50	Seq: 5025320	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	-0.706	0.4	2	
Potassium	18.21	18	200	
Selenium	1.661	1.1	2	
Sodium	20.59	14	200	

CCB 14	Date: 05-Apr-2019 23:17	Seq: 5025332	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	-0.726	0.4	2	
Calcium	38.42	34	500	
Selenium	1.107	1.1	2	
Sodium	60.5	14	200	

CCB 15	Date: 05-Apr-2019 23:33	Seq: 5025339	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	50.36	34	500	
Potassium	20.41	18	200	
Selenium	1.375	1.1	2	
Sodium	176.9	14	200	

CCB 16	Date: 05-Apr-2019 23:55	Seq: 5025349	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	-0.646	0.4	2	
Potassium	25.79	18	200	
Sodium	173	14	200	

CCB 17	Date: 06-Apr-2019 00:11	Seq: 5025356	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	-0.704	0.4	2	
Calcium	34.28	34	500	
Sodium	154.1	14	200	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040233
Start Date: 08-Apr-2019 End Date: 09-Apr-2019

Run ID:ICPMS04_336146
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	08-Apr-2019 12:47	032_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	08-Apr-2019 12:49	033SMPL.d	CA NA
LLICV5	1	08-Apr-2019 12:51	034LICV.d	CA NA
ICB	1	08-Apr-2019 12:54	035_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	08-Apr-2019 13:00	036ICSA.d	CA NA
ICSAB	1	08-Apr-2019 13:03	037ICSB.d	CA NA
MBLK-139518	1	08-Apr-2019 13:15	041SMPL.d	AS CA CD FE K MG NA PB SB SE
20190326-FD-PV40out-control-DSD	5	08-Apr-2019 13:19	043SMPL.d	K SB
20190326-FD-PV40out-control-D	10	08-Apr-2019 13:24	045SMPL.d	CA NA
20190326-FD-PV40out-control-DSD	50	08-Apr-2019 13:26	046SMPL.d	CA NA
CCV 1	1	08-Apr-2019 13:30	048_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	08-Apr-2019 13:44	051_CCB.d	AS CA CD FE K MG NA PB SB SE
20190326-FD-PV40out-30-D	10	08-Apr-2019 13:48	052SMPL.d	CA NA
20190326-FD-PV40out-35-D	10	08-Apr-2019 13:51	053SMPL.d	CA NA
20190326-FD-PV40out-40-D	10	08-Apr-2019 13:53	054SMPL.d	CA NA
20190327-FD-PV40inlet-control-D	10	08-Apr-2019 13:55	055SMPL.d	CA NA
20190327-FD-PV40inlet-30-35-40-D	10	08-Apr-2019 13:57	056SMPL.d	CA NA
20190327-FD-PV40mid-control-D	10	08-Apr-2019 14:00	057SMPL.d	CA NA
20190327-FD-PV40mid-30-D	10	08-Apr-2019 14:02	058SMPL.d	CA NA
20190326-FD-PV40out-control-DPDS	10	08-Apr-2019 14:04	059SMPL.d	CA NA
20190327-FD-PV40mid-35-D	10	08-Apr-2019 14:06	060SMPL.d	CA NA
CCV 2	1	08-Apr-2019 14:11	062_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	08-Apr-2019 14:13	063_CCB.d	AS CA CD FE K MG NA PB SB SE
20190327-FD-PV40mid-40-D	10	08-Apr-2019 14:25	065SMPL.d	CA NA
20190327-FD-PV40inlet-control-DUP-D	10	08-Apr-2019 14:28	066SMPL.d	CA NA
CCV 3	1	08-Apr-2019 14:41	072_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	08-Apr-2019 14:43	073_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	08-Apr-2019 16:19	084_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	08-Apr-2019 16:21	085_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	08-Apr-2019 16:46	096_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	08-Apr-2019 16:48	097_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	08-Apr-2019 17:19	108_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	08-Apr-2019 17:22	109_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 7	1	08-Apr-2019 22:31	124_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	08-Apr-2019 22:34	125SMPL.d	CA NA
LLCCV5	1	08-Apr-2019 22:36	126LICV.d	CA NA
ICCB 7	1	08-Apr-2019 22:40	128_ICB.d	AS CA CD FE K MG NA PB SB SE
CCV 8	1	08-Apr-2019 23:08	137_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	08-Apr-2019 23:10	138_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	08-Apr-2019 23:35	149_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	08-Apr-2019 23:37	150_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 10	1	09-Apr-2019 00:01	161_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	09-Apr-2019 00:04	162_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 11	1	09-Apr-2019 00:31	174_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	09-Apr-2019 00:33	175SMPL.d	CA NA
LLCCV5	1	09-Apr-2019 00:35	176LICV.d	CA NA
ICCB 11	1	09-Apr-2019 00:38	177_ICB.d	AS CA CD FE K MG NA PB SB SE
CCV 12	1	09-Apr-2019 00:56	185_CCV.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040233

Run ID:ICPMS04_336146
Instrument:ICPMS04
Method:SW6020

CCB 1	Date: 08-Apr-2019 13:44	Seq: 5026156	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.547	0.4	2	
Sodium	15.24	14	200	

CCB 2	Date: 08-Apr-2019 14:13	Seq: 5026209	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.717	0.4	2	
Sodium	22.31	14	200	

CCB 3	Date: 08-Apr-2019 14:43	Seq: 5026241	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.434	0.4	2	

CCB 5	Date: 08-Apr-2019 16:48	Seq: 5026796	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	30.81	14	200	

CCB 6	Date: 08-Apr-2019 17:22	Seq: 5026832	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Sodium	19.75	14	200	

CCB 8	Date: 08-Apr-2019 23:10	Seq: 5027166	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.481	0.4	2	
Calcium	37.12	34	500	

CCB 9	Date: 08-Apr-2019 23:37	Seq: 5027178	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	12.96	12	200	

CCB 10	Date: 09-Apr-2019 00:04	Seq: 5027190	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Calcium	36.58	34	500	
Iron	22.6	12	200	
Magnesium	11.42	10	200	

CCB 12	Date: 09-Apr-2019 00:58	Seq: 5027237	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	1.052	0.4	2	
Sodium	164	14	200	

CCB 13	Date: 09-Apr-2019 01:18	Seq: 5027199	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.464	0.4	2	
Sodium	165.8	14	200	

CCB 14	Date: 09-Apr-2019 01:38	Seq: 5027208	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.801	0.4	2	
Iron	36.93	12	200	
Potassium	18.04	18	200	
Sodium	196.2	14	200	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040233
Start Date: 08-Apr-2019 End Date: 09-Apr-2019

Run ID:ICPMS05_336145
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	08-Apr-2019 12:32	021_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	08-Apr-2019 12:34	022SMPL.d	AS CD FE K MG PB SB SE
LLICV5	1	08-Apr-2019 12:36	023LICV.d	AS CD FE K MG PB SB SE
ICB	1	08-Apr-2019 12:38	024_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	08-Apr-2019 12:44	026ICSA.d	AS CD FE K MG PB SB SE
ICSAB	1	08-Apr-2019 12:46	027ICSB.d	AS CD FE K MG PB SB SE
CCV 1	1	08-Apr-2019 13:13	037_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	08-Apr-2019 13:24	040_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	08-Apr-2019 13:57	051_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	08-Apr-2019 13:59	052_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	08-Apr-2019 14:23	063_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	08-Apr-2019 14:25	064_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	08-Apr-2019 15:18	076_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	08-Apr-2019 15:21	077_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	08-Apr-2019 15:37	084_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	08-Apr-2019 15:39	085_CCB.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	08-Apr-2019 17:08	108SMPL.d	AS CD FE K MG PB SB SE
LLCCV5	1	08-Apr-2019 17:11	109LICV.d	AS CD FE K MG PB SB SE
ICCB 6	1	08-Apr-2019 17:13	110_ICB.d	AS CA CD FE K MG NA PB SB SE
ICCV 6	1	08-Apr-2019 17:18	112_ICV.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	08-Apr-2019 17:50	124_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	08-Apr-2019 17:52	125_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-139517	1	08-Apr-2019 17:56	126SMPL.d	AS CA CD FE K MG NA PB SB SE
LCS-139517	1	08-Apr-2019 17:58	127SMPL.d	AS CA CD FE K MG NA PB SB SE
20190326-FD-PV40out-control-T	1	08-Apr-2019 18:00	128SMPL.d	AS CD FE K MG PB SB SE
20190326-FD-PV40out-control-TSD	5	08-Apr-2019 18:03	129SMPL.d	AS CD FE K MG PB SB SE
20190326-FD-PV40out-control-TMS	1	08-Apr-2019 18:05	130SMPL.d	AS CA CD FE K MG NA PB SB SE
20190326-FD-PV40out-control-TMSD	1	08-Apr-2019 18:07	131SMPL.d	AS CA CD FE K MG NA PB SB SE
20190326-FD-PV40out-control-TPDS	1	08-Apr-2019 18:09	132SMPL.d	AS CD FE K MG PB SB SE
CCV 8	1	08-Apr-2019 18:18	136_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	08-Apr-2019 18:20	137_CCB.d	AS CA CD FE K MG NA PB SB SE
20190326-FD-PV40out-30-T	1	08-Apr-2019 18:22	138SMPL.d	AS CD FE K MG PB SB SE
20190326-FD-PV40out-35-T	1	08-Apr-2019 18:24	139SMPL.d	AS CD FE K MG PB SB SE
20190326-FD-PV40out-40-T	1	08-Apr-2019 18:26	140SMPL.d	AS CD FE K MG PB SB SE
20190327-FD-PV40inlet-control-T	1	08-Apr-2019 18:28	141SMPL.d	AS CD FE K MG PB SB SE
20190327-FD-PV40inlet-30-35-40-T	1	08-Apr-2019 18:31	142SMPL.d	AS CD FE K MG PB SB SE
20190327-FD-PV40mid-control-T	1	08-Apr-2019 18:33	143SMPL.d	AS CD FE K MG PB SB SE
20190327-FD-PV40mid-30-T	1	08-Apr-2019 18:35	144SMPL.d	AS CD FE K MG PB SB SE
20190327-FD-PV40mid-35-T	1	08-Apr-2019 18:37	145SMPL.d	AS CD FE K MG PB SB SE
20190327-FD-PV40mid-40-T	1	08-Apr-2019 18:39	146SMPL.d	AS CD FE K MG PB SB SE
20190327-FD-PV40inlet-control-DUP-T	1	08-Apr-2019 18:41	147SMPL.d	AS CD FE K MG PB SB SE
CCV 9	1	08-Apr-2019 18:44	148_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	08-Apr-2019 18:46	149_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 10	1	08-Apr-2019 19:10	160_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	08-Apr-2019 19:12	161_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 11	1	08-Apr-2019 21:55	164_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	08-Apr-2019 21:57	165_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 12	1	08-Apr-2019 22:14	173_CCV.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040233

Run ID:ICPMS05_336145
Instrument:ICPMS05
Method:SW6020

ICB	Date: 08-Apr-2019 12:38	Seq: 5026003		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	14.46	14	200	
CCB 3	Date: 08-Apr-2019 14:25	Seq: 5026254		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	14.94	14	200	
CCB 4	Date: 08-Apr-2019 15:18	Seq: 5026717		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.045	0.4	2	
	Sodium	73.51	14	200	
CCB 5	Date: 08-Apr-2019 15:39	Seq: 5026726		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.508	0.4	2	
	Sodium	36.02	14	200	
CCB 7	Date: 08-Apr-2019 17:52	Seq: 5026986		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.895	0.4	2	
	Sodium	56.02	14	200	
CCB 8	Date: 08-Apr-2019 18:20	Seq: 5026998		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.646	0.4	2	
	Selenium	1.669	1.1	2	
	Sodium	84.04	14	200	
CCB 9	Date: 08-Apr-2019 18:46	Seq: 5027010		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.251	0.4	2	
	Selenium	1.769	1.1	2	
	Sodium	278	14	200	
CCB 10	Date: 08-Apr-2019 19:12	Seq: 5027022		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.182	0.4	2	
	Sodium	444.4	14	200	
CCB 11	Date: 08-Apr-2019 21:57	Seq: 5027025		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.881	0.4	2	
	Selenium	1.388	1.1	2	
	Sodium	95.96	14	200	
CCB 12	Date: 08-Apr-2019 22:16	Seq: 5027034		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.974	0.4	2	
	Selenium	1.476	1.1	2	
	Sodium	48.42	14	200	
CCB 13	Date: 08-Apr-2019 22:56	Seq: 5027038		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040233
Start Date: 09-Apr-2019 End Date: 10-Apr-2019

Run ID:ICPMS05_336226
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	09-Apr-2019 11:56	019_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	09-Apr-2019 11:58	020SMPL.d	CA NA
LLICV5	1	09-Apr-2019 12:00	021LICV.d	CA NA
ICB	1	09-Apr-2019 12:02	022_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	09-Apr-2019 12:13	024ICSA.d	CA NA
ICSAB	1	09-Apr-2019 12:15	025ICSB.d	CA NA
20190326-FD-PV40out-control-T	20	09-Apr-2019 12:29	027SMPL.d	CA NA
20190326-FD-PV40out-control-TSD	100	09-Apr-2019 12:31	028SMPL.d	CA NA
20190326-FD-PV40out-control-TPDS	20	09-Apr-2019 12:34	029SMPL.d	CA NA
20190326-FD-PV40out-30-T	20	09-Apr-2019 12:36	030SMPL.d	CA NA
20190326-FD-PV40out-35-T	20	09-Apr-2019 12:38	031SMPL.d	CA NA
20190326-FD-PV40out-40-T	20	09-Apr-2019 12:40	032SMPL.d	CA NA
20190327-FD-PV40inlet-control-T	20	09-Apr-2019 12:42	033SMPL.d	CA NA
20190327-FD-PV40inlet-30-35-40-T	20	09-Apr-2019 12:44	034SMPL.d	CA NA
20190327-FD-PV40mid-control-T	20	09-Apr-2019 12:47	035SMPL.d	CA NA
20190327-FD-PV40mid-30-T	20	09-Apr-2019 12:49	036SMPL.d	CA NA
CCV 1	1	09-Apr-2019 12:51	037_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	09-Apr-2019 12:53	038_CCB.d	AS CA CD FE K MG NA PB SB SE
20190327-FD-PV40mid-35-T	20	09-Apr-2019 12:58	039SMPL.d	CA NA
20190327-FD-PV40mid-40-T	20	09-Apr-2019 13:00	040SMPL.d	CA NA
20190327-FD-PV40inlet-control-DUP-T	20	09-Apr-2019 13:02	041SMPL.d	CA NA
CCV 2	1	09-Apr-2019 13:19	049_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	09-Apr-2019 13:21	050_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	09-Apr-2019 13:46	061_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	09-Apr-2019 13:48	062_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	09-Apr-2019 14:20	073_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	09-Apr-2019 14:22	074_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	09-Apr-2019 14:53	085_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	09-Apr-2019 14:55	086_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 6	1	09-Apr-2019 15:15	095_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 6	1	09-Apr-2019 15:17	096_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	09-Apr-2019 15:46	106_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	09-Apr-2019 15:48	107_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 8	1	09-Apr-2019 16:26	118_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	09-Apr-2019 16:28	119_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	09-Apr-2019 17:21	131_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	09-Apr-2019 17:30	133_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 10	1	09-Apr-2019 17:59	143_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	09-Apr-2019 18:01	144_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 11	1	09-Apr-2019 18:25	155_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	09-Apr-2019 18:28	156_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 12	1	09-Apr-2019 18:30	157_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 12	1	09-Apr-2019 18:32	158_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 13	1	09-Apr-2019 21:30	161_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 13	1	09-Apr-2019 21:32	162_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 14	1	09-Apr-2019 21:50	170_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 14	1	09-Apr-2019 21:52	171_CCB.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	09-Apr-2019 22:30	184SMPL.d	CA NA
LLCCV5	1	09-Apr-2019 22:32	185LICV.d	CA NA

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040233

Run ID:ICPMS05_336226
Instrument:ICPMS05
Method:SW6020

CCB 1	Date: 09-Apr-2019 12:53	Seq: 5028266		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		14.28	14	200	
CCB 6	Date: 09-Apr-2019 15:17	Seq: 5028459		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		36.94	14	200	
CCB 7	Date: 09-Apr-2019 15:48	Seq: 5028470		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		49.98	14	200	
CCB 8	Date: 09-Apr-2019 16:28	Seq: 5028684		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		104.3	14	200	
CCB 9	Date: 09-Apr-2019 17:21	Seq: 5028696		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		120.8	14	200	
CCB 10	Date: 09-Apr-2019 18:01	Seq: 5028920		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		48	14	200	
CCB 11	Date: 09-Apr-2019 18:28	Seq: 5028932		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		124	14	200	
CCB 12	Date: 09-Apr-2019 18:32	Seq: 5028934		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		84.1	14	200	
CCB 13	Date: 09-Apr-2019 21:32	Seq: 5028952		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		34.11	14	200	
CCB 14	Date: 09-Apr-2019 21:52	Seq: 5028961		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		66.02	14	200	
CCB 17	Date: 09-Apr-2019 23:24	Seq: 5029263		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		307.4	14	200	
CCB 18	Date: 09-Apr-2019 23:45	Seq: 5029291		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		1233	14	200	
CCB 19	Date: 10-Apr-2019 00:16	Seq: 5029304		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		424.7	14	200	
CCB 20	Date: 10-Apr-2019 00:40	Seq: 5029315		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		205.5	14	200	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19040233

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19040233-01	20190326-FD-PV40out-control-D	Groundwater		26-Mar-2019 12:15	04-Apr-2019 08:40	☐
HS19040233-02	20190326-FD-PV40out-30-D	Groundwater		26-Mar-2019 12:15	04-Apr-2019 08:40	☐
HS19040233-03	20190326-FD-PV40out-35-D	Groundwater		26-Mar-2019 12:15	04-Apr-2019 08:40	☐
HS19040233-04	20190326-FD-PV40out-40-D	Groundwater		26-Mar-2019 12:15	04-Apr-2019 08:40	☐
HS19040233-05	20190327-FD-PV40inlet-control-D	Groundwater		27-Mar-2019 17:20	04-Apr-2019 08:40	☐
HS19040233-06	20190327-FD-PV40inlet-30-35-40-D	Groundwater		27-Mar-2019 17:20	04-Apr-2019 08:40	☐
HS19040233-07	20190327-FD-PV40mid-control-D	Groundwater		27-Mar-2019 16:45	04-Apr-2019 08:40	☐
HS19040233-08	20190327-FD-PV40mid-30-D	Groundwater		27-Mar-2019 16:45	04-Apr-2019 08:40	☐
HS19040233-09	20190327-FD-PV40mid-35-D	Groundwater		27-Mar-2019 16:45	04-Apr-2019 08:40	☐
HS19040233-10	20190327-FD-PV40mid-40-D	Groundwater		27-Mar-2019 16:45	04-Apr-2019 08:40	☐
HS19040233-11	20190326-FD-PV40out-control-T	Groundwater		26-Mar-2019 12:15	04-Apr-2019 08:40	☐
HS19040233-12	20190326-FD-PV40out-30-T	Groundwater		26-Mar-2019 12:15	04-Apr-2019 08:40	☐
HS19040233-13	20190326-FD-PV40out-35-T	Groundwater		26-Mar-2019 12:15	04-Apr-2019 08:40	☐
HS19040233-14	20190326-FD-PV40out-40-T	Groundwater		26-Mar-2019 12:15	04-Apr-2019 08:40	☐
HS19040233-15	20190327-FD-PV40inlet-control-T	Groundwater		27-Mar-2019 17:20	04-Apr-2019 08:40	☐
HS19040233-16	20190327-FD-PV40inlet-30-35-40-T	Groundwater		27-Mar-2019 17:20	04-Apr-2019 08:40	☐
HS19040233-17	20190327-FD-PV40mid-control-T	Groundwater		27-Mar-2019 16:45	04-Apr-2019 08:40	☐
HS19040233-18	20190327-FD-PV40mid-30-T	Groundwater		27-Mar-2019 16:45	04-Apr-2019 08:40	☐
HS19040233-19	20190327-FD-PV40mid-35-T	Groundwater		27-Mar-2019 16:45	04-Apr-2019 08:40	☐
HS19040233-20	20190327-FD-PV40mid-40-T	Groundwater		27-Mar-2019 16:45	04-Apr-2019 08:40	☐
HS19040233-21	20190327-FD-PV40inlet-control-DUP-D	Groundwater		27-Mar-2019 17:20	04-Apr-2019 08:40	☐
HS19040233-22	20190327-FD-PV40inlet-control-DUP-T	Groundwater		27-Mar-2019 17:20	04-Apr-2019 08:40	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190326-FD-PV40out-control-D
Collection Date: 26-Mar-2019 12:15

ANALYTICAL REPORT
WorkOrder:HS19040233
Lab ID:HS19040233-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 05-Apr-2019		Analyst: JCJ
Antimony	**0.0339**		**0.000400**	**0.00200**	**mg/L**	1	05-Apr-2019 23:19
Arsenic	**0.000684**	J	**0.000400**	**0.00200**	**mg/L**	1	05-Apr-2019 23:19
Cadmium	U		0.000200	0.00200	mg/L	1	05-Apr-2019 23:19
Calcium	**202**		**0.340**	**5.00**	**mg/L**	10	08-Apr-2019 13:24
Iron	U		0.0120	0.200	mg/L	1	05-Apr-2019 23:19
Lead	U		0.000600	0.00200	mg/L	1	05-Apr-2019 23:19
Magnesium	**1.45**		**0.0100**	**0.200**	**mg/L**	1	05-Apr-2019 23:19
Potassium	**13.5**		**0.0180**	**0.200**	**mg/L**	1	05-Apr-2019 23:19
Selenium	**0.00906**		**0.00110**	**0.00200**	**mg/L**	1	05-Apr-2019 23:19
Sodium	**261**		**0.140**	**2.00**	**mg/L**	10	08-Apr-2019 13:24

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190326-FD-PV40out-30-D
Collection Date: 26-Mar-2019 12:15

ANALYTICAL REPORT
WorkOrder:HS19040233
Lab ID:HS19040233-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 05-Apr-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	05-Apr-2019 23:35
Arsenic	U		0.000400	0.00200	mg/L	1	05-Apr-2019 23:35
Cadmium	U		0.000200	0.00200	mg/L	1	05-Apr-2019 23:35
Calcium	**193**		**0.340**	**5.00**	**mg/L**	10	08-Apr-2019 13:48
Iron	U		0.0120	0.200	mg/L	1	05-Apr-2019 23:35
Lead	U		0.000600	0.00200	mg/L	1	05-Apr-2019 23:35
Magnesium	**1.17**		**0.0100**	**0.200**	**mg/L**	1	05-Apr-2019 23:35
Potassium	**12.7**		**0.0180**	**0.200**	**mg/L**	1	05-Apr-2019 23:35
Selenium	U		0.00110	0.00200	mg/L	1	05-Apr-2019 23:35
Sodium	**266**		**0.140**	**2.00**	**mg/L**	10	08-Apr-2019 13:48

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190326-FD-PV40out-35-D
Collection Date: 26-Mar-2019 12:15

ANALYTICAL REPORT
WorkOrder:HS19040233
Lab ID:HS19040233-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 05-Apr-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	05-Apr-2019 23:37
Arsenic	U		0.000400	0.00200	mg/L	1	05-Apr-2019 23:37
Cadmium	U		0.000200	0.00200	mg/L	1	05-Apr-2019 23:37
Calcium	**193**		**0.340**	**5.00**	**mg/L**	10	08-Apr-2019 13:51
Iron	**0.202**		**0.0120**	**0.200**	**mg/L**	1	05-Apr-2019 23:37
Lead	U		0.000600	0.00200	mg/L	1	05-Apr-2019 23:37
Magnesium	**1.27**		**0.0100**	**0.200**	**mg/L**	1	05-Apr-2019 23:37
Potassium	**13.1**		**0.0180**	**0.200**	**mg/L**	1	05-Apr-2019 23:37
Selenium	**0.00112**	J	**0.00110**	**0.00200**	**mg/L**	1	05-Apr-2019 23:37
Sodium	**266**		**0.140**	**2.00**	**mg/L**	10	08-Apr-2019 13:51

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190326-FD-PV40out-40-D
Collection Date: 26-Mar-2019 12:15

ANALYTICAL REPORT
WorkOrder:HS19040233
Lab ID:HS19040233-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 05-Apr-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	05-Apr-2019 23:40
Arsenic	U		0.000400	0.00200	mg/L	1	05-Apr-2019 23:40
Cadmium	U		0.000200	0.00200	mg/L	1	05-Apr-2019 23:40
Calcium	**186**		**0.340**	**5.00**	**mg/L**	10	08-Apr-2019 13:53
Iron	**0.0264**	J	**0.0120**	**0.200**	**mg/L**	1	05-Apr-2019 23:40
Lead	U		0.000600	0.00200	mg/L	1	05-Apr-2019 23:40
Magnesium	**1.33**		**0.0100**	**0.200**	**mg/L**	1	05-Apr-2019 23:40
Potassium	**13.2**		**0.0180**	**0.200**	**mg/L**	1	05-Apr-2019 23:40
Selenium	**0.00113**	J	**0.00110**	**0.00200**	**mg/L**	1	05-Apr-2019 23:40
Sodium	**252**		**0.140**	**2.00**	**mg/L**	10	08-Apr-2019 13:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190327-FD-PV40inlet-control-D
Collection Date: 27-Mar-2019 17:20

ANALYTICAL REPORT
WorkOrder:HS19040233
Lab ID:HS19040233-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 05-Apr-2019		Analyst: JCJ
Antimony	**0.0334**		**0.000400**	**0.00200**	**mg/L**	1	05-Apr-2019 23:42
Arsenic	**0.00136**	J	**0.000400**	**0.00200**	**mg/L**	1	05-Apr-2019 23:42
Cadmium	U		0.000200	0.00200	mg/L	1	05-Apr-2019 23:42
Calcium	**195**		**0.340**	**5.00**	**mg/L**	10	08-Apr-2019 13:55
Iron	U		0.0120	0.200	mg/L	1	05-Apr-2019 23:42
Lead	U		0.000600	0.00200	mg/L	1	05-Apr-2019 23:42
Magnesium	**1.26**		**0.0100**	**0.200**	**mg/L**	1	05-Apr-2019 23:42
Potassium	**12.4**		**0.0180**	**0.200**	**mg/L**	1	05-Apr-2019 23:42
Selenium	**0.00861**		**0.00110**	**0.00200**	**mg/L**	1	05-Apr-2019 23:42
Sodium	**251**		**0.140**	**2.00**	**mg/L**	10	08-Apr-2019 13:55

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190327-FD-PV40inlet-30-35-40-D
Collection Date: 27-Mar-2019 17:20

ANALYTICAL REPORT
WorkOrder:HS19040233
Lab ID:HS19040233-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 05-Apr-2019		Analyst: JCJ
Antimony	**0.0324**		**0.000400**	**0.00200**	**mg/L**	1	05-Apr-2019 23:44
Arsenic	**0.00104**	J	**0.000400**	**0.00200**	**mg/L**	1	05-Apr-2019 23:44
Cadmium	U		0.000200	0.00200	mg/L	1	05-Apr-2019 23:44
Calcium	**189**		**0.340**	**5.00**	**mg/L**	10	08-Apr-2019 13:57
Iron	U		0.0120	0.200	mg/L	1	05-Apr-2019 23:44
Lead	U		0.000600	0.00200	mg/L	1	05-Apr-2019 23:44
Magnesium	**1.24**		**0.0100**	**0.200**	**mg/L**	1	05-Apr-2019 23:44
Potassium	**12.5**		**0.0180**	**0.200**	**mg/L**	1	05-Apr-2019 23:44
Selenium	**0.00452**		**0.00110**	**0.00200**	**mg/L**	1	05-Apr-2019 23:44
Sodium	**247**		**0.140**	**2.00**	**mg/L**	10	08-Apr-2019 13:57

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190327-FD-PV40mid-control-D
Collection Date: 27-Mar-2019 16:45

ANALYTICAL REPORT
WorkOrder:HS19040233
Lab ID:HS19040233-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 05-Apr-2019		Analyst: JCJ
Antimony	**0.0335**		**0.000400**	**0.00200**	**mg/L**	1	05-Apr-2019 23:46
Arsenic	**0.000629**	J	**0.000400**	**0.00200**	**mg/L**	1	05-Apr-2019 23:46
Cadmium	U		0.000200	0.00200	mg/L	1	05-Apr-2019 23:46
Calcium	**200**		**0.340**	**5.00**	**mg/L**	10	08-Apr-2019 14:00
Iron	U		0.0120	0.200	mg/L	1	05-Apr-2019 23:46
Lead	U		0.000600	0.00200	mg/L	1	05-Apr-2019 23:46
Magnesium	**1.36**		**0.0100**	**0.200**	**mg/L**	1	05-Apr-2019 23:46
Potassium	**12.9**		**0.0180**	**0.200**	**mg/L**	1	05-Apr-2019 23:46
Selenium	**0.00531**		**0.00110**	**0.00200**	**mg/L**	1	05-Apr-2019 23:46
Sodium	**264**		**0.140**	**2.00**	**mg/L**	10	08-Apr-2019 14:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190327-FD-PV40mid-30-D
Collection Date: 27-Mar-2019 16:45

ANALYTICAL REPORT
WorkOrder:HS19040233
Lab ID:HS19040233-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 05-Apr-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	05-Apr-2019 23:49
Arsenic	U		0.000400	0.00200	mg/L	1	05-Apr-2019 23:49
Cadmium	U		0.000200	0.00200	mg/L	1	05-Apr-2019 23:49
Calcium	**185**		**0.340**	**5.00**	**mg/L**	10	08-Apr-2019 14:02
Iron	**0.101**	J	**0.0120**	**0.200**	**mg/L**	1	05-Apr-2019 23:49
Lead	U		0.000600	0.00200	mg/L	1	05-Apr-2019 23:49
Magnesium	**1.12**		**0.0100**	**0.200**	**mg/L**	1	05-Apr-2019 23:49
Potassium	**12.7**		**0.0180**	**0.200**	**mg/L**	1	05-Apr-2019 23:49
Selenium	**0.00156**	J	**0.00110**	**0.00200**	**mg/L**	1	05-Apr-2019 23:49
Sodium	**252**		**0.140**	**2.00**	**mg/L**	10	08-Apr-2019 14:02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190327-FD-PV40mid-35-D
Collection Date: 27-Mar-2019 16:45

ANALYTICAL REPORT
WorkOrder:HS19040233
Lab ID:HS19040233-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 05-Apr-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	05-Apr-2019 23:58
Arsenic	U		0.000400	0.00200	mg/L	1	05-Apr-2019 23:58
Cadmium	U		0.000200	0.00200	mg/L	1	05-Apr-2019 23:58
Calcium	**192**		**0.340**	**5.00**	**mg/L**	10	08-Apr-2019 14:06
Iron	**0.158**	J	**0.0120**	**0.200**	**mg/L**	1	05-Apr-2019 23:58
Lead	U		0.000600	0.00200	mg/L	1	05-Apr-2019 23:58
Magnesium	**1.19**		**0.0100**	**0.200**	**mg/L**	1	05-Apr-2019 23:58
Potassium	**12.7**		**0.0180**	**0.200**	**mg/L**	1	05-Apr-2019 23:58
Selenium	U		0.00110	0.00200	mg/L	1	05-Apr-2019 23:58
Sodium	**263**		**0.140**	**2.00**	**mg/L**	10	08-Apr-2019 14:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190327-FD-PV40mid-40-D
Collection Date: 27-Mar-2019 16:45

ANALYTICAL REPORT
WorkOrder:HS19040233
Lab ID:HS19040233-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 05-Apr-2019		Analyst: JCJ
Antimony	U		0.000400	0.00200	mg/L	1	06-Apr-2019 00:00
Arsenic	U		0.000400	0.00200	mg/L	1	06-Apr-2019 00:00
Cadmium	U		0.000200	0.00200	mg/L	1	06-Apr-2019 00:00
Calcium	**194**		**0.340**	**5.00**	**mg/L**	10	08-Apr-2019 14:25
Iron	**0.0412**	J	**0.0120**	**0.200**	**mg/L**	1	06-Apr-2019 00:00
Lead	U		0.000600	0.00200	mg/L	1	06-Apr-2019 00:00
Magnesium	**1.27**		**0.0100**	**0.200**	**mg/L**	1	06-Apr-2019 00:00
Potassium	**13.1**		**0.0180**	**0.200**	**mg/L**	1	06-Apr-2019 00:00
Selenium	U		0.00110	0.00200	mg/L	1	06-Apr-2019 00:00
Sodium	**262**		**0.140**	**2.00**	**mg/L**	10	08-Apr-2019 14:25

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190326-FD-PV40out-control-T
Collection Date: 26-Mar-2019 12:15

ANALYTICAL REPORT
WorkOrder:HS19040233
Lab ID:HS19040233-11
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**553**		**2.00**	**2.00**	**mg/L**	1	10-Apr-2019 15:15
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 05-Apr-2019		Analyst: JHD
Antimony	**0.0371**		**0.000400**	**0.00200**	**mg/L**	1	08-Apr-2019 18:00
Arsenic	**0.000766**	J	**0.000400**	**0.00200**	**mg/L**	1	08-Apr-2019 18:00
Cadmium	U		0.000200	0.00200	mg/L	1	08-Apr-2019 18:00
Calcium	**219**		**0.680**	**10.0**	**mg/L**	20	09-Apr-2019 12:29
Iron	U		0.0120	0.200	mg/L	1	08-Apr-2019 18:00
Lead	U		0.000600	0.00200	mg/L	1	08-Apr-2019 18:00
Magnesium	**1.43**		**0.0100**	**0.200**	**mg/L**	1	08-Apr-2019 18:00
Potassium	**13.1**		**0.0180**	**0.200**	**mg/L**	1	08-Apr-2019 18:00
Selenium	**0.00663**		**0.00110**	**0.00200**	**mg/L**	1	08-Apr-2019 18:00
Sodium	**279**		**0.280**	**4.00**	**mg/L**	20	09-Apr-2019 12:29

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190326-FD-PV40out-30-T
Collection Date: 26-Mar-2019 12:15

ANALYTICAL REPORT
WorkOrder:HS19040233
Lab ID:HS19040233-12
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**477**		**2.00**	**2.00**	**mg/L**	1	10-Apr-2019 15:15
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 05-Apr-2019		Analyst: JHD
Antimony	**0.000468**	J	**0.000400**	**0.00200**	**mg/L**	1	08-Apr-2019 18:22
Arsenic	U		0.000400	0.00200	mg/L	1	08-Apr-2019 18:22
Cadmium	U		0.000200	0.00200	mg/L	1	08-Apr-2019 18:22
Calcium	**189**		**0.680**	**10.0**	**mg/L**	20	09-Apr-2019 12:36
Iron	**0.115**	J	**0.0120**	**0.200**	**mg/L**	1	08-Apr-2019 18:22
Lead	U		0.000600	0.00200	mg/L	1	08-Apr-2019 18:22
Magnesium	**1.12**		**0.0100**	**0.200**	**mg/L**	1	08-Apr-2019 18:22
Potassium	**12.4**		**0.0180**	**0.200**	**mg/L**	1	08-Apr-2019 18:22
Selenium	**0.00118**	J	**0.00110**	**0.00200**	**mg/L**	1	08-Apr-2019 18:22
Sodium	**258**		**0.280**	**4.00**	**mg/L**	20	09-Apr-2019 12:36

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190326-FD-PV40out-35-T
Collection Date: 26-Mar-2019 12:15

ANALYTICAL REPORT
WorkOrder:HS19040233
Lab ID:HS19040233-13
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**484**		**2.00**	**2.00**	**mg/L**	1	10-Apr-2019 15:15
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 05-Apr-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	08-Apr-2019 18:24
Arsenic	U		0.000400	0.00200	mg/L	1	08-Apr-2019 18:24
Cadmium	U		0.000200	0.00200	mg/L	1	08-Apr-2019 18:24
Calcium	**192**		**0.680**	**10.0**	**mg/L**	20	09-Apr-2019 12:38
Iron	**0.439**		**0.0120**	**0.200**	**mg/L**	1	08-Apr-2019 18:24
Lead	U		0.000600	0.00200	mg/L	1	08-Apr-2019 18:24
Magnesium	**1.21**		**0.0100**	**0.200**	**mg/L**	1	08-Apr-2019 18:24
Potassium	**12.8**		**0.0180**	**0.200**	**mg/L**	1	08-Apr-2019 18:24
Selenium	**0.00144**	J	**0.00110**	**0.00200**	**mg/L**	1	08-Apr-2019 18:24
Sodium	**259**		**0.280**	**4.00**	**mg/L**	20	09-Apr-2019 12:38

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190326-FD-PV40out-40-T
Collection Date: 26-Mar-2019 12:15

ANALYTICAL REPORT
WorkOrder:HS19040233
Lab ID:HS19040233-14
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**467**		**2.00**	**2.00**	**mg/L**	1	10-Apr-2019 15:15
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 05-Apr-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	08-Apr-2019 18:26
Arsenic	U		0.000400	0.00200	mg/L	1	08-Apr-2019 18:26
Cadmium	U		0.000200	0.00200	mg/L	1	08-Apr-2019 18:26
Calcium	**185**		**0.680**	**10.0**	**mg/L**	20	09-Apr-2019 12:40
Iron	**0.124**	J	**0.0120**	**0.200**	**mg/L**	1	08-Apr-2019 18:26
Lead	U		0.000600	0.00200	mg/L	1	08-Apr-2019 18:26
Magnesium	**1.23**		**0.0100**	**0.200**	**mg/L**	1	08-Apr-2019 18:26
Potassium	**12.4**		**0.0180**	**0.200**	**mg/L**	1	08-Apr-2019 18:26
Selenium	U		0.00110	0.00200	mg/L	1	08-Apr-2019 18:26
Sodium	**254**		**0.280**	**4.00**	**mg/L**	20	09-Apr-2019 12:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190327-FD-PV40inlet-control-T
Collection Date: 27-Mar-2019 17:20

ANALYTICAL REPORT
WorkOrder:HS19040233
Lab ID:HS19040233-15
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**472**		**2.00**	**2.00**	**mg/L**	1	10-Apr-2019 15:15
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 05-Apr-2019		Analyst: JHD
Antimony	**0.0342**		**0.000400**	**0.00200**	**mg/L**	1	08-Apr-2019 18:28
Arsenic	**0.00148**	J	**0.000400**	**0.00200**	**mg/L**	1	08-Apr-2019 18:28
Cadmium	U		0.000200	0.00200	mg/L	1	08-Apr-2019 18:28
Calcium	**187**		**0.680**	**10.0**	**mg/L**	20	09-Apr-2019 12:42
Iron	**0.0141**	J	**0.0120**	**0.200**	**mg/L**	1	08-Apr-2019 18:28
Lead	U		0.000600	0.00200	mg/L	1	08-Apr-2019 18:28
Magnesium	**1.19**		**0.0100**	**0.200**	**mg/L**	1	08-Apr-2019 18:28
Potassium	**12.1**		**0.0180**	**0.200**	**mg/L**	1	08-Apr-2019 18:28
Selenium	**0.00775**		**0.00110**	**0.00200**	**mg/L**	1	08-Apr-2019 18:28
Sodium	**242**		**0.280**	**4.00**	**mg/L**	20	09-Apr-2019 12:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190327-FD-PV40inlet-30-35-40-T
Collection Date: 27-Mar-2019 17:20

ANALYTICAL REPORT
WorkOrder:HS19040233
Lab ID:HS19040233-16
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**512**		**2.00**	**2.00**	**mg/L**	1	10-Apr-2019 15:15
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 05-Apr-2019		Analyst: JHD
Antimony	**0.0370**		**0.000400**	**0.00200**	**mg/L**	1	08-Apr-2019 18:31
Arsenic	**0.00146**	J	**0.000400**	**0.00200**	**mg/L**	1	08-Apr-2019 18:31
Cadmium	U		0.000200	0.00200	mg/L	1	08-Apr-2019 18:31
Calcium	**203**		**0.680**	**10.0**	**mg/L**	20	09-Apr-2019 12:44
Iron	U		0.0120	0.200	mg/L	1	08-Apr-2019 18:31
Lead	U		0.000600	0.00200	mg/L	1	08-Apr-2019 18:31
Magnesium	**1.27**		**0.0100**	**0.200**	**mg/L**	1	08-Apr-2019 18:31
Potassium	**12.8**		**0.0180**	**0.200**	**mg/L**	1	08-Apr-2019 18:31
Selenium	**0.00738**		**0.00110**	**0.00200**	**mg/L**	1	08-Apr-2019 18:31
Sodium	**264**		**0.280**	**4.00**	**mg/L**	20	09-Apr-2019 12:44

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190327-FD-PV40mid-control-T
Collection Date: 27-Mar-2019 16:45

ANALYTICAL REPORT
WorkOrder:HS19040233
Lab ID:HS19040233-17
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**455**		**2.00**	**2.00**	**mg/L**	1	10-Apr-2019 15:15
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 05-Apr-2019		Analyst: JHD
Antimony	**0.0359**		**0.000400**	**0.00200**	**mg/L**	1	08-Apr-2019 18:33
Arsenic	**0.000949**	J	**0.000400**	**0.00200**	**mg/L**	1	08-Apr-2019 18:33
Cadmium	U		0.000200	0.00200	mg/L	1	08-Apr-2019 18:33
Calcium	**180**		**0.680**	**10.0**	**mg/L**	20	09-Apr-2019 12:47
Iron	U		0.0120	0.200	mg/L	1	08-Apr-2019 18:33
Lead	U		0.000600	0.00200	mg/L	1	08-Apr-2019 18:33
Magnesium	**1.34**		**0.0100**	**0.200**	**mg/L**	1	08-Apr-2019 18:33
Potassium	**12.7**		**0.0180**	**0.200**	**mg/L**	1	08-Apr-2019 18:33
Selenium	**0.00701**		**0.00110**	**0.00200**	**mg/L**	1	08-Apr-2019 18:33
Sodium	**236**		**0.280**	**4.00**	**mg/L**	20	09-Apr-2019 12:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190327-FD-PV40mid-30-T
Collection Date: 27-Mar-2019 16:45

ANALYTICAL REPORT
WorkOrder:HS19040233
Lab ID:HS19040233-18
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**439**		**2.00**	**2.00**	**mg/L**	1	10-Apr-2019 15:15
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 05-Apr-2019		Analyst: JHD
Antimony	**0.000583**	J	**0.000400**	**0.00200**	**mg/L**	1	08-Apr-2019 18:35
Arsenic	U		0.000400	0.00200	mg/L	1	08-Apr-2019 18:35
Cadmium	U		0.000200	0.00200	mg/L	1	08-Apr-2019 18:35
Calcium	**174**		**0.680**	**10.0**	**mg/L**	20	09-Apr-2019 12:49
Iron	**0.558**		**0.0120**	**0.200**	**mg/L**	1	08-Apr-2019 18:35
Lead	U		0.000600	0.00200	mg/L	1	08-Apr-2019 18:35
Magnesium	**1.14**		**0.0100**	**0.200**	**mg/L**	1	08-Apr-2019 18:35
Potassium	**12.9**		**0.0180**	**0.200**	**mg/L**	1	08-Apr-2019 18:35
Selenium	**0.00130**	J	**0.00110**	**0.00200**	**mg/L**	1	08-Apr-2019 18:35
Sodium	**230**		**0.280**	**4.00**	**mg/L**	20	09-Apr-2019 12:49

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190327-FD-PV40mid-35-T
Collection Date: 27-Mar-2019 16:45

ANALYTICAL REPORT
WorkOrder:HS19040233
Lab ID:HS19040233-19
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**494**		**2.00**	**2.00**	**mg/L**	1	10-Apr-2019 15:15
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 05-Apr-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	08-Apr-2019 18:37
Arsenic	U		0.000400	0.00200	mg/L	1	08-Apr-2019 18:37
Cadmium	U		0.000200	0.00200	mg/L	1	08-Apr-2019 18:37
Calcium	**196**		**0.680**	**10.0**	**mg/L**	20	09-Apr-2019 12:58
Iron	**1.74**		**0.0120**	**0.200**	**mg/L**	1	08-Apr-2019 18:37
Lead	U		0.000600	0.00200	mg/L	1	08-Apr-2019 18:37
Magnesium	**1.19**		**0.0100**	**0.200**	**mg/L**	1	08-Apr-2019 18:37
Potassium	**13.0**		**0.0180**	**0.200**	**mg/L**	1	08-Apr-2019 18:37
Selenium	U		0.00110	0.00200	mg/L	1	08-Apr-2019 18:37
Sodium	**263**		**0.280**	**4.00**	**mg/L**	20	09-Apr-2019 12:58

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190327-FD-PV40mid-40-T
Collection Date: 27-Mar-2019 16:45

ANALYTICAL REPORT
WorkOrder:HS19040233
Lab ID:HS19040233-20
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**492**		**2.00**	**2.00**	**mg/L**	1	10-Apr-2019 15:15
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 05-Apr-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	08-Apr-2019 18:39
Arsenic	U		0.000400	0.00200	mg/L	1	08-Apr-2019 18:39
Cadmium	U		0.000200	0.00200	mg/L	1	08-Apr-2019 18:39
Calcium	**195**		**0.680**	**10.0**	**mg/L**	20	09-Apr-2019 13:00
Iron	**0.403**		**0.0120**	**0.200**	**mg/L**	1	08-Apr-2019 18:39
Lead	U		0.000600	0.00200	mg/L	1	08-Apr-2019 18:39
Magnesium	**1.26**		**0.0100**	**0.200**	**mg/L**	1	08-Apr-2019 18:39
Potassium	**13.1**		**0.0180**	**0.200**	**mg/L**	1	08-Apr-2019 18:39
Selenium	U		0.00110	0.00200	mg/L	1	08-Apr-2019 18:39
Sodium	**263**		**0.280**	**4.00**	**mg/L**	20	09-Apr-2019 13:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190327-FD-PV40inlet-control-DUP-D
Collection Date: 27-Mar-2019 17:20

ANALYTICAL REPORT
WorkOrder:HS19040233
Lab ID:HS19040233-21
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 05-Apr-2019		Analyst: JCJ
Antimony	**0.0335**		**0.000400**	**0.00200**	**mg/L**	1	06-Apr-2019 00:02
Arsenic	**0.00121**	J	**0.000400**	**0.00200**	**mg/L**	1	06-Apr-2019 00:02
Cadmium	U		0.000200	0.00200	mg/L	1	06-Apr-2019 00:02
Calcium	**192**		**0.340**	**5.00**	**mg/L**	10	08-Apr-2019 14:28
Iron	U		0.0120	0.200	mg/L	1	06-Apr-2019 00:02
Lead	U		0.000600	0.00200	mg/L	1	06-Apr-2019 00:02
Magnesium	**1.33**		**0.0100**	**0.200**	**mg/L**	1	06-Apr-2019 00:02
Potassium	**12.8**		**0.0180**	**0.200**	**mg/L**	1	06-Apr-2019 00:02
Selenium	**0.00868**		**0.00110**	**0.00200**	**mg/L**	1	06-Apr-2019 00:02
Sodium	**251**		**0.140**	**2.00**	**mg/L**	10	08-Apr-2019 14:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190327-FD-PV40inlet-control-DUP-T
Collection Date: 27-Mar-2019 17:20

ANALYTICAL REPORT
WorkOrder:HS19040233
Lab ID:HS19040233-22
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**530**		**2.00**	**2.00**	**mg/L**	1	10-Apr-2019 15:15
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 05-Apr-2019		Analyst: JHD
Antimony	**0.0352**		**0.000400**	**0.00200**	**mg/L**	1	08-Apr-2019 18:41
Arsenic	**0.00123**	J	**0.000400**	**0.00200**	**mg/L**	1	08-Apr-2019 18:41
Cadmium	U		0.000200	0.00200	mg/L	1	08-Apr-2019 18:41
Calcium	**210**		**0.680**	**10.0**	**mg/L**	20	09-Apr-2019 13:02
Iron	**0.0136**	J	**0.0120**	**0.200**	**mg/L**	1	08-Apr-2019 18:41
Lead	**0.000823**	J	**0.000600**	**0.00200**	**mg/L**	1	08-Apr-2019 18:41
Magnesium	**1.26**		**0.0100**	**0.200**	**mg/L**	1	08-Apr-2019 18:41
Potassium	**12.8**		**0.0180**	**0.200**	**mg/L**	1	08-Apr-2019 18:41
Selenium	**0.00824**		**0.00110**	**0.00200**	**mg/L**	1	08-Apr-2019 18:41
Sodium	**270**		**0.280**	**4.00**	**mg/L**	20	09-Apr-2019 13:02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040233

Batch ID: 139517 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19040233-11	1	10	10 (mL)	1
HS19040233-12	1	10	10 (mL)	1
HS19040233-13	1	10	10 (mL)	1
HS19040233-14	1	10	10 (mL)	1
HS19040233-15	1	10	10 (mL)	1
HS19040233-16	1	10	10 (mL)	1
HS19040233-17	1	10	10 (mL)	1
HS19040233-18	1	10	10 (mL)	1
HS19040233-19	1	10	10 (mL)	1
HS19040233-20	1	10	10 (mL)	1
HS19040233-22	1	10	10 (mL)	1

Batch ID: 139518 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19040233-01	1	10	10 (mL)	1
HS19040233-02	1	10	10 (mL)	1
HS19040233-03	1	10	10 (mL)	1
HS19040233-04	1	10	10 (mL)	1
HS19040233-05	1	10	10 (mL)	1
HS19040233-06	1	10	10 (mL)	1
HS19040233-07	1	10	10 (mL)	1
HS19040233-08	1	10	10 (mL)	1
HS19040233-09	1	10	10 (mL)	1
HS19040233-10	1	10	10 (mL)	1
HS19040233-21	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040233

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 139517	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19040233-11	20190326-FD-PV40out-control-T	26 Mar 2019 12:15		05 Apr 2019 10:30	09 Apr 2019 12:29	20
HS19040233-11	20190326-FD-PV40out-control-T	26 Mar 2019 12:15		05 Apr 2019 10:30	08 Apr 2019 18:00	1
HS19040233-12	20190326-FD-PV40out-30-T	26 Mar 2019 12:15		05 Apr 2019 10:30	09 Apr 2019 12:36	20
HS19040233-12	20190326-FD-PV40out-30-T	26 Mar 2019 12:15		05 Apr 2019 10:30	08 Apr 2019 18:22	1
HS19040233-13	20190326-FD-PV40out-35-T	26 Mar 2019 12:15		05 Apr 2019 10:30	09 Apr 2019 12:38	20
HS19040233-13	20190326-FD-PV40out-35-T	26 Mar 2019 12:15		05 Apr 2019 10:30	08 Apr 2019 18:24	1
HS19040233-14	20190326-FD-PV40out-40-T	26 Mar 2019 12:15		05 Apr 2019 10:30	09 Apr 2019 12:40	20
HS19040233-14	20190326-FD-PV40out-40-T	26 Mar 2019 12:15		05 Apr 2019 10:30	08 Apr 2019 18:26	1
HS19040233-15	20190327-FD-PV40inlet-control-T	27 Mar 2019 17:20		05 Apr 2019 10:30	09 Apr 2019 12:42	20
HS19040233-15	20190327-FD-PV40inlet-control-T	27 Mar 2019 17:20		05 Apr 2019 10:30	08 Apr 2019 18:28	1
HS19040233-16	20190327-FD-PV40inlet-30-35-40-T	27 Mar 2019 17:20		05 Apr 2019 10:30	09 Apr 2019 12:44	20
HS19040233-16	20190327-FD-PV40inlet-30-35-40-T	27 Mar 2019 17:20		05 Apr 2019 10:30	08 Apr 2019 18:31	1
HS19040233-17	20190327-FD-PV40mid-control-T	27 Mar 2019 16:45		05 Apr 2019 10:30	09 Apr 2019 12:47	20
HS19040233-17	20190327-FD-PV40mid-control-T	27 Mar 2019 16:45		05 Apr 2019 10:30	08 Apr 2019 18:33	1
HS19040233-18	20190327-FD-PV40mid-30-T	27 Mar 2019 16:45		05 Apr 2019 10:30	09 Apr 2019 12:49	20
HS19040233-18	20190327-FD-PV40mid-30-T	27 Mar 2019 16:45		05 Apr 2019 10:30	08 Apr 2019 18:35	1
HS19040233-19	20190327-FD-PV40mid-35-T	27 Mar 2019 16:45		05 Apr 2019 10:30	09 Apr 2019 12:58	20
HS19040233-19	20190327-FD-PV40mid-35-T	27 Mar 2019 16:45		05 Apr 2019 10:30	08 Apr 2019 18:37	1
HS19040233-20	20190327-FD-PV40mid-40-T	27 Mar 2019 16:45		05 Apr 2019 10:30	09 Apr 2019 13:00	20
HS19040233-20	20190327-FD-PV40mid-40-T	27 Mar 2019 16:45		05 Apr 2019 10:30	08 Apr 2019 18:39	1
HS19040233-22	20190327-FD-PV40inlet-control-DUP-T	27 Mar 2019 17:20		05 Apr 2019 10:30	09 Apr 2019 13:02	20
HS19040233-22	20190327-FD-PV40inlet-control-DUP-T	27 Mar 2019 17:20		05 Apr 2019 10:30	08 Apr 2019 18:41	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040233

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 139518	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS19040233-01	20190326-FD-PV40out-control-D	26 Mar 2019 12:15		05 Apr 2019 10:30	08 Apr 2019 13:24	10
HS19040233-01	20190326-FD-PV40out-control-D	26 Mar 2019 12:15		05 Apr 2019 10:30	05 Apr 2019 23:19	1
HS19040233-02	20190326-FD-PV40out-30-D	26 Mar 2019 12:15		05 Apr 2019 10:30	08 Apr 2019 13:48	10
HS19040233-02	20190326-FD-PV40out-30-D	26 Mar 2019 12:15		05 Apr 2019 10:30	05 Apr 2019 23:35	1
HS19040233-03	20190326-FD-PV40out-35-D	26 Mar 2019 12:15		05 Apr 2019 10:30	08 Apr 2019 13:51	10
HS19040233-03	20190326-FD-PV40out-35-D	26 Mar 2019 12:15		05 Apr 2019 10:30	05 Apr 2019 23:37	1
HS19040233-04	20190326-FD-PV40out-40-D	26 Mar 2019 12:15		05 Apr 2019 10:30	08 Apr 2019 13:53	10
HS19040233-04	20190326-FD-PV40out-40-D	26 Mar 2019 12:15		05 Apr 2019 10:30	05 Apr 2019 23:40	1
HS19040233-05	20190327-FD-PV40inlet-control-D	27 Mar 2019 17:20		05 Apr 2019 10:30	08 Apr 2019 13:55	10
HS19040233-05	20190327-FD-PV40inlet-control-D	27 Mar 2019 17:20		05 Apr 2019 10:30	05 Apr 2019 23:42	1
HS19040233-06	20190327-FD-PV40inlet-30-35-40-D	27 Mar 2019 17:20		05 Apr 2019 10:30	08 Apr 2019 13:57	10
HS19040233-06	20190327-FD-PV40inlet-30-35-40-D	27 Mar 2019 17:20		05 Apr 2019 10:30	05 Apr 2019 23:44	1
HS19040233-07	20190327-FD-PV40mid-control-D	27 Mar 2019 16:45		05 Apr 2019 10:30	08 Apr 2019 14:00	10
HS19040233-07	20190327-FD-PV40mid-control-D	27 Mar 2019 16:45		05 Apr 2019 10:30	05 Apr 2019 23:46	1
HS19040233-08	20190327-FD-PV40mid-30-D	27 Mar 2019 16:45		05 Apr 2019 10:30	08 Apr 2019 14:02	10
HS19040233-08	20190327-FD-PV40mid-30-D	27 Mar 2019 16:45		05 Apr 2019 10:30	05 Apr 2019 23:49	1
HS19040233-09	20190327-FD-PV40mid-35-D	27 Mar 2019 16:45		05 Apr 2019 10:30	08 Apr 2019 14:06	10
HS19040233-09	20190327-FD-PV40mid-35-D	27 Mar 2019 16:45		05 Apr 2019 10:30	05 Apr 2019 23:58	1
HS19040233-10	20190327-FD-PV40mid-40-D	27 Mar 2019 16:45		05 Apr 2019 10:30	08 Apr 2019 14:25	10
HS19040233-10	20190327-FD-PV40mid-40-D	27 Mar 2019 16:45		05 Apr 2019 10:30	06 Apr 2019 00:00	1
HS19040233-21	20190327-FD-PV40inlet-control-DUP-D	27 Mar 2019 17:20		05 Apr 2019 10:30	08 Apr 2019 14:28	10
HS19040233-21	20190327-FD-PV40inlet-control-DUP-D	27 Mar 2019 17:20		05 Apr 2019 10:30	06 Apr 2019 00:02	1
Batch ID R336341	**Test Name :** HARDNESS, TOTAL AS CACO3 BY SM2340B			**Matrix:** Groundwater		
HS19040233-11	20190326-FD-PV40out-control-T	26 Mar 2019 12:15			10 Apr 2019 15:15	1
HS19040233-12	20190326-FD-PV40out-30-T	26 Mar 2019 12:15			10 Apr 2019 15:15	1
HS19040233-13	20190326-FD-PV40out-35-T	26 Mar 2019 12:15			10 Apr 2019 15:15	1
HS19040233-14	20190326-FD-PV40out-40-T	26 Mar 2019 12:15			10 Apr 2019 15:15	1
HS19040233-15	20190327-FD-PV40inlet-control-T	27 Mar 2019 17:20			10 Apr 2019 15:15	1
HS19040233-16	20190327-FD-PV40inlet-30-35-40-T	27 Mar 2019 17:20			10 Apr 2019 15:15	1
HS19040233-17	20190327-FD-PV40mid-control-T	27 Mar 2019 16:45			10 Apr 2019 15:15	1
HS19040233-18	20190327-FD-PV40mid-30-T	27 Mar 2019 16:45			10 Apr 2019 15:15	1
HS19040233-19	20190327-FD-PV40mid-35-T	27 Mar 2019 16:45			10 Apr 2019 15:15	1
HS19040233-20	20190327-FD-PV40mid-40-T	27 Mar 2019 16:45			10 Apr 2019 15:15	1
HS19040233-22	20190327-FD-PV40inlet-control-DUP-T	27 Mar 2019 17:20			10 Apr 2019 15:15	1

WorkOrder: HS19040233
InstrumentID: ICPMS04
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000774	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000493	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000493	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0678	0.0340	0.500
A	Iron	7439-89-6	0.0500	0.0716	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000944	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0641	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0595	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00223	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0618	0.0140	0.200

WorkOrder: HS19040233
InstrumentID: ICPMS05
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000493	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000344	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000538	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0387	0.0340	0.500
A	Iron	7439-89-6	0.0500	0.0487	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000878	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0578	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0466	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00187	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0540	0.0140	0.200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040233

QC BATCH REPORT NEW

Batch ID: 139517 (0) **Instrument: ICPMS05** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLK-139517** Units: **mg/L** Analysis Date: **08-Apr-2019 17:56**
Client ID: Run ID: **ICPMS05_336145** SeqNo: **5026987** PrepDate: **05-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.00044	0.00200								J
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	U	0.200								
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	0.03054	0.200								J

LCS Sample ID: **LCS-139517** Units: **mg/L** Analysis Date: **08-Apr-2019 17:58**
Client ID: Run ID: **ICPMS05_336145** SeqNo: **5026988** PrepDate: **05-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05152	0.00200	0.05	0	103	80 - 120				
Arsenic	0.05127	0.00200	0.05	0	103	80 - 120				
Cadmium	0.0515	0.00200	0.05	0	103	80 - 120				
Calcium	5.231	0.500	5	0	105	80 - 120				
Iron	5.158	0.200	5	0	103	80 - 120				
Lead	0.05018	0.00200	0.05	0	100	80 - 120				
Magnesium	5.03	0.200	5	0	101	80 - 120				
Potassium	5.077	0.200	5	0	102	80 - 120				
Selenium	0.05077	0.00200	0.05	0	102	80 - 120				
Sodium	5.196	0.200	5	0	104	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040233

QC BATCH REPORT NEW

Batch ID: 139517 (0) **Instrument: ICPMS05** **Method: ICP-MS METALS BY SW6020A**

MS Sample ID: **HS19040233-11MS** Units: **mg/L** Analysis Date: **08-Apr-2019 18:05**
Client ID: **20190326-FD-PV40out-control-T** Run ID: **ICPMS05_336145** SeqNo: **5026991** PrepDate: **05-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09064	0.00200	0.05	0.03711	107	80 - 120				
Arsenic	0.05321	0.00200	0.05	0.000766	105	80 - 120				
Cadmium	0.0503	0.00200	0.05	0.00004	101	80 - 120				
Calcium	222.1	0.500	5	213.1	181	80 - 120				SEO
Iron	5.139	0.200	5	0.005549	103	80 - 120				
Lead	0.04989	0.00200	0.05	0.000101	99.6	80 - 120				
Magnesium	6.384	0.200	5	1.431	99.1	80 - 120				
Potassium	18.39	0.200	5	13.08	106	80 - 120				
Selenium	0.05864	0.00200	0.05	0.006633	104	80 - 120				
Sodium	271.7	0.200	5	267	93.5	80 - 120				EO

MSD Sample ID: **HS19040233-11MSD** Units: **mg/L** Analysis Date: **08-Apr-2019 18:07**
Client ID: **20190326-FD-PV40out-control-T** Run ID: **ICPMS05_336145** SeqNo: **5026992** PrepDate: **05-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.08609	0.00200	0.05	0.03711	97.9	80 - 120	0.09064	5.15	20	
Arsenic	0.05129	0.00200	0.05	0.000766	101	80 - 120	0.05321	3.68	20	
Cadmium	0.05048	0.00200	0.05	0.00004	101	80 - 120	0.0503	0.361	20	
Calcium	210.5	0.500	5	213.1	-52.8	80 - 120	222.1	5.4	20	SEO
Iron	4.859	0.200	5	0.005549	97.1	80 - 120	5.139	5.6	20	
Lead	0.04982	0.00200	0.05	0.000101	99.4	80 - 120	0.04989	0.126	20	
Magnesium	6.04	0.200	5	1.431	92.2	80 - 120	6.384	5.54	20	
Potassium	16.89	0.200	5	13.08	76.2	80 - 120	18.39	8.51	20	S
Selenium	0.05536	0.00200	0.05	0.006633	97.5	80 - 120	0.05864	5.76	20	
Sodium	252.4	0.200	5	267	-293	80 - 120	271.7	7.38	20	SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040233

QC BATCH REPORT NEW

Batch ID: 139517 (0) **Instrument: ICPMS05** **Method: ICP-MS METALS BY SW6020A**

PDS Sample ID: **HS19040233-11PDS** Units: **mg/L** Analysis Date: **08-Apr-2019 18:09**
Client ID: **20190326-FD-PV40out-control-T** Run ID: **ICPMS05_336145** SeqNo: **5026993** PrepDate: **05-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1327	0.00200	0.1	0.03711	95.6	75 - 125				
Arsenic	0.1046	0.00200	0.1	0.000766	104	75 - 125				
Cadmium	0.1017	0.00200	0.1	0.00004	102	75 - 125				
Iron	10.19	0.200	10	0.005549	102	75 - 125				
Lead	0.09954	0.00200	0.1	0.000101	99.4	75 - 125				
Magnesium	11.45	0.200	10	1.431	100	75 - 125				
Potassium	22.38	0.200	10	13.08	93.1	75 - 125				
Selenium	0.11	0.00200	0.1	0.006633	103	75 - 125				

PDS Sample ID: **HS19040233-11PDS** Units: **mg/L** Analysis Date: **09-Apr-2019 12:34**
Client ID: **20190326-FD-PV40out-control-T** Run ID: **ICPMS05_336226** SeqNo: **5028257** PrepDate: **05-Apr-2019** DF: **20**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	421.7	10.0	200	218.5	102	75 - 125				
Sodium	479.3	4.00	200	279.3	100	75 - 125				

SD Sample ID: **HS19040233-11SD** Units: **mg/L** Analysis Date: **08-Apr-2019 18:03**
Client ID: **20190326-FD-PV40out-control-T** Run ID: **ICPMS05_336145** SeqNo: **5026990** PrepDate: **05-Apr-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	0.03811	0.0100					0.03711	2.7	10	
Arsenic	U	0.0100					0.000766	0	10	
Cadmium	U	0.0100					0.00004	0	10	
Iron	U	1.00					0.005549	0	10	
Lead	U	0.0100					0.000101	0	10	
Magnesium	1.394	1.00					1.431	2.59	10	
Potassium	12.94	1.00					13.08	1.07	10	
Selenium	0.006916	0.0100					0.006633	0	10	J

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040233

QC BATCH REPORT NEW

Batch ID: 139517 (0) **Instrument: ICPMS05** **Method: ICP-MS METALS BY SW6020A**

SD Sample ID: **HS19040233-11SD** Units: **mg/L** Analysis Date: **09-Apr-2019 12:31**
Client ID: **20190326-FD-PV40out-control-T** Run ID: **ICPMS05_336226** SeqNo: **5028256** PrepDate: **05-Apr-2019** DF: **100**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	216.8	50.0					218.5	0.773	10	
Sodium	280.3	20.0					279.3	0.371	10	

The following samples were analyzed in this batch:

HS19040233-11	HS19040233-12	HS19040233-13	HS19040233-14
HS19040233-15	HS19040233-16	HS19040233-17	HS19040233-18
HS19040233-19	HS19040233-20	HS19040233-22	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040233

QC BATCH REPORT NEW

Batch ID: 139518 (0) **Instrument: ICPMS04** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

MBLK Sample ID: **MBLKF2-139518** Units: **mg/L** Analysis Date: **05-Apr-2019 22:55**
Client ID: Run ID: **ICPMS04_336009** SeqNo: **5025322** PrepDate: **05-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.0111	0.200								J
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	0.02428	0.200								J

MBLK Sample ID: **MBLKF1-139518** Units: **mg/L** Analysis Date: **05-Apr-2019 22:52**
Client ID: Run ID: **ICPMS04_336009** SeqNo: **5025321** PrepDate: **05-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01033	0.200								J
Potassium	U	0.200								
Selenium	0.001833	0.00200								J
Sodium	0.06118	0.200								J

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040233

QC BATCH REPORT NEW

Batch ID: 139518 (0) **Instrument: ICPMS04** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

MBLK Sample ID: **MBLK-139518** Units: **mg/L** Analysis Date: **08-Apr-2019 13:15**
Client ID: Run ID: **ICPMS04_336146** SeqNo: **5026088** PrepDate: **05-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	U	0.200								
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	0.01453	0.200								J

LCS Sample ID: **LCS-139518** Units: **mg/L** Analysis Date: **05-Apr-2019 22:59**
Client ID: Run ID: **ICPMS04_336009** SeqNo: **5025324** PrepDate: **05-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04973	0.00200	0.05	0	99.5	80 - 120				
Arsenic	0.05065	0.00200	0.05	0	101	80 - 120				
Cadmium	0.05071	0.00200	0.05	0	101	80 - 120				
Calcium	5.621	0.500	5	0	112	80 - 120				
Iron	5.179	0.200	5	0	104	80 - 120				
Lead	0.04879	0.00200	0.05	0	97.6	80 - 120				
Magnesium	5.255	0.200	5	0	105	80 - 120				
Potassium	5.394	0.200	5	0	108	80 - 120				
Selenium	0.05824	0.00200	0.05	0	116	80 - 120				
Sodium	5.15	0.200	5	0	103	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040233

QC BATCH REPORT NEW

Batch ID: 139518 (0) **Instrument:** ICPMS04 **Method:** DISSOLVED METALS BY SW6020A (DISSOLVED)

MS Sample ID: **HS19040233-01MS** Units: **mg/L** Analysis Date: **05-Apr-2019 23:24**
Client ID: **20190326-FD-PV40out-control-D** Run ID: **ICPMS04_336009** SeqNo: **5025335** PrepDate: **05-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.08118	0.00200	0.05	0.03392	94.5	75 - 125				
Arsenic	0.05187	0.00200	0.05	0.000684	102	75 - 125				
Cadmium	0.04892	0.00200	0.05	-0.000064	98.0	75 - 125				
Calcium	218.9	0.500	5	219.1	-5.13	75 - 125				SEO
Iron	5.028	0.200	5	0.004003	100	75 - 125				
Lead	0.04947	0.00200	0.05	-0.000093	99.1	75 - 125				
Magnesium	6.475	0.200	5	1.447	101	75 - 125				
Potassium	18.11	0.200	5	13.45	93.2	75 - 125				
Selenium	0.05423	0.00200	0.05	0.009064	90.3	75 - 125				
Sodium	260.1	0.200	5	260.3	-3.61	75 - 125				SEO

MSD Sample ID: **HS19040233-01MSD** Units: **mg/L** Analysis Date: **05-Apr-2019 23:26**
Client ID: **20190326-FD-PV40out-control-D** Run ID: **ICPMS04_336009** SeqNo: **5025336** PrepDate: **05-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.08515	0.00200	0.05	0.03392	102	75 - 125	0.08118	4.77	20	
Arsenic	0.05334	0.00200	0.05	0.000684	105	75 - 125	0.05187	2.81	20	
Cadmium	0.04929	0.00200	0.05	-0.000064	98.7	75 - 125	0.04892	0.747	20	
Calcium	222.1	0.500	5	219.1	59.7	75 - 125	218.9	1.47	20	SEO
Iron	5.132	0.200	5	0.004003	103	75 - 125	5.028	2.05	20	
Lead	0.05124	0.00200	0.05	-0.000093	103	75 - 125	0.04947	3.52	20	
Magnesium	6.576	0.200	5	1.447	103	75 - 125	6.475	1.53	20	
Potassium	18.46	0.200	5	13.45	100	75 - 125	18.11	1.9	20	
Selenium	0.05465	0.00200	0.05	0.009064	91.2	75 - 125	0.05423	0.764	20	
Sodium	268.6	0.200	5	260.3	166	75 - 125	260.1	3.21	20	SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040233

QC BATCH REPORT NEW

Batch ID: 139518 (0) **Instrument:** ICPMS04 **Method:** DISSOLVED METALS BY SW6020A (DISSOLVED)

PDS Sample ID: **HS19040233-01PDS** Units: **mg/L** Analysis Date: **05-Apr-2019 23:28**
Client ID: **20190326-FD-PV40out-control-D** Run ID: **ICPMS04_336009** SeqNo: **5025337** PrepDate: **05-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1245	0.00200	0.1	0.03392	90.6	75 - 125				
Arsenic	0.1061	0.00200	0.1	0.000684	105	75 - 125				
Cadmium	0.101	0.00200	0.1	-0.000064	101	75 - 125				
Iron	10.05	0.200	10	0.004003	100	75 - 125				
Lead	0.09688	0.00200	0.1	-0.000093	97.0	75 - 125				
Magnesium	11.58	0.200	10	1.447	101	75 - 125				
Potassium	22.69	0.200	10	13.45	92.4	75 - 125				
Selenium	0.1158	0.00200	0.1	0.009064	107	75 - 125				

PDS Sample ID: **HS19040233-01PDS** Units: **mg/L** Analysis Date: **08-Apr-2019 14:04**
Client ID: **20190326-FD-PV40out-control-D** Run ID: **ICPMS04_336146** SeqNo: **5026205** PrepDate: **05-Apr-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	304.2	5.00	100	202.3	102	75 - 125				
Sodium	362.6	2.00	100	261.4	101	75 - 125				

SD Sample ID: **HS19040233-01SD** Units: **mg/L** Analysis Date: **08-Apr-2019 13:19**
Client ID: **20190326-FD-PV40out-control-D** Run ID: **ICPMS04_336146** SeqNo: **5026090** PrepDate: **05-Apr-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	0.03551	0.0100					0.03392	4.68	10	
Potassium	12.2	1.00					13.45	9.32	10	

SD Sample ID: **HS19040233-01SD** Units: **mg/L** Analysis Date: **05-Apr-2019 23:22**
Client ID: **20190326-FD-PV40out-control-D** Run ID: **ICPMS04_336009** SeqNo: **5025334** PrepDate: **05-Apr-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Arsenic	U	0.0100					0.000684	0	10	
Cadmium	U	0.0100					-0.000064	0	10	
Iron	U	1.00					0.004003	0	10	
Lead	U	0.0100					-0.000093	0	10	
Magnesium	1.31	1.00					1.447	9.48	10	
Selenium	0.01052	0.0100					0.009064	0	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040233

QC BATCH REPORT NEW

Batch ID: 139518 (0) **Instrument:** ICPMS04 **Method:** DISSOLVED METALS BY SW6020A (DISSOLVED)

SD Sample ID: **HS19040233-01SD** Units: **mg/L** Analysis Date: **08-Apr-2019 13:26**
Client ID: **20190326-FD-PV40out-control-D** Run ID: **ICPMS04_336146** SeqNo: **5026122** PrepDate: **05-Apr-2019** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	201.2	25.0					202.3	0.542	10	
Sodium	267.5	10.0					261.4	2.33	10	

The following samples were analyzed in this batch:

HS19040233-01	HS19040233-02	HS19040233-03	HS19040233-04
HS19040233-05	HS19040233-06	HS19040233-07	HS19040233-08
HS19040233-09	HS19040233-10	HS19040233-21	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19040233**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
California	2919, 2018-2019	30-Apr-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19040233

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19040233-01	20190326-FD-PV40out-control-D	Login	4/4/2019 10:25:06 AM	JRM	MET079
HS19040233-02	20190326-FD-PV40out-30-D	Login	4/4/2019 10:25:06 AM	JRM	MET079
HS19040233-03	20190326-FD-PV40out-35-D	Login	4/4/2019 10:25:06 AM	JRM	MET079
HS19040233-04	20190326-FD-PV40out-40-D	Login	4/4/2019 10:25:06 AM	JRM	MET079
HS19040233-05	20190327-FD-PV40inlet-control-D	Login	4/4/2019 10:25:06 AM	JRM	MET079
HS19040233-06	20190327-FD-PV40inlet-30-35-40-D	Login	4/4/2019 10:25:06 AM	JRM	MET079
HS19040233-07	20190327-FD-PV40mid-control-D	Login	4/4/2019 10:25:06 AM	JRM	MET079
HS19040233-08	20190327-FD-PV40mid-30-D	Login	4/4/2019 10:25:06 AM	JRM	MET079
HS19040233-09	20190327-FD-PV40mid-35-D	Login	4/4/2019 10:25:06 AM	JRM	MET079
HS19040233-10	20190327-FD-PV40mid-40-D	Login	4/4/2019 10:25:06 AM	JRM	MET079
HS19040233-11	20190326-FD-PV40out-control-T	Login	4/4/2019 10:25:06 AM	JRM	MET079
HS19040233-12	20190326-FD-PV40out-30-T	Login	4/4/2019 10:25:06 AM	JRM	MET079
HS19040233-13	20190326-FD-PV40out-35-T	Login	4/4/2019 10:25:06 AM	JRM	MET079
HS19040233-14	20190326-FD-PV40out-40-T	Login	4/4/2019 10:25:06 AM	JRM	MET079
HS19040233-15	20190327-FD-PV40inlet-control-T	Login	4/4/2019 10:25:06 AM	JRM	MET079
HS19040233-16	20190327-FD-PV40inlet-30-35-40-T	Login	4/4/2019 10:25:06 AM	JRM	MET079
HS19040233-17	20190327-FD-PV40mid-control-T	Login	4/4/2019 10:25:06 AM	JRM	MET079
HS19040233-18	20190327-FD-PV40mid-30-T	Login	4/4/2019 10:25:06 AM	JRM	MET079
HS19040233-19	20190327-FD-PV40mid-35-T	Login	4/4/2019 10:25:06 AM	JRM	MET079
HS19040233-20	20190327-FD-PV40mid-40-T	Login	4/4/2019 10:25:06 AM	JRM	MET079
HS19040233-21	20190327-FD-PV40inlet-control-DUP-D	Login	4/4/2019 10:25:06 AM	JRM	MET079
HS19040233-22	20190327-FD-PV40inlet-control-DUP-T	Login	4/4/2019 10:25:06 AM	JRM	MET079

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19040233

Date/Time Received: **04-Apr-2019 08:40**
Received by: **JRM**

Checklist completed by: *Jared R. Makan* eSignature 4-Apr-2019 Date

Reviewed by: *Dane J. Wacasey* eSignature 8-Apr-2019 Date

Matrices: **Water**

Carrier name: **FedEx International Priority**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	3 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	18.7c/18.7c UC/C		IR11
Cooler(s)/Kit(s):	44603		
Date/Time sample(s) sent to storage:	04/04/2019 11:00		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

ALS Environmental

Chain of Custody Form

Page 1 of 3

HS19040233

Golder Associates

Exide Column Studies

Customer Information		Project Information		ALS Project Manager:		Work Order #:
PO Number	130-2086-06	Project Name	Exide Column Studies	Parameter/Method Request for Analysis		
Work Order		Project Number	130-2086-06	A	300 W (300Cl, SO4, NO3-48h HT)	
Company Name	Golder Associates	Bill To Company	Golder Associates	B	TDS W 2540C (2540C TDS)	
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	C	ALK W 2320B (2320B alkalinity)	
Address	13515 Barrett Parkway Drive, Suite 260	Address	13515 Barrett Parkway Drive, Suite 260	D	HARD (2340B hardness (calc))	
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	E	ICP TW (6020A total metals (6)+cations)	
Phone	314 984-8800	Phone	314 984-8800	F	ICP DISS (6020A diss metals (6)+cations-FldFltr)	
Fax		Fax		G		
e-Mail Address	ewhite@golder.com	e-Mail Address		H		
				I		
				J		

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190326-FD-PV40out-control-D	03-26-19	12:15 PM	GW	2	1						X					
2	20190326-FD-PV40out-30-D	03-26-19	12:15 PM	GW	2	1						X					
3	20190326-FD-PV40out-35-D	03-26-19	12:15 PM	GW	2	1						X					
4	20190326-FD-PV40out-40-D	03-26-19	12:15 PM	GW	2	1						X					
5	20190327-FD-PV40inlet-control-D	03-27-19	5:20 PM	GW	2	1						X					
6	20190327-FD-PV40inlet-30-35-40-D	03-27-19	5:20 PM	GW	2	1						X					
7	20190327-FD-PV40mid-control-D	03-27-19	4:45 PM	GW	2	1						X					
8	20190327-FD-PV40mid-30-D	03-27-19	4:45 PM	GW	2	1						X					
9	20190327-FD-PV40mid-35-D	03-27-19	4:45 PM	GW	2	1						X					
10	20190327-FD-PV40mid-40-D	03-27-19	4:45 PM	GW	2	1						X					

Sampler(s): Please Print & Sign

Giovanna Llamosas

Shipment Method:

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by: Giovanna Llamosas	Date: 2019/04/02	Time: 15:30	Received by:	Notes:	
Relinquished by:	Date: 4/4/19	Time: 08:40	Received by (Laboratory):	Cooler Temp.	QC Package: (Check Box Below)
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	18.7	Level II: Standard QC; Level III: Std QC + Raw Data; Level IV: SW846 CLP-Like; Other: _____; x TRRP-Checklist; TRRP Level IV

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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IR #11 CIF 9

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Chain of Custody Form

Page 2 of 3

HS19040233

Golder Associates
Exide Column Studies

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086-06	Project Name	Exide Column Studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086-06	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suite 260	Address	13515 Barrett Parkway Drive, Suite 260	E	ICP TW (6020A total metals (6)+cations)
				F	ICP DISS (6020A diss metals (6)+cations-FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	G	
Phone	314 984-8800	Phone	314 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address		J	

ALS Project Manager:

Work Order #:

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190326-FD-PV40out-control-T	03-26-19	12:15 PM	GW	2	1				X	X						
2	20190326-FD-PV40out-30-T	03-26-19	12:15 PM	GW	2	1				X	X						
3	20190326-FD-PV40out-35-T	03-26-19	12:15 PM	GW	2	1				X	X						
4	20190326-FD-PV40out-40-T	03-26-19	12:15 PM	GW	2	1				X	X						
5	20190327-FD-PV40inlet-control-T	03-27-19	5:20 PM	GW	2	1				X	X						
6	20190327-FD-PV40inlet-30-35-40-T	03-27-19	5:20 PM	GW	2	1				X	X						
7	20190327-FD-PV40mid-control-T	03-27-19	4:45 PM	GW	2	1				X	X						
8	20190327-FD-PV40mid-30-T	03-27-19	4:45 PM	GW	2	1				X	X						
9	20190327-FD-PV40mid-35-T	03-27-19	4:45 PM	GW	2	1				X	X						
10	20190327-FD-PV40mid-40-T	03-27-19	4:45 PM	GW	2	1				X	X						

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method:

Required Turnaround Time:
☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by: Giovanna Llamosas	Date: 2019/04/02	Time: 15:30	Received by:	Notes:	
Relinquished by:	Date: 4/4/19	Time: 08:40	Received by (Laboratory):	Cooler Temp: 4°C	QC Package: (Check Box Below)
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	18-7	☐ Level II: Standard QC ☒ TRRP-Checklist ☐ Level III: Std QC + Raw Data ☐ TRRP Level IV ☐ Level IV: SW846 CLP-Like ☐ Other: _____

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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4/4/19 IK # 11 C/K

ALS Environmental

Chain of Custody Form

Page 3 of 3

HS19040233

Golder Associates
Exide Column Studies

ALS Project Manager:

Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086-06	Project Name	Exide Column Studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086-06	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suite 260	Address	13515 Barrett Parkway Drive, Suite 260	E	ICP TW (6020A total metals (6)+cations)
				F	ICP DISS (6020A diss metals (6)+cations-FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	G	
Phone	314 984-8800	Phone	314 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190327-FD-PV40inlet-control-DUP-D	03-27-19	5:20 PM	GW	2	1						X					
2	20190327-FD-PV40inlet-control-DUP-T	03-27-19	5:20 PM	GW	2	1				X	X						
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method:

Required Turnaround Time:
☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by: Giovanna Llamosas	Date: 2019/04/02	Time: 15:30	Received by:	Notes:	
Relinquished by:	Date: 4/4/19	Time: 0840	Received by (Laboratory):	Cooler Temp. 1.6	QC Package: (Check Box Below)
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	18.7	Level II: Standard QC ☐ / TRRP-Checklist ☐
					Level III: Std QC + Raw Data ☐ / TRRP Level IV ☐
					Level IV: SW846 CLP-Like ☐
					Other: _____ ☐

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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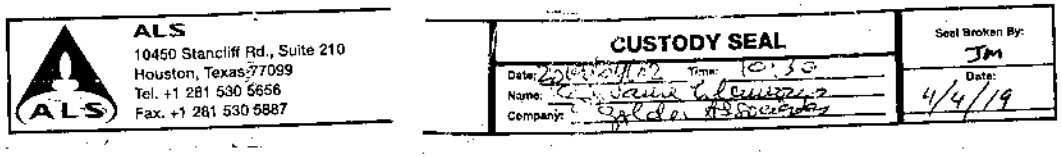
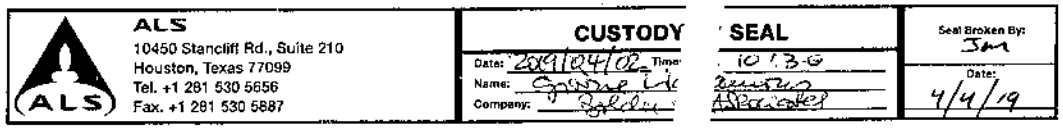
UU603 IR # 11


ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CUSTODY SEAL
Date:
Time: 10:30
Name:
Company:
Seal Broken By:
JM
Date:
4/4/19


ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CUSTODY
SEAL
Date:
Time:
Name:
Company:
10:30
Seal Broken By:
JM
Date:
4/4/19

ORIGIN ID:YUXA (514) 383-0990
AUDREY ETHEVES
GOLDER ASSOCIATES LTD
7250 RUE DU MILE END
3E ETAGE
MONTREAL, PQ H2R3A4
CANADA CA

SHIP DATE: 02APR19
ACTWGT: 16.00 LB
CAD: 108680724/INET4102

BILL RECIPIENT

TO **DANE WACASEY**
ALS HOUSTON LABORATORY
10450 STANCLIFF RD
STE 210
HOUSTON TX 77099
(281) 530-5656 REF:
INV:
PO: DEPT:

(US)

FedEx Express

TRK# 7748 5802 4808
0430

10:30A
INTL PRIORITY

77099
TX-US IAH

NH SGRA

Après l'impression de cette étiquette :
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1. Pliez la page imprimée le long de la ligne horizontale.
2. Placez l'étiquette dans la pochette d'expédition et fixez-la à votre paquet.

DÉFINITIONS [illegible]

ORIGIN ID:YUXA (514) 383-0990
Audrey Etheves
Golder Associates Ltd
7250 rue du Mile End
3e etage
MONTREAL, PQ H2R3A4
CANADA, CA

SHIP DATE: 02APR19
ACTWGT: 16.00 LB
CAD: 108680724/NET4102

BILL RECIPIENT
EIN/VAT:

TO Dane Wacasey
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

(281) 530-5656

FedEx Express

(US)

J1910190107Z00ur

AWB

NH SGRA

PKG:CUSTOMER

TRK# 7748 5802 4808

Form
0430

10:30A
INTL PRIORITY
REF:
DESC1:...chantillon d'eau
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: Audrey Etheves
T/C: R 967554812
D/T: R 967554812

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10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

April 10, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19040237**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 22 sample(s) on Apr 04, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19040237**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS19040237**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 04/10/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19040237				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 139585,139589,R336341				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?			X		
		Were analytical duplicates analyzed at the appropriate frequency?			X		
		Were RPDs or relative standard deviations within the laboratory QC limits?			X		
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				2
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 04/10/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19040237				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 139585,139589,R336341				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			3
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports	
Laboratory Name: ALS Laboratory Group	LRC Date: 04/10/2019
Project Name: Exide Column Studies	Laboratory Job Number: HS19040237
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 139585,139589,R336341

ER#[5]	Description
1	Batch 139585, Metals Method SW6020, sample HS19040270-07, MS and MSD were performed on unrelated sample. Batch 139589, Metals Method SW6020, sample 20190326-DGW-MW11-PV40outcontrol-D, MS and or MSD recovered outside the control limits for Calcium, Magnesium and Sodium due to suspect matrix effect, however, the result in the parent sample is greater than 4x the spike amount.
2	Batch 139589, Dissolved Metals Method SW6020, some samples were analyzed at a dilution due to high sodium concentration.
3	See Run Log and CCB Exceptions Report.

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040237
Start Date: 08-Apr-2019 End Date: 09-Apr-2019

Run ID:ICPMS05_336145
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	08-Apr-2019 12:32	021_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	08-Apr-2019 12:34	022SMPL.d	AS CA CD FE K MG PB SB SE
LLICV5	1	08-Apr-2019 12:36	023LICV.d	AS CA CD FE K MG PB SB SE
ICB	1	08-Apr-2019 12:38	024_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	08-Apr-2019 12:44	026ICSA.d	AS CA CD FE K MG PB SB SE
ICSAB	1	08-Apr-2019 12:46	027ICSB.d	AS CA CD FE K MG PB SB SE
CCV 1	1	08-Apr-2019 13:13	037_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	08-Apr-2019 13:24	040_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 2	1	08-Apr-2019 13:57	051_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	08-Apr-2019 13:59	052_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 3	1	08-Apr-2019 14:23	063_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	08-Apr-2019 14:25	064_CCB.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	08-Apr-2019 15:18	076_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 4	1	08-Apr-2019 15:21	077_CCV.d	AS CA CD FE K MG NA PB SB SE
CCV 5	1	08-Apr-2019 15:37	084_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 5	1	08-Apr-2019 15:39	085_CCB.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	08-Apr-2019 17:08	108SMPL.d	AS CA CD FE K MG PB SB SE
LLCCV5	1	08-Apr-2019 17:11	109LICV.d	AS CA CD FE K MG PB SB SE
ICCB 6	1	08-Apr-2019 17:13	110_ICB.d	AS CA CD FE K MG NA PB SB SE
ICCV 6	1	08-Apr-2019 17:18	112_ICV.d	AS CA CD FE K MG NA PB SB SE
CCV 7	1	08-Apr-2019 17:50	124_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 7	1	08-Apr-2019 17:52	125_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 8	1	08-Apr-2019 18:18	136_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 8	1	08-Apr-2019 18:20	137_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 9	1	08-Apr-2019 18:44	148_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 9	1	08-Apr-2019 18:46	149_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 10	1	08-Apr-2019 19:10	160_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 10	1	08-Apr-2019 19:12	161_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 11	1	08-Apr-2019 21:55	164_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 11	1	08-Apr-2019 21:57	165_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLKF1-139589	1	08-Apr-2019 22:08	170SMPL.d	AS CA CD FE K MG NA PB SB SE
LCS-139589	1	08-Apr-2019 22:12	172SMPL.d	AS CA CD FE K MG NA PB SB SE
CCV 12	1	08-Apr-2019 22:14	173_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 12	1	08-Apr-2019 22:16	174_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 13	1	08-Apr-2019 22:54	180_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 13	1	08-Apr-2019 22:56	181_CCB.d	AS CA CD FE K MG NA PB SB SE
20190326-DGW-MW11-PV40out-control-D	5	08-Apr-2019 22:58	182SMPL.d	AS CA CD FE K MG PB SB SE
20190326-DGW-MW11-PV40out-control-DSD	25	08-Apr-2019 23:00	183SMPL.d	AS CA CD FE K MG PB SB SE
20190326-DGW-MW11-PV40out-control-DMS	5	08-Apr-2019 23:03	184SMPL.d	AS CA CD FE K MG NA PB SB SE
20190326-DGW-MW11-PV40out-control-DMSD	5	08-Apr-2019 23:05	185SMPL.d	AS CA CD FE K MG NA PB SB SE
20190326-DGW-MW11-PV40out-control-DPDS	5	08-Apr-2019 23:07	186SMPL.d	AS CA CD FE K MG PB SB SE
CCV 14	1	08-Apr-2019 23:09	187_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 14	1	08-Apr-2019 23:11	188_CCB.d	AS CA CD FE K MG NA PB SB SE
20190326-DGW-MW11-PV40out-30-D	5	08-Apr-2019 23:14	189SMPL.d	AS CA CD FE K MG PB SB SE
20190326-DGW-MW11-PV40out-35-D	5	08-Apr-2019 23:16	190SMPL.d	AS CA CD FE K MG PB SB SE
20190326-DGW-MW11-PV40out-40-D	5	08-Apr-2019 23:18	191SMPL.d	AS CA CD FE K MG PB SB SE

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040237
Start Date: 08-Apr-2019 End Date: 09-Apr-2019

Run ID:ICPMS05_336145
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
20190327-DGW-MW11-PV40inlet-control-D	5	08-Apr-2019 23:20	192SMPL.d	AS CA CD FE K MG PB SB SE
20190327-DGW-MW11-PV40inlet-30-35-40-D	5	08-Apr-2019 23:22	193SMPL.d	AS CA CD FE K MG PB SB SE
20190327-DGW-MW11-PV40mid-control-D	5	08-Apr-2019 23:24	194SMPL.d	AS CA CD FE K MG PB SB SE
20190327-DGW-MW11-PV40mid-30-D	5	08-Apr-2019 23:27	195SMPL.d	AS CA CD FE K MG PB SB SE
20190327-DGW-MW11-PV40mid-35-D	5	08-Apr-2019 23:29	196SMPL.d	AS CA CD FE K MG PB SB SE
20190327-DGW-MW11-PV40mid-40-D	5	08-Apr-2019 23:31	197SMPL.d	AS CA CD FE K MG PB SB SE
20190327-DGW-MW11-PV40inlet-control-DUP-D	5	08-Apr-2019 23:33	198SMPL.d	AS CA CD FE K MG PB SB SE
CCV 15	1	08-Apr-2019 23:35	199_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 15	1	08-Apr-2019 23:37	200_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 16	1	09-Apr-2019 00:01	211_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 16	1	09-Apr-2019 00:03	212_CCB.d	AS CA CD FE K MG NA PB SB SE
ICCV 17	1	09-Apr-2019 00:29	224_ICV.d	AS CA CD FE K MG NA PB SB SE
LLCCV2	1	09-Apr-2019 00:31	225SMPL.d	AS CA CD FE K MG PB SB SE
LLCCV5	1	09-Apr-2019 00:34	226LICV.d	AS CA CD FE K MG PB SB SE
ICCB 17	1	09-Apr-2019 00:36	227_ICB.d	AS CA CD FE K MG NA PB SB SE
MBLK-139589	1	09-Apr-2019 00:38	228SMPL.d	AS CA CD FE K MG NA PB SB SE
MBLK-139585	1	09-Apr-2019 00:40	229SMPL.d	AS CA CD FE K MG PB SB SE
LCS-139585	1	09-Apr-2019 00:42	230SMPL.d	AS CA CD FE K MG PB SB SE
ZZZZZZSD	5	09-Apr-2019 00:47	232SMPL.d	AS CD FE K MG PB SB SE
ZZZZZZMS	1	09-Apr-2019 00:49	233SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZMSD	1	09-Apr-2019 00:51	234SMPL.d	AS CA CD FE K MG NA PB SB SE
ZZZZZZPDS	1	09-Apr-2019 00:53	235SMPL.d	AS CD FE K MG PB SB SE
CCV 18	1	09-Apr-2019 00:55	236_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 18	1	09-Apr-2019 00:58	237_CCB.d	AS CA CD FE K MG NA PB SB SE
20190326-DGW-MW11-PV40out-control-T	5	09-Apr-2019 01:15	245SMPL.d	AS CA CD FE K MG PB SB SE
20190326-DGW-MW11-PV40out-30-T	5	09-Apr-2019 01:17	246SMPL.d	AS CA CD FE K MG PB SB SE
20190326-DGW-MW11-PV40out-35-T	5	09-Apr-2019 01:19	247SMPL.d	AS CA CD FE K MG PB SB SE
CCV 19	1	09-Apr-2019 01:22	248_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 19	1	09-Apr-2019 01:24	249_CCB.d	AS CA CD FE K MG NA PB SB SE
20190326-DGW-MW11-PV40out-40-T	5	09-Apr-2019 01:26	250SMPL.d	AS CA CD FE K MG PB SB SE
20190327-DGW-MW11-PV40inlet-control-T	5	09-Apr-2019 01:28	251SMPL.d	AS CA CD FE K MG PB SB SE
20190327-DGW-MW11-PV40inlet-30-35-40-T	5	09-Apr-2019 01:30	252SMPL.d	AS CA CD FE K MG PB SB SE
20190327-DGW-MW11-PV40mid-control-T	5	09-Apr-2019 01:33	253SMPL.d	AS CA CD FE K MG PB SB SE
20190327-DGW-MW11-PV40mid-30-T	5	09-Apr-2019 01:35	254SMPL.d	AS CA CD FE K MG PB SB SE
20190327-DGW-MW11-PV40mid-35-T	5	09-Apr-2019 01:37	255SMPL.d	AS CA CD FE K MG PB SB SE
20190327-DGW-MW11-PV40mid-40-T	5	09-Apr-2019 01:39	256SMPL.d	AS CA CD FE K MG PB SB SE
20190327-DGW-MW11-PV40inlet-control-DUP-T	5	09-Apr-2019 01:41	257SMPL.d	AS CA CD FE K MG PB SB SE
CCV 20	1	09-Apr-2019 01:48	260_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 20	1	09-Apr-2019 01:50	261_CCB.d	AS CA CD FE K MG NA PB SB SE
CCV 21	1	09-Apr-2019 01:56	264_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 21	1	09-Apr-2019 01:59	265_CCB.d	AS CA CD FE K MG NA PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040237 Date: 08-Apr-2019 22:56 Seq: 5027038

Run ID:ICPMS05_336145
Instrument:ICPMS05
Method:SW6020

CCB 13	Antimony	0.651	0.4	2	
	Selenium	1.327	1.1	2	
	Sodium	155.9	14	200	
CCB 14	Date: 08-Apr-2019 23:11	Seq: 5027045	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	1.28	0.4	2	
	Selenium	1.704	1.1	2	
	Sodium	285.4	14	200	
CCB 15	Date: 08-Apr-2019 23:37	Seq: 5027057	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.8	0.4	2	
	Selenium	1.737	1.1	2	
	Sodium	414.9	14	200	
CCB 16	Date: 09-Apr-2019 00:03	Seq: 5027297	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.701	0.4	2	
	Selenium	2.481	1.1	2	
	Sodium	136.2	14	200	
ICCB 17	Date: 09-Apr-2019 00:36	Seq: 5027456	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Sodium	-28.37	14	200	
CCB 18	Date: 09-Apr-2019 00:58	Seq: 5027465	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.808	0.4	2	
	Potassium	19.49	18	200	
	Sodium	246.8	14	200	
CCB 19	Date: 09-Apr-2019 01:24	Seq: 5027477	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.58	0.4	2	
	Sodium	254.6	14	200	
CCB 20	Date: 09-Apr-2019 01:50	Seq: 5027489	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.476	0.4	2	
	Sodium	252.3	14	200	
CCB 21	Date: 09-Apr-2019 01:59	Seq: 5027493	D/F: 1	Units: ug/L	
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.623	0.4	2	
	Sodium	166.3	14	200	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040237
Start Date: 09-Apr-2019 End Date: 10-Apr-2019

Run ID:ICPMS05_336226
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	09-Apr-2019 11:56	019_ICV.d	AS CA CD FE K MG NA PB SB SE
LLICV2	1	09-Apr-2019 11:58	020SMPL.d	NA
LLICV5	1	09-Apr-2019 12:00	021LICV.d	NA
ICB	1	09-Apr-2019 12:02	022_ICB.d	AS CA CD FE K MG NA PB SB SE
ICSA	1	09-Apr-2019 12:13	024ICSA.d	NA
ICSAB	1	09-Apr-2019 12:15	025ICSB.d	NA
CCV 1	1	09-Apr-2019 12:51	037_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 1	1	09-Apr-2019 12:53	038_CCB.d	AS CA CD FE K MG NA PB SB SE
20190326-DGW-MW11-PV40out-control-D	100	09-Apr-2019 13:06	043SMPL.d	NA
20190326-DGW-MW11-PV40out-control-DSD	500	09-Apr-2019 13:09	044SMPL.d	NA
20190326-DGW-MW11-PV40out-control-DPDS	100	09-Apr-2019 13:11	045SMPL.d	NA
20190326-DGW-MW11-PV40out-30-D	100	09-Apr-2019 13:13	046SMPL.d	NA
20190326-DGW-MW11-PV40out-35-D	100	09-Apr-2019 13:15	047SMPL.d	NA
20190326-DGW-MW11-PV40out-40-D	100	09-Apr-2019 13:17	048SMPL.d	NA
CCV 2	1	09-Apr-2019 13:19	049_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 2	1	09-Apr-2019 13:21	050_CCB.d	AS CA CD FE K MG NA PB SB SE
20190327-DGW-MW11-PV40inlet-control-D	100	09-Apr-2019 13:24	051SMPL.d	NA
20190327-DGW-MW11-PV40inlet-30-35-40-D	100	09-Apr-2019 13:26	052SMPL.d	NA
20190327-DGW-MW11-PV40mid-control-D	100	09-Apr-2019 13:28	053SMPL.d	NA
20190327-DGW-MW11-PV40mid-30-D	100	09-Apr-2019 13:31	054SMPL.d	NA
20190327-DGW-MW11-PV40mid-35-D	100	09-Apr-2019 13:33	055SMPL.d	NA
20190327-DGW-MW11-PV40mid-40-D	100	09-Apr-2019 13:35	056SMPL.d	NA
20190327-DGW-MW11-PV40inlet-control-DUP-D	100	09-Apr-2019 13:37	057SMPL.d	NA
CCV 3	1	09-Apr-2019 13:46	061_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 3	1	09-Apr-2019 13:48	062_CCB.d	AS CA CD FE K MG NA PB SB SE
MBLK-139585	1	09-Apr-2019 13:58	064SMPL.d	NA
LCS-139585	1	09-Apr-2019 14:00	065SMPL.d	NA
ZZZZZZSD	25	09-Apr-2019 14:05	067SMPL.d	CA NA
ZZZZZZPDS	5	09-Apr-2019 14:07	068SMPL.d	CA NA
20190326-DGW-MW11-PV40out-control-T	100	09-Apr-2019 14:11	069SMPL.d	NA
20190326-DGW-MW11-PV40out-30-T	100	09-Apr-2019 14:14	070SMPL.d	NA
20190326-DGW-MW11-PV40out-35-T	100	09-Apr-2019 14:16	071SMPL.d	NA
20190326-DGW-MW11-PV40out-40-T	100	09-Apr-2019 14:18	072SMPL.d	NA
CCV 4	1	09-Apr-2019 14:20	073_CCV.d	AS CA CD FE K MG NA PB SB SE
CCB 4	1	09-Apr-2019 14:22	074_CCB.d	AS CA CD FE K MG NA PB SB SE
20190327-DGW-MW11-PV40inlet-control-T	100	09-Apr-2019 14:31	075SMPL.d	NA
20190327-DGW-MW11-PV40inlet-30-35-40-T	100	09-Apr-2019 14:33	076SMPL.d	NA
20190327-DGW-MW11-PV40mid-control-T	100	09-Apr-2019 14:35	077SMPL.d	NA
20190327-DGW-MW11-PV40mid-30-T	100	09-Apr-2019 14:40	079SMPL.d	NA

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040237

Run ID:ICPMS05_336226
Instrument:ICPMS05
Method:SW6020

CCB 1	Date: 09-Apr-2019 12:53	Seq: 5028266		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		14.28	14	200	
CCB 6	Date: 09-Apr-2019 15:17	Seq: 5028459		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		36.94	14	200	
CCB 7	Date: 09-Apr-2019 15:48	Seq: 5028470		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		49.98	14	200	
CCB 8	Date: 09-Apr-2019 16:28	Seq: 5028684		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		104.3	14	200	
CCB 9	Date: 09-Apr-2019 17:21	Seq: 5028696		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		120.8	14	200	
CCB 10	Date: 09-Apr-2019 18:01	Seq: 5028920		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		48	14	200	
CCB 11	Date: 09-Apr-2019 18:28	Seq: 5028932		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		124	14	200	
CCB 12	Date: 09-Apr-2019 18:32	Seq: 5028934		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		84.1	14	200	
CCB 13	Date: 09-Apr-2019 21:32	Seq: 5028952		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		34.11	14	200	
CCB 14	Date: 09-Apr-2019 21:52	Seq: 5028961		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		66.02	14	200	
CCB 17	Date: 09-Apr-2019 23:24	Seq: 5029263		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		307.4	14	200	
CCB 18	Date: 09-Apr-2019 23:45	Seq: 5029291		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		1233	14	200	
CCB 19	Date: 10-Apr-2019 00:16	Seq: 5029304		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		424.7	14	200	
CCB 20	Date: 10-Apr-2019 00:40	Seq: 5029315		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Sodium		205.5	14	200	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19040237

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19040237-01	20190326-DGW-MW11-PV40out-control-D	Groundwater		26-Mar-2019 12:30	04-Apr-2019 08:40	☐
HS19040237-02	20190326-DGW-MW11-PV40out-30-D	Groundwater		26-Mar-2019 12:30	04-Apr-2019 08:40	☐
HS19040237-03	20190326-DGW-MW11-PV40out-35-D	Groundwater		26-Mar-2019 12:30	04-Apr-2019 08:40	☐
HS19040237-04	20190326-DGW-MW11-PV40out-40-D	Groundwater		26-Mar-2019 12:30	04-Apr-2019 08:40	☐
HS19040237-05	20190327-DGW-MW11-PV40inlet-control-D	Groundwater		27-Mar-2019 17:20	04-Apr-2019 08:40	☐
HS19040237-06	20190327-DGW-MW11-PV40inlet-30-35-40-D	Groundwater		27-Mar-2019 17:20	04-Apr-2019 08:40	☐
HS19040237-07	20190327-DGW-MW11-PV40mid-control-D	Groundwater		27-Mar-2019 16:45	04-Apr-2019 08:40	☐
HS19040237-08	20190327-DGW-MW11-PV40mid-30-D	Groundwater		27-Mar-2019 16:45	04-Apr-2019 08:40	☐
HS19040237-09	20190327-DGW-MW11-PV40mid-35-D	Groundwater		27-Mar-2019 16:45	04-Apr-2019 08:40	☐
HS19040237-10	20190327-DGW-MW11-PV40mid-40-D	Groundwater		27-Mar-2019 16:45	04-Apr-2019 08:40	☐
HS19040237-11	20190326-DGW-MW11-PV40out-control-T	Groundwater		26-Mar-2019 12:30	04-Apr-2019 08:40	☐
HS19040237-12	20190326-DGW-MW11-PV40out-30-T	Groundwater		26-Mar-2019 12:30	04-Apr-2019 08:40	☐
HS19040237-13	20190326-DGW-MW11-PV40out-35-T	Groundwater		26-Mar-2019 12:30	04-Apr-2019 08:40	☐
HS19040237-14	20190326-DGW-MW11-PV40out-40-T	Groundwater		26-Mar-2019 12:30	04-Apr-2019 08:40	☐
HS19040237-15	20190327-DGW-MW11-PV40inlet-control-T	Groundwater		27-Mar-2019 17:20	04-Apr-2019 08:40	☐
HS19040237-16	20190327-DGW-MW11-PV40inlet-30-35-40-T	Groundwater		27-Mar-2019 17:20	04-Apr-2019 08:40	☐
HS19040237-17	20190327-DGW-MW11-PV40mid-control-T	Groundwater		27-Mar-2019 16:45	04-Apr-2019 08:40	☐
HS19040237-18	20190327-DGW-MW11-PV40mid-30-T	Groundwater		27-Mar-2019 16:45	04-Apr-2019 08:40	☐
HS19040237-19	20190327-DGW-MW11-PV40mid-35-T	Groundwater		27-Mar-2019 16:45	04-Apr-2019 08:40	☐
HS19040237-20	20190327-DGW-MW11-PV40mid-40-T	Groundwater		27-Mar-2019 16:45	04-Apr-2019 08:40	☐
HS19040237-21	20190327-DGW-MW11-PV40inlet-control-DUP-D	Groundwater		27-Mar-2019 17:20	04-Apr-2019 08:40	☐
HS19040237-22	20190327-DGW-MW11-PV40inlet-control-DUP-T	Groundwater		27-Mar-2019 17:20	04-Apr-2019 08:40	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190326-DGW-MW11-PV40out-control-D
Collection Date: 26-Mar-2019 12:30

ANALYTICAL REPORT
WorkOrder:HS19040237
Lab ID:HS19040237-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 08-Apr-2019		Analyst: JHD
Antimony	**0.00247**	J	**0.00200**	**0.0100**	**mg/L**	5	08-Apr-2019 22:58
Arsenic	U		0.00200	0.0100	mg/L	5	08-Apr-2019 22:58
Cadmium	**0.00854**	J	**0.00100**	**0.0100**	**mg/L**	5	08-Apr-2019 22:58
Calcium	**500**		**0.170**	**2.50**	**mg/L**	5	08-Apr-2019 22:58
Iron	U		0.0600	1.00	mg/L	5	08-Apr-2019 22:58
Lead	U		0.00300	0.0100	mg/L	5	08-Apr-2019 22:58
Magnesium	**294**		**0.0500**	**1.00**	**mg/L**	5	08-Apr-2019 22:58
Potassium	**18.6**		**0.0900**	**1.00**	**mg/L**	5	08-Apr-2019 22:58
Selenium	**0.00826**	J	**0.00550**	**0.0100**	**mg/L**	5	08-Apr-2019 22:58
Sodium	**1,760**		**1.40**	**20.0**	**mg/L**	100	09-Apr-2019 13:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190326-DGW-MW11-PV40out-30-D
Collection Date: 26-Mar-2019 12:30

ANALYTICAL REPORT
WorkOrder:HS19040237
Lab ID:HS19040237-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 08-Apr-2019		Analyst: JHD
Antimony	**0.00292**	J	**0.00200**	**0.0100**	**mg/L**	5	08-Apr-2019 23:14
Arsenic	U		0.00200	0.0100	mg/L	5	08-Apr-2019 23:14
Cadmium	U		0.00100	0.0100	mg/L	5	08-Apr-2019 23:14
Calcium	**313**		**0.170**	**2.50**	**mg/L**	5	08-Apr-2019 23:14
Iron	U		0.0600	1.00	mg/L	5	08-Apr-2019 23:14
Lead	U		0.00300	0.0100	mg/L	5	08-Apr-2019 23:14
Magnesium	**288**		**0.0500**	**1.00**	**mg/L**	5	08-Apr-2019 23:14
Potassium	**18.4**		**0.0900**	**1.00**	**mg/L**	5	08-Apr-2019 23:14
Selenium	U		0.00550	0.0100	mg/L	5	08-Apr-2019 23:14
Sodium	**1,670**		**1.40**	**20.0**	**mg/L**	100	09-Apr-2019 13:13

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190326-DGW-MW11-PV40out-35-D
Collection Date: 26-Mar-2019 12:30

ANALYTICAL REPORT
WorkOrder:HS19040237
Lab ID:HS19040237-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 08-Apr-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	08-Apr-2019 23:16
Arsenic	U		0.00200	0.0100	mg/L	5	08-Apr-2019 23:16
Cadmium	U		0.00100	0.0100	mg/L	5	08-Apr-2019 23:16
Calcium	**315**		**0.170**	**2.50**	**mg/L**	5	08-Apr-2019 23:16
Iron	U		0.0600	1.00	mg/L	5	08-Apr-2019 23:16
Lead	U		0.00300	0.0100	mg/L	5	08-Apr-2019 23:16
Magnesium	**285**		**0.0500**	**1.00**	**mg/L**	5	08-Apr-2019 23:16
Potassium	**18.6**		**0.0900**	**1.00**	**mg/L**	5	08-Apr-2019 23:16
Selenium	**0.00587**	J	**0.00550**	**0.0100**	**mg/L**	5	08-Apr-2019 23:16
Sodium	**1,690**		**1.40**	**20.0**	**mg/L**	100	09-Apr-2019 13:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190326-DGW-MW11-PV40out-40-D
Collection Date: 26-Mar-2019 12:30

ANALYTICAL REPORT
WorkOrder:HS19040237
Lab ID:HS19040237-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 08-Apr-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	08-Apr-2019 23:18
Arsenic	U		0.00200	0.0100	mg/L	5	08-Apr-2019 23:18
Cadmium	U		0.00100	0.0100	mg/L	5	08-Apr-2019 23:18
Calcium	**305**		**0.170**	**2.50**	**mg/L**	5	08-Apr-2019 23:18
Iron	U		0.0600	1.00	mg/L	5	08-Apr-2019 23:18
Lead	U		0.00300	0.0100	mg/L	5	08-Apr-2019 23:18
Magnesium	**295**		**0.0500**	**1.00**	**mg/L**	5	08-Apr-2019 23:18
Potassium	**19.7**		**0.0900**	**1.00**	**mg/L**	5	08-Apr-2019 23:18
Selenium	**0.00888**	J	**0.00550**	**0.0100**	**mg/L**	5	08-Apr-2019 23:18
Sodium	**1,750**		**1.40**	**20.0**	**mg/L**	100	09-Apr-2019 13:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190327-DGW-MW11-PV40inlet-control-D
Collection Date: 27-Mar-2019 17:20

ANALYTICAL REPORT
WorkOrder:HS19040237
Lab ID:HS19040237-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 08-Apr-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	08-Apr-2019 23:20
Arsenic	U		0.00200	0.0100	mg/L	5	08-Apr-2019 23:20
Cadmium	**0.00746**	J	**0.00100**	**0.0100**	**mg/L**	5	08-Apr-2019 23:20
Calcium	**513**		**0.170**	**2.50**	**mg/L**	5	08-Apr-2019 23:20
Iron	**1.68**		**0.0600**	**1.00**	**mg/L**	5	08-Apr-2019 23:20
Lead	U		0.00300	0.0100	mg/L	5	08-Apr-2019 23:20
Magnesium	**309**		**0.0500**	**1.00**	**mg/L**	5	08-Apr-2019 23:20
Potassium	**19.5**		**0.0900**	**1.00**	**mg/L**	5	08-Apr-2019 23:20
Selenium	**0.00914**	J	**0.00550**	**0.0100**	**mg/L**	5	08-Apr-2019 23:20
Sodium	**1,700**		**1.40**	**20.0**	**mg/L**	100	09-Apr-2019 13:24

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190327-DGW-MW11-PV40inlet-30-35-40-D
Collection Date: 27-Mar-2019 17:20

ANALYTICAL REPORT
WorkOrder:HS19040237
Lab ID:HS19040237-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 08-Apr-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	08-Apr-2019 23:22
Arsenic	U		0.00200	0.0100	mg/L	5	08-Apr-2019 23:22
Cadmium	**0.00591**	J	**0.00100**	**0.0100**	**mg/L**	5	08-Apr-2019 23:22
Calcium	**474**		**0.170**	**2.50**	**mg/L**	5	08-Apr-2019 23:22
Iron	**2.06**		**0.0600**	**1.00**	**mg/L**	5	08-Apr-2019 23:22
Lead	U		0.00300	0.0100	mg/L	5	08-Apr-2019 23:22
Magnesium	**290**		**0.0500**	**1.00**	**mg/L**	5	08-Apr-2019 23:22
Potassium	**17.7**		**0.0900**	**1.00**	**mg/L**	5	08-Apr-2019 23:22
Selenium	**0.00944**	J	**0.00550**	**0.0100**	**mg/L**	5	08-Apr-2019 23:22
Sodium	**1,640**		**1.40**	**20.0**	**mg/L**	100	09-Apr-2019 13:26

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190327-DGW-MW11-PV40mid-control-D
Collection Date: 27-Mar-2019 16:45

ANALYTICAL REPORT
WorkOrder:HS19040237
Lab ID:HS19040237-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 08-Apr-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	08-Apr-2019 23:24
Arsenic	U		0.00200	0.0100	mg/L	5	08-Apr-2019 23:24
Cadmium	**0.00807**	J	**0.00100**	**0.0100**	**mg/L**	5	08-Apr-2019 23:24
Calcium	**477**		**0.170**	**2.50**	**mg/L**	5	08-Apr-2019 23:24
Iron	U		0.0600	1.00	mg/L	5	08-Apr-2019 23:24
Lead	U		0.00300	0.0100	mg/L	5	08-Apr-2019 23:24
Magnesium	**289**		**0.0500**	**1.00**	**mg/L**	5	08-Apr-2019 23:24
Potassium	**18.1**		**0.0900**	**1.00**	**mg/L**	5	08-Apr-2019 23:24
Selenium	**0.00725**	J	**0.00550**	**0.0100**	**mg/L**	5	08-Apr-2019 23:24
Sodium	**1,730**		**1.40**	**20.0**	**mg/L**	100	09-Apr-2019 13:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190327-DGW-MW11-PV40mid-30-D
Collection Date: 27-Mar-2019 16:45

ANALYTICAL REPORT
WorkOrder:HS19040237
Lab ID:HS19040237-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 08-Apr-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	08-Apr-2019 23:27
Arsenic	U		0.00200	0.0100	mg/L	5	08-Apr-2019 23:27
Cadmium	U		0.00100	0.0100	mg/L	5	08-Apr-2019 23:27
Calcium	**405**		**0.170**	**2.50**	**mg/L**	5	08-Apr-2019 23:27
Iron	**0.306**	J	**0.0600**	**1.00**	**mg/L**	5	08-Apr-2019 23:27
Lead	U		0.00300	0.0100	mg/L	5	08-Apr-2019 23:27
Magnesium	**294**		**0.0500**	**1.00**	**mg/L**	5	08-Apr-2019 23:27
Potassium	**18.6**		**0.0900**	**1.00**	**mg/L**	5	08-Apr-2019 23:27
Selenium	**0.0117**		**0.00550**	**0.0100**	**mg/L**	5	08-Apr-2019 23:27
Sodium	**1,740**		**1.40**	**20.0**	**mg/L**	100	09-Apr-2019 13:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190327-DGW-MW11-PV40mid-35-D
Collection Date: 27-Mar-2019 16:45

ANALYTICAL REPORT
WorkOrder:HS19040237
Lab ID:HS19040237-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 08-Apr-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	08-Apr-2019 23:29
Arsenic	U		0.00200	0.0100	mg/L	5	08-Apr-2019 23:29
Cadmium	U		0.00100	0.0100	mg/L	5	08-Apr-2019 23:29
Calcium	**381**		**0.170**	**2.50**	**mg/L**	5	08-Apr-2019 23:29
Iron	**0.297**	J	**0.0600**	**1.00**	**mg/L**	5	08-Apr-2019 23:29
Lead	U		0.00300	0.0100	mg/L	5	08-Apr-2019 23:29
Magnesium	**289**		**0.0500**	**1.00**	**mg/L**	5	08-Apr-2019 23:29
Potassium	**18.4**		**0.0900**	**1.00**	**mg/L**	5	08-Apr-2019 23:29
Selenium	**0.00743**	J	**0.00550**	**0.0100**	**mg/L**	5	08-Apr-2019 23:29
Sodium	**1,720**		**1.40**	**20.0**	**mg/L**	100	09-Apr-2019 13:33

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190327-DGW-MW11-PV40mid-40-D
Collection Date: 27-Mar-2019 16:45

ANALYTICAL REPORT
WorkOrder:HS19040237
Lab ID:HS19040237-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 08-Apr-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	08-Apr-2019 23:31
Arsenic	U		0.00200	0.0100	mg/L	5	08-Apr-2019 23:31
Cadmium	U		0.00100	0.0100	mg/L	5	08-Apr-2019 23:31
Calcium	**339**		**0.170**	**2.50**	**mg/L**	5	08-Apr-2019 23:31
Iron	U		0.0600	1.00	mg/L	5	08-Apr-2019 23:31
Lead	U		0.00300	0.0100	mg/L	5	08-Apr-2019 23:31
Magnesium	**293**		**0.0500**	**1.00**	**mg/L**	5	08-Apr-2019 23:31
Potassium	**18.6**		**0.0900**	**1.00**	**mg/L**	5	08-Apr-2019 23:31
Selenium	**0.0116**		**0.00550**	**0.0100**	**mg/L**	5	08-Apr-2019 23:31
Sodium	**1,760**		**1.40**	**20.0**	**mg/L**	100	09-Apr-2019 13:35

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190326-DGW-MW11-PV40out-control-T
Collection Date: 26-Mar-2019 12:30

ANALYTICAL REPORT
WorkOrder:HS19040237
Lab ID:HS19040237-11
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,290**		**2.00**	**2.00**	**mg/L**	1	10-Apr-2019 15:15
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 08-Apr-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	09-Apr-2019 01:15
Arsenic	U		0.00200	0.0100	mg/L	5	09-Apr-2019 01:15
Cadmium	**0.00764**	J	**0.00100**	**0.0100**	**mg/L**	5	09-Apr-2019 01:15
Calcium	**465**		**0.170**	**2.50**	**mg/L**	5	09-Apr-2019 01:15
Iron	U		0.0600	1.00	mg/L	5	09-Apr-2019 01:15
Lead	U		0.00300	0.0100	mg/L	5	09-Apr-2019 01:15
Magnesium	**274**		**0.0500**	**1.00**	**mg/L**	5	09-Apr-2019 01:15
Potassium	**17.5**		**0.0900**	**1.00**	**mg/L**	5	09-Apr-2019 01:15
Selenium	U		0.00550	0.0100	mg/L	5	09-Apr-2019 01:15
Sodium	**1,450**		**1.40**	**20.0**	**mg/L**	100	09-Apr-2019 14:11

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190326-DGW-MW11-PV40out-30-T
Collection Date: 26-Mar-2019 12:30

ANALYTICAL REPORT
WorkOrder:HS19040237
Lab ID:HS19040237-12
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**1,920**		**2.00**	**2.00**	**mg/L**	1	10-Apr-2019 15:15
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 08-Apr-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	09-Apr-2019 01:17
Arsenic	U		0.00200	0.0100	mg/L	5	09-Apr-2019 01:17
Cadmium	U		0.00100	0.0100	mg/L	5	09-Apr-2019 01:17
Calcium	**312**		**0.170**	**2.50**	**mg/L**	5	09-Apr-2019 01:17
Iron	**0.743**	J	**0.0600**	**1.00**	**mg/L**	5	09-Apr-2019 01:17
Lead	U		0.00300	0.0100	mg/L	5	09-Apr-2019 01:17
Magnesium	**277**		**0.0500**	**1.00**	**mg/L**	5	09-Apr-2019 01:17
Potassium	**18.2**		**0.0900**	**1.00**	**mg/L**	5	09-Apr-2019 01:17
Selenium	U		0.00550	0.0100	mg/L	5	09-Apr-2019 01:17
Sodium	**1,730**		**1.40**	**20.0**	**mg/L**	100	09-Apr-2019 14:14

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190326-DGW-MW11-PV40out-35-T
Collection Date: 26-Mar-2019 12:30

ANALYTICAL REPORT
WorkOrder:HS19040237
Lab ID:HS19040237-13
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**1,960**		**2.00**	**2.00**	**mg/L**	1	10-Apr-2019 15:15
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 08-Apr-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	09-Apr-2019 01:19
Arsenic	U		0.00200	0.0100	mg/L	5	09-Apr-2019 01:19
Cadmium	U		0.00100	0.0100	mg/L	5	09-Apr-2019 01:19
Calcium	**317**		**0.170**	**2.50**	**mg/L**	5	09-Apr-2019 01:19
Iron	**1.65**		**0.0600**	**1.00**	**mg/L**	5	09-Apr-2019 01:19
Lead	U		0.00300	0.0100	mg/L	5	09-Apr-2019 01:19
Magnesium	**284**		**0.0500**	**1.00**	**mg/L**	5	09-Apr-2019 01:19
Potassium	**18.5**		**0.0900**	**1.00**	**mg/L**	5	09-Apr-2019 01:19
Selenium	U		0.00550	0.0100	mg/L	5	09-Apr-2019 01:19
Sodium	**1,690**		**1.40**	**20.0**	**mg/L**	100	09-Apr-2019 14:16

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190326-DGW-MW11-PV40out-40-T
Collection Date: 26-Mar-2019 12:30

ANALYTICAL REPORT
WorkOrder:HS19040237
Lab ID:HS19040237-14
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**1,880**		**2.00**	**2.00**	**mg/L**	1	10-Apr-2019 15:15
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 08-Apr-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	09-Apr-2019 01:26
Arsenic	U		0.00200	0.0100	mg/L	5	09-Apr-2019 01:26
Cadmium	U		0.00100	0.0100	mg/L	5	09-Apr-2019 01:26
Calcium	**286**		**0.170**	**2.50**	**mg/L**	5	09-Apr-2019 01:26
Iron	**1.32**		**0.0600**	**1.00**	**mg/L**	5	09-Apr-2019 01:26
Lead	U		0.00300	0.0100	mg/L	5	09-Apr-2019 01:26
Magnesium	**283**		**0.0500**	**1.00**	**mg/L**	5	09-Apr-2019 01:26
Potassium	**18.4**		**0.0900**	**1.00**	**mg/L**	5	09-Apr-2019 01:26
Selenium	U		0.00550	0.0100	mg/L	5	09-Apr-2019 01:26
Sodium	**1,690**		**1.40**	**20.0**	**mg/L**	100	09-Apr-2019 14:18

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190327-DGW-MW11-PV40inlet-control-T
Collection Date: 27-Mar-2019 17:20

ANALYTICAL REPORT
WorkOrder:HS19040237
Lab ID:HS19040237-15
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,340**		**2.00**	**2.00**	**mg/L**	1	10-Apr-2019 15:15
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 08-Apr-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	09-Apr-2019 01:28
Arsenic	U		0.00200	0.0100	mg/L	5	09-Apr-2019 01:28
Cadmium	**0.00646**	J	**0.00100**	**0.0100**	**mg/L**	5	09-Apr-2019 01:28
Calcium	**477**		**0.170**	**2.50**	**mg/L**	5	09-Apr-2019 01:28
Iron	**4.24**		**0.0600**	**1.00**	**mg/L**	5	09-Apr-2019 01:28
Lead	U		0.00300	0.0100	mg/L	5	09-Apr-2019 01:28
Magnesium	**280**		**0.0500**	**1.00**	**mg/L**	5	09-Apr-2019 01:28
Potassium	**18.2**		**0.0900**	**1.00**	**mg/L**	5	09-Apr-2019 01:28
Selenium	U		0.00550	0.0100	mg/L	5	09-Apr-2019 01:28
Sodium	**1,670**		**1.40**	**20.0**	**mg/L**	100	09-Apr-2019 14:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190327-DGW-MW11-PV40inlet-30-35-40-T
Collection Date: 27-Mar-2019 17:20

ANALYTICAL REPORT
WorkOrder:HS19040237
Lab ID:HS19040237-16
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,360**		**2.00**	**2.00**	**mg/L**	1	10-Apr-2019 15:15
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 08-Apr-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	09-Apr-2019 01:30
Arsenic	U		0.00200	0.0100	mg/L	5	09-Apr-2019 01:30
Cadmium	**0.00605**	J	**0.00100**	**0.0100**	**mg/L**	5	09-Apr-2019 01:30
Calcium	**475**		**0.170**	**2.50**	**mg/L**	5	09-Apr-2019 01:30
Iron	**7.88**		**0.0600**	**1.00**	**mg/L**	5	09-Apr-2019 01:30
Lead	**0.00405**	J	**0.00300**	**0.0100**	**mg/L**	5	09-Apr-2019 01:30
Magnesium	**284**		**0.0500**	**1.00**	**mg/L**	5	09-Apr-2019 01:30
Potassium	**17.9**		**0.0900**	**1.00**	**mg/L**	5	09-Apr-2019 01:30
Selenium	U		0.00550	0.0100	mg/L	5	09-Apr-2019 01:30
Sodium	**1,690**		**1.40**	**20.0**	**mg/L**	100	09-Apr-2019 14:33

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190327-DGW-MW11-PV40mid-control-T
Collection Date: 27-Mar-2019 16:45

ANALYTICAL REPORT
WorkOrder:HS19040237
Lab ID:HS19040237-17
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,480**		**2.00**	**2.00**	**mg/L**	1	10-Apr-2019 15:15
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 08-Apr-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	09-Apr-2019 01:33
Arsenic	U		0.00200	0.0100	mg/L	5	09-Apr-2019 01:33
Cadmium	**0.00848**	J	**0.00100**	**0.0100**	**mg/L**	5	09-Apr-2019 01:33
Calcium	**503**		**0.170**	**2.50**	**mg/L**	5	09-Apr-2019 01:33
Iron	U		0.0600	1.00	mg/L	5	09-Apr-2019 01:33
Lead	U		0.00300	0.0100	mg/L	5	09-Apr-2019 01:33
Magnesium	**298**		**0.0500**	**1.00**	**mg/L**	5	09-Apr-2019 01:33
Potassium	**18.9**		**0.0900**	**1.00**	**mg/L**	5	09-Apr-2019 01:33
Selenium	U		0.00550	0.0100	mg/L	5	09-Apr-2019 01:33
Sodium	**1,800**		**1.40**	**20.0**	**mg/L**	100	09-Apr-2019 14:35

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190327-DGW-MW11-PV40mid-30-T
Collection Date: 27-Mar-2019 16:45

ANALYTICAL REPORT
WorkOrder:HS19040237
Lab ID:HS19040237-18
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,370**		**2.00**	**2.00**	**mg/L**	1	10-Apr-2019 15:15
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 08-Apr-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	09-Apr-2019 01:35
Arsenic	U		0.00200	0.0100	mg/L	5	09-Apr-2019 01:35
Cadmium	U		0.00100	0.0100	mg/L	5	09-Apr-2019 01:35
Calcium	**430**		**0.170**	**2.50**	**mg/L**	5	09-Apr-2019 01:35
Iron	**15.0**		**0.0600**	**1.00**	**mg/L**	5	09-Apr-2019 01:35
Lead	U		0.00300	0.0100	mg/L	5	09-Apr-2019 01:35
Magnesium	**314**		**0.0500**	**1.00**	**mg/L**	5	09-Apr-2019 01:35
Potassium	**19.8**		**0.0900**	**1.00**	**mg/L**	5	09-Apr-2019 01:35
Selenium	U		0.00550	0.0100	mg/L	5	09-Apr-2019 01:35
Sodium	**1,820**		**1.40**	**20.0**	**mg/L**	100	09-Apr-2019 14:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190327-DGW-MW11-PV40mid-35-T
Collection Date: 27-Mar-2019 16:45

ANALYTICAL REPORT
WorkOrder:HS19040237
Lab ID:HS19040237-19
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,210**		**2.00**	**2.00**	**mg/L**	1	10-Apr-2019 15:15
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 08-Apr-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	09-Apr-2019 01:37
Arsenic	U		0.00200	0.0100	mg/L	5	09-Apr-2019 01:37
Cadmium	U		0.00100	0.0100	mg/L	5	09-Apr-2019 01:37
Calcium	**393**		**0.170**	**2.50**	**mg/L**	5	09-Apr-2019 01:37
Iron	**9.42**		**0.0600**	**1.00**	**mg/L**	5	09-Apr-2019 01:37
Lead	U		0.00300	0.0100	mg/L	5	09-Apr-2019 01:37
Magnesium	**299**		**0.0500**	**1.00**	**mg/L**	5	09-Apr-2019 01:37
Potassium	**19.0**		**0.0900**	**1.00**	**mg/L**	5	09-Apr-2019 01:37
Selenium	U		0.00550	0.0100	mg/L	5	09-Apr-2019 01:37
Sodium	**1,740**		**1.40**	**20.0**	**mg/L**	100	09-Apr-2019 14:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190327-DGW-MW11-PV40mid-40-T
Collection Date: 27-Mar-2019 16:45

ANALYTICAL REPORT
WorkOrder:HS19040237
Lab ID:HS19040237-20
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,030**		**2.00**	**2.00**	**mg/L**	1	10-Apr-2019 15:15
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 08-Apr-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	09-Apr-2019 01:39
Arsenic	U		0.00200	0.0100	mg/L	5	09-Apr-2019 01:39
Cadmium	U		0.00100	0.0100	mg/L	5	09-Apr-2019 01:39
Calcium	**343**		**0.170**	**2.50**	**mg/L**	5	09-Apr-2019 01:39
Iron	**2.27**		**0.0600**	**1.00**	**mg/L**	5	09-Apr-2019 01:39
Lead	U		0.00300	0.0100	mg/L	5	09-Apr-2019 01:39
Magnesium	**286**		**0.0500**	**1.00**	**mg/L**	5	09-Apr-2019 01:39
Potassium	**18.8**		**0.0900**	**1.00**	**mg/L**	5	09-Apr-2019 01:39
Selenium	U		0.00550	0.0100	mg/L	5	09-Apr-2019 01:39
Sodium	**1,760**		**1.40**	**20.0**	**mg/L**	100	09-Apr-2019 14:44

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates **ANALYTICAL REPORT**
Project: Exide Column Studies WorkOrder:HS19040237
Sample ID: 20190327-DGW-MW11-PV40inlet-control-DUP-D Lab ID:HS19040237-21
Collection Date: 27-Mar-2019 17:20 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 08-Apr-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	08-Apr-2019 23:33
Arsenic	U		0.00200	0.0100	mg/L	5	08-Apr-2019 23:33
Cadmium	**0.00683**	J	**0.00100**	**0.0100**	**mg/L**	5	08-Apr-2019 23:33
Calcium	**475**		**0.170**	**2.50**	**mg/L**	5	08-Apr-2019 23:33
Iron	**1.58**		**0.0600**	**1.00**	**mg/L**	5	08-Apr-2019 23:33
Lead	U		0.00300	0.0100	mg/L	5	08-Apr-2019 23:33
Magnesium	**286**		**0.0500**	**1.00**	**mg/L**	5	08-Apr-2019 23:33
Potassium	**18.0**		**0.0900**	**1.00**	**mg/L**	5	08-Apr-2019 23:33
Selenium	**0.0106**		**0.00550**	**0.0100**	**mg/L**	5	08-Apr-2019 23:33
Sodium	**1,650**		**1.40**	**20.0**	**mg/L**	100	09-Apr-2019 13:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
ANALYTICAL REPORT
Project: Exide Column Studies
WorkOrder:HS19040237
Sample ID: 20190327-DGW-MW11-PV40inlet-control-DUP-T
Lab ID:HS19040237-22
Collection Date: 27-Mar-2019 17:20
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**2,480**		**2.00**	**2.00**	**mg/L**	1	10-Apr-2019 15:15
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 08-Apr-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	09-Apr-2019 01:41
Arsenic	U		0.00200	0.0100	mg/L	5	09-Apr-2019 01:41
Cadmium	**0.00722**	J	**0.00100**	**0.0100**	**mg/L**	5	09-Apr-2019 01:41
Calcium	**502**		**0.170**	**2.50**	**mg/L**	5	09-Apr-2019 01:41
Iron	**4.47**		**0.0600**	**1.00**	**mg/L**	5	09-Apr-2019 01:41
Lead	U		0.00300	0.0100	mg/L	5	09-Apr-2019 01:41
Magnesium	**298**		**0.0500**	**1.00**	**mg/L**	5	09-Apr-2019 01:41
Potassium	**19.0**		**0.0900**	**1.00**	**mg/L**	5	09-Apr-2019 01:41
Selenium	U		0.00550	0.0100	mg/L	5	09-Apr-2019 01:41
Sodium	**1,740**		**1.40**	**20.0**	**mg/L**	100	09-Apr-2019 14:46

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040237

Batch ID: 139585 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19040237-11	1	10	10 (mL)	1
HS19040237-12	1	10	10 (mL)	1
HS19040237-13	1	10	10 (mL)	1
HS19040237-14	1	10	10 (mL)	1
HS19040237-15	1	10	10 (mL)	1
HS19040237-16	1	10	10 (mL)	1
HS19040237-17	1	10	10 (mL)	1
HS19040237-18	1	10	10 (mL)	1
HS19040237-19	1	10	10 (mL)	1
HS19040237-20	1	10	10 (mL)	1
HS19040237-22	1	10	10 (mL)	1

Batch ID: 139589 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19040237-01	1	10	10 (mL)	1
HS19040237-02	1	10	10 (mL)	1
HS19040237-03	1	10	10 (mL)	1
HS19040237-04	1	10	10 (mL)	1
HS19040237-05	1	10	10 (mL)	1
HS19040237-06	1	10	10 (mL)	1
HS19040237-07	1	10	10 (mL)	1
HS19040237-08	1	10	10 (mL)	1
HS19040237-09	1	10	10 (mL)	1
HS19040237-10	1	10	10 (mL)	1
HS19040237-21	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040237

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 139585	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19040237-11	20190326-DGW-MW11-PV40out-control-T	26 Mar 2019 12:30		08 Apr 2019 11:00	09 Apr 2019 14:11	100
HS19040237-11	20190326-DGW-MW11-PV40out-control-T	26 Mar 2019 12:30		08 Apr 2019 11:00	09 Apr 2019 01:15	5
HS19040237-12	20190326-DGW-MW11-PV40out-30-T	26 Mar 2019 12:30		08 Apr 2019 11:00	09 Apr 2019 14:14	100
HS19040237-12	20190326-DGW-MW11-PV40out-30-T	26 Mar 2019 12:30		08 Apr 2019 11:00	09 Apr 2019 01:17	5
HS19040237-13	20190326-DGW-MW11-PV40out-35-T	26 Mar 2019 12:30		08 Apr 2019 11:00	09 Apr 2019 14:16	100
HS19040237-13	20190326-DGW-MW11-PV40out-35-T	26 Mar 2019 12:30		08 Apr 2019 11:00	09 Apr 2019 01:19	5
HS19040237-14	20190326-DGW-MW11-PV40out-40-T	26 Mar 2019 12:30		08 Apr 2019 11:00	09 Apr 2019 14:18	100
HS19040237-14	20190326-DGW-MW11-PV40out-40-T	26 Mar 2019 12:30		08 Apr 2019 11:00	09 Apr 2019 01:26	5
HS19040237-15	20190327-DGW-MW11-PV40inlet-control-T	27 Mar 2019 17:20		08 Apr 2019 11:00	09 Apr 2019 14:31	100
HS19040237-15	20190327-DGW-MW11-PV40inlet-control-T	27 Mar 2019 17:20		08 Apr 2019 11:00	09 Apr 2019 01:28	5
HS19040237-16	20190327-DGW-MW11-PV40inlet-30-35-40-T	27 Mar 2019 17:20		08 Apr 2019 11:00	09 Apr 2019 14:33	100
HS19040237-16	20190327-DGW-MW11-PV40inlet-30-35-40-T	27 Mar 2019 17:20		08 Apr 2019 11:00	09 Apr 2019 01:30	5
HS19040237-17	20190327-DGW-MW11-PV40mid-control-T	27 Mar 2019 16:45		08 Apr 2019 11:00	09 Apr 2019 14:35	100
HS19040237-17	20190327-DGW-MW11-PV40mid-control-T	27 Mar 2019 16:45		08 Apr 2019 11:00	09 Apr 2019 01:33	5
HS19040237-18	20190327-DGW-MW11-PV40mid-30-T	27 Mar 2019 16:45		08 Apr 2019 11:00	09 Apr 2019 14:40	100
HS19040237-18	20190327-DGW-MW11-PV40mid-30-T	27 Mar 2019 16:45		08 Apr 2019 11:00	09 Apr 2019 01:35	5
HS19040237-19	20190327-DGW-MW11-PV40mid-35-T	27 Mar 2019 16:45		08 Apr 2019 11:00	09 Apr 2019 14:42	100
HS19040237-19	20190327-DGW-MW11-PV40mid-35-T	27 Mar 2019 16:45		08 Apr 2019 11:00	09 Apr 2019 01:37	5
HS19040237-20	20190327-DGW-MW11-PV40mid-40-T	27 Mar 2019 16:45		08 Apr 2019 11:00	09 Apr 2019 14:44	100
HS19040237-20	20190327-DGW-MW11-PV40mid-40-T	27 Mar 2019 16:45		08 Apr 2019 11:00	09 Apr 2019 01:39	5
HS19040237-22	20190327-DGW-MW11-PV40inlet-control-DUP-T	27 Mar 2019 17:20		08 Apr 2019 11:00	09 Apr 2019 14:46	100
HS19040237-22	20190327-DGW-MW11-PV40inlet-control-DUP-T	27 Mar 2019 17:20		08 Apr 2019 11:00	09 Apr 2019 01:41	5

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040237

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 139589	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS19040237-01	20190326-DGW-MW11-PV40out-control-D	26 Mar 2019 12:30		08 Apr 2019 11:00	09 Apr 2019 13:06	100
HS19040237-01	20190326-DGW-MW11-PV40out-control-D	26 Mar 2019 12:30		08 Apr 2019 11:00	08 Apr 2019 22:58	5
HS19040237-02	20190326-DGW-MW11-PV40out-30-D	26 Mar 2019 12:30		08 Apr 2019 11:00	09 Apr 2019 13:13	100
HS19040237-02	20190326-DGW-MW11-PV40out-30-D	26 Mar 2019 12:30		08 Apr 2019 11:00	08 Apr 2019 23:14	5
HS19040237-03	20190326-DGW-MW11-PV40out-35-D	26 Mar 2019 12:30		08 Apr 2019 11:00	09 Apr 2019 13:15	100
HS19040237-03	20190326-DGW-MW11-PV40out-35-D	26 Mar 2019 12:30		08 Apr 2019 11:00	08 Apr 2019 23:16	5
HS19040237-04	20190326-DGW-MW11-PV40out-40-D	26 Mar 2019 12:30		08 Apr 2019 11:00	09 Apr 2019 13:17	100
HS19040237-04	20190326-DGW-MW11-PV40out-40-D	26 Mar 2019 12:30		08 Apr 2019 11:00	08 Apr 2019 23:18	5
HS19040237-05	20190327-DGW-MW11-PV40inlet-control-D	27 Mar 2019 17:20		08 Apr 2019 11:00	09 Apr 2019 13:24	100
HS19040237-05	20190327-DGW-MW11-PV40inlet-control-D	27 Mar 2019 17:20		08 Apr 2019 11:00	08 Apr 2019 23:20	5
HS19040237-06	20190327-DGW-MW11-PV40inlet-30-35-40-D	27 Mar 2019 17:20		08 Apr 2019 11:00	09 Apr 2019 13:26	100
HS19040237-06	20190327-DGW-MW11-PV40inlet-30-35-40-D	27 Mar 2019 17:20		08 Apr 2019 11:00	08 Apr 2019 23:22	5
HS19040237-07	20190327-DGW-MW11-PV40mid-control-D	27 Mar 2019 16:45		08 Apr 2019 11:00	09 Apr 2019 13:28	100
HS19040237-07	20190327-DGW-MW11-PV40mid-control-D	27 Mar 2019 16:45		08 Apr 2019 11:00	08 Apr 2019 23:24	5
HS19040237-08	20190327-DGW-MW11-PV40mid-30-D	27 Mar 2019 16:45		08 Apr 2019 11:00	09 Apr 2019 13:31	100
HS19040237-08	20190327-DGW-MW11-PV40mid-30-D	27 Mar 2019 16:45		08 Apr 2019 11:00	08 Apr 2019 23:27	5
HS19040237-09	20190327-DGW-MW11-PV40mid-35-D	27 Mar 2019 16:45		08 Apr 2019 11:00	09 Apr 2019 13:33	100
HS19040237-09	20190327-DGW-MW11-PV40mid-35-D	27 Mar 2019 16:45		08 Apr 2019 11:00	08 Apr 2019 23:29	5
HS19040237-10	20190327-DGW-MW11-PV40mid-40-D	27 Mar 2019 16:45		08 Apr 2019 11:00	09 Apr 2019 13:35	100
HS19040237-10	20190327-DGW-MW11-PV40mid-40-D	27 Mar 2019 16:45		08 Apr 2019 11:00	08 Apr 2019 23:31	5
HS19040237-21	20190327-DGW-MW11-PV40inlet-control-DUP-D	27 Mar 2019 17:20		08 Apr 2019 11:00	09 Apr 2019 13:37	100
HS19040237-21	20190327-DGW-MW11-PV40inlet-control-DUP-D	27 Mar 2019 17:20		08 Apr 2019 11:00	08 Apr 2019 23:33	5

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040237

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R336341	**Test Name :** HARDNESS, TOTAL AS CACO3 BY SM2340B			**Matrix:** Groundwater		
HS19040237-11	20190326-DGW-MW11-PV40out-control-T	26 Mar 2019 12:30			10 Apr 2019 15:15	1
HS19040237-12	20190326-DGW-MW11-PV40out-30-T	26 Mar 2019 12:30			10 Apr 2019 15:15	1
HS19040237-13	20190326-DGW-MW11-PV40out-35-T	26 Mar 2019 12:30			10 Apr 2019 15:15	1
HS19040237-14	20190326-DGW-MW11-PV40out-40-T	26 Mar 2019 12:30			10 Apr 2019 15:15	1
HS19040237-15	20190327-DGW-MW11-PV40inlet-control-T	27 Mar 2019 17:20			10 Apr 2019 15:15	1
HS19040237-16	20190327-DGW-MW11-PV40inlet-30-35-40-T	27 Mar 2019 17:20			10 Apr 2019 15:15	1
HS19040237-17	20190327-DGW-MW11-PV40mid-control-T	27 Mar 2019 16:45			10 Apr 2019 15:15	1
HS19040237-18	20190327-DGW-MW11-PV40mid-30-T	27 Mar 2019 16:45			10 Apr 2019 15:15	1
HS19040237-19	20190327-DGW-MW11-PV40mid-35-T	27 Mar 2019 16:45			10 Apr 2019 15:15	1
HS19040237-20	20190327-DGW-MW11-PV40mid-40-T	27 Mar 2019 16:45			10 Apr 2019 15:15	1
HS19040237-22	20190327-DGW-MW11-PV40inlet-control-DUP-T	27 Mar 2019 17:20			10 Apr 2019 15:15	1

WorkOrder: HS19040237
InstrumentID: ICPMS05
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000493	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000344	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000538	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0387	0.0340	0.500
A	Iron	7439-89-6	0.0500	0.0487	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000878	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0578	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0466	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00187	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0540	0.0140	0.200

WorkOrder: HS19040237
InstrumentID: ICPMS05
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000493	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000344	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000538	0.000200	0.00200
A	Calcium	7440-70-2	0.0500	0.0387	0.0340	0.500
A	Iron	7439-89-6	0.0500	0.0487	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000878	0.000600	0.00200
A	Magnesium	7439-95-4	0.0500	0.0578	0.0100	0.200
A	Potassium	7440-09-7	0.0500	0.0466	0.0180	0.200
A	Selenium	7782-49-2	0.00250	0.00187	0.00110	0.00200
A	Sodium	7440-23-5	0.0500	0.0540	0.0140	0.200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040237

QC BATCH REPORT NEW

Batch ID: 139585 (0) **Instrument: ICPMS05** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLK-139585** Units: **mg/L** Analysis Date: **09-Apr-2019 00:40**
Client ID: Run ID: **ICPMS05_336145** SeqNo: **5027457** PrepDate: **08-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	U	0.200								
Potassium	U	0.200								
Selenium	U	0.00200								

MBLK Sample ID: **MBLK-139585** Units: **mg/L** Analysis Date: **09-Apr-2019 13:58**
Client ID: Run ID: **ICPMS05_336226** SeqNo: **5028342** PrepDate: **08-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	U	0.200								

LCS Sample ID: **LCS-139585** Units: **mg/L** Analysis Date: **09-Apr-2019 00:42**
Client ID: Run ID: **ICPMS05_336145** SeqNo: **5027458** PrepDate: **08-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05264	0.00200	0.05	0	105	80 - 120				
Arsenic	0.05265	0.00200	0.05	0	105	80 - 120				
Cadmium	0.05215	0.00200	0.05	0	104	80 - 120				
Calcium	5.246	0.500	5	0	105	80 - 120				
Iron	5.142	0.200	5	0	103	80 - 120				
Lead	0.05171	0.00200	0.05	0	103	80 - 120				
Magnesium	5.052	0.200	5	0	101	80 - 120				
Potassium	5.121	0.200	5	0	102	80 - 120				
Selenium	0.05273	0.00200	0.05	0	105	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040237

QC BATCH REPORT NEW

Batch ID: 139585 (0) **Instrument: ICPMS05** **Method: ICP-MS METALS BY SW6020A**

LCS Sample ID: **LCS-139585** Units: **mg/L** Analysis Date: **09-Apr-2019 14:00**
Client ID: Run ID: **ICPMS05_336226** SeqNo: **5028343** PrepDate: **08-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	5.23	0.200	5	0	105	80 - 120				

MS Sample ID: **HS19040270-07MS** Units: **mg/L** Analysis Date: **09-Apr-2019 00:49**
Client ID: Run ID: **ICPMS05_336145** SeqNo: **5027461** PrepDate: **08-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05387	0.00200	0.05	0.000442	107	80 - 120				
Arsenic	0.05497	0.00200	0.05	0	110	80 - 120				
Cadmium	0.05039	0.00200	0.05	0.000121	101	80 - 120				
Calcium	204.2	0.500	5	204.9	-15.6	80 - 120				SEO
Iron	5.273	0.200	5	0.04924	104	80 - 120				
Lead	0.0521	0.00200	0.05	0.00018	104	80 - 120				
Magnesium	57.87	0.200	5	52.15	114	80 - 120				O
Potassium	6.912	0.200	5	1.732	104	80 - 120				
Selenium	0.05459	0.00200	0.05	0.000263	109	80 - 120				
Sodium	515.9	0.200	5	504.3	233	80 - 120				SEO

MSD Sample ID: **HS19040270-07MSD** Units: **mg/L** Analysis Date: **09-Apr-2019 00:51**
Client ID: Run ID: **ICPMS05_336145** SeqNo: **5027462** PrepDate: **08-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05091	0.00200	0.05	0.000442	101	80 - 120	0.05387	5.64	20	
Arsenic	0.05178	0.00200	0.05	0	104	80 - 120	0.05497	5.97	20	
Cadmium	0.05061	0.00200	0.05	0.000121	101	80 - 120	0.05039	0.442	20	
Calcium	205.3	0.500	5	204.9	6.54	80 - 120	204.2	0.542	20	SEO
Iron	5.049	0.200	5	0.04924	100.0	80 - 120	5.273	4.34	20	
Lead	0.05155	0.00200	0.05	0.00018	103	80 - 120	0.0521	1.06	20	
Magnesium	57.21	0.200	5	52.15	101	80 - 120	57.87	1.14	20	O
Potassium	6.76	0.200	5	1.732	101	80 - 120	6.912	2.23	20	
Selenium	0.05129	0.00200	0.05	0.000263	102	80 - 120	0.05459	6.24	20	
Sodium	505.8	0.200	5	504.3	30.6	80 - 120	515.9	1.98	20	SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040237

QC BATCH REPORT NEW

Batch ID: 139585 (0) **Instrument: ICPMS05** **Method: ICP-MS METALS BY SW6020A**

PDS Sample ID: **HS19040270-07PDS** Units: **mg/L** Analysis Date: **09-Apr-2019 00:53**
Client ID: Run ID: **ICPMS05_336145** SeqNo: **5027463** PrepDate: **08-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1047	0.00200	0.1	0.000442	104	75 - 125				
Arsenic	0.1045	0.00200	0.1	0	104	75 - 125				
Cadmium	0.09858	0.00200	0.1	0.000121	98.5	75 - 125				
Iron	10.14	0.200	10	0.04924	101	75 - 125				
Lead	0.1031	0.00200	0.1	0.00018	103	75 - 125				
Magnesium	60.56	0.200	10	52.15	84.1	75 - 125				O
Potassium	12.42	0.200	10	1.732	107	75 - 125				
Selenium	0.1033	0.00200	0.1	0.000263	103	75 - 125				

PDS Sample ID: **HS19040270-07PDS** Units: **mg/L** Analysis Date: **09-Apr-2019 14:07**
Client ID: Run ID: **ICPMS05_336226** SeqNo: **5028346** PrepDate: **08-Apr-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	242.3	2.50	50	183.7	117	75 - 125				
Sodium	554	1.00	50	494.4	119	75 - 125				O

SD Sample ID: **HS19040270-07SD** Units: **mg/L** Analysis Date: **09-Apr-2019 00:47**
Client ID: Run ID: **ICPMS05_336145** SeqNo: **5027460** PrepDate: **08-Apr-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000442	0	10	
Arsenic	U	0.0100					0	0	10	
Cadmium	U	0.0100					0.000121	0	10	
Iron	U	1.00					0.04924	0	10	
Lead	U	0.0100					0.00018	0	10	
Magnesium	48.59	1.00					52.15	6.84	10	
Potassium	1.659	1.00					1.732	4.22	10	
Selenium	U	0.0100					0.000263	0	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040237

QC BATCH REPORT NEW

Batch ID: 139585 (0) **Instrument: ICPMS05** **Method: ICP-MS METALS BY SW6020A**

SD Sample ID: **HS19040270-07SD** Units: **mg/L** Analysis Date: **09-Apr-2019 14:05**
Client ID: Run ID: **ICPMS05_336226** SeqNo: **5028345** PrepDate: **08-Apr-2019** DF: **25**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Calcium	187.3	12.5					183.7	1.98	10	
Sodium	503.8	5.00					494.4	1.91	10	

The following samples were analyzed in this batch:

HS19040237-11	HS19040237-12	HS19040237-13	HS19040237-14
HS19040237-15	HS19040237-16	HS19040237-17	HS19040237-18
HS19040237-19	HS19040237-20	HS19040237-22	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040237

QC BATCH REPORT NEW

Batch ID: 139589 (0) **Instrument: ICPMS05** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

MBLK Sample ID: **MBLKF1-139589** Units: **mg/L** Analysis Date: **08-Apr-2019 22:08**
Client ID: Run ID: **ICPMS05_336145** SeqNo: **5027030** PrepDate: **08-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	U	0.200								
Potassium	0.02414	0.200								J
Selenium	U	0.00200								
Sodium	0.06463	0.200								J

MBLK Sample ID: **MBLK-139589** Units: **mg/L** Analysis Date: **09-Apr-2019 00:38**
Client ID: Run ID: **ICPMS05_336145** SeqNo: **5027413** PrepDate: **08-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Calcium	U	0.500								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	U	0.200								
Potassium	U	0.200								
Selenium	U	0.00200								
Sodium	U	0.200								

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040237

QC BATCH REPORT NEW

Batch ID: 139589 (0) **Instrument: ICPMS05** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

LCS Sample ID: **LCS-139589** Units: **mg/L** Analysis Date: **08-Apr-2019 22:12**
Client ID: Run ID: **ICPMS05_336145** SeqNo: **5027032** PrepDate: **08-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05295	0.00200	0.05	0	106	80 - 120				
Arsenic	0.05311	0.00200	0.05	0	106	80 - 120				
Cadmium	0.0527	0.00200	0.05	0	105	80 - 120				
Calcium	5.414	0.500	5	0	108	80 - 120				
Iron	5.374	0.200	5	0	107	80 - 120				
Lead	0.05272	0.00200	0.05	0	105	80 - 120				
Magnesium	5.217	0.200	5	0	104	80 - 120				
Potassium	5.296	0.200	5	0	106	80 - 120				
Selenium	0.05683	0.00200	0.05	0	114	80 - 120				
Sodium	5.508	0.200	5	0	110	80 - 120				

MS Sample ID: **HS19040237-01MS** Units: **mg/L** Analysis Date: **08-Apr-2019 23:03**
Client ID: **20190326-DGW-MW11-PV40out-control-D** Run ID: **ICPMS05_336145** SeqNo: **5027041** PrepDate: **08-Apr-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05182	0.0100	0.05	0.002467	98.7	75 - 125				
Arsenic	0.05268	0.0100	0.05	0.00133	103	75 - 125				
Cadmium	0.06005	0.0100	0.05	0.008539	103	75 - 125				
Calcium	491.8	2.50	5	499.7	-158	75 - 125				SO
Iron	4.882	1.00	5	0.003244	97.6	75 - 125				
Lead	0.04949	0.0100	0.05	0.000203	98.6	75 - 125				
Magnesium	294.6	1.00	5	293.7	16.4	75 - 125				SO
Potassium	22.72	1.00	5	18.58	82.8	75 - 125				
Selenium	0.06066	0.0100	0.05	0.008256	105	75 - 125				
Sodium	1691	1.00	5	1699	-160	75 - 125				SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040237

QC BATCH REPORT NEW

Batch ID: 139589 (0) **Instrument:** ICPMS05 **Method:** DISSOLVED METALS BY SW6020A (DISSOLVED)

MSD Sample ID: **HS19040237-01MSD** Units: **mg/L** Analysis Date: **08-Apr-2019 23:05**
Client ID: **20190326-DGW-MW11-PV40out-control-D** Run ID: **ICPMS05_336145** SeqNo: **5027042** PrepDate: **08-Apr-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05075	0.0100	0.05	0.002467	96.6	75 - 125	0.05182	2.08	20	
Arsenic	0.05193	0.0100	0.05	0.00133	101	75 - 125	0.05268	1.44	20	
Cadmium	0.0592	0.0100	0.05	0.008539	101	75 - 125	0.06005	1.43	20	
Calcium	500.1	2.50	5	499.7	8.41	75 - 125	491.8	1.68	20	SO
Iron	5.011	1.00	5	0.003244	100	75 - 125	4.882	2.62	20	
Lead	0.04937	0.0100	0.05	0.000203	98.3	75 - 125	0.04949	0.259	20	
Magnesium	296.8	1.00	5	293.7	60.9	75 - 125	294.6	0.753	20	SO
Potassium	23.62	1.00	5	18.58	101	75 - 125	22.72	3.87	20	
Selenium	0.0501	0.0100	0.05	0.008256	83.7	75 - 125	0.06066	19.1	20	
Sodium	1683	1.00	5	1699	-321	75 - 125	1691	0.475	20	SEO

PDS Sample ID: **HS19040237-01PDS** Units: **mg/L** Analysis Date: **08-Apr-2019 23:07**
Client ID: **20190326-DGW-MW11-PV40out-control-D** Run ID: **ICPMS05_336145** SeqNo: **5027043** PrepDate: **08-Apr-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.4826	0.0100	0.5	0.002467	96.0	75 - 125				
Arsenic	0.5362	0.0100	0.5	0.00133	107	75 - 125				
Cadmium	0.5502	0.0100	0.5	0.008539	108	75 - 125				
Calcium	555.3	2.50	50	499.7	111	75 - 125				O
Iron	54.43	1.00	50	0.003244	109	75 - 125				
Lead	0.5184	0.0100	0.5	0.000203	104	75 - 125				
Magnesium	353.3	1.00	50	293.7	119	75 - 125				O
Potassium	72.69	1.00	50	18.58	108	75 - 125				
Selenium	0.5032	0.0100	0.5	0.008256	99.0	75 - 125				

PDS Sample ID: **HS19040237-01PDS** Units: **mg/L** Analysis Date: **09-Apr-2019 13:11**
Client ID: **20190326-DGW-MW11-PV40out-control-D** Run ID: **ICPMS05_336226** SeqNo: **5028228** PrepDate: **08-Apr-2019** DF: **100**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	2831	20.0	1000	1765	107	75 - 125				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040237

QC BATCH REPORT NEW

Batch ID: 139589 (0) **Instrument:** ICPMS05 **Method:** DISSOLVED METALS BY SW6020A (DISSOLVED)

SD Sample ID: **HS19040237-01SD** Units: **mg/L** Analysis Date: **08-Apr-2019 23:00**
Client ID: **20190326-DGW-MW11-PV40out-control-D** Run ID: **ICPMS05_336145** SeqNo: **5027040** PrepDate: **08-Apr-2019** DF: **25**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0500					0.002467	0	10	
Arsenic	U	0.0500					0.00133	0	10	
Cadmium	0.007098	0.0500					0.008539	0	10	J
Calcium	517.7	12.5					499.7	3.62	10	
Iron	U	5.00					0.003244	0	10	
Lead	U	0.0500					0.000203	0	10	
Magnesium	310.7	5.00					293.7	5.77	10	
Potassium	20.07	5.00					18.58	8	10	
Selenium	0.02853	0.0500					0.008256	0	10	J

SD Sample ID: **HS19040237-01SD** Units: **mg/L** Analysis Date: **09-Apr-2019 13:09**
Client ID: **20190326-DGW-MW11-PV40out-control-D** Run ID: **ICPMS05_336226** SeqNo: **5028227** PrepDate: **08-Apr-2019** DF: **500**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Sodium	1801	100					1765	2.04	10	

The following samples were analyzed in this batch:

HS19040237-01	HS19040237-02	HS19040237-03	HS19040237-04
HS19040237-05	HS19040237-06	HS19040237-07	HS19040237-08
HS19040237-09	HS19040237-10	HS19040237-21	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19040237**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
California	2919, 2018-2019	30-Apr-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19040237

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19040237-01	20190326-DGW-MW11-PV40out-control-D	Login	4/4/2019 10:55:44 AM	JRM	MET002
HS19040237-02	20190326-DGW-MW11-PV40out-30-D	Login	4/4/2019 10:55:44 AM	JRM	MET002
HS19040237-03	20190326-DGW-MW11-PV40out-35-D	Login	4/4/2019 10:55:44 AM	JRM	MET002
HS19040237-04	20190326-DGW-MW11-PV40out-40-D	Login	4/4/2019 10:55:44 AM	JRM	MET002
HS19040237-05	20190327-DGW-MW11-PV40inlet-control-D	Login	4/4/2019 10:55:44 AM	JRM	MET002
HS19040237-06	20190327-DGW-MW11-PV40inlet-30-35-40-D	Login	4/4/2019 10:55:44 AM	JRM	MET002
HS19040237-07	20190327-DGW-MW11-PV40mid-control-D	Login	4/4/2019 10:55:44 AM	JRM	MET002
HS19040237-08	20190327-DGW-MW11-PV40mid-30-D	Login	4/4/2019 10:55:44 AM	JRM	MET002
HS19040237-09	20190327-DGW-MW11-PV40mid-35-D	Login	4/4/2019 10:55:44 AM	JRM	MET002
HS19040237-10	20190327-DGW-MW11-PV40mid-40-D	Login	4/4/2019 10:55:44 AM	JRM	MET002
HS19040237-11	20190326-DGW-MW11-PV40out-control-T	Login	4/4/2019 10:55:44 AM	JRM	MET002
HS19040237-12	20190326-DGW-MW11-PV40out-30-T	Login	4/4/2019 10:55:44 AM	JRM	MET002
HS19040237-13	20190326-DGW-MW11-PV40out-35-T	Login	4/4/2019 10:55:44 AM	JRM	MET002
HS19040237-14	20190326-DGW-MW11-PV40out-40-T	Login	4/4/2019 10:55:44 AM	JRM	MET002
HS19040237-15	20190327-DGW-MW11-PV40inlet-control-T	Login	4/4/2019 10:55:44 AM	JRM	MET002
HS19040237-16	20190327-DGW-MW11-PV40inlet-30-35-40-T	Login	4/4/2019 10:55:44 AM	JRM	MET002
HS19040237-17	20190327-DGW-MW11-PV40mid-control-T	Login	4/4/2019 10:55:44 AM	JRM	MET002
HS19040237-18	20190327-DGW-MW11-PV40mid-30-T	Login	4/4/2019 10:55:44 AM	JRM	MET002
HS19040237-19	20190327-DGW-MW11-PV40mid-35-T	Login	4/4/2019 10:55:44 AM	JRM	MET002
HS19040237-20	20190327-DGW-MW11-PV40mid-40-T	Login	4/4/2019 10:55:44 AM	JRM	MET002
HS19040237-21	20190327-DGW-MW11-PV40inlet-control-DUP-D	Login	4/4/2019 10:55:44 AM	JRM	MET002
HS19040237-22	20190327-DGW-MW11-PV40inlet-control-DUP-T	Login	4/4/2019 10:55:44 AM	JRM	MET002

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19040237

Date/Time Received: **04-Apr-2019 08:40**
Received by: **JRM**

Checklist completed by: *Jared R. Makan* eSignature 4-Apr-2019 Date

Reviewed by: *Dane J. Wacasey* eSignature 8-Apr-2019 Date

Matrices: **Water**

Carrier name: **FedEx International Priority**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	3 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	18.7c/18.7c UC/C	IR11	
Cooler(s)/Kit(s):	44603		
Date/Time sample(s) sent to storage:	04/04/2019 11:00		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

ALS Environmental

Chain of Custody Form

Page 1 of 3

HS19040237

Golder Associates
Exide Column Studies

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086-06	Project Name	Exide Column Studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086-06	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suite 260	Address	13515 Barrett Parkway Drive, Suite 260	E	ICP TW (6020A total metals (6)+cations)
				F	ICP DISS (6020A diss metals (6)+cations-FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	G	
Phone	314 984-8800	Phone	314 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address		J	

ALS Project Manager:

Work Order #:

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190326-DGW-MW11-PV40out-control-D	03-26-19	12:30 PM	GW	2	1						X					
2	20190326-DGW-MW11-PV40out-30-D	03-26-19	12:30 PM	GW	2	1						X					
3	20190326-DGW-MW11-PV40out-35-D	03-26-19	12:30 PM	GW	2	1						X					
4	20190326-DGW-MW11-PV40out-40-D	03-26-19	12:30 PM	GW	2	1						X					
5	20190327-DGW-MW11-PV40inlet-control-D	03-27-19	5:20 PM	GW	2	1						X					
6	20190327-DGW-MW11-PV40inlet-30-35-40-D	03-27-19	5:20 PM	GW	2	1						X					
7	20190327-DGW-MW11-PV40mid-control-D	03-27-19	4:45 PM	GW	2	1						X					
8	20190327-DGW-MW11-PV40mid-30-D	03-27-19	4:45 PM	GW	2	1						X					
9	20190327-DGW-MW11-PV40mid-35-D	03-27-19	4:45 PM	GW	2	1						X					
10	20190327-DGW-MW11-PV40mid-40-D	03-27-19	4:45 PM	GW	2	1						X					

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method:

Required Turnaround Time:
☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by: Giovanna Llamosas	Date: 2019/04/02	Time: 15:30	Received by:	Notes:
Relinquished by:	Date: 4/4/19	Time: 08:40	Received by (Laboratory): NR	Cooler Temp. 4.2 / 18.7
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	

QC Package: (Check Box Below)

	Level II: Standard QC	x	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other: _____		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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Chain of Custody Form

Page 2 of 3

HS19040237

Golder Associates
Exide Column Studies

Customer Information		Project Information		ALS Project Manager:		Work Order #:
PO Number	130-2086-06	Project Name	Exide Column Studies	Parameter/Method Request for Analysis		
Work Order		Project Number	130-2086-06	A	300 W (300Cl, SO4, NO3-48h HT)	
Company Name	Golder Associates	Bill To Company	Golder Associates	B	TDS W 2540C (2540C TDS)	
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	C	ALK W 2320B (2320B alkalinity)	
Address	13515 Barrett Parkway Drive, Suite 260	Address	13515 Barrett Parkway Drive, Suite 260	D	HARD (2340B hardness (calc))	
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	E	ICP TW (6020A total metals (6)+cations)	
Phone	314 984-8800	Phone	314 984-8800	F	ICP DISS (6020A diss metals (6)+cations-FldFltr)	
Fax		Fax		G		
e-Mail Address	ewhite@golder.com	e-Mail Address		H		
				I		
				J		

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190326-DGW-MW11-PV40out-control-T	03-26-19	12:30 PM	GW	2	1				X	X						
2	20190326-DGW-MW11-PV40out-30-T	03-26-19	12:30 PM	GW	2	1				X	X						
3	20190326-DGW-MW11-PV40out-35-T	03-26-19	12:30 PM	GW	2	1				X	X						
4	20190326-DGW-MW11-PV40out-40-T	03-26-19	12:30 PM	GW	2	1				X	X						
5	20190327-DGW-MW11-PV40inlet-control-T	03-27-19	5:20 PM	GW	2	1				X	X						
6	20190327-DGW-MW11-PV40inlet-30-35-40-T	03-27-19	5:20 PM	GW	2	1				X	X						
7	20190327-DGW-MW11-PV40mid-control-T	03-27-19	4:45 PM	GW	2	1				X	X						
8	20190327-DGW-MW11-PV40mid-30-T	03-27-19	4:45 PM	GW	2	1				X	X						
9	20190327-DGW-MW11-PV40mid-35-T	03-27-19	4:45 PM	GW	2	1				X	X						
10	20190327-DGW-MW11-PV40mid-40-T	03-27-19	4:45 PM	GW	2	1				X	X						

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method:

Required Turnaround Time:
☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by: Giovanna Llamosas	Date: 2019/04/02	Time: 15:30	Received by:	Notes:	
Relinquished by:	Date: 4/4/19	Time: 03:40	Received by (Laboratory): NR	Cooler Temp. 4/C	QC Package: (Check Box Below)
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	18.7	☐ Level II: Standard QC ☒ TRRP-Checklist
					☐ Level III: Std QC + Raw Data ☐ TRRP Level IV
					☐ Level IV: SW846 CLP-Like
					☐ Other: _____

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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HS19040237

Golder Associates
Exide Column Studies

Chain of Custody Form

Page 3 of 3

ALS Environmental

ALS Project Manager:

Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086-06	Project Name	Exide Column Studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086-06	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suite 260	Address	13515 Barrett Parkway Drive, Suite 260	E	ICP TW (6020A total metals (6)+cations)
				F	ICP DISS (6020A diss metals (6)+cations-FldFltr)
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	G	
Phone	314 984-8800	Phone	314 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address		J	

o.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190327-DGW-MW11-PV40inlet-control-DUP-D	03-27-19	5:20 PM	GW	2	1						X					
2	20190327-DGW-MW11-PV40inlet-control-DUP-T	03-27-19	5:20 PM	GW	2	1				X	X						
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

mpler(s): Please Print & Sign
ovanna Llamosas

Shipment Method:

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

linquished by: ovanna Llamosas	Date: 2019/04/02	Time: 15:30	Received by:	Notes:	
linquished by:	Date: 4/4/19	Time: 08:45	Received by (Laboratory):	Cooler Temp. 1.2	QC Package: (Check Box Below)
gged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	18.7	Level II: Standard QC; Level III: Std QC + Raw Data; Level IV: SW846 CLP-Like; Other: _____

x TRRP-Checklist; TRRP Level IV

eservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

te: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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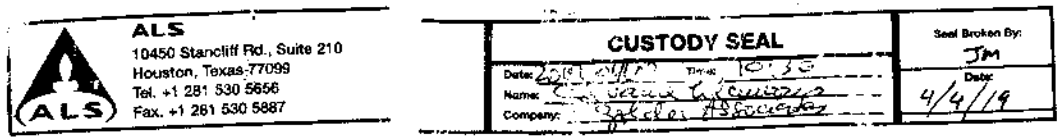
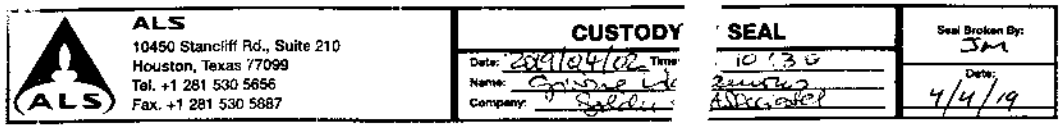
CK # 11
c/HO


ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CUSTODY SEAL
Date:
Time: 10:30
Name:
Company:
Seal Broken By:
JM
Date:
4/4/19


ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CUSTODY
SEAL
Date:
Time:
Name:
Company:
10:30
Seal Broken By:
JM
Date:
4/4/19

ORIGIN ID:YUXA (514) 383-0990
AUDREY ETHEVES
GOLDER ASSOCIATES LTD
7250 RUE DU MILE END
3E ETAGE
MONTREAL, PQ H2R3A4
CANADA CA

SHIP DATE: 02APR19
ACTWGT: 16.00 LB
CAD: 108680724/INET4102

BILL RECIPIENT

TO **DANE WACASEY**
ALS HOUSTON LABORATORY
10450 STANCLIFF RD
STE 210
HOUSTON TX 77099 **(US)**
(281) 530-5656 REF:
INV:
PO: DEPT:

565J1/D7E5/23AD

FedEx Express

E

J191019010702uv

TRK# 0430 **7748 5802 4808**

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ORIGIN ID:YUXA (514) 383-0990
Audrey Etheves
Golder Associates Ltd
7250 rue du Mile End
3e etage
MONTREAL, PQ H2R3A4
CANADA, CA

SHIP DATE: 02APR19
ACTWGT: 16.00 LB
CAD: 108680724/INET4102

BILL RECIPIENT
EIN/VAT:

TO Dane Wacasey (281) 530-5656
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

FedEx Express

(US)

AWB J191019010720dv

NH SGRA

PKG:CUSTOMER

TRK# 7748 5802 4808 Form 0430

10:30A
INTL PRIORITY

REF:
DESC1:...chantillon d'eau
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: Audrey Etheves
T/C: R 967554812
D/T: R 967554812

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10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

April 15, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19040564**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 8 sample(s) on Apr 10, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DAYNA.FISHER
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19040564**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS19040564**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data								
Laboratory Name: ALS Laboratory Group			LRC Date: 04/15/2019					
Project Name: Exide Column Studies			Laboratory Job Number: HS19040564					
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 139755, 139756					
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]	
R1	OI	**Chain-of-custody (C-O-C)**						
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X					
		Were all departures from standard conditions described in an exception report?	X					
R2	OI	**Sample and quality control (QC) identification**						
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X					
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X					
R3	OI	**Test reports**						
		Were all samples prepared and analyzed within holding times?	X					
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X					
		Were calculations checked by a peer or supervisor?	X					
		Were all analyte identifications checked by a peer or supervisor?	X					
		Were sample detection limits reported for all analytes not detected?	X					
		Were all results for soil and sediment samples reported on a dry weight basis?			X			
		Were % moisture (or solids) reported for all soil and sediment samples?			X			
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X			
		If required for the project, TICs reported?			X			
R4	O	**Surrogate recovery data**						
		Were surrogates added prior to extraction?			X			
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X			
R5	OI	**Test reports/summary forms for blank samples**						
		Were appropriate type(s) of blanks analyzed?	X					
		Were blanks analyzed at the appropriate frequency?	X					
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X					
		Were blank concentrations < MQL?	X					
R6	OI	**Laboratory control samples (LCS):**						
		Were all COCs included in the LCS?	X					
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X					
		Were LCSs analyzed at the required frequency?	X					
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X					
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X					
		Was the LCSD RPD within QC limits?	X					
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**						
		Were the project/method specified analytes included in the MS and MSD?	X					
		Were MS/MSD analyzed at the appropriate frequency?	X					
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1	
		Were MS/MSD RPDs within laboratory QC limits?	X					
R8	OI	**Analytical duplicate data**						
		Were appropriate analytical duplicates analyzed for each matrix?			X			
		Were analytical duplicates analyzed at the appropriate frequency?			X			
		Were RPDs or relative standard deviations within the laboratory QC limits?			X			
R9	OI	**Method quantitation limits (MQLs):**						
		Are the MQLs for each method analyte included in the laboratory data package?	X					
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X					
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X					
R10	OI	**Other problems/anomalies**						
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X					
		Were all necessary corrective actions performed for the reported data?	X					
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X					
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X					

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 04/15/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19040564				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 139755, 139756				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			2
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports		
Laboratory Name: ALS Laboratory Group		LRC Date: 04/15/2019
Project Name: Exide Column Studies		Laboratory Job Number: HS19040564
Reviewer Name: Dane Wacasey		Prep Batch Number(s): 139755, 139756
ER#[5]	**Description**	
1	Batch 139755, Metals Method SW6020, sample 139755 (, MS and or MSD recovered outside the control limits for Lead and Selenium, however, the result in the parent sample is greater than 4x the spike amount.	
2	See Run Log and CCB Exceptions Report.	

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
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FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040564
Start Date: 12-Apr-2019 End Date: 13-Apr-2019

Run ID:ICPMS04_336497
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	12-Apr-2019 13:04	019_ICV.d	AS CD FE PB SB SE
LLICV2	1	12-Apr-2019 13:06	020SMPL.d	AS CD FE PB SB SE
ICB	1	12-Apr-2019 13:11	022_ICB.d	AS CD FE PB SB SE
ICV	1	12-Apr-2019 13:13	023_ICV.d	AS CD FE PB SB SE
LLICV5	1	12-Apr-2019 13:15	024LICV.d	AS CD FE PB SB SE
ICSA	1	12-Apr-2019 13:20	026ICSA.d	AS CD FE PB SB SE
ICSAB	1	12-Apr-2019 13:23	027ICSB.d	AS CD FE PB SB SE
CCV 1	1	12-Apr-2019 13:52	037_CCV.d	AS CD FE PB SB SE
CCB 1	1	12-Apr-2019 13:54	038_CCB.d	AS CD FE PB SB SE
MBLK-139756	1	12-Apr-2019 13:59	040SMPL.d	AS CD FE PB SB SE
LCS-139756	1	12-Apr-2019 14:02	041SMPL.d	AS CD FE PB SB SE
ZZZZZZSD	5	12-Apr-2019 14:08	043SMPL.d	AS CD FE PB SB SE
ZZZZZZMS	1	12-Apr-2019 14:10	044SMPL.d	AS CD FE PB SB SE
ZZZZZZMSD	1	12-Apr-2019 14:12	045SMPL.d	AS CD FE PB SB SE
ZZZZZZPDS	1	12-Apr-2019 14:14	046SMPL.d	AS CD FE PB SB SE
CCV 2	1	12-Apr-2019 14:24	049_CCV.d	AS CD FE PB SB SE
CCB 2	1	12-Apr-2019 14:26	050_CCB.d	AS CD FE PB SB SE
20190408-NSF-T0-controlFD-T	1	12-Apr-2019 14:50	052SMPL.d	AS CD FE PB
20190408-NSF-T0-30MW3-T	1	12-Apr-2019 14:52	053SMPL.d	AS CD FE PB
20190408-NSF-T0-30FD-T	1	12-Apr-2019 14:55	054SMPL.d	AS CD FE PB
20190408-NSF-T0-30MW11-T	1	12-Apr-2019 14:57	055SMPL.d	AS CD FE PB
20190408-NSF-T0-controlFD-T	10	12-Apr-2019 15:14	058SMPL.d	SE
20190408-NSF-T0-30MW3-T	10	12-Apr-2019 15:17	059SMPL.d	SE
CCB 3	1	12-Apr-2019 15:23	062_CCB.d	AS CD FE PB SB SE
CCV 3	1	12-Apr-2019 15:41	064_CCV.d	AS CD FE PB SB SE
20190408-NSF-T0-30FD-T	10	12-Apr-2019 15:53	066SMPL.d	SE
20190408-NSF-T0-30MW11-T	10	12-Apr-2019 15:56	067SMPL.d	SE
CCB 4	1	12-Apr-2019 16:02	070_CCB.d	AS CD FE PB SB SE
CCV 4	1	12-Apr-2019 16:05	071_CCV.d	AS CD FE PB SB SE
CCV 5	1	12-Apr-2019 16:40	082_CCV.d	AS CD FE PB SB SE
CCB 5	1	12-Apr-2019 16:42	083_CCB.d	AS CD FE PB SB SE
ICCV 6	1	12-Apr-2019 22:17	104_ICV.d	AS CD FE PB SB SE
LLCCV2	1	12-Apr-2019 22:19	105SMPL.d	AS CD FE PB SB SE
LLCCV5	1	12-Apr-2019 22:21	106LICV.d	AS CD FE PB SB SE
ICCV 7	1	12-Apr-2019 22:24	107_ICV.d	AS CD FE PB SB SE
ICCB 6	1	12-Apr-2019 22:26	108_ICB.d	AS CD FE PB SB SE
20190408-NSF-T0-controlFD-T	10	12-Apr-2019 22:41	114SMPL.d	SB
20190408-NSF-T0-30MW3-T	10	12-Apr-2019 22:43	115SMPL.d	SB
20190408-NSF-T0-30FD-T	10	12-Apr-2019 22:45	116SMPL.d	SB
20190408-NSF-T0-30MW11-T	10	12-Apr-2019 22:47	117SMPL.d	SB
CCV 8	1	12-Apr-2019 22:50	118_CCV.d	AS CD FE PB SB SE
CCB 7	1	12-Apr-2019 22:52	119_CCB.d	AS CD FE PB SB SE
CCV 9	1	12-Apr-2019 23:17	130_CCV.d	AS CD FE PB SB SE
CCB 8	1	12-Apr-2019 23:19	131_CCB.d	AS CD FE PB SB SE
CCV 10	1	12-Apr-2019 23:33	137_CCV.d	AS CD FE PB SB SE
CCB 9	1	12-Apr-2019 23:35	138_CCB.d	AS CD FE PB SB SE
CCV 11	1	13-Apr-2019 00:00	149_CCV.d	AS CD FE PB SB SE
CCB 10	1	13-Apr-2019 00:02	150_CCB.d	AS CD FE PB SB SE
CCV 12	1	13-Apr-2019 00:27	161_CCV.d	AS CD FE PB SB SE
CCB 11	1	13-Apr-2019 00:30	162_CCB.d	AS CD FE PB SB SE
CCV 13	1	13-Apr-2019 00:34	164_CCV.d	AS CD FE PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040564

Run ID:ICPMS04_336497
Instrument:ICPMS04
Method:SW6020

CCB 1	Date: 12-Apr-2019 13:54	Seq: 5033577		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Antimony		0.521	0.4	2	
CCB 2	Date: 12-Apr-2019 14:26	Seq: 5033603		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Antimony		0.848	0.4	2	
CCB 3	Date: 12-Apr-2019 15:23	Seq: 5033704		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Antimony		0.789	0.4	2	
CCB 4	Date: 12-Apr-2019 16:02	Seq: 5034128		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Antimony		0.616	0.4	2	
ICCB 6	Date: 12-Apr-2019 22:26	Seq: 5034786		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Antimony		-0.787	0.4	2	
CCB 7	Date: 12-Apr-2019 22:52	Seq: 5034797		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Antimony		-1.1	0.4	2	
CCB 8	Date: 12-Apr-2019 23:19	Seq: 5034809		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Antimony		-1.052	0.4	2	
CCB 9	Date: 12-Apr-2019 23:35	Seq: 5034816		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Antimony		-0.474	0.4	2	
CCB 10	Date: 13-Apr-2019 00:02	Seq: 5034828		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Antimony		-1.092	0.4	2	
CCB 11	Date: 13-Apr-2019 00:30	Seq: 5034840		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Antimony		-1.165	0.4	2	
CCB 12	Date: 13-Apr-2019 00:36	Seq: 5034843		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Antimony		-1.149	0.4	2	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19040564

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19040564-01	20190408-NSF-T0-controlFD-D	Groundwater		08-Apr-2019 22:10	10-Apr-2019 09:00	☐
HS19040564-02	20190408-NSF-T0-controlFD-T	Groundwater		08-Apr-2019 22:10	10-Apr-2019 09:00	☐
HS19040564-03	20190408-NSF-T0-30MW3-D	Groundwater		08-Apr-2019 22:40	10-Apr-2019 09:00	☐
HS19040564-04	20190408-NSF-T0-30MW3-T	Groundwater		08-Apr-2019 22:40	10-Apr-2019 09:00	☐
HS19040564-05	20190408-NSF-T0-30FD-D	Groundwater		08-Apr-2019 22:20	10-Apr-2019 09:00	☐
HS19040564-06	20190408-NSF-T0-30FD-T	Groundwater		08-Apr-2019 22:20	10-Apr-2019 09:00	☐
HS19040564-07	20190408-NSF-T0-30MW11-D	Groundwater		08-Apr-2019 22:30	10-Apr-2019 09:00	☐
HS19040564-08	20190408-NSF-T0-30MW11-T	Groundwater		08-Apr-2019 22:30	10-Apr-2019 09:00	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190408-NSF-T0-controlFD-D
Collection Date: 08-Apr-2019 22:10

ANALYTICAL REPORT
WorkOrder:HS19040564
Lab ID:HS19040564-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 12-Apr-2019		Analyst: JHD
Antimony	**0.198**		**0.000400**	**0.00200**	**mg/L**	1	12-Apr-2019 14:24
Arsenic	**0.270**		**0.000400**	**0.00200**	**mg/L**	1	12-Apr-2019 14:24
Cadmium	**0.0769**		**0.000200**	**0.00200**	**mg/L**	1	12-Apr-2019 14:24
Iron	U		0.0120	0.200	mg/L	1	12-Apr-2019 14:24
Lead	**0.890**		**0.000600**	**0.00200**	**mg/L**	1	12-Apr-2019 14:24
Selenium	**1.90**		**0.0110**	**0.0200**	**mg/L**	10	12-Apr-2019 15:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190408-NSF-T0-controlFD-T
Collection Date: 08-Apr-2019 22:10

ANALYTICAL REPORT
WorkOrder:HS19040564
Lab ID:HS19040564-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 12-Apr-2019		Analyst: JC
Antimony	**0.214**		**0.00400**	**0.0200**	**mg/L**	10	12-Apr-2019 22:41
Arsenic	**0.301**		**0.000400**	**0.00200**	**mg/L**	1	12-Apr-2019 14:50
Cadmium	**0.0718**		**0.000200**	**0.00200**	**mg/L**	1	12-Apr-2019 14:50
Iron	**2.00**		**0.0120**	**0.200**	**mg/L**	1	12-Apr-2019 14:50
Lead	**1.39**		**0.000600**	**0.00200**	**mg/L**	1	12-Apr-2019 14:50
Selenium	**1.91**		**0.0110**	**0.0200**	**mg/L**	10	12-Apr-2019 15:14

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190408-NSF-T0-30MW3-D
Collection Date: 08-Apr-2019 22:40

ANALYTICAL REPORT
WorkOrder:HS19040564
Lab ID:HS19040564-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 12-Apr-2019		Analyst: JHD
Antimony	**0.126**		**0.000400**	**0.00200**	**mg/L**	1	12-Apr-2019 14:38
Arsenic	**0.275**		**0.000400**	**0.00200**	**mg/L**	1	12-Apr-2019 14:38
Cadmium	**0.0698**		**0.000200**	**0.00200**	**mg/L**	1	12-Apr-2019 14:38
Iron	**0.288**		**0.0120**	**0.200**	**mg/L**	1	12-Apr-2019 14:38
Lead	**0.596**		**0.000600**	**0.00200**	**mg/L**	1	12-Apr-2019 14:38
Selenium	**1.95**		**0.0110**	**0.0200**	**mg/L**	10	12-Apr-2019 15:11

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190408-NSF-T0-30MW3-T
Collection Date: 08-Apr-2019 22:40

ANALYTICAL REPORT
WorkOrder:HS19040564
Lab ID:HS19040564-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 12-Apr-2019		Analyst: JC
Antimony	**0.138**		**0.00400**	**0.0200**	**mg/L**	10	12-Apr-2019 22:43
Arsenic	**0.302**		**0.000400**	**0.00200**	**mg/L**	1	12-Apr-2019 14:52
Cadmium	**0.0699**		**0.000200**	**0.00200**	**mg/L**	1	12-Apr-2019 14:52
Iron	**3.78**		**0.0120**	**0.200**	**mg/L**	1	12-Apr-2019 14:52
Lead	**1.30**		**0.000600**	**0.00200**	**mg/L**	1	12-Apr-2019 14:52
Selenium	**1.91**		**0.0110**	**0.0200**	**mg/L**	10	12-Apr-2019 15:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190408-NSF-T0-30FD-D
Collection Date: 08-Apr-2019 22:20

ANALYTICAL REPORT
WorkOrder:HS19040564
Lab ID:HS19040564-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 12-Apr-2019		Analyst: JHD
Antimony	**0.109**		**0.000400**	**0.00200**	**mg/L**	1	12-Apr-2019 14:40
Arsenic	**0.275**		**0.000400**	**0.00200**	**mg/L**	1	12-Apr-2019 14:40
Cadmium	**0.0711**		**0.000200**	**0.00200**	**mg/L**	1	12-Apr-2019 14:40
Iron	**0.319**		**0.0120**	**0.200**	**mg/L**	1	12-Apr-2019 14:40
Lead	**0.882**		**0.000600**	**0.00200**	**mg/L**	1	12-Apr-2019 14:40
Selenium	**1.92**		**0.0110**	**0.0200**	**mg/L**	10	12-Apr-2019 15:13

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190408-NSF-T0-30FD-T
Collection Date: 08-Apr-2019 22:20

ANALYTICAL REPORT
WorkOrder:HS19040564
Lab ID:HS19040564-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 12-Apr-2019		Analyst: JC
Antimony	**0.109**		**0.00400**	**0.0200**	**mg/L**	10	12-Apr-2019 22:45
Arsenic	**0.297**		**0.000400**	**0.00200**	**mg/L**	1	12-Apr-2019 14:55
Cadmium	**0.0692**		**0.000200**	**0.00200**	**mg/L**	1	12-Apr-2019 14:55
Iron	**1.79**		**0.0120**	**0.200**	**mg/L**	1	12-Apr-2019 14:55
Lead	**1.31**		**0.000600**	**0.00200**	**mg/L**	1	12-Apr-2019 14:55
Selenium	**1.92**		**0.0110**	**0.0200**	**mg/L**	10	12-Apr-2019 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190408-NSF-T0-30MW11-D
Collection Date: 08-Apr-2019 22:30

ANALYTICAL REPORT
WorkOrder:HS19040564
Lab ID:HS19040564-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 12-Apr-2019		Analyst: JHD
Antimony	**0.139**		**0.000400**	**0.00200**	**mg/L**	1	12-Apr-2019 14:44
Arsenic	**0.275**		**0.000400**	**0.00200**	**mg/L**	1	12-Apr-2019 14:44
Cadmium	**0.0683**		**0.000200**	**0.00200**	**mg/L**	1	12-Apr-2019 14:44
Iron	**0.402**		**0.0120**	**0.200**	**mg/L**	1	12-Apr-2019 14:44
Lead	**0.524**		**0.000600**	**0.00200**	**mg/L**	1	12-Apr-2019 14:44
Selenium	**1.91**		**0.0110**	**0.0200**	**mg/L**	10	12-Apr-2019 15:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190408-NSF-T0-30MW11-T
Collection Date: 08-Apr-2019 22:30

ANALYTICAL REPORT
WorkOrder:HS19040564
Lab ID:HS19040564-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 12-Apr-2019		Analyst: JC
Antimony	**0.166**		**0.00400**	**0.0200**	**mg/L**	10	12-Apr-2019 22:47
Arsenic	**0.302**		**0.000400**	**0.00200**	**mg/L**	1	12-Apr-2019 14:57
Cadmium	**0.0703**		**0.000200**	**0.00200**	**mg/L**	1	12-Apr-2019 14:57
Iron	**4.04**		**0.0120**	**0.200**	**mg/L**	1	12-Apr-2019 14:57
Lead	**1.35**		**0.000600**	**0.00200**	**mg/L**	1	12-Apr-2019 14:57
Selenium	**1.89**		**0.0110**	**0.0200**	**mg/L**	10	12-Apr-2019 15:56

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040564

Batch ID: 139755 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19040564-01	1	10	10 (mL)	1
HS19040564-03	1	10	10 (mL)	1
HS19040564-05	1	10	10 (mL)	1
HS19040564-07	1	10	10 (mL)	1

Batch ID: 139756 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19040564-02	1	10	10 (mL)	1
HS19040564-04	1	10	10 (mL)	1
HS19040564-06	1	10	10 (mL)	1
HS19040564-08	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040564

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 139755	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS19040564-01	20190408-NSF-T0-controlFD-D	08 Apr 2019 22:10		12 Apr 2019 09:00	12 Apr 2019 15:04	10
HS19040564-01	20190408-NSF-T0-controlFD-D	08 Apr 2019 22:10		12 Apr 2019 09:00	12 Apr 2019 14:24	1
HS19040564-03	20190408-NSF-T0-30MW3-D	08 Apr 2019 22:40		12 Apr 2019 09:00	12 Apr 2019 15:11	10
HS19040564-03	20190408-NSF-T0-30MW3-D	08 Apr 2019 22:40		12 Apr 2019 09:00	12 Apr 2019 14:38	1
HS19040564-05	20190408-NSF-T0-30FD-D	08 Apr 2019 22:20		12 Apr 2019 09:00	12 Apr 2019 15:13	10
HS19040564-05	20190408-NSF-T0-30FD-D	08 Apr 2019 22:20		12 Apr 2019 09:00	12 Apr 2019 14:40	1
HS19040564-07	20190408-NSF-T0-30MW11-D	08 Apr 2019 22:30		12 Apr 2019 09:00	12 Apr 2019 15:15	10
HS19040564-07	20190408-NSF-T0-30MW11-D	08 Apr 2019 22:30		12 Apr 2019 09:00	12 Apr 2019 14:44	1
Batch ID 139756	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19040564-02	20190408-NSF-T0-controlFD-T	08 Apr 2019 22:10		12 Apr 2019 09:00	12 Apr 2019 22:41	10
HS19040564-02	20190408-NSF-T0-controlFD-T	08 Apr 2019 22:10		12 Apr 2019 09:00	12 Apr 2019 15:14	10
HS19040564-02	20190408-NSF-T0-controlFD-T	08 Apr 2019 22:10		12 Apr 2019 09:00	12 Apr 2019 14:50	1
HS19040564-04	20190408-NSF-T0-30MW3-T	08 Apr 2019 22:40		12 Apr 2019 09:00	12 Apr 2019 22:43	10
HS19040564-04	20190408-NSF-T0-30MW3-T	08 Apr 2019 22:40		12 Apr 2019 09:00	12 Apr 2019 15:17	10
HS19040564-04	20190408-NSF-T0-30MW3-T	08 Apr 2019 22:40		12 Apr 2019 09:00	12 Apr 2019 14:52	1
HS19040564-06	20190408-NSF-T0-30FD-T	08 Apr 2019 22:20		12 Apr 2019 09:00	12 Apr 2019 22:45	10
HS19040564-06	20190408-NSF-T0-30FD-T	08 Apr 2019 22:20		12 Apr 2019 09:00	12 Apr 2019 15:53	10
HS19040564-06	20190408-NSF-T0-30FD-T	08 Apr 2019 22:20		12 Apr 2019 09:00	12 Apr 2019 14:55	1
HS19040564-08	20190408-NSF-T0-30MW11-T	08 Apr 2019 22:30		12 Apr 2019 09:00	12 Apr 2019 22:47	10
HS19040564-08	20190408-NSF-T0-30MW11-T	08 Apr 2019 22:30		12 Apr 2019 09:00	12 Apr 2019 15:56	10
HS19040564-08	20190408-NSF-T0-30MW11-T	08 Apr 2019 22:30		12 Apr 2019 09:00	12 Apr 2019 14:57	1

WorkOrder: HS19040564
InstrumentID: ICPMS05
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000493	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000344	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000538	0.000200	0.00200
A	Iron	7439-89-6	0.0500	0.0487	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000878	0.000600	0.00200
A	Selenium	7782-49-2	0.00250	0.00187	0.00110	0.00200

WorkOrder: HS19040564
InstrumentID: ICPMS04
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000774	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000493	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000493	0.000200	0.00200
A	Iron	7439-89-6	0.0500	0.0716	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000944	0.000600	0.00200
A	Selenium	7782-49-2	0.00250	0.00223	0.00110	0.00200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040564

QC BATCH REPORT NEW

Batch ID: 139755 (0) **Instrument:** ICPMS05 **Method:** DISSOLVED METALS BY SW6020A (DISSOLVED)

MBLK Sample ID: **MBLK-139755** Units: **mg/L** Analysis Date: **12-Apr-2019 14:07**
Client ID: Run ID: **ICPMS05_336490** SeqNo: **5033579** PrepDate: **12-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Iron	U	0.200								
Lead	U	0.00200								
Selenium	U	0.00200								

LCS Sample ID: **LCS-139755** Units: **mg/L** Analysis Date: **12-Apr-2019 14:10**
Client ID: Run ID: **ICPMS05_336490** SeqNo: **5033580** PrepDate: **12-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05027	0.00200	0.05	0	101	80 - 120				
Arsenic	0.05124	0.00200	0.05	0	102	80 - 120				
Cadmium	0.0516	0.00200	0.05	0	103	80 - 120				
Iron	4.979	0.200	5	0	99.6	80 - 120				
Lead	0.04979	0.00200	0.05	0	99.6	80 - 120				
Selenium	0.05123	0.00200	0.05	0	102	80 - 120				

MS Sample ID: **HS19040564-01MS** Units: **mg/L** Analysis Date: **12-Apr-2019 14:29**
Client ID: **20190408-NSF-T0-controlFD-D** Run ID: **ICPMS05_336490** SeqNo: **5033586** PrepDate: **12-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.2542	0.00200	0.05	0.198	112	75 - 125				
Arsenic	0.3287	0.00200	0.05	0.2697	118	75 - 125				O
Cadmium	0.1241	0.00200	0.05	0.07695	94.4	75 - 125				
Iron	4.544	0.200	5	0.004474	90.8	75 - 125				
Lead	0.9573	0.00200	0.05	0.8896	135	75 - 125				SO
Selenium	2.204	0.00200	0.05	2.112	185	75 - 125				SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040564

QC BATCH REPORT NEW

Batch ID: 139755 (0) **Instrument:** ICPMS05 **Method:** DISSOLVED METALS BY SW6020A (DISSOLVED)

MSD Sample ID: **HS19040564-01MSD** Units: **mg/L** Analysis Date: **12-Apr-2019 14:31**
Client ID: **20190408-NSF-T0-controlFD-D** Run ID: **ICPMS05_336490** SeqNo: **5033587** PrepDate: **12-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.2542	0.00200	0.05	0.198	112	75 - 125	0.2542	0.0279	20	
Arsenic	0.3324	0.00200	0.05	0.2697	125	75 - 125	0.3287	1.14	20	SO
Cadmium	0.1277	0.00200	0.05	0.07695	102	75 - 125	0.1241	2.85	20	
Iron	4.758	0.200	5	0.004474	95.1	75 - 125	4.544	4.6	20	
Lead	0.9709	0.00200	0.05	0.8896	163	75 - 125	0.9573	1.41	20	SO
Selenium	2.232	0.00200	0.05	2.112	241	75 - 125	2.204	1.25	20	SEO

PDS Sample ID: **HS19040564-01PDS** Units: **mg/L** Analysis Date: **12-Apr-2019 14:33**
Client ID: **20190408-NSF-T0-controlFD-D** Run ID: **ICPMS05_336490** SeqNo: **5033588** PrepDate: **12-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.285	0.00200	0.1	0.198	87.0	75 - 125				
Arsenic	0.37	0.00200	0.1	0.2697	100	75 - 125				
Cadmium	0.1828	0.00200	0.1	0.07695	106	75 - 125				
Iron	9.573	0.200	10	0.004474	95.7	75 - 125				
Lead	0.9971	0.00200	0.1	0.8896	107	75 - 125				O

PDS Sample ID: **HS19040564-01PDS** Units: **mg/L** Analysis Date: **12-Apr-2019 15:08**
Client ID: **20190408-NSF-T0-controlFD-D** Run ID: **ICPMS05_336490** SeqNo: **5033727** PrepDate: **12-Apr-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	2.85	0.0200	1	1.9	95.0	75 - 125				

SD Sample ID: **HS19040564-01SD** Units: **mg/L** Analysis Date: **12-Apr-2019 14:26**
Client ID: **20190408-NSF-T0-controlFD-D** Run ID: **ICPMS05_336490** SeqNo: **5033585** PrepDate: **12-Apr-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	0.2039	0.0100					0.198	2.97	10	
Arsenic	0.2616	0.0100					0.2697	3.03	10	
Cadmium	0.07709	0.0100					0.07695	0.19	10	
Iron	U	1.00					0.004474	0	10	
Lead	0.8453	0.0100					0.8896	4.98	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040564

QC BATCH REPORT NEW

Batch ID: **139755 (0)** **Instrument:** **ICPMS05** **Method:** **DISSOLVED METALS BY SW6020A (DISSOLVED)**

SD Sample ID: **HS19040564-01SD** Units: **mg/L** Analysis Date: **12-Apr-2019 15:06**
Client ID: **20190408-NSF-T0-controlFD-D** Run ID: **ICPMS05_336490** SeqNo: **5033726** PrepDate: **12-Apr-2019** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Selenium	1.892	0.100					1.9	0.432	10	

The following samples were analyzed in this batch: HS19040564-01 HS19040564-03 HS19040564-05 HS19040564-07

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040564

QC BATCH REPORT NEW

Batch ID: 139756 (0) **Instrument: ICPMS04** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLK-139756** Units: **mg/L** Analysis Date: **12-Apr-2019 13:59**
Client ID: Run ID: **ICPMS04_336497** SeqNo: **5033593** PrepDate: **12-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Iron	U	0.200								
Lead	U	0.00200								
Selenium	U	0.00200								

LCS Sample ID: **LCS-139756** Units: **mg/L** Analysis Date: **12-Apr-2019 14:02**
Client ID: Run ID: **ICPMS04_336497** SeqNo: **5033594** PrepDate: **12-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.0529	0.00200	0.05	0	106	80 - 120				
Arsenic	0.04991	0.00200	0.05	0	99.8	80 - 120				
Cadmium	0.0493	0.00200	0.05	0	98.6	80 - 120				
Iron	4.908	0.200	5	0	98.2	80 - 120				
Lead	0.0487	0.00200	0.05	0	97.4	80 - 120				
Selenium	0.04939	0.00200	0.05	0	98.8	80 - 120				

MS Sample ID: **HS19040588-01MS** Units: **mg/L** Analysis Date: **12-Apr-2019 14:10**
Client ID: Run ID: **ICPMS04_336497** SeqNo: **5033597** PrepDate: **12-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05232	0.00200	0.05	0.000303	104	80 - 120				
Arsenic	0.04921	0.00200	0.05	0.000025	98.4	80 - 120				
Cadmium	0.04958	0.00200	0.05	0	99.2	80 - 120				
Iron	5.064	0.200	5	0.01136	101	80 - 120				
Lead	0.05018	0.00200	0.05	0.000887	98.6	80 - 120				
Selenium	0.04929	0.00200	0.05	0.000294	98.0	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19040564

QC BATCH REPORT NEW

Batch ID: 139756 (0) **Instrument: ICPMS04** **Method: ICP-MS METALS BY SW6020A**

MSD Sample ID: **HS19040588-01MSD** Units: **mg/L** Analysis Date: **12-Apr-2019 14:12**
Client ID: Run ID: **ICPMS04_336497** SeqNo: **5033598** PrepDate: **12-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05402	0.00200	0.05	0.000303	107	80 - 120	0.05232	3.2	20	
Arsenic	0.04974	0.00200	0.05	0.000025	99.4	80 - 120	0.04921	1.08	20	
Cadmium	0.04978	0.00200	0.05	0	99.6	80 - 120	0.04958	0.401	20	
Iron	5.041	0.200	5	0.01136	101	80 - 120	5.064	0.448	20	
Lead	0.05108	0.00200	0.05	0.000887	100	80 - 120	0.05018	1.76	20	
Selenium	0.05012	0.00200	0.05	0.000294	99.6	80 - 120	0.04929	1.65	20	

PDS Sample ID: **HS19040588-01PDS** Units: **mg/L** Analysis Date: **12-Apr-2019 14:14**
Client ID: Run ID: **ICPMS04_336497** SeqNo: **5033599** PrepDate: **12-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1024	0.00200	0.1	0.000303	102	75 - 125				
Arsenic	0.1058	0.00200	0.1	0.000025	106	75 - 125				
Cadmium	0.1047	0.00200	0.1	0	105	75 - 125				
Iron	10.48	0.200	10	0.01136	105	75 - 125				
Lead	0.1063	0.00200	0.1	0.000887	105	75 - 125				
Selenium	0.1034	0.00200	0.1	0.000294	103	75 - 125				

SD Sample ID: **HS19040588-01SD** Units: **mg/L** Analysis Date: **12-Apr-2019 14:08**
Client ID: Run ID: **ICPMS04_336497** SeqNo: **5033596** PrepDate: **12-Apr-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000303	0	10	
Arsenic	U	0.0100					0.000025	0	10	
Cadmium	U	0.0100					0	0	10	
Iron	U	1.00					0.01136	0	10	
Lead	U	0.0100					0.000887	0	10	
Selenium	U	0.0100					0.000294	0	10	

The following samples were analyzed in this batch: HS19040564-02 HS19040564-04 HS19040564-06 HS19040564-08

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19040564**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
California	2919, 2018-2019	30-Apr-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19040564

Date/Time Received: **10-Apr-2019 09:00**
Received by: **RPG**

Checklist completed by: *Raegen Giga* eSignature — 10-Apr-2019 Date

Reviewed by: *Dane J. Wacasey* eSignature — 11-Apr-2019 Date

Matrices: **GW**

Carrier name: **FedEx International Priority**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	18.9 uc/c	IR 11
Cooler(s)/Kit(s):	44507	
Date/Time sample(s) sent to storage:	04/10/2019 13:18	

Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

ALS Environmental

Chain of Custody Form

Page 1 of 1

HS19040564

Golder Associates
Exide Column Studies

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ALS Project Manager:

Customer Information		Project Information			
PO Number	130-2086-06	Project Name	Exide Column Studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086-06	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suite 260	Address	13515 Barrett Parkway Drive, Suite 260	E	ICP TW (6020A total metals (6)): Pb, Cd, Sb, Se, As, Fe
				F	ICP DISS (6020A diss metals (6)-FldFltr): Pb, Cd, Sb, Se, As, Fe
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	G	
Phone	314 984-8800	Phone	314 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190408-NSF-T0-controlFD-D	04-08-19	10:10 PM	GW	2	1						X					
2	20190408-NSF-T0-controlFD-T	04-08-19	10:10 PM	GW	2	1					X						
3	20190408-NSF-T0-30MW3-D	04-08-19	10:40 PM	GW	2	1						X					
4	20190408-NSF-T0-30MW3-T	04-08-19	10:40 PM	GW	2	1					X						
5	20190408-NSF-T0-30FD-D	04-08-19	10:20 PM	GW	2	1						X					
6	20190408-NSF-T0-30FD-T	04-08-19	10:20 PM	GW	2	1					X						
7	20190408-NSF-T0-30MW11-D	04-08-19	10:30 PM	GW	2	1						X					
8	20190408-NSF-T0-30MW11-T	04-08-19	10:30 PM	GW	2	1					X						
9																	
10																	

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method:

Required Turnaround Time: ☐ STD 10 Wk Days ☐ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☑ Other

Results Due Date: STD 3-DAY TAT

Relinquished by:	Date:	Time:	Received by:	Notes:
Giovanna Llamosas	2019/04/08	15:30:00		
Relinquished by:	Date:	Time:	Received by (Laboratory): R Cisa 4/10/19 09:00	Cooler Temp. 4C
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory): IR 11 CFO	18-9C

QC Package: (Check Box Below)

	Level II: Standard QC	x	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other:		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental. Coder # 44507

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ORIGIN ID:YUXA (514) 383-0990
AUDREY EHEVES
GOLDER ASSOCIATES LTD
7250 RUE DU MILE END
3E ETAGE
MONTREAL, PQ H2R3A4
CANADA CA

SHIP DATE: 09APR19
ACTWGT: 3.90 KG
CAD: 106838724/INET4102

BILL RECIPIENT

TO DANE WACASEY
ALS HOUSTON LABORATORY
10450 STANCLIFF RD
STE 210
HOUSTON TX 77099
(281) 530-5656

REF

DEPT

(US)

565J1/D7E5/23A0

FedEx Express

TRK# 7749 2089 0980
0201

NH SGRA

TX-US IAH

77099

INTL PRIORITY

10:30A

APR 10 2019

APR 10 2019

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DÉFINITIONS Dans la présente lettre de transport aérien, « nous », « notre », « nos » et « FedEx » se rapportent à Federal Express Corporation, ses filiales exploitantes et leurs employés, mandataires et prestataires externes. « Vous », « votre » et « vos » se rapportent à l'expéditeur, désigné sur le recto et mentionné. Si l'envoi ne prévoit pas des États-Unis, votre contrat d'expédition est conclu avec la filiale, la succursale ou les prestataires externes de FedEx ayant établi l'origine acceptant de procéder à l'expédition. « Colis » s'entend de tout contenant ou de toute enveloppe dont nous acceptons d'effectuer la livraison, notamment les marchandises remises au transport par vous seul(e) par le biais de nos système(s) automatisé(s), employeurs, mandataires ou lettres de transport, « Envoi » s'entend de tout colis pour lequel nous acceptons d'effectuer le transport aérien. REMARQUE RELATIVE AU TRANSPORT AÉRIEN La Convention de Varsovie désigne par application à tout envoi aérien international. La Convention de Varsovie, amendée, régit et limite dans la plupart des cas la responsabilité de FedEx en cas de perte, retard ou dommage affectant votre envoi. La Convention de Varsovie amendée limite la responsabilité de FedEx. Par exemple, aux États-Unis, la responsabilité est limitée à 9,07 $ par livre (20 $ par kilogramme), à moins qu'une valeur d'expédition supérieure ne soit déclarée comme décrit ci-dessous, auquel cas, un droit supplémentaire vous sera alors à votre charge. L'interprétation et le mode d'application des dispositions relatives aux limites de responsabilité de la Convention de Varsovie peuvent varier d'un pays à l'autre. FedEx se réserve le droit d'organiser l'itinéraire emprunté selon ses modes à sa convenance. REMARQUE RELATIVE AU TRANSPORT ROUTIER. Les envois transportés uniquement par voie terrestre vers ou depuis un pays ayant ratifié la Convention de Varsovie ou la Convention relative au contrat de transport international de marchandises par route (« CMR ») sont soumis aux termes et conditions de la CMR, sans préjudice de toute autre disposition contenue dans la présente lettre de transport aérien. Concernant les envois transportés exclusivement par voie terrestre, les dispositions de la CMR prévalent en cas de conflit entre les dispositions de la CMR et celles de la présente lettre de transport aérien LIMITATION DE RESPONSABILITÉ. La responsabilité maximale de FedEx en cas de dommage, perte, retard, manque à gagner ou limitation, défaut de limitation, déclaration inexacte ou défaut d'indication spécifique à l'envoi est limitée (sauf disposition contraire dans le présent Contrat et nonobstant tout contrat d'expédition et sauf responsabilité n'ayant pas fait l'objet d'une déclaration de valeur) à 100 $ USD, sauf si vous payez des frais supplémentaires et déclarez une valeur supérieure. Les dispositions réglementaires, douanes ou classes. Veuillez vous référer au contrat d'expédition énoncé dans le Guide des Services FedEx en vigueur ou document équivalent afin de déterminer les limites d'indemnisation. FedEx ne propose pas de responsabilité marchandise(s) assurée sur tout(e)s, mais il vous est possible de payer des frais supplémentaires par tranche de 100 $ US supplémentaires (ou équivalent en monnaie locale du pays d'origine) de valeur d'expédition déclarée. Si la valeur d'expédition déclarée est supérieure et des frais supplémentaires sont acquittés, la responsabilité de FedEx couvrira alors à la valeur déclarée dans la valeur déclarée et les dommages-intérêts, EXCLUSIONS DE RESPONSABILITÉ. FEDEX NE SAURAIT EN AUCUN CAS ÊTRE TENU POUR RESPONSABLE DE TOUT DOMMAGE DIRECT, INDIRECT, ACCESSOIRE, SPÉCIAL OU CONSÉCUTIF SUPÉRIEUR À LA VALEUR D'EXPLOITATION DÉCLARÉE (Y COMPRIS, SANS QUE CELA SOIT LIMITATIF DE PERTES DE REVENUS OU BÉNÉFICES), QUELLE QUE SOIT LA VALEUR RÉELLE DE L'ENVOI, SAUF DANS LES CAS PRÉVUS AU PRÉSENT CONTRAT OU NON SAVOIR QUE DE TELS DOMMAGES POURRAIENT SURVENIR). FedEx ne saurait en aucun cas être tenu pour responsable de vos agissements ou omissions, y compris, sans que cela soit limitatif, de dommages incorrects de marchandises dangereuses, identification, marquage ou emballage non adaptés ou inadéquats de la part, ni des agissements ou omissions du destinataire ou de quiconque pouvant être autrement par cet envoi, ni de la validité par tiers des parties des présents contrats. FedEx ne saurait en aucun cas être tenu pour responsable de tous dommages, pertes, intérêts, intérêts, retards, erreurs de livraison, défauts de livraison, informations incorrectes ou défaut d'informations relativement aux envois de fragiles, denrées ou autres marchandises infectées ou d'événements hors de notre contrôle tels que les catastrophes naturelles, risques politiques, risques météorologiques, grèves de personnels, pannes, grèves, désordres publics, actes accomplis ou omissions des autorités publiques (notamment des douanes ou prescriptions de la santé publique) ayant survenu.
DÉLAI DE GARANTIE. Nous n'accordons aucune garantie, expresse ou tacite. RECOURS EN CAS DE PERTE, DOMMAGE OU RETARD TOUT RECOURS DOIT ÊTRE EXERCÉ PAR ÉCRIT ET DANS DES DÉLAIS STRICTS. VOIR NOS TARIFS. LE GUIDE DES SERVICES FEDEX EN VIGUEUR OU LES CONDITIONS STANDARD D'EXPÉDITION POUR PLUS D'INFORMATIONS. La Convention de Varsovie prévoit des procédures de réclamation écrites spécifiques en cas de dommages, retards ou défaut de livraison des envois. En outre, l'interprétation et la mise en application des dispositions relevant aux voies de recours de la Convention de Varsovie peuvent varier d'un pays à l'autre. Veuillez vous référer à la Convention pour déterminer les délais de recours applicables à votre envoi. Le droit à dommages-intérêts naissant, sauf si un recours est formé dans un délai de deux ans, comme spécifié dans la Convention. FedEx n'est pas tenu de répondre à un recours avant que tous les frais d'expédition n'aient été acquittés. Le montant du recours peut ne pas être défini des frais d'expédition. Si le destinataire accepte l'envoi sans aucun dommage sur le bulletin de livraison, FedEx considérera alors que la marchandise a été livrée dans de bonnes conditions. Afin que vous puissiez répondre aux demandes de dommages, nous vous demandons de mettre à notre disposition les contenus, colonne d'expédition et emballages d'origine à des fins d'inspection. CHOIX INACTIF. Cela lorsque l'une des dispositions contenues ou citées dans la présente lettre de transport aérien va à l'encontre des traités, lois, dispositions réglementaires, décrets ou décrets internationaux, toutes dispositions restent en vigueur dans la limite du présent contrat dans la mesure du cela n'est pas annulé. Le fait que l'une des dispositions soit invalide ou inapplicable n'affecte pas les autres parties de la présente lettre de transport aérien. Sous indication contraire, FEDERAL EXPRESS CORPORATION, 2005 Corporate Avenue, Memphis, TN 38132, USA, est le premier transporteur du présent envoi.

ORIGIN ID:YUXA (514) 383-0990
audrey etheves
Golder Associates Ltd
7250 rue du Mile End
3e etage
MONTREAL, PQ H2R3A4
CANADA, CA

SHIP DATE: 09APR19
ACTWGT: 3.90 KG
CAD: 108680724/INET4102

BILL RECIPIENT
EIN/VAT:

TO Dane Wacasey
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

(281) 530-5656

FedEx Express

(US)

E

AWB

J191019010720

NH SGRA

PKG:CUSTOMER

TRK# 7749 2089 0980 Form 0430

10:30A
INTL PRIORITY

REF:
DESC1: Échantillon d'eau
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: audrey etheves
T/C: R 967554812
D/T: R 967554812

Ces marchandises, cette technologie ou ce logiciel ont été exportés du Canada conformément à la réglementation sur l'administration des exportations. Toute modification contraire à la loi canadienne est interdite. La Convention de Varsovie peut s'appliquer et elle régit, et dans la grande majorité des cas, elle limite la responsabilité de Federal Express pour toute perte, retard ou dommage causé à votre envoi. Sous réserve des conditions et modalités du contrat.

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44507 APR 10 2019

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10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

April 29, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19041287**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 12 sample(s) on Apr 23, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DAYNA.FISHER
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19041287**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19041287**	

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 04/29/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19041287				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 140147, 140158				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	X				
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?			X		
		Were analytical duplicates analyzed at the appropriate frequency?			X		
		Were RPDs or relative standard deviations within the laboratory QC limits?			X		
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 04/29/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19041287				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 140147, 140158				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			1
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports	
Laboratory Name: ALS Laboratory Group	LRC Date: 04/29/2019
Project Name: Exide Column Studies	Laboratory Job Number: HS19041287
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 140147, 140158

ER#[5]	Description
1	See Run Log and CCB Exception Reports

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19041287
Start Date: 24-Apr-2019 End Date: 25-Apr-2019

Run ID:ICPMS04_337178
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
20190416-NSF-PV63inlet-30MW3-T	2	24-Apr-2019 23:42	217SMPL.d	AS CD FE PB SB SE
20190416-NSF-PV63mid-30MW3-T	2	24-Apr-2019 23:44	218SMPL.d	FE SE
20190416-NSF-PV56inlet-30FD-T	2	24-Apr-2019 23:49	220SMPL.d	AS CD FE PB SB SE
20190416-NSF-PV56mid-30FD-T	2	24-Apr-2019 23:51	221SMPL.d	FE SE
CCV 19	1	24-Apr-2019 23:58	224_CCV.d	AS CD FE PB SB SE
CCB 18	1	25-Apr-2019 00:00	225_CCB.d	AS CD FE PB SB SE
ICCV 20	1	25-Apr-2019 00:27	237_ICV.d	AS CD FE PB SB SE
LLCCV2	1	25-Apr-2019 00:29	238LCV2.d	AS CD FE PB SB SE
LLCCV5	1	25-Apr-2019 00:31	239LCV5.d	AS CD FE PB SB SE
ICCB 19	1	25-Apr-2019 00:33	240_ICB.d	AS CD FE PB SB SE
CCV 21	1	25-Apr-2019 00:51	248_CCV.d	AS CD FE PB SB SE
CCB 20	1	25-Apr-2019 00:53	249_CCB.d	AS CD FE PB SB SE
ICSA	1	25-Apr-2019 00:56	250ICSA.d	AS CD FE PB SB SE
ICSAB	1	25-Apr-2019 00:58	251ICSB.d	AS CD FE PB SB SE
CCV 22	1	25-Apr-2019 01:11	257_CCV.d	AS CD FE PB SB SE
CCB 21	1	25-Apr-2019 01:14	258_CCB.d	AS CD FE PB SB SE
CCV 23	1	25-Apr-2019 01:35	268_CCV.d	AS CD FE PB SB SE
CCB 22	1	25-Apr-2019 01:38	269_CCB.d	AS CD FE PB SB SE
CCV 24	1	25-Apr-2019 01:57	278_CCV.d	AS CD FE PB SB SE
CCB 23	1	25-Apr-2019 02:00	279_CCB.d	AS CD FE PB SB SE
CCV 25	1	25-Apr-2019 02:24	290_CCV.d	AS CD FE PB SB SE
CCB 24	1	25-Apr-2019 02:27	291_CCB.d	AS CD FE PB SB SE
CCV 26	1	25-Apr-2019 02:51	302_CCV.d	AS CD FE PB SB SE
CCB 25	1	25-Apr-2019 02:54	303_CCB.d	AS CD FE PB SB SE
CCV 27	1	25-Apr-2019 03:07	309_CCV.d	AS CD FE PB SB SE
CCB 26	1	25-Apr-2019 03:09	310_CCB.d	AS CD FE PB SB SE
LLICV2	1	25-Apr-2019 03:12	311LCV2.d	AS CD FE PB SB SE
LLICV5	1	25-Apr-2019 03:14	312LCV5.d	AS CD FE PB SB SE
ICSA	1	25-Apr-2019 03:16	313ICSA.d	AS CD FE PB SB SE
ICSAB	1	25-Apr-2019 03:18	314ICSB.d	AS CD FE PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19041287

Run ID:ICPMS04_337178
Instrument:ICPMS04
Method:SW6020

CCB 7	Date: 24-Apr-2019 16:20	Seq: 5048501		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.673	0.4	2	
CCB 18	Date: 25-Apr-2019 00:00	Seq: 5048997		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Selenium	1.295	1.1	2	
CCB 20	Date: 25-Apr-2019 00:53	Seq: 5049043		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Iron	12.56	12	200	
CCB 21	Date: 25-Apr-2019 01:14	Seq: 5049004		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Iron	16.58	12	200	
CCB 22	Date: 25-Apr-2019 01:38	Seq: 5049015		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Iron	16.31	12	200	
CCB 23	Date: 25-Apr-2019 02:00	Seq: 5049046		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Iron	20.86	12	200	
CCB 24	Date: 25-Apr-2019 02:27	Seq: 5049058		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.639	0.4	2	
CCB 25	Date: 25-Apr-2019 02:54	Seq: 5049070		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Selenium	1.73	1.1	2	
CCB 26	Date: 25-Apr-2019 03:09	Seq: 5049077		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Selenium	2.166	1.1	2	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19041287

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19041287-01	20190416-NSF-PV63inlet-30MW3-D	Groundwater		16-Apr-2019 22:00	23-Apr-2019 08:35	☐
HS19041287-02	20190416-NSF-PV63inlet-30MW3-T	Groundwater		16-Apr-2019 22:00	23-Apr-2019 08:35	☐
HS19041287-03	20190416-NSF-PV63mid-30MW3-D	Groundwater		16-Apr-2019 21:50	23-Apr-2019 08:35	☐
HS19041287-04	20190416-NSF-PV63mid-30MW3-T	Groundwater		16-Apr-2019 21:50	23-Apr-2019 08:35	☐
HS19041287-05	20190416-NSF-PV63out-30MW3-D	Groundwater		16-Apr-2019 15:15	23-Apr-2019 08:35	☐
HS19041287-06	20190416-NSF-PV63out-30MW3-T	Groundwater		16-Apr-2019 15:15	23-Apr-2019 08:35	☐
HS19041287-07	20190416-NSF-PV56inlet-30FD-D	Groundwater		16-Apr-2019 22:00	23-Apr-2019 08:35	☐
HS19041287-08	20190416-NSF-PV56inlet-30FD-T	Groundwater		16-Apr-2019 22:00	23-Apr-2019 08:35	☐
HS19041287-09	20190416-NSF-PV56mid-30FD-D	Groundwater		16-Apr-2019 21:50	23-Apr-2019 08:35	☐
HS19041287-10	20190416-NSF-PV56mid-30FD-T	Groundwater		16-Apr-2019 21:50	23-Apr-2019 08:35	☐
HS19041287-11	20190416-NSF-PV56out-30FD-D	Groundwater		16-Apr-2019 15:15	23-Apr-2019 08:35	☐
HS19041287-12	20190416-NSF-PV56out-30FD-T	Groundwater		16-Apr-2019 15:15	23-Apr-2019 08:35	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190416-NSF-PV63inlet-30MW3-D
Collection Date: 16-Apr-2019 22:00

ANALYTICAL REPORT
WorkOrder:HS19041287
Lab ID:HS19041287-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 24-Apr-2019		Analyst: JHD
Antimony	**0.117**		**0.000400**	**0.00200**	**mg/L**	1	26-Apr-2019 00:39
Arsenic	**0.0743**		**0.000400**	**0.00200**	**mg/L**	1	26-Apr-2019 00:39
Cadmium	**0.0623**		**0.000200**	**0.00200**	**mg/L**	1	26-Apr-2019 00:39
Iron	U		0.0120	0.200	mg/L	1	26-Apr-2019 00:39
Lead	**0.164**		**0.000600**	**0.00200**	**mg/L**	1	26-Apr-2019 00:39
Selenium	**1.83**		**0.0220**	**0.0400**	**mg/L**	20	26-Apr-2019 15:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190416-NSF-PV63inlet-30MW3-T
Collection Date: 16-Apr-2019 22:00

ANALYTICAL REPORT
WorkOrder:HS19041287
Lab ID:HS19041287-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 24-Apr-2019		Analyst: JC
Antimony	**0.127**		**0.000800**	**0.00400**	**mg/L**	2	24-Apr-2019 23:42
Arsenic	**0.133**		**0.000800**	**0.00400**	**mg/L**	2	24-Apr-2019 23:42
Cadmium	**0.0637**		**0.000400**	**0.00400**	**mg/L**	2	24-Apr-2019 23:42
Iron	**1.91**		**0.0240**	**0.400**	**mg/L**	2	24-Apr-2019 23:42
Lead	**0.637**		**0.00120**	**0.00400**	**mg/L**	2	24-Apr-2019 23:42
Selenium	**2.13**		**0.00220**	**0.00400**	**mg/L**	2	24-Apr-2019 23:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190416-NSF-PV63mid-30MW3-D
Collection Date: 16-Apr-2019 21:50

ANALYTICAL REPORT
WorkOrder:HS19041287
Lab ID:HS19041287-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 24-Apr-2019		Analyst: JHD
Antimony	**0.00304**		**0.000400**	**0.00200**	**mg/L**	1	26-Apr-2019 00:41
Arsenic	U		0.000400	0.00200	mg/L	1	26-Apr-2019 00:41
Cadmium	U		0.000200	0.00200	mg/L	1	26-Apr-2019 00:41
Iron	**0.0531**	J	**0.0120**	**0.200**	**mg/L**	1	26-Apr-2019 00:41
Lead	U		0.000600	0.00200	mg/L	1	26-Apr-2019 00:41
Selenium	**0.294**		**0.00110**	**0.00200**	**mg/L**	1	26-Apr-2019 00:41

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190416-NSF-PV63mid-30MW3-T
Collection Date: 16-Apr-2019 21:50

ANALYTICAL REPORT
WorkOrder:HS19041287
Lab ID:HS19041287-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 24-Apr-2019		Analyst: JC
Antimony	**0.00284**		**0.000400**	**0.00200**	**mg/L**	1	24-Apr-2019 23:06
Arsenic	U		0.000400	0.00200	mg/L	1	24-Apr-2019 23:06
Cadmium	U		0.000200	0.00200	mg/L	1	24-Apr-2019 23:06
Iron	**6.86**		**0.0240**	**0.400**	**mg/L**	2	24-Apr-2019 23:44
Lead	U		0.000600	0.00200	mg/L	1	24-Apr-2019 23:06
Selenium	**0.247**		**0.00220**	**0.00400**	**mg/L**	2	24-Apr-2019 23:44

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190416-NSF-PV63out-30MW3-D
Collection Date: 16-Apr-2019 15:15

ANALYTICAL REPORT
WorkOrder:HS19041287
Lab ID:HS19041287-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 24-Apr-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	26-Apr-2019 00:43
Arsenic	U		0.000400	0.00200	mg/L	1	26-Apr-2019 00:43
Cadmium	U		0.000200	0.00200	mg/L	1	26-Apr-2019 00:43
Iron	U		0.0120	0.200	mg/L	1	26-Apr-2019 00:43
Lead	U		0.000600	0.00200	mg/L	1	26-Apr-2019 00:43
Selenium	**0.0256**		**0.00110**	**0.00200**	**mg/L**	1	26-Apr-2019 00:43

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190416-NSF-PV63out-30MW3-T
Collection Date: 16-Apr-2019 15:15

ANALYTICAL REPORT
WorkOrder:HS19041287
Lab ID:HS19041287-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 24-Apr-2019		Analyst: JC
Antimony	U		0.000400	0.00200	mg/L	1	25-Apr-2019 13:19
Arsenic	U		0.000400	0.00200	mg/L	1	25-Apr-2019 13:19
Cadmium	U		0.000200	0.00200	mg/L	1	25-Apr-2019 13:19
Iron	**3.23**		**0.0120**	**0.200**	**mg/L**	1	25-Apr-2019 13:19
Lead	U		0.000600	0.00200	mg/L	1	25-Apr-2019 13:19
Selenium	**0.0237**		**0.00110**	**0.00200**	**mg/L**	1	25-Apr-2019 13:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190416-NSF-PV56inlet-30FD-D
Collection Date: 16-Apr-2019 22:00

ANALYTICAL REPORT
WorkOrder:HS19041287
Lab ID:HS19041287-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 24-Apr-2019		Analyst: JHD
Antimony	**0.124**		**0.000400**	**0.00200**	**mg/L**	1	26-Apr-2019 00:45
Arsenic	**0.119**		**0.000400**	**0.00200**	**mg/L**	1	26-Apr-2019 00:45
Cadmium	**0.0636**		**0.000200**	**0.00200**	**mg/L**	1	26-Apr-2019 00:45
Iron	U		0.0120	0.200	mg/L	1	26-Apr-2019 00:45
Lead	**0.351**		**0.000600**	**0.00200**	**mg/L**	1	26-Apr-2019 00:45
Selenium	**1.79**		**0.0220**	**0.0400**	**mg/L**	20	26-Apr-2019 15:32

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190416-NSF-PV56inlet-30FD-T
Collection Date: 16-Apr-2019 22:00

ANALYTICAL REPORT
WorkOrder:HS19041287
Lab ID:HS19041287-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 24-Apr-2019		Analyst: JC
Antimony	**0.114**		**0.000800**	**0.00400**	**mg/L**	2	24-Apr-2019 23:49
Arsenic	**0.173**		**0.000800**	**0.00400**	**mg/L**	2	24-Apr-2019 23:49
Cadmium	**0.0647**		**0.000400**	**0.00400**	**mg/L**	2	24-Apr-2019 23:49
Iron	**1.12**		**0.0240**	**0.400**	**mg/L**	2	24-Apr-2019 23:49
Lead	**0.741**		**0.00120**	**0.00400**	**mg/L**	2	24-Apr-2019 23:49
Selenium	**2.14**		**0.00220**	**0.00400**	**mg/L**	2	24-Apr-2019 23:49

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190416-NSF-PV56mid-30FD-D
Collection Date: 16-Apr-2019 21:50

ANALYTICAL REPORT
WorkOrder:HS19041287
Lab ID:HS19041287-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 24-Apr-2019		Analyst: JHD
Antimony	**0.00232**		**0.000400**	**0.00200**	**mg/L**	1	26-Apr-2019 00:46
Arsenic	U		0.000400	0.00200	mg/L	1	26-Apr-2019 00:46
Cadmium	U		0.000200	0.00200	mg/L	1	26-Apr-2019 00:46
Iron	U		0.0120	0.200	mg/L	1	26-Apr-2019 00:46
Lead	U		0.000600	0.00200	mg/L	1	26-Apr-2019 00:46
Selenium	**0.139**		**0.00110**	**0.00200**	**mg/L**	1	26-Apr-2019 00:46

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190416-NSF-PV56mid-30FD-T
Collection Date: 16-Apr-2019 21:50

ANALYTICAL REPORT
WorkOrder:HS19041287
Lab ID:HS19041287-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 24-Apr-2019		Analyst: JC
Antimony	**0.00249**		**0.000400**	**0.00200**	**mg/L**	1	25-Apr-2019 13:22
Arsenic	**0.000494**	J	**0.000400**	**0.00200**	**mg/L**	1	25-Apr-2019 13:22
Cadmium	U		0.000200	0.00200	mg/L	1	25-Apr-2019 13:22
Iron	**7.16**		**0.0240**	**0.400**	**mg/L**	2	24-Apr-2019 23:51
Lead	U		0.000600	0.00200	mg/L	1	25-Apr-2019 13:22
Selenium	**0.120**		**0.00220**	**0.00400**	**mg/L**	2	24-Apr-2019 23:51

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190416-NSF-PV56out-30FD-D
Collection Date: 16-Apr-2019 15:15

ANALYTICAL REPORT
WorkOrder:HS19041287
Lab ID:HS19041287-11
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 24-Apr-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	26-Apr-2019 00:51
Arsenic	U		0.000400	0.00200	mg/L	1	26-Apr-2019 00:51
Cadmium	U		0.000200	0.00200	mg/L	1	26-Apr-2019 00:51
Iron	U		0.0120	0.200	mg/L	1	26-Apr-2019 00:51
Lead	U		0.000600	0.00200	mg/L	1	26-Apr-2019 00:51
Selenium	**0.00248**		**0.00110**	**0.00200**	**mg/L**	1	26-Apr-2019 00:51

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190416-NSF-PV56out-30FD-T
Collection Date: 16-Apr-2019 15:15

ANALYTICAL REPORT
WorkOrder:HS19041287
Lab ID:HS19041287-12
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 24-Apr-2019		Analyst: JC
Antimony	U		0.000400	0.00200	mg/L	1	25-Apr-2019 13:24
Arsenic	**0.000524**	J	**0.000400**	**0.00200**	**mg/L**	1	25-Apr-2019 13:24
Cadmium	U		0.000200	0.00200	mg/L	1	25-Apr-2019 13:24
Iron	**4.23**		**0.0120**	**0.200**	**mg/L**	1	25-Apr-2019 13:24
Lead	U		0.000600	0.00200	mg/L	1	25-Apr-2019 13:24
Selenium	**0.00203**		**0.00110**	**0.00200**	**mg/L**	1	25-Apr-2019 13:24

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19041287

Batch ID: 140147 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19041287-02	1	10	10 (mL)	1
HS19041287-04	1	10	10 (mL)	1
HS19041287-06	1	10	10 (mL)	1
HS19041287-08	1	10	10 (mL)	1
HS19041287-10	1	10	10 (mL)	1
HS19041287-12	1	10	10 (mL)	1

Batch ID: 140158 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19041287-01	1	10	10 (mL)	1
HS19041287-03	1	10	10 (mL)	1
HS19041287-05	1	10	10 (mL)	1
HS19041287-07	1	10	10 (mL)	1
HS19041287-09	1	10	10 (mL)	1
HS19041287-11	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19041287

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 140147	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19041287-02	20190416-NSF-PV63inlet-30MW3-T	16 Apr 2019 22:00		24 Apr 2019 10:15	24 Apr 2019 23:42	2
HS19041287-04	20190416-NSF-PV63mid-30MW3-T	16 Apr 2019 21:50		24 Apr 2019 10:15	24 Apr 2019 23:44	2
HS19041287-04	20190416-NSF-PV63mid-30MW3-T	16 Apr 2019 21:50		24 Apr 2019 10:15	24 Apr 2019 23:06	1
HS19041287-06	20190416-NSF-PV63out-30MW3-T	16 Apr 2019 15:15		24 Apr 2019 10:15	25 Apr 2019 13:19	1
HS19041287-08	20190416-NSF-PV56inlet-30FD-T	16 Apr 2019 22:00		24 Apr 2019 10:15	24 Apr 2019 23:49	2
HS19041287-10	20190416-NSF-PV56mid-30FD-T	16 Apr 2019 21:50		24 Apr 2019 10:15	25 Apr 2019 13:22	1
HS19041287-10	20190416-NSF-PV56mid-30FD-T	16 Apr 2019 21:50		24 Apr 2019 10:15	24 Apr 2019 23:51	2
HS19041287-12	20190416-NSF-PV56out-30FD-T	16 Apr 2019 15:15		24 Apr 2019 10:15	25 Apr 2019 13:24	1
Batch ID 140158	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS19041287-01	20190416-NSF-PV63inlet-30MW3-D	16 Apr 2019 22:00		24 Apr 2019 11:00	26 Apr 2019 15:30	20
HS19041287-01	20190416-NSF-PV63inlet-30MW3-D	16 Apr 2019 22:00		24 Apr 2019 11:00	26 Apr 2019 00:39	1
HS19041287-03	20190416-NSF-PV63mid-30MW3-D	16 Apr 2019 21:50		24 Apr 2019 11:00	26 Apr 2019 00:41	1
HS19041287-05	20190416-NSF-PV63out-30MW3-D	16 Apr 2019 15:15		24 Apr 2019 11:00	26 Apr 2019 00:43	1
HS19041287-07	20190416-NSF-PV56inlet-30FD-D	16 Apr 2019 22:00		24 Apr 2019 11:00	26 Apr 2019 15:32	20
HS19041287-07	20190416-NSF-PV56inlet-30FD-D	16 Apr 2019 22:00		24 Apr 2019 11:00	26 Apr 2019 00:45	1
HS19041287-09	20190416-NSF-PV56mid-30FD-D	16 Apr 2019 21:50		24 Apr 2019 11:00	26 Apr 2019 00:46	1
HS19041287-11	20190416-NSF-PV56out-30FD-D	16 Apr 2019 15:15		24 Apr 2019 11:00	26 Apr 2019 00:51	1

WorkOrder: HS19041287
InstrumentID: ICPMS06
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000461	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000438	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000484	0.000200	0.00200
A	Iron	7439-89-6	0.0500	0.0528	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000931	0.000600	0.00200
A	Selenium	7782-49-2	0.00250	0.00239	0.00110	0.00200

WorkOrder: HS19041287
InstrumentID: ICPMS04
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000774	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000493	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000493	0.000200	0.00200
A	Iron	7439-89-6	0.0500	0.0716	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000944	0.000600	0.00200
A	Selenium	7782-49-2	0.00250	0.00223	0.00110	0.00200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19041287

QC BATCH REPORT

Batch ID: 140147 (0) **Instrument: ICPMS04** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLK-140147** Units: **mg/L** Analysis Date: **24-Apr-2019 22:14**
Client ID: Run ID: **ICPMS04_337178** SeqNo: **5048951** PrepDate: **24-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Iron	U	0.200								
Lead	U	0.00200								
Selenium	U	0.00200								

LCS Sample ID: **LCS-140147** Units: **mg/L** Analysis Date: **24-Apr-2019 22:16**
Client ID: Run ID: **ICPMS04_337178** SeqNo: **5048952** PrepDate: **24-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04788	0.00200	0.05	0	95.8	80 - 120				
Arsenic	0.04921	0.00200	0.05	0	98.4	80 - 120				
Cadmium	0.04874	0.00200	0.05	0	97.5	80 - 120				
Iron	4.869	0.200	5	0	97.4	80 - 120				
Lead	0.04614	0.00200	0.05	0	92.3	80 - 120				
Selenium	0.04969	0.00200	0.05	0	99.4	80 - 120				

MS Sample ID: **HS19040954-04MS** Units: **mg/L** Analysis Date: **24-Apr-2019 22:23**
Client ID: Run ID: **ICPMS04_337178** SeqNo: **5048955** PrepDate: **24-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04929	0.00200	0.05	0.000024	98.5	80 - 120				
Arsenic	0.05455	0.00200	0.05	0.00149	106	80 - 120				
Cadmium	0.04869	0.00200	0.05	0.000054	97.3	80 - 120				
Iron	5.152	0.200	5	0.1804	99.4	80 - 120				
Lead	0.0489	0.00200	0.05	0.000079	97.6	80 - 120				
Selenium	0.05376	0.00200	0.05	0.000691	106	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19041287

QC BATCH REPORT

Batch ID: 140147 (0) **Instrument: ICPMS04** **Method: ICP-MS METALS BY SW6020A**

MSD Sample ID: **HS19040954-04MSD** Units: **mg/L** Analysis Date: **24-Apr-2019 22:27**
Client ID: Run ID: **ICPMS04_337178** SeqNo: **5048957** PrepDate: **24-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04706	0.00200	0.05	0.000024	94.1	80 - 120	0.04929	4.64	20	
Arsenic	0.05256	0.00200	0.05	0.00149	102	80 - 120	0.05455	3.73	20	
Cadmium	0.04761	0.00200	0.05	0.000054	95.1	80 - 120	0.04869	2.24	20	
Iron	4.927	0.200	5	0.1804	94.9	80 - 120	5.152	4.46	20	
Lead	0.04705	0.00200	0.05	0.000079	93.9	80 - 120	0.0489	3.85	20	
Selenium	0.05098	0.00200	0.05	0.000691	101	80 - 120	0.05376	5.31	20	

PDS Sample ID: **HS19040954-04PDS** Units: **mg/L** Analysis Date: **24-Apr-2019 22:30**
Client ID: Run ID: **ICPMS04_337178** SeqNo: **5048958** PrepDate: **24-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09654	0.00200	0.1	0.000024	96.5	75 - 125				
Arsenic	0.1063	0.00200	0.1	0.00149	105	75 - 125				
Cadmium	0.09688	0.00200	0.1	0.000054	96.8	75 - 125				
Iron	10.02	0.200	10	0.1804	98.3	75 - 125				
Lead	0.09848	0.00200	0.1	0.000079	98.4	75 - 125				
Selenium	0.1031	0.00200	0.1	0.000691	102	75 - 125				

SD Sample ID: **HS19040954-04SD** Units: **mg/L** Analysis Date: **24-Apr-2019 22:21**
Client ID: Run ID: **ICPMS04_337178** SeqNo: **5048954** PrepDate: **24-Apr-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000024	0	10	
Arsenic	U	0.0100					0.00149	0	10	
Cadmium	U	0.0100					0.000054	0	10	
Iron	0.1641	1.00					0.1804	0	10	J
Lead	U	0.0100					0.000079	0	10	
Selenium	U	0.0100					0.000691	0	10	

The following samples were analyzed in this batch: HS19041287-02 HS19041287-04 HS19041287-06 HS19041287-08 HS19041287-10 HS19041287-12

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19041287

QC BATCH REPORT

Batch ID: 140158 (0) **Instrument: ICPMS06** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

MBLK Sample ID: **MBLK-140158** Units: **mg/L** Analysis Date: **26-Apr-2019 00:17**
Client ID: Run ID: **ICPMS06_337272** SeqNo: **5051123** PrepDate: **24-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Iron	U	0.200								
Lead	U	0.00200								
Selenium	U	0.00200								

LCS Sample ID: **LCS-140158** Units: **mg/L** Analysis Date: **26-Apr-2019 00:19**
Client ID: Run ID: **ICPMS06_337272** SeqNo: **5051124** PrepDate: **24-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05142	0.00200	0.05	0	103	80 - 120				
Arsenic	0.05034	0.00200	0.05	0	101	80 - 120				
Cadmium	0.05278	0.00200	0.05	0	106	80 - 120				
Iron	4.733	0.200	5	0	94.7	80 - 120				
Lead	0.04841	0.00200	0.05	0	96.8	80 - 120				
Selenium	0.05542	0.00200	0.05	0	111	80 - 120				

MS Sample ID: **HS19041102-07MS** Units: **mg/L** Analysis Date: **26-Apr-2019 00:24**
Client ID: Run ID: **ICPMS06_337272** SeqNo: **5051127** PrepDate: **24-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05366	0.00200	0.05	0.00021	107	75 - 125				
Arsenic	0.05493	0.00200	0.05	0.003352	103	75 - 125				
Cadmium	0.04995	0.00200	0.05	0.000069	99.8	75 - 125				
Iron	4.818	0.200	5	0.01541	96.0	75 - 125				
Lead	0.0487	0.00200	0.05	0.001408	94.6	75 - 125				
Selenium	0.05473	0.00200	0.05	0.001054	107	75 - 125				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19041287

QC BATCH REPORT

Batch ID: 140158 (0) **Instrument: ICPMS06** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

MSD Sample ID: **HS19041102-07MSD** Units: **mg/L** Analysis Date: **26-Apr-2019 00:25**
Client ID: Run ID: **ICPMS06_337272** SeqNo: **5051128** PrepDate: **24-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.0548	0.00200	0.05	0.00021	109	75 - 125	0.05366	2.09	20	
Arsenic	0.05553	0.00200	0.05	0.003352	104	75 - 125	0.05493	1.09	20	
Cadmium	0.05023	0.00200	0.05	0.000069	100	75 - 125	0.04995	0.561	20	
Iron	4.748	0.200	5	0.01541	94.7	75 - 125	4.818	1.45	20	
Lead	0.0497	0.00200	0.05	0.001408	96.6	75 - 125	0.0487	2.03	20	
Selenium	0.05573	0.00200	0.05	0.001054	109	75 - 125	0.05473	1.82	20	

PDS Sample ID: **HS19041102-07PDS** Units: **mg/L** Analysis Date: **26-Apr-2019 00:27**
Client ID: Run ID: **ICPMS06_337272** SeqNo: **5051129** PrepDate: **24-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1077	0.00200	0.1	0.00021	108	75 - 125				
Arsenic	0.1075	0.00200	0.1	0.003352	104	75 - 125				
Cadmium	0.1066	0.00200	0.1	0.000069	107	75 - 125				
Iron	9.77	0.200	10	0.01541	97.5	75 - 125				
Lead	0.1041	0.00200	0.1	0.001408	103	75 - 125				
Selenium	0.112	0.00200	0.1	0.001054	111	75 - 125				

SD Sample ID: **HS19041102-07SD** Units: **mg/L** Analysis Date: **26-Apr-2019 00:22**
Client ID: Run ID: **ICPMS06_337272** SeqNo: **5051126** PrepDate: **24-Apr-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.00021	0	10	
Arsenic	0.003014	0.0100					0.003352	0	10	J
Cadmium	U	0.0100					0.000069	0	10	
Iron	U	1.00					0.01541	0	10	
Lead	U	0.0100					0.001408	0	10	
Selenium	U	0.0100					0.001054	0	10	

The following samples were analyzed in this batch: HS19041287-01 HS19041287-03 HS19041287-05 HS19041287-07 HS19041287-09 HS19041287-11

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19041287**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
California	2919, 2018-2019	30-Apr-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19041287

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19041287-01	20190416-NSF-PV63inlet-30MW3-D	Login	4/23/2019 12:40:46 PM	NDR	MET046
HS19041287-02	20190416-NSF-PV63inlet-30MW3-T	Login	4/23/2019 12:40:46 PM	NDR	MET046
HS19041287-03	20190416-NSF-PV63mid-30MW3-D	Login	4/23/2019 12:40:46 PM	NDR	MET046
HS19041287-04	20190416-NSF-PV63mid-30MW3-T	Login	4/23/2019 12:40:46 PM	NDR	MET046
HS19041287-05	20190416-NSF-PV63out-30MW3-D	Login	4/23/2019 12:40:46 PM	NDR	MET046
HS19041287-06	20190416-NSF-PV63out-30MW3-T	Login	4/23/2019 12:40:46 PM	NDR	MET046
HS19041287-07	20190416-NSF-PV56inlet-30FD-D	Login	4/23/2019 12:40:46 PM	NDR	MET046
HS19041287-08	20190416-NSF-PV56inlet-30FD-T	Login	4/23/2019 12:40:46 PM	NDR	MET046

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19041287
Date/Time Received: **23-Apr-2019 08:35**
Received by: **PMG**

Checklist completed by: *Nilesh D. Ranchod* eSignature — 23-Apr-2019 Date
Reviewed by: *Dane J. Wacasey* eSignature — 25-Apr-2019 Date

Matrices: **GW**
Carrier name: **FedEx International Priority**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	2 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	20.5c uc/c	IR 25
Cooler(s)/Kit(s):	43635	
Date/Time sample(s) sent to storage:	04/23/2019 13:45	

Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

ALS Environmental

Chain of Custody Form

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HS19041287

Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086-06	Project Name	Exide Column Studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086-06	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suite 260	Address	13515 Barrett Parkway Drive, Suite 260	E	ICP TW (6020A total metals (6)): Pb, Cd, Sb, Se, As, Fe
				F	ICP DISS (6020A diss metals (6)-FldFltr): Pb, Cd, Sb, Se, As, Fe
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	G	
Phone	314 984-8800	Phone	314 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190416-NSF-PV63inlet-30MW3-D	04-16-19	10:00 PM	GW	2	1						X					
2	20190416-NSF-PV63inlet-30MW3-T	04-16-19	10:00 PM	GW	2	1					X						
3	20190416-NSF-PV63mid-30MW3-D	04-16-19	9:50 PM	GW	2	1						X					
4	20190416-NSF-PV63mid-30MW3-T	04-16-19	9:50 PM	GW	2	1					X						
5	20190416-NSF-PV63out-30MW3-D	04-16-19	3:15 PM	GW	2	1						X					
6	20190416-NSF-PV63out-30MW3-T	04-16-19	3:15 PM	GW	2	1					X						
7	20190416-NSF-PV56inlet-30FD-D	04-16-19	10:00 PM	GW	2	1						X					
8	20190416-NSF-PV56inlet-30FD-T	04-16-19	10:00 PM	GW	2	1					X						
9	20190416-NSF-PV56mid-30FD-D	04-16-19	9:50 PM	GW	2	1						X					
10	20190416-NSF-PV56mid-30FD-T	04-16-19	9:50 PM	GW	2	1					X						

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method: FedEx

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☑ Other

Results Due Date: STD 5-DAY TAT

Relinquished by: Giovanna Llamosas	Date: 2019/04/22	15:30:00	Received by:	Notes:
Relinquished by:	Date:	Time:	Received by (Laboratory): 4/23/19 08:35	Cooler Temp. 6.1°C
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	20.5-0.2 = 20.3

QC Package: (Check Box Below)

	Level II: Standard QC	x	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other:		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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Chain of Custody Form

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HS19041287

Golder Associates
Exide Column Studies

Customer Information		Project Information		ALS Project Manager:
PO Number	130-2086-06	Project Name	Exide Column Studies	
Work Order		Project Number	130-2086-06	
Company Name	Golder Associates	Bill To Company	Golder Associates	
Send Report To	Emily White	Invoice Attn:	Tammy Kurzmack Exide A/P	
Address	13515 Barrett Parkway Drive, Suite 260	Address	13515 Barrett Parkway Drive, Suite 260	
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	
Phone	314 984-8800	Phone	314 984-8800	
Fax		Fax		
e-Mail Address	ewhite@golder.com	e-Mail Address		

Analysis Requested

A	300 W (300Cl, SO4, NO3-48h HT)
B	TDS W 2540C (2540C TDS)
C	ALK W 2320B (2320B alkalinity)
D	HARD (2340B hardness (calc))
E	ICP TW (6020A total metals (6)): Pb, Cd, Sb, Se, As, Fe
F	ICP DISS (6020A diss metals (6)-FldFltr): Pb, Cd, Sb, Se, As, Fe
G	
H	
I	
J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
11	20190416-NSF-PV56out-30FD-D	04-16-19	3:15 PM	GW	2	1						X					
12	20190416-NSF-PV56out-30FD-T	04-16-19	3:15 PM	GW	2	1					X						
13																	
14																	
15																	
16																	
17																	
18																	
19																	
20																	

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method: FedEx

Required Turnaround Time: ☐ STD 10 Wk Days ☐ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☑ Other ____

Results Due Date: STD 5-DAY TAT

Relinquished by: Giovanna Llamosas	Date: 2019/04/22	15:30:00	Received by:	Notes:
Relinquished by:	Date:	Time:	Received by (Laboratory): 4/23/19 08:35	Cooler Temp.
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	

QC Package: (Check Box Below)

	Level II: Standard QC	x	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other:		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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ORIGIN ID:YUXA (514) 383-0990
AUDREY ETHEVES
GOLDER ASSOCIATES LTD
7250 RUE DU MILE END
3E ETAGE
MONTREAL, PQ H2R3A4
CANADA CA

SHIP DATE: 22APR19
ACTWGT: 5.30 KG
CAD: 108680724/INET4102

BILL RECIPIENT

TO **DANE WACASEY**
ALS HOUSTON LABORATORY
10450 STANCLIFF RD
STE 210
HOUSTON TX 77099 **(US)**
(281) 530-5656 REF:
INV:
PO: DEPT:

565J1/D7E5/23AD

FedEx Express

E

J19101901070Zav

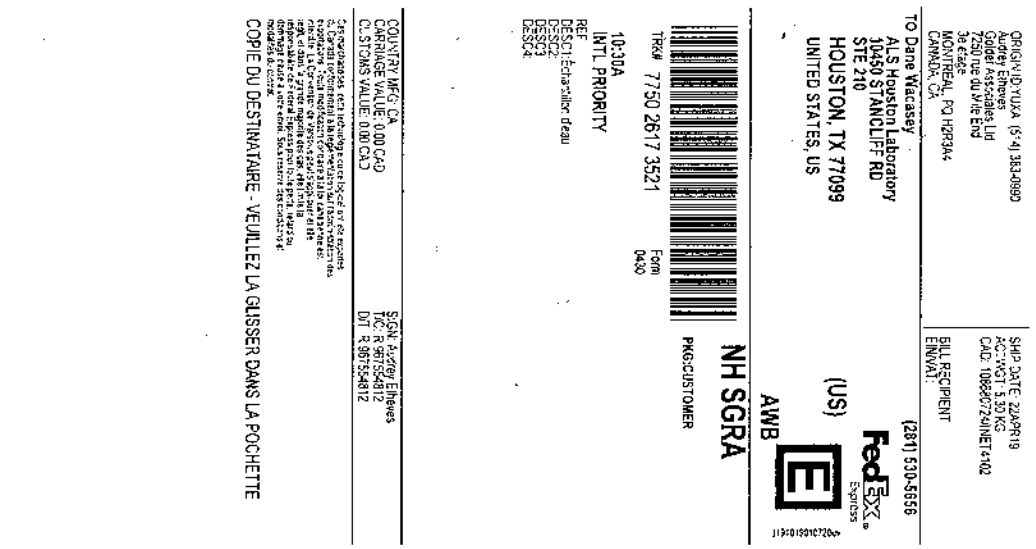
10:30A
INTL PRIORITY

TRK# 0430 **7750 2617 3521**

NH SGRA

77099
TX-US IAH

Après l'impression de cette étiquette :
COPIE DU DESTINATAIRE - VEUILLEZ LA PLACER DEVANT LA POCHETTE
1. Pliez la page imprimée le long de la ligne horizontale.
2. Placez l'étiquette dans la pochette d'expédition et fixez-la à votre paquet.



ORIGIN ID:YUXA (514) 363-0990
Audrey Ethieves
Golder Associates Ltd
7250 rue du Mile End
3e étage
MONTREAL, PQ H2R3A4
CANADA, CA

SHIP DATE: 22APR19
ACTWGT: 5.30 KG
CAD: 106887724/INET4102

BILL RECIPIENT
EINVAT

TO Dane Wiarcassey
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

(281) 530-5656

(US)

FedEx Express

AWB

J19018010720uv

NH SGRA

PKG/CUSTOMER

TRK# 7750 2617 3521

Form 0430

10:30A
INTL PRIORITY

REF
DESC1:Echantillon d'eau
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: Audrey Ethieves
TIC: R 9875548812
DUT R 9875548812

COPIE DU DESTINATAIRE - VEUILLEZ LA GLISSER DANS LA POCHETTE

Après l'impression de cette étiquette :
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ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
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43623

CUSTODY SEAL

Date: 20190422 Time: 15:30
Name: Dane Wiarcassey
Company: Golder Associate

Seal Broken By: GM
Date: 04/23/19

43623 APR 23 2019

ALS
10450 Stancliff Rd., Suite 210
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43623

CUSTODY SEAL

Date: 20190422 Time: 15:30
Name: Dane Wiarcassey
Company: Golder Associate

Seal Broken By: GM
Date: 04/23/19

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
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April 29, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19041290**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 12 sample(s) on Apr 23, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19041290**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS19041290**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 04/29/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19041290				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 140158,140215				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	X				
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?			X		
		Were analytical duplicates analyzed at the appropriate frequency?			X		
		Were RPDs or relative standard deviations within the laboratory QC limits?			X		
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 04/29/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19041290				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 140158,140215				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			1
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports	
Laboratory Name: ALS Laboratory Group	LRC Date: 04/29/2019
Project Name: Exide Column Studies	Laboratory Job Number: HS19041290
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 140158,140215

ER#[5]	Description
1	See Run Log and CCB Exceptions Report.

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19041290
Start Date: 26-Apr-2019 End Date: 29-Apr-2019

Run ID:ICPMS04_337345
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ICV	1	26-Apr-2019 12:50	019_ICV.d	AS CD FE PB SB SE
LLICV2	1	26-Apr-2019 12:52	020LCV2.d	AS CD FE PB SB SE
LLICV5	1	26-Apr-2019 12:55	021LCV5.d	AS CD FE PB SB SE
ICB	1	26-Apr-2019 12:57	022_ICB.d	AS CD FE PB SB SE
ICSA	1	26-Apr-2019 13:06	023ICSA.d	AS CD FE PB SB SE
ICSAB	1	26-Apr-2019 13:08	024ICSB.d	AS CD FE PB SB SE
CCV 1	1	26-Apr-2019 13:37	035_CCV.d	AS CD FE PB SB SE
CCB 1	1	26-Apr-2019 13:39	036_CCB.d	AS CD FE PB SB SE
CCV 2	1	26-Apr-2019 13:59	044_CCV.d	AS CD FE PB SB SE
CCB 2	1	26-Apr-2019 14:01	045_CCB.d	AS CD FE PB SB SE
CCV 3	1	26-Apr-2019 14:28	055_CCV.d	AS CD FE PB SB SE
CCB 3	1	26-Apr-2019 14:39	058_CCB.d	AS CD FE PB SB SE
CCV 4	1	26-Apr-2019 15:03	069_CCV.d	AS CD FE PB SB SE
CCB 4	1	26-Apr-2019 15:05	070_CCB.d	AS CD FE PB SB SE
ICCV 5	1	26-Apr-2019 15:44	085_ICV.d	AS CD FE PB SB SE
LLCCV2	1	26-Apr-2019 15:47	086LCV2.d	AS CD FE PB SB SE
LLCCV5	1	26-Apr-2019 15:49	087LCV5.d	AS CD FE PB SB SE
ICCB 5	1	26-Apr-2019 15:51	088_ICB.d	AS CD FE PB SB SE
CCV 6	1	26-Apr-2019 16:20	099_CCV.d	AS CD FE PB SB SE
CCB 6	1	26-Apr-2019 16:22	100_CCB.d	AS CD FE PB SB SE
CCV 7	1	26-Apr-2019 16:50	111_CCV.d	AS CD FE PB SB SE
CCB 7	1	26-Apr-2019 16:52	112_CCB.d	AS CD FE PB SB SE
CCV 8	1	26-Apr-2019 17:18	123_CCV.d	AS CD FE PB SB SE
CCB 8	1	26-Apr-2019 17:21	124_CCB.d	AS CD FE PB SB SE
CCV 9	1	26-Apr-2019 17:45	134_CCV.d	AS CD FE PB SB SE
CCB 9	1	26-Apr-2019 17:47	135_CCB.d	AS CD FE PB SB SE
CCV 10	1	26-Apr-2019 18:12	146_CCV.d	AS CD FE PB SB SE
CCB 10	1	26-Apr-2019 18:14	147_CCB.d	AS CD FE PB SB SE
CCV 11	1	26-Apr-2019 18:30	154_CCV.d	AS CD FE PB SB SE
CCB 11	1	26-Apr-2019 18:32	155_CCB.d	AS CD FE PB SB SE
CCV 12	1	26-Apr-2019 18:57	166_CCV.d	AS CD FE PB SB SE
CCB 12	1	26-Apr-2019 18:59	167_CCB.d	AS CD FE PB SB SE
CCV 13	1	26-Apr-2019 19:24	178_CCV.d	AS CD FE PB SB SE
CCB 13	1	26-Apr-2019 19:26	179_CCB.d	AS CD FE PB SB SE
CCV 14	1	26-Apr-2019 19:37	184_CCV.d	AS CD FE PB SB SE
CCB 14	1	26-Apr-2019 19:39	185_CCB.d	AS CD FE PB SB SE
ICCV 15	1	26-Apr-2019 23:22	201_ICV.d	AS CD FE PB SB SE
LLCCV2	1	26-Apr-2019 23:24	202LCV2.d	AS CD FE PB SB SE
LLCCV5	1	26-Apr-2019 23:26	203LCV5.d	AS CD FE PB SB SE
ICCB 15	1	26-Apr-2019 23:29	204_ICB.d	AS CD FE PB SB SE
MBLK-140215	1	26-Apr-2019 23:49	206SMPL.d	AS CD FE PB SB SE
LCS-140215	1	26-Apr-2019 23:51	207SMPL.d	AS CD FE PB SB SE
ZZZZZZSD	5	26-Apr-2019 23:56	209SMPL.d	CD FE PB SB SE
ZZZZZZMS	1	26-Apr-2019 23:58	210SMPL.d	AS CD FE PB SB SE
ZZZZZZMSD	1	27-Apr-2019 00:00	211SMPL.d	AS CD FE PB SB SE
ZZZZZZPDS	1	27-Apr-2019 00:03	212SMPL.d	AS CD FE PB SB SE
CCV 16	1	27-Apr-2019 00:05	213_CCV.d	AS CD FE PB SB SE
CCB 16	1	27-Apr-2019 00:07	214_CCB.d	AS CD FE PB SB SE
20190416-NSF-PV55inlet-30MW11-T	1	27-Apr-2019 00:18	219SMPL.d	AS CD FE PB SB
20190416-NSF-PV55mid-30MW11-T	1	27-Apr-2019 00:20	220SMPL.d	AS CD FE PB SB SE

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19041290
Start Date: 26-Apr-2019 End Date: 29-Apr-2019

Run ID:ICPMS04_337345
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
20190416-NSF-PV55out-30MW11-T	1	27-Apr-2019 00:23	221SMPL.d	AS CD FE PB SB SE
20190416-NSF-PV56inlet-controlFD-T	1	27-Apr-2019 00:25	222SMPL.d	AS CD FE PB SB
20190416-NSF-PV56mid-controlFD-T	1	27-Apr-2019 00:27	223SMPL.d	AS CD FE PB SB
20190416-NSF-PV56out-controlFD-T	1	27-Apr-2019 00:29	224SMPL.d	AS CD FE PB SB
CCV 17	1	27-Apr-2019 00:32	225_CCV.d	AS CD FE PB SB SE
CCB 17	1	27-Apr-2019 00:34	226_CCB.d	AS CD FE PB SB SE
CCV 18	1	27-Apr-2019 00:58	237_CCV.d	AS CD FE PB SB SE
CCB 18	1	27-Apr-2019 01:01	238_CCB.d	AS CD FE PB SB SE
ICCV 19	1	27-Apr-2019 01:23	248_ICV.d	AS CD FE PB SB SE
LLCCV2	1	27-Apr-2019 01:25	249LCV2.d	AS CD FE PB SB SE
LLCCV5	1	27-Apr-2019 01:27	250LCV5.d	AS CD FE PB SB SE
ICCB 19	1	27-Apr-2019 01:29	251_ICB.d	AS CD FE PB SB SE
ICSA	1	27-Apr-2019 01:32	252ICSA.d	AS CD FE PB SB SE
ICSAB	1	27-Apr-2019 01:34	253ICSB.d	AS CD FE PB SB SE
CCV 20	1	27-Apr-2019 01:54	262_CCV.d	AS CD FE PB SB SE
CCB 20	1	27-Apr-2019 01:56	263_CCB.d	AS CD FE PB SB SE
CCV 21	1	27-Apr-2019 02:20	274_CCV.d	AS CD FE PB SB SE
CCB 21	1	27-Apr-2019 02:23	275_CCB.d	AS CD FE PB SB SE
CCV 22	1	27-Apr-2019 02:47	286_CCV.d	AS CD FE PB SB SE
CCB 22	1	27-Apr-2019 02:49	287_CCB.d	AS CD FE PB SB SE
CCV 23	1	27-Apr-2019 02:53	289_CCV.d	AS CD FE PB SB SE
CCB 23	1	27-Apr-2019 02:56	290_CCB.d	AS CD FE PB SB SE
LLICV2	1	27-Apr-2019 02:58	291LCV2.d	AS CD FE PB SB SE
LLICV5	1	27-Apr-2019 03:00	292LCV5.d	AS CD FE PB SB SE
ICSA	1	27-Apr-2019 03:02	293ICSA.d	AS CD FE PB SB SE
ICSAB	1	27-Apr-2019 03:05	294ICSB.d	AS CD FE PB SB SE
CCV 24	1	29-Apr-2019 13:53	034_CCV.d	AS CD FE PB SB SE
CCB 24	1	29-Apr-2019 13:55	035_CCB.d	AS CD FE PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19041290

Run ID:ICPMS04_337345
Instrument:ICPMS04
Method:SW6020

CCB 16	Date: 27-Apr-2019 00:07	Seq: 5052878		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.475	0.4	2	
CCB 17	Date: 27-Apr-2019 00:34	Seq: 5052890		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Selenium	1.577	1.1	2	
CCB 18	Date: 27-Apr-2019 01:01	Seq: 5052874		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Selenium	2.101	1.1	2	
ICCB 19	Date: 27-Apr-2019 01:29	Seq: 5052911		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Selenium	-1.206	1.1	2	
CCB 20	Date: 27-Apr-2019 01:56	Seq: 5052923		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Iron	42.35	12	200	
	Selenium	-1.101	1.1	2	
CCB 21	Date: 27-Apr-2019 02:23	Seq: 5052935		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Iron	49.68	12	200	
CCB 22	Date: 27-Apr-2019 02:49	Seq: 5052947		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Iron	35.03	12	200	
	Selenium	-4.985	1.1	2	
CCB 23	Date: 27-Apr-2019 02:56	Seq: 5052950		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Iron	19.44	12	200	
	Selenium	-4.273	1.1	2	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19041290

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19041290-01	20190416-NSF-PV55inlet-30MW11-D	Groundwater		16-Apr-2019 22:00	23-Apr-2019 08:35	☐
HS19041290-02	20190416-NSF-PV55inlet-30MW11-T	Groundwater		16-Apr-2019 22:00	23-Apr-2019 08:35	☐
HS19041290-03	20190416-NSF-PV55mid-30MW11-D	Groundwater		16-Apr-2019 21:50	23-Apr-2019 08:35	☐
HS19041290-04	20190416-NSF-PV55mid-30MW11-T	Groundwater		16-Apr-2019 21:50	23-Apr-2019 08:35	☐
HS19041290-05	20190416-NSF-PV55out-30MW11-D	Groundwater		16-Apr-2019 15:15	23-Apr-2019 08:35	☐
HS19041290-06	20190416-NSF-PV55out-30MW11-T	Groundwater		16-Apr-2019 15:15	23-Apr-2019 08:35	☐
HS19041290-07	20190416-NSF-PV56inlet-controlFD-D	Groundwater		16-Apr-2019 22:00	23-Apr-2019 08:35	☐
HS19041290-08	20190416-NSF-PV56inlet-controlFD-T	Groundwater		16-Apr-2019 22:00	23-Apr-2019 08:35	☐
HS19041290-09	20190416-NSF-PV56mid-controlFD-D	Groundwater		16-Apr-2019 21:50	23-Apr-2019 08:35	☐
HS19041290-10	20190416-NSF-PV56mid-controlFD-T	Groundwater		16-Apr-2019 21:50	23-Apr-2019 08:35	☐
HS19041290-11	20190416-NSF-PV56out-controlFD-D	Groundwater		16-Apr-2019 15:15	23-Apr-2019 08:35	☐
HS19041290-12	20190416-NSF-PV56out-controlFD-T	Groundwater		16-Apr-2019 15:15	23-Apr-2019 08:35	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190416-NSF-PV55inlet-30MW11-D
Collection Date: 16-Apr-2019 22:00

ANALYTICAL REPORT
WorkOrder:HS19041290
Lab ID:HS19041290-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 24-Apr-2019		Analyst: JHD
Antimony	**0.138**		**0.000400**	**0.00200**	**mg/L**	1	26-Apr-2019 00:52
Arsenic	**0.0464**		**0.000400**	**0.00200**	**mg/L**	1	26-Apr-2019 00:52
Cadmium	**0.0645**		**0.000200**	**0.00200**	**mg/L**	1	26-Apr-2019 00:52
Iron	U		0.0120	0.200	mg/L	1	26-Apr-2019 00:52
Lead	**0.116**		**0.000600**	**0.00200**	**mg/L**	1	26-Apr-2019 00:52
Selenium	**1.81**		**0.0220**	**0.0400**	**mg/L**	20	26-Apr-2019 15:33

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190416-NSF-PV55inlet-30MW11-T
Collection Date: 16-Apr-2019 22:00

ANALYTICAL REPORT
WorkOrder:HS19041290
Lab ID:HS19041290-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 25-Apr-2019		Analyst: JC
Antimony	**0.213**		**0.000400**	**0.00200**	**mg/L**	1	27-Apr-2019 00:18
Arsenic	**0.248**		**0.000400**	**0.00200**	**mg/L**	1	27-Apr-2019 00:18
Cadmium	**0.0723**		**0.000200**	**0.00200**	**mg/L**	1	27-Apr-2019 00:18
Iron	**5.31**		**0.0120**	**0.200**	**mg/L**	1	27-Apr-2019 00:18
Lead	**1.33**		**0.000600**	**0.00200**	**mg/L**	1	27-Apr-2019 00:18
Selenium	**2.18**		**0.0220**	**0.0400**	**mg/L**	20	29-Apr-2019 14:09

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190416-NSF-PV55mid-30MW11-D
Collection Date: 16-Apr-2019 21:50

ANALYTICAL REPORT
WorkOrder:HS19041290
Lab ID:HS19041290-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 24-Apr-2019		Analyst: JHD
Antimony	**0.000456**	J	**0.000400**	**0.00200**	**mg/L**	1	26-Apr-2019 00:54
Arsenic	U		0.000400	0.00200	mg/L	1	26-Apr-2019 00:54
Cadmium	U		0.000200	0.00200	mg/L	1	26-Apr-2019 00:54
Iron	**3.38**		**0.0120**	**0.200**	**mg/L**	1	26-Apr-2019 00:54
Lead	U		0.000600	0.00200	mg/L	1	26-Apr-2019 00:54
Selenium	**0.319**		**0.00110**	**0.00200**	**mg/L**	1	26-Apr-2019 00:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190416-NSF-PV55mid-30MW11-T
Collection Date: 16-Apr-2019 21:50

ANALYTICAL REPORT
WorkOrder:HS19041290
Lab ID:HS19041290-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 25-Apr-2019		Analyst: JC
Antimony	**0.000993**	J	**0.000400**	**0.00200**	**mg/L**	1	27-Apr-2019 00:20
Arsenic	**0.000402**	J	**0.000400**	**0.00200**	**mg/L**	1	27-Apr-2019 00:20
Cadmium	U		0.000200	0.00200	mg/L	1	27-Apr-2019 00:20
Iron	**31.0**		**0.0120**	**0.200**	**mg/L**	1	27-Apr-2019 00:20
Lead	**0.000672**	J	**0.000600**	**0.00200**	**mg/L**	1	27-Apr-2019 00:20
Selenium	**0.345**		**0.00110**	**0.00200**	**mg/L**	1	27-Apr-2019 00:20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190416-NSF-PV55out-30MW11-D
Collection Date: 16-Apr-2019 15:15

ANALYTICAL REPORT
WorkOrder:HS19041290
Lab ID:HS19041290-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 24-Apr-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	26-Apr-2019 00:56
Arsenic	U		0.000400	0.00200	mg/L	1	26-Apr-2019 00:56
Cadmium	U		0.000200	0.00200	mg/L	1	26-Apr-2019 00:56
Iron	U		0.0120	0.200	mg/L	1	26-Apr-2019 00:56
Lead	U		0.000600	0.00200	mg/L	1	26-Apr-2019 00:56
Selenium	**0.00394**		**0.00110**	**0.00200**	**mg/L**	1	26-Apr-2019 00:56

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190416-NSF-PV55out-30MW11-T
Collection Date: 16-Apr-2019 15:15

ANALYTICAL REPORT
WorkOrder:HS19041290
Lab ID:HS19041290-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 25-Apr-2019		Analyst: JC
Antimony	U		0.000400	0.00200	mg/L	1	27-Apr-2019 00:23
Arsenic	U		0.000400	0.00200	mg/L	1	27-Apr-2019 00:23
Cadmium	U		0.000200	0.00200	mg/L	1	27-Apr-2019 00:23
Iron	**4.56**		**0.0120**	**0.200**	**mg/L**	1	27-Apr-2019 00:23
Lead	U		0.000600	0.00200	mg/L	1	27-Apr-2019 00:23
Selenium	**0.00508**		**0.00110**	**0.00200**	**mg/L**	1	27-Apr-2019 00:23

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190416-NSF-PV56inlet-controlFD-D
Collection Date: 16-Apr-2019 22:00

ANALYTICAL REPORT
WorkOrder:HS19041290
Lab ID:HS19041290-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 24-Apr-2019		Analyst: JHD
Antimony	**0.210**		**0.000400**	**0.00200**	**mg/L**	1	26-Apr-2019 00:58
Arsenic	**0.170**		**0.000400**	**0.00200**	**mg/L**	1	26-Apr-2019 00:58
Cadmium	**0.0668**		**0.000200**	**0.00200**	**mg/L**	1	26-Apr-2019 00:58
Iron	U		0.0120	0.200	mg/L	1	26-Apr-2019 00:58
Lead	**0.410**		**0.000600**	**0.00200**	**mg/L**	1	26-Apr-2019 00:58
Selenium	**1.89**		**0.0220**	**0.0400**	**mg/L**	20	26-Apr-2019 15:35

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190416-NSF-PV56inlet-controlFD-T
Collection Date: 16-Apr-2019 22:00

ANALYTICAL REPORT
WorkOrder:HS19041290
Lab ID:HS19041290-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 25-Apr-2019		Analyst: JC
Antimony	**0.227**		**0.000400**	**0.00200**	**mg/L**	1	27-Apr-2019 00:25
Arsenic	**0.248**		**0.000400**	**0.00200**	**mg/L**	1	27-Apr-2019 00:25
Cadmium	**0.0742**		**0.000200**	**0.00200**	**mg/L**	1	27-Apr-2019 00:25
Iron	**1.50**		**0.0120**	**0.200**	**mg/L**	1	27-Apr-2019 00:25
Lead	**0.986**		**0.000600**	**0.00200**	**mg/L**	1	27-Apr-2019 00:25
Selenium	**2.27**		**0.0220**	**0.0400**	**mg/L**	20	29-Apr-2019 14:11

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190416-NSF-PV56mid-controlFD-D
Collection Date: 16-Apr-2019 21:50

ANALYTICAL REPORT
WorkOrder:HS19041290
Lab ID:HS19041290-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 24-Apr-2019		Analyst: JHD
Antimony	**0.183**		**0.000400**	**0.00200**	**mg/L**	1	26-Apr-2019 00:59
Arsenic	**0.163**		**0.000400**	**0.00200**	**mg/L**	1	26-Apr-2019 00:59
Cadmium	**0.0628**		**0.000200**	**0.00200**	**mg/L**	1	26-Apr-2019 00:59
Iron	U		0.0120	0.200	mg/L	1	26-Apr-2019 00:59
Lead	**0.00115**	J	**0.000600**	**0.00200**	**mg/L**	1	26-Apr-2019 00:59
Selenium	**1.85**		**0.0220**	**0.0400**	**mg/L**	20	26-Apr-2019 15:16

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190416-NSF-PV56mid-controlFD-T
Collection Date: 16-Apr-2019 21:50

ANALYTICAL REPORT
WorkOrder:HS19041290
Lab ID:HS19041290-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 25-Apr-2019		Analyst: JC
Antimony	**0.160**		**0.000400**	**0.00200**	**mg/L**	1	27-Apr-2019 00:27
Arsenic	**0.174**		**0.000400**	**0.00200**	**mg/L**	1	27-Apr-2019 00:27
Cadmium	**0.0671**		**0.000200**	**0.00200**	**mg/L**	1	27-Apr-2019 00:27
Iron	**0.128**	J	**0.0120**	**0.200**	**mg/L**	1	27-Apr-2019 00:27
Lead	**0.00538**		**0.000600**	**0.00200**	**mg/L**	1	27-Apr-2019 00:27
Selenium	**2.14**		**0.0220**	**0.0400**	**mg/L**	20	29-Apr-2019 14:13

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190416-NSF-PV56out-controlFD-D
Collection Date: 16-Apr-2019 15:15

ANALYTICAL REPORT
WorkOrder:HS19041290
Lab ID:HS19041290-11
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 24-Apr-2019		Analyst: JHD
Antimony	**0.180**		**0.000400**	**0.00200**	**mg/L**	1	26-Apr-2019 01:01
Arsenic	**0.161**		**0.000400**	**0.00200**	**mg/L**	1	26-Apr-2019 01:01
Cadmium	**0.0630**		**0.000200**	**0.00200**	**mg/L**	1	26-Apr-2019 01:01
Iron	U		0.0120	0.200	mg/L	1	26-Apr-2019 01:01
Lead	U		0.000600	0.00200	mg/L	1	26-Apr-2019 01:01
Selenium	**1.80**		**0.0220**	**0.0400**	**mg/L**	20	26-Apr-2019 15:18

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190416-NSF-PV56out-controlFD-T
Collection Date: 16-Apr-2019 15:15

ANALYTICAL REPORT
WorkOrder:HS19041290
Lab ID:HS19041290-12
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 25-Apr-2019		Analyst: JC
Antimony	**0.153**		**0.000400**	**0.00200**	**mg/L**	1	27-Apr-2019 00:29
Arsenic	**0.171**		**0.000400**	**0.00200**	**mg/L**	1	27-Apr-2019 00:29
Cadmium	**0.0686**		**0.000200**	**0.00200**	**mg/L**	1	27-Apr-2019 00:29
Iron	**0.0780**	J	**0.0120**	**0.200**	**mg/L**	1	27-Apr-2019 00:29
Lead	**0.00195**	J	**0.000600**	**0.00200**	**mg/L**	1	27-Apr-2019 00:29
Selenium	**2.13**		**0.0220**	**0.0400**	**mg/L**	20	29-Apr-2019 14:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19041290

Batch ID: 140158 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19041290-01	1	10	10 (mL)	1
HS19041290-03	1	10	10 (mL)	1
HS19041290-05	1	10	10 (mL)	1
HS19041290-07	1	10	10 (mL)	1
HS19041290-09	1	10	10 (mL)	1
HS19041290-11	1	10	10 (mL)	1

Batch ID: 140215 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19041290-02	1	10	10 (mL)	1
HS19041290-04	1	10	10 (mL)	1
HS19041290-06	1	10	10 (mL)	1
HS19041290-08	1	10	10 (mL)	1
HS19041290-10	1	10	10 (mL)	1
HS19041290-12	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19041290

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 140158	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS19041290-01	20190416-NSF-PV55inlet-30MW11-D	16 Apr 2019 22:00		24 Apr 2019 11:00	26 Apr 2019 15:33	20
HS19041290-01	20190416-NSF-PV55inlet-30MW11-D	16 Apr 2019 22:00		24 Apr 2019 11:00	26 Apr 2019 00:52	1
HS19041290-03	20190416-NSF-PV55mid-30MW11-D	16 Apr 2019 21:50		24 Apr 2019 11:00	26 Apr 2019 00:54	1
HS19041290-05	20190416-NSF-PV55out-30MW11-D	16 Apr 2019 15:15		24 Apr 2019 11:00	26 Apr 2019 00:56	1
HS19041290-07	20190416-NSF-PV56inlet-controlFD-D	16 Apr 2019 22:00		24 Apr 2019 11:00	26 Apr 2019 15:35	20
HS19041290-07	20190416-NSF-PV56inlet-controlFD-D	16 Apr 2019 22:00		24 Apr 2019 11:00	26 Apr 2019 00:58	1
HS19041290-09	20190416-NSF-PV56mid-controlFD-D	16 Apr 2019 21:50		24 Apr 2019 11:00	26 Apr 2019 15:16	20
HS19041290-09	20190416-NSF-PV56mid-controlFD-D	16 Apr 2019 21:50		24 Apr 2019 11:00	26 Apr 2019 00:59	1
HS19041290-11	20190416-NSF-PV56out-controlFD-D	16 Apr 2019 15:15		24 Apr 2019 11:00	26 Apr 2019 15:18	20
HS19041290-11	20190416-NSF-PV56out-controlFD-D	16 Apr 2019 15:15		24 Apr 2019 11:00	26 Apr 2019 01:01	1
Batch ID 140215	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19041290-02	20190416-NSF-PV55inlet-30MW11-T	16 Apr 2019 22:00		25 Apr 2019 11:00	29 Apr 2019 14:09	20
HS19041290-02	20190416-NSF-PV55inlet-30MW11-T	16 Apr 2019 22:00		25 Apr 2019 11:00	27 Apr 2019 00:18	1
HS19041290-04	20190416-NSF-PV55mid-30MW11-T	16 Apr 2019 21:50		25 Apr 2019 11:00	27 Apr 2019 00:20	1
HS19041290-06	20190416-NSF-PV55out-30MW11-T	16 Apr 2019 15:15		25 Apr 2019 11:00	27 Apr 2019 00:23	1
HS19041290-08	20190416-NSF-PV56inlet-controlFD-T	16 Apr 2019 22:00		25 Apr 2019 11:00	29 Apr 2019 14:11	20
HS19041290-08	20190416-NSF-PV56inlet-controlFD-T	16 Apr 2019 22:00		25 Apr 2019 11:00	27 Apr 2019 00:25	1
HS19041290-10	20190416-NSF-PV56mid-controlFD-T	16 Apr 2019 21:50		25 Apr 2019 11:00	29 Apr 2019 14:13	20
HS19041290-10	20190416-NSF-PV56mid-controlFD-T	16 Apr 2019 21:50		25 Apr 2019 11:00	27 Apr 2019 00:27	1
HS19041290-12	20190416-NSF-PV56out-controlFD-T	16 Apr 2019 15:15		25 Apr 2019 11:00	29 Apr 2019 14:15	20
HS19041290-12	20190416-NSF-PV56out-controlFD-T	16 Apr 2019 15:15		25 Apr 2019 11:00	27 Apr 2019 00:29	1

WorkOrder: HS19041290
InstrumentID: ICPMS06
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000461	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000438	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000484	0.000200	0.00200
A	Iron	7439-89-6	0.0500	0.0528	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000931	0.000600	0.00200
A	Selenium	7782-49-2	0.00250	0.00239	0.00110	0.00200

WorkOrder: HS19041290
InstrumentID: ICPMS04
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000774	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000493	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000493	0.000200	0.00200
A	Iron	7439-89-6	0.0500	0.0716	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000944	0.000600	0.00200
A	Selenium	7782-49-2	0.00250	0.00223	0.00110	0.00200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19041290

QC BATCH REPORT

Batch ID: 140158 (0) **Instrument: ICPMS06** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

MBLK Sample ID: **MBLK-140158** Units: **mg/L** Analysis Date: **26-Apr-2019 00:17**
Client ID: Run ID: **ICPMS06_337272** SeqNo: **5051123** PrepDate: **24-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Iron	U	0.200								
Lead	U	0.00200								
Selenium	U	0.00200								

LCS Sample ID: **LCS-140158** Units: **mg/L** Analysis Date: **26-Apr-2019 00:19**
Client ID: Run ID: **ICPMS06_337272** SeqNo: **5051124** PrepDate: **24-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05142	0.00200	0.05	0	103	80 - 120				
Arsenic	0.05034	0.00200	0.05	0	101	80 - 120				
Cadmium	0.05278	0.00200	0.05	0	106	80 - 120				
Iron	4.733	0.200	5	0	94.7	80 - 120				
Lead	0.04841	0.00200	0.05	0	96.8	80 - 120				
Selenium	0.05542	0.00200	0.05	0	111	80 - 120				

MS Sample ID: **HS19041102-07MS** Units: **mg/L** Analysis Date: **26-Apr-2019 00:24**
Client ID: Run ID: **ICPMS06_337272** SeqNo: **5051127** PrepDate: **24-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05366	0.00200	0.05	0.00021	107	75 - 125				
Arsenic	0.05493	0.00200	0.05	0.003352	103	75 - 125				
Cadmium	0.04995	0.00200	0.05	0.000069	99.8	75 - 125				
Iron	4.818	0.200	5	0.01541	96.0	75 - 125				
Lead	0.0487	0.00200	0.05	0.001408	94.6	75 - 125				
Selenium	0.05473	0.00200	0.05	0.001054	107	75 - 125				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19041290

QC BATCH REPORT

Batch ID: 140158 (0) **Instrument: ICPMS06** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

MSD Sample ID: **HS19041102-07MSD** Units: **mg/L** Analysis Date: **26-Apr-2019 00:25**
Client ID: Run ID: **ICPMS06_337272** SeqNo: **5051128** PrepDate: **24-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.0548	0.00200	0.05	0.00021	109	75 - 125	0.05366	2.09	20	
Arsenic	0.05553	0.00200	0.05	0.003352	104	75 - 125	0.05493	1.09	20	
Cadmium	0.05023	0.00200	0.05	0.000069	100	75 - 125	0.04995	0.561	20	
Iron	4.748	0.200	5	0.01541	94.7	75 - 125	4.818	1.45	20	
Lead	0.0497	0.00200	0.05	0.001408	96.6	75 - 125	0.0487	2.03	20	
Selenium	0.05573	0.00200	0.05	0.001054	109	75 - 125	0.05473	1.82	20	

PDS Sample ID: **HS19041102-07PDS** Units: **mg/L** Analysis Date: **26-Apr-2019 00:27**
Client ID: Run ID: **ICPMS06_337272** SeqNo: **5051129** PrepDate: **24-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1077	0.00200	0.1	0.00021	108	75 - 125				
Arsenic	0.1075	0.00200	0.1	0.003352	104	75 - 125				
Cadmium	0.1066	0.00200	0.1	0.000069	107	75 - 125				
Iron	9.77	0.200	10	0.01541	97.5	75 - 125				
Lead	0.1041	0.00200	0.1	0.001408	103	75 - 125				
Selenium	0.112	0.00200	0.1	0.001054	111	75 - 125				

SD Sample ID: **HS19041102-07SD** Units: **mg/L** Analysis Date: **26-Apr-2019 00:22**
Client ID: Run ID: **ICPMS06_337272** SeqNo: **5051126** PrepDate: **24-Apr-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.00021	0	10	
Arsenic	0.003014	0.0100					0.003352	0	10	J
Cadmium	U	0.0100					0.000069	0	10	
Iron	U	1.00					0.01541	0	10	
Lead	U	0.0100					0.001408	0	10	
Selenium	U	0.0100					0.001054	0	10	

The following samples were analyzed in this batch: HS19041290-01 HS19041290-03 HS19041290-05 HS19041290-07 HS19041290-09 HS19041290-11

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19041290

QC BATCH REPORT

Batch ID: 140215 (0) **Instrument: ICPMS04** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLK-140215** Units: **mg/L** Analysis Date: **26-Apr-2019 23:49**
Client ID: Run ID: **ICPMS04_337345** SeqNo: **5052869** PrepDate: **25-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Iron	U	0.200								
Lead	U	0.00200								
Selenium	U	0.00200								

LCS Sample ID: **LCS-140215** Units: **mg/L** Analysis Date: **26-Apr-2019 23:51**
Client ID: Run ID: **ICPMS04_337345** SeqNo: **5052870** PrepDate: **25-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05469	0.00200	0.05	0	109	80 - 120				
Arsenic	0.05551	0.00200	0.05	0	111	80 - 120				
Cadmium	0.05564	0.00200	0.05	0	111	80 - 120				
Iron	5.517	0.200	5	0	110	80 - 120				
Lead	0.05495	0.00200	0.05	0	110	80 - 120				
Selenium	0.05539	0.00200	0.05	0	111	80 - 120				

MS Sample ID: **HS19041192-01MS** Units: **mg/L** Analysis Date: **26-Apr-2019 23:58**
Client ID: Run ID: **ICPMS04_337345** SeqNo: **5052873** PrepDate: **25-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05242	0.00200	0.05	0	105	80 - 120				
Arsenic	0.156	0.00200	0.05	0.09852	115	80 - 120				
Cadmium	0.05212	0.00200	0.05	0	104	80 - 120				
Iron	11.74	0.200	5	6.2	111	80 - 120				
Lead	0.05402	0.00200	0.05	0.000626	107	80 - 120				
Selenium	0.0533	0.00200	0.05	0	107	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19041290

QC BATCH REPORT

Batch ID: 140215 (0) **Instrument: ICPMS04** **Method: ICP-MS METALS BY SW6020A**

MSD Sample ID: **HS19041192-01MSD** Units: **mg/L** Analysis Date: **27-Apr-2019 00:00**
Client ID: Run ID: **ICPMS04_337345** SeqNo: **5052875** PrepDate: **25-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05156	0.00200	0.05	0	103	80 - 120	0.05242	1.66	20	
Arsenic	0.1562	0.00200	0.05	0.09852	115	80 - 120	0.156	0.151	20	
Cadmium	0.05227	0.00200	0.05	0	105	80 - 120	0.05212	0.284	20	
Iron	12.06	0.200	5	6.2	117	80 - 120	11.74	2.67	20	
Lead	0.05452	0.00200	0.05	0.000626	108	80 - 120	0.05402	0.929	20	
Selenium	0.05469	0.00200	0.05	0	109	80 - 120	0.0533	2.58	20	

PDS Sample ID: **HS19041192-01PDS** Units: **mg/L** Analysis Date: **27-Apr-2019 00:03**
Client ID: Run ID: **ICPMS04_337345** SeqNo: **5052876** PrepDate: **25-Apr-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09362	0.00200	0.1	0.000186	93.4	75 - 125				
Arsenic	0.1993	0.00200	0.1	0.09852	101	75 - 125				
Cadmium	0.09934	0.00200	0.1	0.000071	99.3	75 - 125				
Iron	16.17	0.200	10	6.2	99.7	75 - 125				
Lead	0.1048	0.00200	0.1	0.000626	104	75 - 125				
Selenium	0.1072	0.00200	0.1	0.000489	107	75 - 125				

SD Sample ID: **HS19041192-01SD** Units: **mg/L** Analysis Date: **26-Apr-2019 23:56**
Client ID: Run ID: **ICPMS04_337345** SeqNo: **5052872** PrepDate: **25-Apr-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000186	0	10	
Cadmium	U	0.0100					0.000071	0	10	
Iron	5.789	1.00					6.2	6.63	10	
Lead	U	0.0100					0.000626	0	10	
Selenium	U	0.0100					0.000489	0	10	

The following samples were analyzed in this batch: HS19041290-02 HS19041290-04 HS19041290-06 HS19041290-08 HS19041290-10 HS19041290-12

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19041290**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
California	2919, 2018-2019	30-Apr-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19041290

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19041290-01	20190416-NSF-PV55inlet-30MW11-D	Login	4/23/2019 12:59:51 PM	NDR	MET029
HS19041290-02	20190416-NSF-PV55inlet-30MW11-T	Login	4/23/2019 12:59:51 PM	NDR	MET029
HS19041290-03	20190416-NSF-PV55mid-30MW11-D	Login	4/23/2019 12:59:51 PM	NDR	MET029
HS19041290-04	20190416-NSF-PV55mid-30MW11-T	Login	4/23/2019 12:59:51 PM	NDR	MET029
HS19041290-05	20190416-NSF-PV55out-30MW11-D	Login	4/23/2019 12:59:51 PM	NDR	MET029
HS19041290-06	20190416-NSF-PV55out-30MW11-T	Login	4/23/2019 12:59:51 PM	NDR	MET029
HS19041290-07	20190416-NSF-PV56inlet-controlFD-D	Login	4/23/2019 12:59:51 PM	NDR	MET029
HS19041290-08	20190416-NSF-PV56inlet-controlFD-T	Login	4/23/2019 12:59:51 PM	NDR	MET029
HS19041290-09	20190416-NSF-PV56mid-controlFD-D	Login	4/23/2019 12:59:51 PM	NDR	MET029
HS19041290-10	20190416-NSF-PV56mid-controlFD-T	Login	4/23/2019 12:59:51 PM	NDR	MET029
HS19041290-11	20190416-NSF-PV56out-controlFD-D	Login	4/23/2019 12:59:51 PM	NDR	MET029
HS19041290-12	20190416-NSF-PV56out-controlFD-T	Login	4/23/2019 12:59:51 PM	NDR	MET029

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19041290
Date/Time Received: **23-Apr-2019 08:35**
Received by: **PMG**

Checklist completed by: *Nilesh D. Ranchod* eSignature — 23-Apr-2019 Date
Reviewed by: *Dane J. Wacasey* eSignature — 25-Apr-2019 Date

Matrices: **GW**
Carrier name: **FedEx International Priority**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	2 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	20.5c uc/c	IR 25
Cooler(s)/Kit(s):	43635	
Date/Time sample(s) sent to storage:	04/23/2019 13:45	

Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Chain of Custody Form

Page 1 of 2

HS19041290

Golder Associates
Exide Column Studies

ALS Environmental

ALS Project Manager:

Customer Information		Project Information		
PO Number	130-2086-06	Project Name	Exide Column Studies	A 300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086-06	B TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn:	Tammy Kurzmack Exide A/P	D HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suite 260	Address	13515 Barrett Parkway Drive, Suite 260	E ICP TW (6020A total metals (6)): Pb, Cd, Sb, Se, As, Fe
				F ICP DISS (6020A diss metals (6)-FldFltr): Pb, Cd, Sb, Se, As, Fe
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	G
Phone	314 984-8800	Phone	314 984-8800	H
Fax		Fax		I
e-Mail Address	ewhite@golder.com	e-Mail Address		J

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190416-NSF-PV55inlet-30MW11-D	04-16-19	10:00 PM	GW	2	1						X					
2	20190416-NSF-PV55inlet-30MW11-T	04-16-19	10:00 PM	GW	2	1					X						
3	20190416-NSF-PV55mid-30MW11-D	04-16-19	9:50 PM	GW	2	1						X					
4	20190416-NSF-PV55mid-30MW11-T	04-16-19	9:50 PM	GW	2	1					X						
5	20190416-NSF-PV55out-30MW11-D	04-16-19	3:15 PM	GW	2	1						X					
6	20190416-NSF-PV55out-30MW11-T	04-16-19	3:15 PM	GW	2	1					X						
7	20190416-NSF-PV56inlet-controlFD-D	04-16-19	10:00 PM	GW	2	1						X					
8	20190416-NSF-PV56inlet-controlFD-T	04-16-19	10:00 PM	GW	2	1					X						
9	20190416-NSF-PV56mid-controlFD-D	04-16-19	9:50 PM	GW	2	1						X					
10	20190416-NSF-PV56mid-controlFD-T	04-16-19	9:50 PM	GW	2	1					X						

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method: FedEx

Required Turnaround Time: ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ Other _____ ☐ 2 Wk Days ☐ 24 Hour

Results Due Date: STD 5-DAY TAT

Relinquished by: Giovanna Llamosas	Date: 2019/04/22	15:30:00	Received by:	Notes:
Relinquished by:	Date:	Time:	Received by (Laboratory): 4/23/19 08:35	Cooler Temp. 5.2° 20.5° -1.2°
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	

QC Package: (Check Box Below)

	Level II: Standard QC	x	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other:		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035. 4°C-0°

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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ALS Environmental

Chain of Custody Form

Page 2 of 2

HS19041290

Golder Associates
Exide Column Studies

Customer Information		Project Information		ALS Project Manager:
PO Number	130-2086-06	Project Name	Exide Column Studies	
Work Order		Project Number	130-2086-06	
Company Name	Golder Associates	Bill To Company	Golder Associates	
Send Report To	Emily White	Invoice Attn:	Tammy Kurzmack Exide A/P	
Address	13515 Barrett Parkway Drive, Suite 260	Address	13515 Barrett Parkway Drive, Suite 260	
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	
Phone	314 984-8800	Phone	314 984-8800	
Fax		Fax		
e-Mail Address	ewhite@golder.com	e-Mail Address		

Parameter/Method Request for Analysis

A	300 W (300Cl, SO4, NO3-48h HT)
B	TDS W 2540C (2540C TDS)
C	ALK W 2320B (2320B alkalinity)
D	HARD (2340B hardness (calc))
E	ICP TW (6020A total metals (6)): Pb, Cd, Sb, Se, As, Fe
F	ICP DISS (6020A diss metals (6)-FldFltr): Pb, Cd, Sb, Se, As, Fe
G	
H	
I	
J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
11	20190416-NSF-PV56out-controlFD-D	04-16-19	3:15 PM	GW	2	1						X					
12	20190416-NSF-PV56out-controlFD-T	04-16-19	3:15 PM	GW	2	1					X						
13																	
14																	
15																	
16																	
17																	
18																	
19																	
20																	

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method: FedEx

Required Turnaround Time: ☐ STD 10 Wk Days ☐ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☑ Other _____

Results Due Date: STD 5-DAY TAT

Relinquished by: Giovanna Llamosas	Date: 2019/04/22	15:30:00	Received by:	Notes:
Relinquished by:	Date:	Time:	Received by (Laboratory): 4/23/19 8:35	Cooler Temp.
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	

QC Package: (Check Box Below)

	Level II: Standard QC	x	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other:		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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ORIGIN ID:YUXA (514) 369-0990
AUDREY ETHEVES
GOLDSEP ASSOCIATES LTD
7250 RUE DU MILE END
3E ETAGE
MONTREAL, PQ H2R3A4
CANADA CA

SHIP DATE: 22APR19
ACTWGT: 5.30 KG
CAD: 10868072/INET4102

BILL RECIPIENT

TO **DANE WACASEY**
ALS HOUSTON LABORATORY
10450 STANCLIFF RD
STE 210
HOUSTON TX 77099
(281) 530-5656 (US)
INV:
PO: REF:

DEPT

565J1/D7E5/23A0

FedEx Express

J191019013722uv

TRK# 7750 2617 3521
0430

NH SGRA

10:30A INTL PRIORITY

77099
TX-US IAH

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2. Placez l'étiquette dans la pochette d'expédition et fixez-la à votre paquet.

DÉFINITIONS. Conseils présente lettre de transport aérien. « nous », « notre », « nos » et « FedEx » se rapportent à Federal Express Corporation, ses filiales, sociétés liées et leurs employés, mandataires et prestataires tiers. « Vous », « votre » et « vos » se rapportent à l'expéditeur, ses employés, donneurs d'ordre et mandataires. Si d'autres ne prévoient pas des États-Unis, votre contrat d'expédition est conclu avec la filiale, la succursale ou les prestataires externes de FedEx ayant, à l'origine, accepté de procéder à l'expédition. « Colis » désigne de tout conteneur ou de toute enveloppe dont nous acceptons d'effectuer la livraison, notamment les marchandises remises au transporteur par vos soins par la base de nos systèmes automatisés, comptoirs, machines, cuisettes et kiosques. « Lieux » désigne de tout cette nous avons réservé au transport sur votre lettre de transport aérien. REMARQUE RELATIVE AU TRANSPORT AÉRIEN : La Convention de Varsovie s'applique et régit et limite dans la plupart des cas la responsabilité de FedEx en cas de perte, retard ou dommage affectant votre envoi. La Convention de Varsovie entendue limite la responsabilité de FedEx. Par exemple, aux États-Unis, la responsabilité est limitée à 9,07 $ par livre (20 $ par kilogramme). Si vous déclarez une valeur d'expédition supérieure ou cet additif comme décrit ci-dessous, aux frais supplémentaires dont alors à votre charge. L'interprétation et la mise en application des dispositions relatives aux limites de responsabilité de la Convention de Varsovie peuvent varier d'un pays à l'autre. FedEx se réserve le droit d'organiser l'itinéraire emprunté et les escales à sa convenance. REMARQUE RELATIVE AU TRANSPORT ROUTIER. Les envois transportés uniquement par voie terrestre vers ou depuis un pays n'ayant ratifié la Convention de Varsovie ou la Convention relative au contrat de transport international de marchandises par route de CMR n'en sont soumis aux limites et conditions de la CMR, sont présidés de toute autre disposition contraire de la présente lettre de transport aérien. Concernant les envois transportés exclusivement par voie terrestre, les dispositions de la CMR prévalent en cas de conflit entre les dispositions de la CMR et celles de la présente lettre de transport aérien. LIMITATION DE RESPONSABILITÉ. Sa responsabilité maximale de FedEx en cas de dommage, perte, retard, manque, erreur de livraison, défaut de livraison, informations incomplètes ou défaut d'informations exactes et l'achat matérielle par le présent Contrat et conforme aux lois et conditions du service d'expédition, à toute responsabilité n'est pas régie par la Convention de Varsovie, la CMR ou autres traités internationaux, lois, dispositions réglementaires, décrets ou directives. Veuillez vous référer au tarif de l'expédition disponible dans le Guide des Services FedEx ou auprès du document équivalent afin de déterminer les limites correspondantes. FedEx ne propose pas de responsabilité marchandise ni assurance tout risque. Mais il vous est possible de payer des frais supplémentaires par tranche de 100 $US supplémentaires (ou équivalent en monnaie locale du pays d'origine) de valeur d'expédition déclarée. Si la valeur d'expédition déclarée est supérieure et cas des suppléments sont acquittés, le risque assumé de FedEx couvrira alors à la valeur la plus faible entre la valeur déclarée et les dommages réels. EXCLUSION DE RESPONSABILITÉ. FEDEX NE SAURAIT EN AUCUN CAS ÊTRE TENU POUR RESPONSABLE DE TOUT DOMMAGE DIRECT, INDIRECT, ACCESSOIRE, SPÉCIAL OU CONSÉCUTIF SURVENU À LA VALEUR D'EXPÉDITION DÉCLARÉE (Y COMPRIS, SANS QUE CELA SOIT LIMITATIF DE PERTES DE REVENUS OU BÉNÉFICES) OU À LA VALEUR RÉELLE DE L'ENVOI, SI CELLE-CI EST INFÉRIEURE, QUE FEDEX AIT OU NON SAVOIR QUE DE TELS DOMMAGES POURRAIENT SURVENIR. FedEx ne sera en aucun cas être tenu pour responsable de vol, agissement ou connivence, y compris, sans que cela soit limitatif, de déclaration incorrecte de marchandises, d'emballage, rétroaction, marquage ou adresses non adaptés ou insuffisants de l'envoi, ni d'un agissement ou omission du destinataire ou de quelconque personne pouvant être concerné par cet envoi, ni de la violation par l'une des parties des clauses du présent contrat. FedEx ne saurait en aucun cas être tenu pour responsable de tout dommages, pertes, retards, manques, erreurs de livraison, défauts de livraison, informations incomplètes ou défaut d'informations exactes relativement aux envois de liquidités, devises ou autres instruments négociés et d'investissements hors de notre contrôle tels que les catastrophes naturelles (risques sismiques, conditions météorologiques, actes de terrorisme, guerre, grèves, désordres publics, arrêts administratifs ou omissions des autorités publiques, incidents dans des aéroports ou responsables en la santé publique) exept autorité. DÉFAUT DE GARANTIE. Nous n'accordons aucune garantie expresse ou tacite. RECOURS EN CAS DE PERTE, DOMMAGE OU RETARD. TOUT RECOURS DOIT ÊTRE EXERCÉ PAR ÉCRIT ET DANS DES DÉLAIS STRICTS. VOIR LNOS TARIFS & LE GUIDE DES SERVICES FEDEX EN VIGUEUR QUI EN DÉFINISSENT LES CONDITIONS STANDARD D'EXPÉDITION POUR PLUS D'INFORMATIONS. La Convention de Varsovie prévoit des procédures de recours écrites spécifiques en cas de dommages, retard ou défaut de livraison des envois. Toutefois l'interprétation et la mise en application des dispositions régissant ces voies de recours de la Convention de Varsovie peuvent varier d'un pays à l'autre. Veuillez vous référer à la Convention pour déterminer les délais de recours applicables à votre envoi. Le droit à dommages-intérêts éventuel, tout à un recours préalablement dans un délai de deux ans, comme spécifié dans la Convention. FedEx n'est pas tenu de rembourser sauf lorsque vous avez payé tous les frais d'expédition n'ayant été acquittés. Le montant du recours peut ne pas être déduit des frais d'expédition. Si le destinataire accepte l'envoi sans noter aucun dommage sur le bulletin de livraison, FedEx considérera alors que la marchandise a été livrée dans de bonnes conditions. Afin que nous puissions répondre aux demandes de dommages, nous vous demandons de mettre à notre disposition les conteneurs, cartons d'expédition et emballages d'origine à des fins d'évaluation. DROIT APPLICABLE. Déclaration que l'une des dispositions contenues ou citées dans la présente lettre de transport aérien en il l'emporte des traités, lois, décisions réglementaires, décrets ou décrets internationaux, lesdites dispositions restent en vigueur dans la partie du présent contrat dans la mesure où cela n'est pas annulé. Le fait que l'une des dispositions soit invalide ou inapplicable n'affecte pas les autres parties de la présente lettre de transport aérien. Sauf indication contraire, FEDERAL EXPRESS CORPORATION, 2000 Corporate Avenue, Memphis, TN 38132, USA, est le premier transporteur du présent envoi.

ORIGIN ID:YUXA (514) 383-0990
Audrey Etheves
Golder Associates Ltd
7250 rue du Mile End
3e etage
MONTREAL, PQ H2R3A4
CANADA, CA

SHIP DATE: 22APR19
ACTWGT: 5.30 KG
CAD: 108680724/INET4102

BILL RECIPIENT
EIN/VAT:

TO Dane Wacasey
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

(281) 530-5656

FedEx Express

(US)

E

AWB

J19101901072uv

NH SGRA

PKG:CUSTOMER

TRK# 7750 2617 3521

Form 0430

10:30A
INTL PRIORITY

REF:
DESC1:Échantillon d'eau
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: Audrey Etheves
T/C: R 967554812
D/T: R 967554812

Ces marchandises, cette technologie ou ce logiciel ont ete exportes du Canada conformement a la reglementation sur l'administration des exportations. Toute modification contraire a la loi canadienne est interdite. La Convention de Varsovie peut s'appliquer et elle regit, et dans la grande majorite des cas, elle limite la responsabilite de Federal Express pour toute perte, retard ou dommage cause a votre envoi. Sous reserve des conditions et modalites du contrat.

COPIE DU DESTINATAIRE - VEUILLEZ LA GLISSER DANS LA POCHETTE

Après l'impression de cette étiquette :
COPIE DU BORDEREAU FEDEX - VEUILLEZ LA PLACER DERRIÈRE LA COPIE DU DESTINATAIRE
1. Pliez la page imprimée le long de la ligne horizontale.
2. Placez l'étiquette dans la pochette d'expédition et fixez-la à votre paquet.

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

43623

CUSTODY SEAL
Date: 2019/04/22 Time: 15:30
Name: Jérémie Eliaiuru
Company: Golder Associates

Seal Broken By: GM
Date: 04/23/19

APR 2 3 2019

43623

ALS
10450 Stancliff Rd., Suite 210
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10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

May 07, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19041731**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 14 sample(s) on Apr 30, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DANE.WACASEY
Dane J. Wacasey

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS19041731**

TRRP Laboratory Data Package Cover Page

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS19041731**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 05/06/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19041731				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 140402,140436				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?			X		
		Were analytical duplicates analyzed at the appropriate frequency?			X		
		Were RPDs or relative standard deviations within the laboratory QC limits?			X		
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 05/06/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19041731				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 140402,140436				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			2
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	X				
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports		
Laboratory Name: ALS Laboratory Group		LRC Date: 05/06/2019
Project Name: Exide Column Studies		Laboratory Job Number: HS19041731
Reviewer Name: Dane Wacasey		Prep Batch Number(s): 140402,140436
ER#[5]	**Description**	
1	Batch 140436, Metals Method SW6020, sample 20190426-NSF-PV65inlet-30MW11-D, MS and or MSD recovered outside the control limits for Arsenic, Lead and Selenium, however, the result in the parent sample is greater than 4x the spike amount.	
2	See Run Log and CCB Exceptions Report.	

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19041731
Start Date: 01-May-2019 End Date: 02-May-2019

Run ID:ICPMS04_337643
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
LLICV2	1	01-May-2019 13:44	019LCV2.d	AS CD FE PB SB SE
LLICV5	1	01-May-2019 13:46	020LCV5.d	AS CD FE PB SB SE
ICB	1	01-May-2019 13:49	021_ICB.d	AS CD FE PB SB SE
ICV	1	01-May-2019 13:51	022_ICV.d	AS CD FE PB SB SE
ICSA	1	01-May-2019 14:03	024ICSA.d	AS CD FE PB SB SE
ICSAB	1	01-May-2019 14:05	025ICSB.d	AS CD FE PB SB SE
CCV 1	1	01-May-2019 14:50	036_CCV.d	AS CD FE PB SB SE
CCB 1	1	01-May-2019 14:52	037_CCB.d	AS CD FE PB SB SE
CCB 2	1	01-May-2019 15:22	046_CCB.d	AS CD FE PB SB SE
CCV 2	1	01-May-2019 15:33	048_CCV.d	AS CD FE PB SB SE
CCB 3	1	01-May-2019 15:58	059_CCB.d	AS CD FE PB SB SE
CCV 3	1	01-May-2019 16:03	061_CCV.d	AS CD FE PB SB SE
MBLK-140402	1	01-May-2019 16:18	063SMPL.d	AS CD FE PB SB SE
LCS-140402	1	01-May-2019 16:20	064SMPL.d	AS CD FE PB SB SE
ZZZZZZSD	5	01-May-2019 16:25	066SMPL.d	AS CD FE PB SB SE
ZZZZZZMS	1	01-May-2019 16:27	067SMPL.d	AS CD FE PB SB SE
ZZZZZZMSD	1	01-May-2019 16:29	068SMPL.d	AS CD FE PB SB SE
ZZZZZZPDS	1	01-May-2019 16:31	069SMPL.d	AS CD FE PB SB SE
CCV 4	1	01-May-2019 16:35	071_CCV.d	AS CD FE PB SB SE
CCB 4	1	01-May-2019 16:38	072_CCB.d	AS CD FE PB SB SE
20190426-NSF-PV65inlet-30MW11-T	1	01-May-2019 16:58	078SMPL.d	AS CD FE PB SB
20190426-NSF-PV65inlet-30MW11-T-DUP	1	01-May-2019 17:00	079SMPL.d	AS CD FE PB SB
20190426-NSF-PV65mid-30MW11-T	1	01-May-2019 17:02	080SMPL.d	AS CD FE PB SB SE
20190426-NSF-PV65out-30MW-11-T	1	01-May-2019 17:04	081SMPL.d	AS CD FE PB SB SE
20190426-NSF-PV66inlet-controlFD-T	1	01-May-2019 17:06	082SMPL.d	AS CD FE PB SB
CCV 5	1	01-May-2019 17:09	083_CCV.d	AS CD FE PB SB SE
CCB 5	1	01-May-2019 17:11	084_CCB.d	AS CD FE PB SB SE
20190426-NSF-PV66mid-controlFD-T	1	01-May-2019 17:18	085SMPL.d	AS FE PB SB
20190426-NSF-PV66out-controlFD-T	1	01-May-2019 17:21	086SMPL.d	AS FE PB SB
CCB 6	1	01-May-2019 17:44	096_CCB.d	AS CD FE PB SB SE
CCV 6	1	01-May-2019 17:58	098_CCV.d	AS CD FE PB SB SE
ICCV 7	1	01-May-2019 21:41	114_ICV.d	AS CD FE PB SB SE
LLCCV2	1	01-May-2019 21:44	115LCV2.d	AS CD FE PB SB SE
LLCCV5	1	01-May-2019 21:46	116LCV5.d	AS CD FE PB SB SE
ICCB 7	1	01-May-2019 21:48	117_ICB.d	AS CD FE PB SB SE
CCV 8	1	01-May-2019 22:09	125_CCV.d	AS CD FE PB SB SE
CCB 8	1	01-May-2019 22:12	126_CCB.d	AS CD FE PB SB SE
CCV 9	1	01-May-2019 22:18	128_CCV.d	AS CD FE PB SB SE
ICCV 10	1	01-May-2019 23:02	139_ICV.d	AS CD FE PB SB SE
LLCCV2	1	01-May-2019 23:04	140LCV2.d	AS CD FE PB SB SE
LLCCV5	1	01-May-2019 23:07	141LCV5.d	AS CD FE PB SB SE
ICCB 9	1	01-May-2019 23:09	142_ICB.d	AS CD FE PB SB SE
CCV 11	1	01-May-2019 23:26	150_CCV.d	AS CD FE PB SB SE
CCB 10	1	01-May-2019 23:28	151_CCB.d	AS CD FE PB SB SE
CCV 12	1	01-May-2019 23:58	162_CCV.d	AS CD FE PB SB SE
CCB 11	1	02-May-2019 00:00	163_CCB.d	AS CD FE PB SB SE
CCV 13	1	02-May-2019 00:11	168_CCV.d	AS CD FE PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19041731

Run ID:ICPMS04_337643
Instrument:ICPMS04
Method:SW6020

CCB 2	Date: 01-May-2019 15:22	Seq: 5058353		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Selenium	1.444	1.1	2	
CCB 4	Date: 01-May-2019 16:38	Seq: 5058731		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.433	0.4	2	
CCB 5	Date: 01-May-2019 17:11	Seq: 5058760		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Selenium	1.306	1.1	2	
CCB 6	Date: 01-May-2019 17:44	Seq: 5058878		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Selenium	2.123	1.1	2	
CCB 8	Date: 01-May-2019 22:12	Seq: 5059148		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Arsenic	-0.424	0.4	2	
CCB 11	Date: 02-May-2019 00:00	Seq: 5059121		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Iron	15.23	12	200	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19041731

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19041731-01	20190426-NSF-PV65inlet-30MW11-D	Groundwater		26-Apr-2019 21:00	30-Apr-2019 09:42	☐
HS19041731-02	20190426-NSF-PV65inlet-30MW11-T	Groundwater		26-Apr-2019 21:00	30-Apr-2019 09:42	☐
HS19041731-03	20190426-NSF-PV65inlet-30MW11-D-DUP	Groundwater		26-Apr-2019 21:00	30-Apr-2019 09:42	☐
HS19041731-04	20190426-NSF-PV65inlet-30MW11-T-DUP	Groundwater		26-Apr-2019 21:00	30-Apr-2019 09:42	☐
HS19041731-05	20190426-NSF-PV65mid-30MW11-D	Groundwater		26-Apr-2019 20:00	30-Apr-2019 09:42	☐
HS19041731-06	20190426-NSF-PV65mid-30MW11-T	Groundwater		26-Apr-2019 20:00	30-Apr-2019 09:42	☐
HS19041731-07	20190426-NSF-PV65out-30MW11-D	Groundwater		26-Apr-2019 14:00	30-Apr-2019 09:42	☐
HS19041731-08	20190426-NSF-PV65out-30MW-11-T	Groundwater		26-Apr-2019 14:00	30-Apr-2019 09:42	☐
HS19041731-09	20190426-NSF-PV66inlet-controlFD-D	Groundwater		26-Apr-2019 21:00	30-Apr-2019 09:42	☐
HS19041731-10	20190426-NSF-PV66inlet-controlFD-T	Groundwater		26-Apr-2019 21:00	30-Apr-2019 09:42	☐
HS19041731-11	20190426-NSF-PV66mid-controlFD-D	Groundwater		26-Apr-2019 20:00	30-Apr-2019 09:42	☐
HS19041731-12	20190426-NSF-PV66mid-controlFD-T	Groundwater		26-Apr-2019 20:00	30-Apr-2019 09:42	☐
HS19041731-13	20190426-NSF-PV66out-controlFD-D	Groundwater		26-Apr-2019 14:00	30-Apr-2019 09:42	☐
HS19041731-14	20190426-NSF-PV66out-controlFD-T	Groundwater		26-Apr-2019 14:00	30-Apr-2019 09:42	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190426-NSF-PV65inlet-30MW11-D
Collection Date: 26-Apr-2019 21:00

ANALYTICAL REPORT
WorkOrder:HS19041731
Lab ID:HS19041731-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 02-May-2019		Analyst: JHD
Antimony	**0.0537**		**0.000400**	**0.00200**	**mg/L**	1	02-May-2019 16:35
Arsenic	**0.285**		**0.00800**	**0.0400**	**mg/L**	20	03-May-2019 16:31
Cadmium	**0.0685**		**0.000200**	**0.00200**	**mg/L**	1	02-May-2019 16:35
Iron	U		0.0120	0.200	mg/L	1	02-May-2019 16:35
Lead	**0.852**		**0.0120**	**0.0400**	**mg/L**	20	03-May-2019 16:31
Selenium	**2.28**		**0.0220**	**0.0400**	**mg/L**	20	03-May-2019 16:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190426-NSF-PV65inlet-30MW11-T
Collection Date: 26-Apr-2019 21:00

ANALYTICAL REPORT
WorkOrder:HS19041731
Lab ID:HS19041731-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 01-May-2019		Analyst: JC
Antimony	**0.0480**		**0.000400**	**0.00200**	**mg/L**	1	01-May-2019 16:58
Arsenic	**0.300**		**0.000400**	**0.00200**	**mg/L**	1	01-May-2019 16:58
Cadmium	**0.0692**		**0.000200**	**0.00200**	**mg/L**	1	01-May-2019 16:58
Iron	**0.141**	J	**0.0120**	**0.200**	**mg/L**	1	01-May-2019 16:58
Lead	**1.12**		**0.000600**	**0.00200**	**mg/L**	1	01-May-2019 16:58
Selenium	**2.08**		**0.0220**	**0.0400**	**mg/L**	20	02-May-2019 14:41

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190426-NSF-PV65inlet-30MW11-D-DUP
Collection Date: 26-Apr-2019 21:00

ANALYTICAL REPORT
WorkOrder:HS19041731
Lab ID:HS19041731-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 02-May-2019		Analyst: JHD
Antimony	**0.0491**		**0.000400**	**0.00200**	**mg/L**	1	02-May-2019 16:43
Arsenic	**0.304**		**0.000400**	**0.00200**	**mg/L**	1	02-May-2019 16:43
Cadmium	**0.0653**		**0.000200**	**0.00200**	**mg/L**	1	02-May-2019 16:43
Iron	U		0.0120	0.200	mg/L	1	02-May-2019 16:43
Lead	**0.971**		**0.000600**	**0.00200**	**mg/L**	1	02-May-2019 16:43
Selenium	**2.07**		**0.0220**	**0.0400**	**mg/L**	20	03-May-2019 13:41

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190426-NSF-PV65inlet-30MW11-T-DUP
Collection Date: 26-Apr-2019 21:00

ANALYTICAL REPORT
WorkOrder:HS19041731
Lab ID:HS19041731-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 01-May-2019		Analyst: JC
Antimony	**0.0476**		**0.000400**	**0.00200**	**mg/L**	1	01-May-2019 17:00
Arsenic	**0.293**		**0.000400**	**0.00200**	**mg/L**	1	01-May-2019 17:00
Cadmium	**0.0682**		**0.000200**	**0.00200**	**mg/L**	1	01-May-2019 17:00
Iron	**0.159**	J	**0.0120**	**0.200**	**mg/L**	1	01-May-2019 17:00
Lead	**1.13**		**0.000600**	**0.00200**	**mg/L**	1	01-May-2019 17:00
Selenium	**2.04**		**0.0220**	**0.0400**	**mg/L**	20	02-May-2019 14:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190426-NSF-PV65mid-30MW11-D
Collection Date: 26-Apr-2019 20:00

ANALYTICAL REPORT
WorkOrder:HS19041731
Lab ID:HS19041731-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 02-May-2019		Analyst: JHD
Antimony	**0.000944**	J	**0.000400**	**0.00200**	**mg/L**	1	02-May-2019 16:45
Arsenic	**0.000410**	J	**0.000400**	**0.00200**	**mg/L**	1	02-May-2019 16:45
Cadmium	U		0.000200	0.00200	mg/L	1	02-May-2019 16:45
Iron	U		0.0120	0.200	mg/L	1	02-May-2019 16:45
Lead	U		0.000600	0.00200	mg/L	1	02-May-2019 16:45
Selenium	**0.0177**		**0.00110**	**0.00200**	**mg/L**	1	03-May-2019 13:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190426-NSF-PV65mid-30MW11-T
Collection Date: 26-Apr-2019 20:00

ANALYTICAL REPORT
WorkOrder:HS19041731
Lab ID:HS19041731-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 01-May-2019		Analyst: JC
Antimony	**0.00116**	J	**0.000400**	**0.00200**	**mg/L**	1	01-May-2019 17:02
Arsenic	**0.000424**	J	**0.000400**	**0.00200**	**mg/L**	1	01-May-2019 17:02
Cadmium	U		0.000200	0.00200	mg/L	1	01-May-2019 17:02
Iron	**2.75**		**0.0120**	**0.200**	**mg/L**	1	01-May-2019 17:02
Lead	**0.000614**	J	**0.000600**	**0.00200**	**mg/L**	1	01-May-2019 17:02
Selenium	**0.0200**		**0.00110**	**0.00200**	**mg/L**	1	01-May-2019 17:02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190426-NSF-PV65out-30MW11-D
Collection Date: 26-Apr-2019 14:00

ANALYTICAL REPORT
WorkOrder:HS19041731
Lab ID:HS19041731-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 02-May-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	02-May-2019 17:03
Arsenic	U		0.000400	0.00200	mg/L	1	02-May-2019 17:03
Cadmium	U		0.000200	0.00200	mg/L	1	02-May-2019 17:03
Iron	U		0.0120	0.200	mg/L	1	02-May-2019 17:03
Lead	U		0.000600	0.00200	mg/L	1	02-May-2019 17:03
Selenium	U		0.00110	0.00200	mg/L	1	02-May-2019 17:03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190426-NSF-PV65out-30MW-11-T
Collection Date: 26-Apr-2019 14:00

ANALYTICAL REPORT
WorkOrder:HS19041731
Lab ID:HS19041731-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 01-May-2019		Analyst: JC
Antimony	U		0.000400	0.00200	mg/L	1	01-May-2019 17:04
Arsenic	U		0.000400	0.00200	mg/L	1	01-May-2019 17:04
Cadmium	U		0.000200	0.00200	mg/L	1	01-May-2019 17:04
Iron	**2.68**		**0.0120**	**0.200**	**mg/L**	1	01-May-2019 17:04
Lead	U		0.000600	0.00200	mg/L	1	01-May-2019 17:04
Selenium	**0.00187**	J	**0.00110**	**0.00200**	**mg/L**	1	01-May-2019 17:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190426-NSF-PV66inlet-controlFD-D
Collection Date: 26-Apr-2019 21:00

ANALYTICAL REPORT
WorkOrder:HS19041731
Lab ID:HS19041731-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 02-May-2019		Analyst: JHD
Antimony	**0.0462**		**0.000400**	**0.00200**	**mg/L**	1	02-May-2019 17:04
Arsenic	**0.250**		**0.000400**	**0.00200**	**mg/L**	1	02-May-2019 17:04
Cadmium	**0.0604**		**0.000200**	**0.00200**	**mg/L**	1	02-May-2019 17:04
Iron	U		0.0120	0.200	mg/L	1	02-May-2019 17:04
Lead	**0.0970**		**0.000600**	**0.00200**	**mg/L**	1	02-May-2019 17:04
Selenium	**1.62**		**0.0220**	**0.0400**	**mg/L**	20	03-May-2019 13:44

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190426-NSF-PV66inlet-controlFD-T
Collection Date: 26-Apr-2019 21:00

ANALYTICAL REPORT
WorkOrder:HS19041731
Lab ID:HS19041731-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 01-May-2019		Analyst: JC
Antimony	**0.0448**		**0.000400**	**0.00200**	**mg/L**	1	01-May-2019 17:06
Arsenic	**0.279**		**0.000400**	**0.00200**	**mg/L**	1	01-May-2019 17:06
Cadmium	**0.0693**		**0.000200**	**0.00200**	**mg/L**	1	01-May-2019 17:06
Iron	**1.90**		**0.0120**	**0.200**	**mg/L**	1	01-May-2019 17:06
Lead	**1.30**		**0.000600**	**0.00200**	**mg/L**	1	01-May-2019 17:06
Selenium	**1.92**		**0.0220**	**0.0400**	**mg/L**	20	02-May-2019 14:44

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190426-NSF-PV66mid-controlFD-D
Collection Date: 26-Apr-2019 20:00

ANALYTICAL REPORT
WorkOrder:HS19041731
Lab ID:HS19041731-11
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 02-May-2019		Analyst: JHD
Antimony	**0.0500**		**0.000400**	**0.00200**	**mg/L**	1	02-May-2019 17:06
Arsenic	**0.209**		**0.000400**	**0.00200**	**mg/L**	1	02-May-2019 17:06
Cadmium	**0.0519**		**0.000200**	**0.00200**	**mg/L**	1	02-May-2019 17:06
Iron	U		0.0120	0.200	mg/L	1	02-May-2019 17:06
Lead	**0.00223**		**0.000600**	**0.00200**	**mg/L**	1	02-May-2019 17:06
Selenium	**1.79**		**0.0220**	**0.0400**	**mg/L**	20	03-May-2019 13:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190426-NSF-PV66mid-controlFD-T
Collection Date: 26-Apr-2019 20:00

ANALYTICAL REPORT
WorkOrder:HS19041731
Lab ID:HS19041731-12
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 01-May-2019		Analyst: JC
Antimony	**0.0450**		**0.000400**	**0.00200**	**mg/L**	1	01-May-2019 17:18
Arsenic	**0.186**		**0.000400**	**0.00200**	**mg/L**	1	01-May-2019 17:18
Cadmium	**0.0476**		**0.000400**	**0.00400**	**mg/L**	2	02-May-2019 14:32
Iron	**0.0275**	J	**0.0120**	**0.200**	**mg/L**	1	01-May-2019 17:18
Lead	**0.00819**		**0.000600**	**0.00200**	**mg/L**	1	01-May-2019 17:18
Selenium	**1.83**		**0.0220**	**0.0400**	**mg/L**	20	02-May-2019 14:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190426-NSF-PV66out-controlFD-D
Collection Date: 26-Apr-2019 14:00

ANALYTICAL REPORT
WorkOrder:HS19041731
Lab ID:HS19041731-13
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 02-May-2019		Analyst: JHD
Antimony	**0.0477**		**0.000400**	**0.00200**	**mg/L**	1	02-May-2019 17:08
Arsenic	**0.224**		**0.000400**	**0.00200**	**mg/L**	1	02-May-2019 17:08
Cadmium	**0.0519**		**0.000200**	**0.00200**	**mg/L**	1	02-May-2019 17:08
Iron	U		0.0120	0.200	mg/L	1	02-May-2019 17:08
Lead	**0.00152**	J	**0.000600**	**0.00200**	**mg/L**	1	02-May-2019 17:08
Selenium	**2.13**		**0.0220**	**0.0400**	**mg/L**	20	03-May-2019 13:46

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190426-NSF-PV66out-controlFD-T
Collection Date: 26-Apr-2019 14:00

ANALYTICAL REPORT
WorkOrder:HS19041731
Lab ID:HS19041731-14
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 01-May-2019		Analyst: JC
Antimony	**0.0397**		**0.000400**	**0.00200**	**mg/L**	1	01-May-2019 17:21
Arsenic	**0.188**		**0.000400**	**0.00200**	**mg/L**	1	01-May-2019 17:21
Cadmium	**0.0471**		**0.000400**	**0.00400**	**mg/L**	2	02-May-2019 14:33
Iron	**0.0178**	J	**0.0120**	**0.200**	**mg/L**	1	01-May-2019 17:21
Lead	**0.00514**		**0.000600**	**0.00200**	**mg/L**	1	01-May-2019 17:21
Selenium	**1.89**		**0.0220**	**0.0400**	**mg/L**	20	02-May-2019 15:08

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19041731

Batch ID: 140402 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19041731-02	1	10	10 (mL)	1
HS19041731-04	1	10	10 (mL)	1
HS19041731-06	1	10	10 (mL)	1
HS19041731-08	1	10	10 (mL)	1
HS19041731-10	1	10	10 (mL)	1
HS19041731-12	1	10	10 (mL)	1
HS19041731-14	1	10	10 (mL)	1

Batch ID: 140436 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19041731-01	1	10	10 (mL)	1
HS19041731-03	1	10	10 (mL)	1
HS19041731-05	1	10	10 (mL)	1
HS19041731-07	1	10	10 (mL)	1
HS19041731-09	1	10	10 (mL)	1
HS19041731-11	1	10	10 (mL)	1
HS19041731-13	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19041731

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 140402	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19041731-02	20190426-NSF-PV65inlet-30MW11-T	26 Apr 2019 21:00		01 May 2019 11:00	02 May 2019 14:41	20
HS19041731-02	20190426-NSF-PV65inlet-30MW11-T	26 Apr 2019 21:00		01 May 2019 11:00	01 May 2019 16:58	1
HS19041731-04	20190426-NSF-PV65inlet-30MW11-T-DUP	26 Apr 2019 21:00		01 May 2019 11:00	02 May 2019 14:42	20
HS19041731-04	20190426-NSF-PV65inlet-30MW11-T-DUP	26 Apr 2019 21:00		01 May 2019 11:00	01 May 2019 17:00	1
HS19041731-06	20190426-NSF-PV65mid-30MW11-T	26 Apr 2019 20:00		01 May 2019 11:00	01 May 2019 17:02	1
HS19041731-08	20190426-NSF-PV65out-30MW-11-T	26 Apr 2019 14:00		01 May 2019 11:00	01 May 2019 17:04	1
HS19041731-10	20190426-NSF-PV66inlet-controlFD-T	26 Apr 2019 21:00		01 May 2019 11:00	02 May 2019 14:44	20
HS19041731-10	20190426-NSF-PV66inlet-controlFD-T	26 Apr 2019 21:00		01 May 2019 11:00	01 May 2019 17:06	1
HS19041731-12	20190426-NSF-PV66mid-controlFD-T	26 Apr 2019 20:00		01 May 2019 11:00	02 May 2019 14:45	20
HS19041731-12	20190426-NSF-PV66mid-controlFD-T	26 Apr 2019 20:00		01 May 2019 11:00	02 May 2019 14:32	2
HS19041731-12	20190426-NSF-PV66mid-controlFD-T	26 Apr 2019 20:00		01 May 2019 11:00	01 May 2019 17:18	1
HS19041731-14	20190426-NSF-PV66out-controlFD-T	26 Apr 2019 14:00		01 May 2019 11:00	02 May 2019 15:08	20
HS19041731-14	20190426-NSF-PV66out-controlFD-T	26 Apr 2019 14:00		01 May 2019 11:00	02 May 2019 14:33	2
HS19041731-14	20190426-NSF-PV66out-controlFD-T	26 Apr 2019 14:00		01 May 2019 11:00	01 May 2019 17:21	1
Batch ID 140436	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS19041731-01	20190426-NSF-PV65inlet-30MW11-D	26 Apr 2019 21:00		02 May 2019 09:30	03 May 2019 16:31	20
HS19041731-01	20190426-NSF-PV65inlet-30MW11-D	26 Apr 2019 21:00		02 May 2019 09:30	02 May 2019 16:35	1
HS19041731-03	20190426-NSF-PV65inlet-30MW11-D-DUP	26 Apr 2019 21:00		02 May 2019 09:30	03 May 2019 13:41	20
HS19041731-03	20190426-NSF-PV65inlet-30MW11-D-DUP	26 Apr 2019 21:00		02 May 2019 09:30	02 May 2019 16:43	1
HS19041731-05	20190426-NSF-PV65mid-30MW11-D	26 Apr 2019 20:00		02 May 2019 09:30	03 May 2019 13:42	1
HS19041731-05	20190426-NSF-PV65mid-30MW11-D	26 Apr 2019 20:00		02 May 2019 09:30	02 May 2019 16:45	1
HS19041731-07	20190426-NSF-PV65out-30MW11-D	26 Apr 2019 14:00		02 May 2019 09:30	02 May 2019 17:03	1
HS19041731-09	20190426-NSF-PV66inlet-controlFD-D	26 Apr 2019 21:00		02 May 2019 09:30	03 May 2019 13:44	20
HS19041731-09	20190426-NSF-PV66inlet-controlFD-D	26 Apr 2019 21:00		02 May 2019 09:30	02 May 2019 17:04	1
HS19041731-11	20190426-NSF-PV66mid-controlFD-D	26 Apr 2019 20:00		02 May 2019 09:30	03 May 2019 13:45	20
HS19041731-11	20190426-NSF-PV66mid-controlFD-D	26 Apr 2019 20:00		02 May 2019 09:30	02 May 2019 17:06	1
HS19041731-13	20190426-NSF-PV66out-controlFD-D	26 Apr 2019 14:00		02 May 2019 09:30	03 May 2019 13:46	20
HS19041731-13	20190426-NSF-PV66out-controlFD-D	26 Apr 2019 14:00		02 May 2019 09:30	02 May 2019 17:08	1

WorkOrder: HS19041731
InstrumentID: ICPMS06
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000461	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000438	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000484	0.000200	0.00200
A	Iron	7439-89-6	0.0500	0.0528	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000931	0.000600	0.00200
A	Selenium	7782-49-2	0.00250	0.00239	0.00110	0.00200

WorkOrder: HS19041731
InstrumentID: ICPMS04
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000774	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000493	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000493	0.000200	0.00200
A	Iron	7439-89-6	0.0500	0.0716	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000944	0.000600	0.00200
A	Selenium	7782-49-2	0.00250	0.00223	0.00110	0.00200

WorkOrder: HS19041731
InstrumentID: ICPMS06
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Cadmium	7440-43-9	0.000500	0.000484	0.000200	0.00200
A	Selenium	7782-49-2	0.00250	0.00239	0.00110	0.00200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19041731

QC BATCH REPORT

Batch ID: 140402 (0) **Instrument: ICPMS04** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLK-140402** Units: **mg/L** Analysis Date: **01-May-2019 16:18**
Client ID: Run ID: **ICPMS04_337643** SeqNo: **5058722** PrepDate: **01-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Iron	U	0.200								
Lead	U	0.00200								
Selenium	U	0.00200								

LCS Sample ID: **LCS-140402** Units: **mg/L** Analysis Date: **01-May-2019 16:20**
Client ID: Run ID: **ICPMS04_337643** SeqNo: **5058723** PrepDate: **01-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.0542	0.00200	0.05	0	108	80 - 120				
Arsenic	0.05213	0.00200	0.05	0	104	80 - 120				
Cadmium	0.0556	0.00200	0.05	0	111	80 - 120				
Iron	5.217	0.200	5	0	104	80 - 120				
Lead	0.04497	0.00200	0.05	0	89.9	80 - 120				
Selenium	0.05361	0.00200	0.05	0	107	80 - 120				

MS Sample ID: **HS19041541-02MS** Units: **mg/L** Analysis Date: **01-May-2019 16:27**
Client ID: Run ID: **ICPMS04_337643** SeqNo: **5058726** PrepDate: **01-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05356	0.00200	0.05	0.000317	106	80 - 120				
Arsenic	0.05424	0.00200	0.05	0.001266	106	80 - 120				
Cadmium	0.05387	0.00200	0.05	0.000226	107	80 - 120				
Iron	8.861	0.200	5	3.71	103	80 - 120				
Lead	0.04677	0.00200	0.05	0.000684	92.2	80 - 120				
Selenium	0.0572	0.00200	0.05	0.002549	109	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19041731

QC BATCH REPORT

Batch ID: 140402 (0) **Instrument: ICPMS04** **Method: ICP-MS METALS BY SW6020A**

MSD Sample ID: **HS19041541-02MSD** Units: **mg/L** Analysis Date: **01-May-2019 16:29**
Client ID: Run ID: **ICPMS04_337643** SeqNo: **5058727** PrepDate: **01-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05366	0.00200	0.05	0.000317	107	80 - 120	0.05356	0.194	20	
Arsenic	0.05468	0.00200	0.05	0.001266	107	80 - 120	0.05424	0.808	20	
Cadmium	0.05527	0.00200	0.05	0.000226	110	80 - 120	0.05387	2.56	20	
Iron	8.757	0.200	5	3.71	101	80 - 120	8.861	1.18	20	
Lead	0.04691	0.00200	0.05	0.000684	92.4	80 - 120	0.04677	0.286	20	
Selenium	0.05778	0.00200	0.05	0.002549	110	80 - 120	0.0572	1.01	20	

PDS Sample ID: **HS19041541-02PDS** Units: **mg/L** Analysis Date: **01-May-2019 16:31**
Client ID: Run ID: **ICPMS04_337643** SeqNo: **5058728** PrepDate: **01-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09155	0.00200	0.1	0.000317	91.2	75 - 125				
Arsenic	0.1048	0.00200	0.1	0.001266	104	75 - 125				
Cadmium	0.1052	0.00200	0.1	0.000226	105	75 - 125				
Iron	13.3	0.200	10	3.71	95.9	75 - 125				
Lead	0.1074	0.00200	0.1	0.000684	107	75 - 125				
Selenium	0.1091	0.00200	0.1	0.002549	107	75 - 125				

SD Sample ID: **HS19041541-02SD** Units: **mg/L** Analysis Date: **01-May-2019 16:25**
Client ID: Run ID: **ICPMS04_337643** SeqNo: **5058725** PrepDate: **01-May-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000317	0	10	
Arsenic	U	0.0100					0.001266	0	10	
Cadmium	U	0.0100					0.000226	0	10	
Iron	3.661	1.00					3.71	1.32	10	
Lead	U	0.0100					0.000684	0	10	
Selenium	U	0.0100					0.002549	0	10	

The following samples were analyzed in this batch:

HS19041731-02	HS19041731-04	HS19041731-06	HS19041731-08
HS19041731-10	HS19041731-12	HS19041731-14	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19041731

QC BATCH REPORT

Batch ID: 140436 (0) **Instrument:** ICPMS06 **Method:** DISSOLVED METALS BY SW6020A (DISSOLVED)

MBLK Sample ID: **MBLK-140436** Units: **mg/L** Analysis Date: **02-May-2019 16:33**
Client ID: Run ID: **ICPMS06_337735** SeqNo: **5060765** PrepDate: **02-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Iron	U	0.200								
Lead	U	0.00200								
Selenium	U	0.00200								

LCS Sample ID: **LCS-140436** Units: **mg/L** Analysis Date: **02-May-2019 16:34**
Client ID: Run ID: **ICPMS06_337735** SeqNo: **5060766** PrepDate: **02-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05787	0.00200	0.05	0	116	80 - 120				
Arsenic	0.0571	0.00200	0.05	0	114	80 - 120				
Cadmium	0.05704	0.00200	0.05	0	114	80 - 120				
Iron	5.533	0.200	5	0	111	80 - 120				
Lead	0.05152	0.00200	0.05	0	103	80 - 120				
Selenium	0.05703	0.00200	0.05	0	114	80 - 120				

MS Sample ID: **HS19041731-01MS** Units: **mg/L** Analysis Date: **02-May-2019 16:39**
Client ID: **20190426-NSF-PV65inlet-30MW11-D** Run ID: **ICPMS06_337735** SeqNo: **5060769** PrepDate: **02-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1051	0.00200	0.05	0.05374	103	75 - 125				
Arsenic	0.3697	0.00200	0.05	0.3335	72.4	75 - 125				SO
Cadmium	0.1143	0.00200	0.05	0.06848	91.7	75 - 125				
Iron	5.449	0.200	5	0.002442	109	75 - 125				
Lead	0.9865	0.00200	0.05	0.9955	-18.0	75 - 125				SO
Selenium	2.627	0.00200	0.05	2.773	-293	75 - 125				SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19041731

QC BATCH REPORT

Batch ID: 140436 (0) **Instrument:** ICPMS06 **Method:** DISSOLVED METALS BY SW6020A (DISSOLVED)

MSD Sample ID: **HS19041731-01MSD** Units: **mg/L** Analysis Date: **02-May-2019 16:40**
Client ID: **20190426-NSF-PV65inlet-30MW11-D** Run ID: **ICPMS06_337735** SeqNo: **5060770** PrepDate: **02-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1006	0.00200	0.05	0.05374	93.8	75 - 125	0.1051	4.38	20	
Arsenic	0.3605	0.00200	0.05	0.3335	53.9	75 - 125	0.3697	2.53	20	SO
Cadmium	0.113	0.00200	0.05	0.06848	89.1	75 - 125	0.1143	1.13	20	
Iron	5.317	0.200	5	0.002442	106	75 - 125	5.449	2.45	20	
Lead	1.006	0.00200	0.05	0.9955	21.6	75 - 125	0.9865	1.99	20	SO
Selenium	2.582	0.00200	0.05	2.773	-382	75 - 125	2.627	1.71	20	SEO

PDS Sample ID: **HS19041731-01PDS** Units: **mg/L** Analysis Date: **02-May-2019 16:42**
Client ID: **20190426-NSF-PV65inlet-30MW11-D** Run ID: **ICPMS06_337735** SeqNo: **5060771** PrepDate: **02-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1396	0.00200	0.1	0.05374	85.9	75 - 125				
Cadmium	0.158	0.00200	0.1	0.06848	89.5	75 - 125				
Iron	9.908	0.200	10	0.002442	99.1	75 - 125				

PDS Sample ID: **HS19041731-01PDS** Units: **mg/L** Analysis Date: **03-May-2019 13:39**
Client ID: **20190426-NSF-PV65inlet-30MW11-D** Run ID: **ICPMS06_337804** SeqNo: **5061775** PrepDate: **02-May-2019** DF: **20**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	2.297	0.0400	2	0.2848	101	75 - 125				
Lead	2.758	0.0400	2	0.8521	95.3	75 - 125				
Selenium	3.975	0.0400	2	2.283	84.6	75 - 125				

SD Sample ID: **HS19041731-01SD** Units: **mg/L** Analysis Date: **03-May-2019 16:32**
Client ID: **20190426-NSF-PV65inlet-30MW11-D** Run ID: **ICPMS06_337804** SeqNo: **5062246** PrepDate: **02-May-2019** DF: **100**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Arsenic	0.2989	0.200					0.2848	4.96	10	
Lead	0.899	0.200					0.8521	5.5	10	
Selenium	2.466	0.200					2.283	8.03	10	

The following samples were analyzed in this batch:

HS19041731-01	HS19041731-03	HS19041731-05	HS19041731-07
HS19041731-09	HS19041731-11	HS19041731-13	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19041731**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020
Texas	TX104704231-19-23	30-Apr-2020

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19041731

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19041731-01	20190426-NSF-PV65inlet-30MW11-D	Login	4/30/2019 4:18:10 PM	JRM	MET029
HS19041731-02	20190426-NSF-PV65inlet-30MW11-T	Login	4/30/2019 4:18:10 PM	JRM	MET029
HS19041731-03	20190426-NSF-PV65inlet-30MW11-D-DUP	Login	4/30/2019 4:18:10 PM	JRM	MET029
HS19041731-04	20190426-NSF-PV65inlet-30MW11-T-DUP	Login	4/30/2019 4:18:10 PM	JRM	MET029
HS19041731-05	20190426-NSF-PV65mid-30MW11-D	Login	4/30/2019 4:18:10 PM	JRM	MET029
HS19041731-06	20190426-NSF-PV65mid-30MW11-T	Login	4/30/2019 4:18:10 PM	JRM	MET029
HS19041731-07	20190426-NSF-PV65out-30MW11-D	Login	4/30/2019 4:18:10 PM	JRM	MET029
HS19041731-08	20190426-NSF-PV65out-30MW-11-T	Login	4/30/2019 4:18:10 PM	JRM	MET029
HS19041731-09	20190426-NSF-PV66inlet-controlFD-D	Login	4/30/2019 4:18:10 PM	JRM	MET029
HS19041731-10	20190426-NSF-PV66inlet-controlFD-T	Login	4/30/2019 4:18:10 PM	JRM	MET029
HS19041731-11	20190426-NSF-PV66mid-controlFD-D	Login	4/30/2019 4:18:10 PM	JRM	MET029
HS19041731-12	20190426-NSF-PV66mid-controlFD-T	Login	4/30/2019 4:18:10 PM	JRM	MET029

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19041731

Date/Time Received: **30-Apr-2019 09:42**
Received by: **PMG**

Checklist completed by: *Jared R. Makan* eSignature 30-Apr-2019 Date

Reviewed by: *Dane J. Wacasey* eSignature 2-May-2019 Date

Matrices: **Water**

Carrier name: **FedEx International Priority**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	2 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	21.8c/21.8c UC/C	IR25	
Cooler(s)/Kit(s):	44075		
Date/Time sample(s) sent to storage:	04/30/2019 16:30		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

ALS Environmental

Chain of Custody Form

Page 1 of 2

HS19041731

Golder Associates
Exide Column Studies

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086-06	Project Name	Exide Column Studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086-06	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suite 260	Address	13515 Barrett Parkway Drive, Suite 260	E	ICP TW (6020A total metals (6)): Pb, Cd, Sb, Se, As, Fe
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	F	ICP DISS (6020A diss metals (6)-FldFltr): Pb, Cd, Sb, Se, As, Fe
Phone	314 984-8800	Phone	314 984-8800	G	
Fax		Fax		H	
e-Mail Address	ewhite@golder.com	e-Mail Address		I	
				J	

ALS Project Manager:

Work Order #:

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190426-NSF-PV65inlet-30MW11-D	04-26-19	9:00 PM	GW	2	1						X					
2	20190426-NSF-PV65inlet-30MW11-T	04-26-19	9:00 PM	GW	2	1					X						
3	20190426-NSF-PV65inlet-30MW11-D-DUP	04-26-19	9:00 PM	GW	2	1						X					
4	20190426-NSF-PV65inlet-30MW11-T-DUP	04-26-19	9:00 PM	GW	2	1					X						
5	20190426-NSF-PV65mid-30MW11-D	04-26-19	8:00 PM	GW	2	1						X					
6	20190426-NSF-PV65mid-30MW11-T	04-26-19	8:00 PM	GW	2	1					X						
7	20190426-NSF-PV65out-30MW11-D	04-26-19	2:00 PM	GW	2	1						X					
8	20190426-NSF-PV65out-30MW11-T	04-26-19	2:00 PM	GW	2	1					X						
9	20190426-NSF-PV66inlet-controlFD-D	04-26-19	9:00 PM	GW	2	1						X					
10	20190426-NSF-PV66inlet-controlFD-T	04-26-19	9:00 PM	GW	2	1					X						

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method: FedEx

Required Turnaround Time: ☐ STD 10 Wk Days ☒ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☒ Other _____

Results Due Date: STD 5-DAY TAT

Relinquished by: Giovanna Llamosas	Date: 2019/04/29	15:30:00	Received by:	Notes:
Relinquished by:	Date:	Time:	Received by (Laboratory): 4/30/19 09:42	Cooler Temp. 21.8°C
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	

QC Package: (Check Box Below)

	Level II: Standard QC	x	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other:		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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4407.

ALS Environmental

Chain of Custody Form

Page 2 of 2

HS19041731

Golder Associates
Exide Column Studies

ALS Project Manager:

Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086-06	Project Name	Exide Column Studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086-06	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suite 260	Address	13515 Barrett Parkway Drive, Suite 260	E	ICP TW (6020A total metals (6)): Pb, Cd, Sb, Se, As, Fe
				F	ICP DISS (6020A diss metals (6)-FldFltr): Pb, Cd, Sb, Se, As, Fe
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	G	
Phone	314 984-8800	Phone	314 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
11	20190426-NSF-PV66mid-controlFD-D	04-26-19	8:00 PM	GW	2	1						X					
12	20190426-NSF-PV66mid-controlFD-T	04-26-19	8:00 PM	GW	2	1					X						
13	20190426-NSF-PV66out-controlFD-D	04-26-19	2:00 PM	GW	2	1						X					
14	20190426-NSF-P66out-controlFD-T	04-26-19	2:00 PM	GW	2	1					X						
15																	
16																	
17																	
18																	
19																	
20																	

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method: FedEx

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date: STD 5-DAY TAT

Relinquished by: Giovanna Llamosas — Date: 2019/04/29 — Time: 15:30:00

Received by:

Notes:

Relinquished by: — Date: — Time:

Received by (Laboratory): 4/30/19 09:42

Cooler Temp.

Logged by (Laboratory): — Date: — Time:

Checked by (Laboratory):

QC Package: (Check Box Below)

	Level II: Standard QC	x	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other:		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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ORIGIN ID:YUXA (514) 383-0990
Audrey Etheves
Golder Associates Ltd
7250 rue du Mile End
3e étage
MONTREAL, PQ H2R3A4
CANADA, CA

SHIP DATE: 29APR19
ACTWGT: 6.14 KG
CAD: 108680724/INET4102

BILL RECIPIENT
EIN/VAT:

TO Dane Wacasey
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

(281) 530-5656

FedEx Express

(US)

E

AWB

NH SGRA

PKG:CUSTOMER

TRK# 7750 8291 0345 Form 0430

10:30A
INTL PRIORITY

REF:
DESC1: Échantillon d'eau
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN. Audrey Etheves
T/C: R 967554812
D/T: R 967554812

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2. Placez l'étiquette dans la pochette d'expédition et fixez-la à votre paquet

ALS	CUSTODY SEAL	Seal Broken By:
10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887 44075	Date: 2019/04/30 Time: 15:30 Name: [illegible] Company: Golder Associates	[illegible] Date: 04/30/19

44075 APR 30 2019

ALS	CUSTODY SEAL	Seal Broken By:
10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887 44075	Date: 2019/04/30 Time: 15:30 Name: [illegible] Company: Golder Associates	[illegible] Date: 04/30/19

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TRK# 0430 7750 8291 0345

NH SGRA

0A
INTL PRIORITY CLR
CLR
77099
TX-US
IAH

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

May 06, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19041735**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 14 sample(s) on Apr 30, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS19041735**

TRRP Laboratory Data Package Cover Page

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19041735**	

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 05/06/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19041735				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 140402,140436				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?			X		
		Were analytical duplicates analyzed at the appropriate frequency?			X		
		Were RPDs or relative standard deviations within the laboratory QC limits?			X		
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 05/06/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19041735				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 140402,140436				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			2
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports	
Laboratory Name: ALS Laboratory Group	LRC Date: 05/06/2019
Project Name: Exide Column Studies	Laboratory Job Number: HS19041735
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 140402,140436

ER#[5]	Description
1	Batch 140436, Dissolved Metals Method SW6020, sample HS19041731-01, MS and MSD were performed on unrelated sample.
2	See Run Log and CCB Exceptions Report.

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19041735
Start Date: 01-May-2019 End Date: 02-May-2019

Run ID:ICPMS04_337643
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
LLICV2	1	01-May-2019 13:44	019LCV2.d	AS FE PB SB SE
LLICV5	1	01-May-2019 13:46	020LCV5.d	AS FE PB SB SE
ICB	1	01-May-2019 13:49	021_ICB.d	AS CD FE PB SB SE
ICV	1	01-May-2019 13:51	022_ICV.d	AS CD FE PB SB SE
ICSA	1	01-May-2019 14:03	024ICSA.d	AS FE PB SB SE
ICSAB	1	01-May-2019 14:05	025ICSB.d	AS FE PB SB SE
CCV 1	1	01-May-2019 14:50	036_CCV.d	AS CD FE PB SB SE
CCB 1	1	01-May-2019 14:52	037_CCB.d	AS CD FE PB SB SE
CCB 2	1	01-May-2019 15:22	046_CCB.d	AS CD FE PB SB SE
CCV 2	1	01-May-2019 15:33	048_CCV.d	AS CD FE PB SB SE
CCB 3	1	01-May-2019 15:58	059_CCB.d	AS CD FE PB SB SE
CCV 3	1	01-May-2019 16:03	061_CCV.d	AS CD FE PB SB SE
MBLK-140402	1	01-May-2019 16:18	063SMPL.d	AS CD FE PB SB SE
LCS-140402	1	01-May-2019 16:20	064SMPL.d	AS CD FE PB SB SE
ZZZZZZSD	5	01-May-2019 16:25	066SMPL.d	AS CD FE PB SB SE
ZZZZZZMS	1	01-May-2019 16:27	067SMPL.d	AS CD FE PB SB SE
ZZZZZZMSD	1	01-May-2019 16:29	068SMPL.d	AS CD FE PB SB SE
ZZZZZZPDS	1	01-May-2019 16:31	069SMPL.d	AS CD FE PB SB SE
CCV 4	1	01-May-2019 16:35	071_CCV.d	AS CD FE PB SB SE
CCB 4	1	01-May-2019 16:38	072_CCB.d	AS CD FE PB SB SE
CCV 5	1	01-May-2019 17:09	083_CCV.d	AS CD FE PB SB SE
CCB 5	1	01-May-2019 17:11	084_CCB.d	AS CD FE PB SB SE
20190426-NSF-PV73inlet-30MW3-T	1	01-May-2019 17:23	087SMPL.d	AS FE PB SB
20190426-NSF-PV73mid-30MW3-T	1	01-May-2019 17:25	088SMPL.d	AS FE PB SB SE
20190426-NSF-PV73out-30MW3-T	1	01-May-2019 17:27	089SMPL.d	AS FE PB SB SE
20190426-NSF-PV66inlet-30FD-T	1	01-May-2019 17:29	090SMPL.d	AS FE PB SB
20190426-NSF-PV66inlet-30FD-T-DUP	1	01-May-2019 17:32	091SMPL.d	AS FE PB SB
20190426-NSF-PV66mid-30FD-T	1	01-May-2019 17:34	092SMPL.d	AS FE PB SB SE
20190426-NSF-PV66out-30FD-T	1	01-May-2019 17:36	093SMPL.d	AS FE PB SB
CCB 6	1	01-May-2019 17:44	096_CCB.d	AS CD FE PB SB SE
CCV 6	1	01-May-2019 17:58	098_CCV.d	AS CD FE PB SB SE
ICCV 7	1	01-May-2019 21:41	114_ICV.d	AS CD FE PB SB SE
LLCCV2	1	01-May-2019 21:44	115LCV2.d	AS FE PB SB SE
LLCCV5	1	01-May-2019 21:46	116LCV5.d	AS FE PB SB SE
ICCB 7	1	01-May-2019 21:48	117_ICB.d	AS CD FE PB SB SE
CCV 8	1	01-May-2019 22:09	125_CCV.d	AS CD FE PB SB SE
CCB 8	1	01-May-2019 22:12	126_CCB.d	AS CD FE PB SB SE
CCV 9	1	01-May-2019 22:18	128_CCV.d	AS CD FE PB SB SE
ICCV 10	1	01-May-2019 23:02	139_ICV.d	AS CD FE PB SB SE
LLCCV2	1	01-May-2019 23:04	140LCV2.d	AS FE PB SB SE
LLCCV5	1	01-May-2019 23:07	141LCV5.d	AS FE PB SB SE
ICCB 9	1	01-May-2019 23:09	142_ICB.d	AS CD FE PB SB SE
CCV 11	1	01-May-2019 23:26	150_CCV.d	AS CD FE PB SB SE
CCB 10	1	01-May-2019 23:28	151_CCB.d	AS CD FE PB SB SE
CCV 12	1	01-May-2019 23:58	162_CCV.d	AS CD FE PB SB SE
CCB 11	1	02-May-2019 00:00	163_CCB.d	AS CD FE PB SB SE
CCV 13	1	02-May-2019 00:11	168_CCV.d	AS CD FE PB SB SE
CCB 12	1	02-May-2019 00:14	169_CCB.d	AS CD FE PB SB SE
LLICV2	1	02-May-2019 00:16	170LCV2.d	AS CD FE PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19041735

Run ID:ICPMS04_337643
Instrument:ICPMS04
Method:SW6020

CCB 2	Date: 01-May-2019 15:22	Seq: 5058353		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Selenium		1.444	1.1	2	
CCB 4	Date: 01-May-2019 16:38	Seq: 5058731		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Antimony		0.433	0.4	2	
CCB 5	Date: 01-May-2019 17:11	Seq: 5058760		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Selenium		1.306	1.1	2	
CCB 6	Date: 01-May-2019 17:44	Seq: 5058878		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Selenium		2.123	1.1	2	
CCB 8	Date: 01-May-2019 22:12	Seq: 5059148		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Arsenic		-0.424	0.4	2	
CCB 11	Date: 02-May-2019 00:00	Seq: 5059121		D/F: 1	Units: ug/L
Analyte		**Result**	**MDL**	**Report Limit**	
Iron		15.23	12	200	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19041735

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19041735-01	20190426-NSF-PV73inlet-30MW3-D	Groundwater		26-Apr-2019 21:00	30-Apr-2019 09:42	☐
HS19041735-02	20190426-NSF-PV73inlet-30MW3-T	Groundwater		26-Apr-2019 21:00	30-Apr-2019 09:42	☐
HS19041735-03	20190426-NSF-PV73mid-30MW3-D	Groundwater		26-Apr-2019 20:00	30-Apr-2019 09:42	☐
HS19041735-04	20190426-NSF-PV73mid-30MW3-T	Groundwater		26-Apr-2019 20:00	30-Apr-2019 09:42	☐
HS19041735-05	20190426-NSF-PV73out-30MW3-D	Groundwater		26-Apr-2019 14:00	30-Apr-2019 09:42	☐
HS19041735-06	20190426-NSF-PV73out-30MW3-T	Groundwater		26-Apr-2019 14:00	30-Apr-2019 09:42	☐
HS19041735-07	20190426-NSF-PV66inlet-30FD-D	Groundwater		26-Apr-2019 21:00	30-Apr-2019 09:42	☐
HS19041735-08	20190426-NSF-PV66inlet-30FD-T	Groundwater		26-Apr-2019 21:00	30-Apr-2019 09:42	☐
HS19041735-09	20190426-NSF-PV66inlet-30FD-D-DUP	Groundwater		26-Apr-2019 21:00	30-Apr-2019 09:42	☐
HS19041735-10	20190426-NSF-PV66inlet-30FD-T-DUP	Groundwater		26-Apr-2019 21:00	30-Apr-2019 09:42	☐
HS19041735-11	20190426-NSF-PV66mid-30FD-D	Groundwater		26-Apr-2019 20:00	30-Apr-2019 09:42	☐
HS19041735-12	20190426-NSF-PV66mid-30FD-T	Groundwater		26-Apr-2019 20:00	30-Apr-2019 09:42	☐
HS19041735-13	20190426-NSF-PV66out-30DFD-D	Groundwater		26-Apr-2019 14:00	30-Apr-2019 09:42	☐
HS19041735-14	20190426-NSF-PV66out-30FD-T	Groundwater		26-Apr-2019 14:00	30-Apr-2019 09:42	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190426-NSF-PV73inlet-30MW3-D
Collection Date: 26-Apr-2019 21:00

ANALYTICAL REPORT
WorkOrder:HS19041735
Lab ID:HS19041735-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 02-May-2019		Analyst: JHD
Antimony	**0.0575**		**0.000400**	**0.00200**	**mg/L**	1	02-May-2019 17:16
Arsenic	**0.316**		**0.000400**	**0.00200**	**mg/L**	1	02-May-2019 17:16
Cadmium	**0.0693**		**0.000200**	**0.00200**	**mg/L**	1	02-May-2019 17:16
Iron	U		0.0120	0.200	mg/L	1	02-May-2019 17:16
Lead	**0.420**		**0.000600**	**0.00200**	**mg/L**	1	02-May-2019 17:16
Selenium	**1.77**		**0.0220**	**0.0400**	**mg/L**	20	03-May-2019 13:07

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190426-NSF-PV73inlet-30MW3-T
Collection Date: 26-Apr-2019 21:00

ANALYTICAL REPORT
WorkOrder:HS19041735
Lab ID:HS19041735-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 01-May-2019		Analyst: JC
Antimony	**0.0524**		**0.000400**	**0.00200**	**mg/L**	1	01-May-2019 17:23
Arsenic	**0.285**		**0.000400**	**0.00200**	**mg/L**	1	01-May-2019 17:23
Cadmium	**0.0656**		**0.000400**	**0.00400**	**mg/L**	2	02-May-2019 14:35
Iron	**0.722**		**0.0120**	**0.200**	**mg/L**	1	01-May-2019 17:23
Lead	**1.02**		**0.000600**	**0.00200**	**mg/L**	1	01-May-2019 17:23
Selenium	**1.98**		**0.0220**	**0.0400**	**mg/L**	20	02-May-2019 15:09

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190426-NSF-PV73mid-30MW3-D
Collection Date: 26-Apr-2019 20:00

ANALYTICAL REPORT
WorkOrder:HS19041735
Lab ID:HS19041735-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 02-May-2019		Analyst: JHD
Antimony	**0.00836**		**0.000400**	**0.00200**	**mg/L**	1	02-May-2019 17:18
Arsenic	U		0.000400	0.00200	mg/L	1	02-May-2019 17:18
Cadmium	U		0.000200	0.00200	mg/L	1	02-May-2019 17:18
Iron	**0.0186**	J	**0.0120**	**0.200**	**mg/L**	1	02-May-2019 17:18
Lead	U		0.000600	0.00200	mg/L	1	02-May-2019 17:18
Selenium	**0.781**		**0.00110**	**0.00200**	**mg/L**	1	02-May-2019 17:18

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190426-NSF-PV73mid-30MW3-T
Collection Date: 26-Apr-2019 20:00

ANALYTICAL REPORT
WorkOrder:HS19041735
Lab ID:HS19041735-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 01-May-2019		Analyst: JC
Antimony	**0.00828**		**0.000400**	**0.00200**	**mg/L**	1	01-May-2019 17:25
Arsenic	U		0.000400	0.00200	mg/L	1	01-May-2019 17:25
Cadmium	U		0.000200	0.00200	mg/L	1	02-May-2019 14:36
Iron	**3.92**		**0.0120**	**0.200**	**mg/L**	1	01-May-2019 17:25
Lead	**0.000610**	J	**0.000600**	**0.00200**	**mg/L**	1	01-May-2019 17:25
Selenium	**0.686**		**0.00110**	**0.00200**	**mg/L**	1	01-May-2019 17:25

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190426-NSF-PV73out-30MW3-D
Collection Date: 26-Apr-2019 14:00

ANALYTICAL REPORT
WorkOrder:HS19041735
Lab ID:HS19041735-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 02-May-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	02-May-2019 17:20
Arsenic	U		0.000400	0.00200	mg/L	1	02-May-2019 17:20
Cadmium	U		0.000200	0.00200	mg/L	1	02-May-2019 17:20
Iron	U		0.0120	0.200	mg/L	1	02-May-2019 17:20
Lead	U		0.000600	0.00200	mg/L	1	02-May-2019 17:20
Selenium	**0.0629**		**0.00110**	**0.00200**	**mg/L**	1	02-May-2019 17:20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190426-NSF-PV73out-30MW3-T
Collection Date: 26-Apr-2019 14:00

ANALYTICAL REPORT
WorkOrder:HS19041735
Lab ID:HS19041735-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 01-May-2019		Analyst: JC
Antimony	**0.000620**	J	**0.000400**	**0.00200**	**mg/L**	1	01-May-2019 17:27
Arsenic	U		0.000400	0.00200	mg/L	1	01-May-2019 17:27
Cadmium	U		0.000200	0.00200	mg/L	1	02-May-2019 14:39
Iron	**2.99**		**0.0120**	**0.200**	**mg/L**	1	01-May-2019 17:27
Lead	U		0.000600	0.00200	mg/L	1	01-May-2019 17:27
Selenium	**0.0657**		**0.00110**	**0.00200**	**mg/L**	1	01-May-2019 17:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190426-NSF-PV66inlet-30FD-D
Collection Date: 26-Apr-2019 21:00

ANALYTICAL REPORT
WorkOrder:HS19041735
Lab ID:HS19041735-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 02-May-2019		Analyst: JHD
Antimony	**0.0548**		**0.000400**	**0.00200**	**mg/L**	1	02-May-2019 17:21
Arsenic	**0.299**		**0.000400**	**0.00200**	**mg/L**	1	02-May-2019 17:21
Cadmium	**0.0661**		**0.000200**	**0.00200**	**mg/L**	1	02-May-2019 17:21
Iron	U		0.0120	0.200	mg/L	1	02-May-2019 17:21
Lead	**0.745**		**0.000600**	**0.00200**	**mg/L**	1	02-May-2019 17:21
Selenium	**1.72**		**0.0220**	**0.0400**	**mg/L**	20	03-May-2019 13:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190426-NSF-PV66inlet-30FD-T
Collection Date: 26-Apr-2019 21:00

ANALYTICAL REPORT
WorkOrder:HS19041735
Lab ID:HS19041735-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 01-May-2019		Analyst: JC
Antimony	**0.0518**		**0.000400**	**0.00200**	**mg/L**	1	01-May-2019 17:29
Arsenic	**0.287**		**0.000400**	**0.00200**	**mg/L**	1	01-May-2019 17:29
Cadmium	**0.0622**		**0.000400**	**0.00400**	**mg/L**	2	02-May-2019 15:05
Iron	**0.378**		**0.0120**	**0.200**	**mg/L**	1	01-May-2019 17:29
Lead	**1.07**		**0.000600**	**0.00200**	**mg/L**	1	01-May-2019 17:29
Selenium	**1.88**		**0.0220**	**0.0400**	**mg/L**	20	02-May-2019 15:11

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190426-NSF-PV66inlet-30FD-D-DUP
Collection Date: 26-Apr-2019 21:00

ANALYTICAL REPORT
WorkOrder:HS19041735
Lab ID:HS19041735-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 02-May-2019		Analyst: JHD
Antimony	**0.0549**		**0.000400**	**0.00200**	**mg/L**	1	02-May-2019 17:23
Arsenic	**0.301**		**0.000400**	**0.00200**	**mg/L**	1	02-May-2019 17:23
Cadmium	**0.0668**		**0.000200**	**0.00200**	**mg/L**	1	02-May-2019 17:23
Iron	U		0.0120	0.200	mg/L	1	02-May-2019 17:23
Lead	**0.740**		**0.000600**	**0.00200**	**mg/L**	1	02-May-2019 17:23
Selenium	**1.97**		**0.0220**	**0.0400**	**mg/L**	20	03-May-2019 13:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190426-NSF-PV66inlet-30FD-T-DUP
Collection Date: 26-Apr-2019 21:00

ANALYTICAL REPORT
WorkOrder:HS19041735
Lab ID:HS19041735-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 01-May-2019		Analyst: JC
Antimony	**0.0567**		**0.000400**	**0.00200**	**mg/L**	1	01-May-2019 17:32
Arsenic	**0.323**		**0.000400**	**0.00200**	**mg/L**	1	01-May-2019 17:32
Cadmium	**0.0640**		**0.000400**	**0.00400**	**mg/L**	2	02-May-2019 15:06
Iron	**0.908**		**0.0120**	**0.200**	**mg/L**	1	01-May-2019 17:32
Lead	**1.50**		**0.000600**	**0.00200**	**mg/L**	1	01-May-2019 17:32
Selenium	**2.02**		**0.0220**	**0.0400**	**mg/L**	20	02-May-2019 15:12

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190426-NSF-PV66mid-30FD-D
Collection Date: 26-Apr-2019 20:00

ANALYTICAL REPORT
WorkOrder:HS19041735
Lab ID:HS19041735-11
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 02-May-2019		Analyst: JHD
Antimony	**0.00912**		**0.000400**	**0.00200**	**mg/L**	1	02-May-2019 17:24
Arsenic	U		0.000400	0.00200	mg/L	1	02-May-2019 17:24
Cadmium	U		0.000200	0.00200	mg/L	1	02-May-2019 17:24
Iron	U		0.0120	0.200	mg/L	1	02-May-2019 17:24
Lead	U		0.000600	0.00200	mg/L	1	02-May-2019 17:24
Selenium	**0.561**		**0.00110**	**0.00200**	**mg/L**	1	02-May-2019 17:24

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190426-NSF-PV66mid-30FD-T
Collection Date: 26-Apr-2019 20:00

ANALYTICAL REPORT
WorkOrder:HS19041735
Lab ID:HS19041735-12
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 01-May-2019		Analyst: JC
Antimony	**0.00931**		**0.000400**	**0.00200**	**mg/L**	1	01-May-2019 17:34
Arsenic	**0.000632**	J	**0.000400**	**0.00200**	**mg/L**	1	01-May-2019 17:34
Cadmium	U		0.000200	0.00200	mg/L	1	02-May-2019 15:01
Iron	**4.52**		**0.0120**	**0.200**	**mg/L**	1	01-May-2019 17:34
Lead	**0.000817**	J	**0.000600**	**0.00200**	**mg/L**	1	01-May-2019 17:34
Selenium	**0.521**		**0.00110**	**0.00200**	**mg/L**	1	01-May-2019 17:34

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190426-NSF-PV66out-30DFD-D
Collection Date: 26-Apr-2019 14:00

ANALYTICAL REPORT
WorkOrder:HS19041735
Lab ID:HS19041735-13
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 02-May-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	02-May-2019 17:26
Arsenic	U		0.000400	0.00200	mg/L	1	02-May-2019 17:26
Cadmium	U		0.000200	0.00200	mg/L	1	02-May-2019 17:26
Iron	U		0.0120	0.200	mg/L	1	02-May-2019 17:26
Lead	U		0.000600	0.00200	mg/L	1	02-May-2019 17:26
Selenium	**0.00559**		**0.00110**	**0.00200**	**mg/L**	1	03-May-2019 13:02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190426-NSF-PV66out-30FD-T
Collection Date: 26-Apr-2019 14:00

ANALYTICAL REPORT
WorkOrder:HS19041735
Lab ID:HS19041735-14
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 01-May-2019		Analyst: JC
Antimony	U		0.000400	0.00200	mg/L	1	01-May-2019 17:36
Arsenic	U		0.000400	0.00200	mg/L	1	01-May-2019 17:36
Cadmium	U		0.000200	0.00200	mg/L	1	02-May-2019 15:03
Iron	**4.69**		**0.0120**	**0.200**	**mg/L**	1	01-May-2019 17:36
Lead	U		0.000600	0.00200	mg/L	1	01-May-2019 17:36
Selenium	**0.00477**		**0.00110**	**0.00200**	**mg/L**	1	02-May-2019 15:03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19041735

Batch ID: 140402 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19041735-02	1	10	10 (mL)	1
HS19041735-04	1	10	10 (mL)	1
HS19041735-06	1	10	10 (mL)	1
HS19041735-08	1	10	10 (mL)	1
HS19041735-10	1	10	10 (mL)	1
HS19041735-12	1	10	10 (mL)	1
HS19041735-14	1	10	10 (mL)	1

Batch ID: 140436 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19041735-01	1	10	10 (mL)	1
HS19041735-03	1	10	10 (mL)	1
HS19041735-05	1	10	10 (mL)	1
HS19041735-07	1	10	10 (mL)	1
HS19041735-09	1	10	10 (mL)	1
HS19041735-11	1	10	10 (mL)	1
HS19041735-13	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19041735

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 140402	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19041735-02	20190426-NSF-PV73inlet-30MW3-T	26 Apr 2019 21:00		01 May 2019 11:00	02 May 2019 15:09	20
HS19041735-02	20190426-NSF-PV73inlet-30MW3-T	26 Apr 2019 21:00		01 May 2019 11:00	02 May 2019 14:35	2
HS19041735-02	20190426-NSF-PV73inlet-30MW3-T	26 Apr 2019 21:00		01 May 2019 11:00	01 May 2019 17:23	1
HS19041735-04	20190426-NSF-PV73mid-30MW3-T	26 Apr 2019 20:00		01 May 2019 11:00	02 May 2019 14:36	1
HS19041735-04	20190426-NSF-PV73mid-30MW3-T	26 Apr 2019 20:00		01 May 2019 11:00	01 May 2019 17:25	1
HS19041735-06	20190426-NSF-PV73out-30MW3-T	26 Apr 2019 14:00		01 May 2019 11:00	02 May 2019 14:39	1
HS19041735-06	20190426-NSF-PV73out-30MW3-T	26 Apr 2019 14:00		01 May 2019 11:00	01 May 2019 17:27	1
HS19041735-08	20190426-NSF-PV66inlet-30FD-T	26 Apr 2019 21:00		01 May 2019 11:00	02 May 2019 15:11	20
HS19041735-08	20190426-NSF-PV66inlet-30FD-T	26 Apr 2019 21:00		01 May 2019 11:00	02 May 2019 15:05	2
HS19041735-08	20190426-NSF-PV66inlet-30FD-T	26 Apr 2019 21:00		01 May 2019 11:00	01 May 2019 17:29	1
HS19041735-10	20190426-NSF-PV66inlet-30FD-T-DUP	26 Apr 2019 21:00		01 May 2019 11:00	02 May 2019 15:12	20
HS19041735-10	20190426-NSF-PV66inlet-30FD-T-DUP	26 Apr 2019 21:00		01 May 2019 11:00	02 May 2019 15:06	2
HS19041735-10	20190426-NSF-PV66inlet-30FD-T-DUP	26 Apr 2019 21:00		01 May 2019 11:00	01 May 2019 17:32	1
HS19041735-12	20190426-NSF-PV66mid-30FD-T	26 Apr 2019 20:00		01 May 2019 11:00	02 May 2019 15:01	1
HS19041735-12	20190426-NSF-PV66mid-30FD-T	26 Apr 2019 20:00		01 May 2019 11:00	01 May 2019 17:34	1
HS19041735-14	20190426-NSF-PV66out-30FD-T	26 Apr 2019 14:00		01 May 2019 11:00	02 May 2019 15:03	1
HS19041735-14	20190426-NSF-PV66out-30FD-T	26 Apr 2019 14:00		01 May 2019 11:00	01 May 2019 17:36	1
Batch ID 140436	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS19041735-01	20190426-NSF-PV73inlet-30MW3-D	26 Apr 2019 21:00		02 May 2019 09:30	03 May 2019 13:07	20
HS19041735-01	20190426-NSF-PV73inlet-30MW3-D	26 Apr 2019 21:00		02 May 2019 09:30	02 May 2019 17:16	1
HS19041735-03	20190426-NSF-PV73mid-30MW3-D	26 Apr 2019 20:00		02 May 2019 09:30	02 May 2019 17:18	1
HS19041735-05	20190426-NSF-PV73out-30MW3-D	26 Apr 2019 14:00		02 May 2019 09:30	02 May 2019 17:20	1
HS19041735-07	20190426-NSF-PV66inlet-30FD-D	26 Apr 2019 21:00		02 May 2019 09:30	03 May 2019 13:04	20
HS19041735-07	20190426-NSF-PV66inlet-30FD-D	26 Apr 2019 21:00		02 May 2019 09:30	02 May 2019 17:21	1
HS19041735-09	20190426-NSF-PV66inlet-30FD-D-DUP	26 Apr 2019 21:00		02 May 2019 09:30	03 May 2019 13:05	20
HS19041735-09	20190426-NSF-PV66inlet-30FD-D-DUP	26 Apr 2019 21:00		02 May 2019 09:30	02 May 2019 17:23	1
HS19041735-11	20190426-NSF-PV66mid-30FD-D	26 Apr 2019 20:00		02 May 2019 09:30	02 May 2019 17:24	1
HS19041735-13	20190426-NSF-PV66out-30DFD-D	26 Apr 2019 14:00		02 May 2019 09:30	03 May 2019 13:02	1
HS19041735-13	20190426-NSF-PV66out-30DFD-D	26 Apr 2019 14:00		02 May 2019 09:30	02 May 2019 17:26	1

WorkOrder: HS19041735
InstrumentID: ICPMS06
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000461	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000438	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000484	0.000200	0.00200
A	Iron	7439-89-6	0.0500	0.0528	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000931	0.000600	0.00200
A	Selenium	7782-49-2	0.00250	0.00239	0.00110	0.00200

WorkOrder: HS19041735
InstrumentID: ICPMS04
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000774	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000493	0.000400	0.00200
A	Iron	7439-89-6	0.0500	0.0716	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000944	0.000600	0.00200
A	Selenium	7782-49-2	0.00250	0.00223	0.00110	0.00200

WorkOrder: HS19041735
InstrumentID: ICPMS06
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Cadmium	7440-43-9	0.000500	0.000484	0.000200	0.00200
A	Selenium	7782-49-2	0.00250	0.00239	0.00110	0.00200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19041735

QC BATCH REPORT

Batch ID: 140402 (0) **Instrument: ICPMS04** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLK-140402** Units: **mg/L** Analysis Date: **01-May-2019 16:18**
Client ID: Run ID: **ICPMS04_337643** SeqNo: **5058722** PrepDate: **01-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Iron	U	0.200								
Lead	U	0.00200								
Selenium	U	0.00200								

LCS Sample ID: **LCS-140402** Units: **mg/L** Analysis Date: **01-May-2019 16:20**
Client ID: Run ID: **ICPMS04_337643** SeqNo: **5058723** PrepDate: **01-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.0542	0.00200	0.05	0	108	80 - 120				
Arsenic	0.05213	0.00200	0.05	0	104	80 - 120				
Cadmium	0.0556	0.00200	0.05	0	111	80 - 120				
Iron	5.217	0.200	5	0	104	80 - 120				
Lead	0.04497	0.00200	0.05	0	89.9	80 - 120				
Selenium	0.05361	0.00200	0.05	0	107	80 - 120				

MS Sample ID: **HS19041541-02MS** Units: **mg/L** Analysis Date: **01-May-2019 16:27**
Client ID: Run ID: **ICPMS04_337643** SeqNo: **5058726** PrepDate: **01-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05356	0.00200	0.05	0.000317	106	80 - 120				
Arsenic	0.05424	0.00200	0.05	0.001266	106	80 - 120				
Cadmium	0.05387	0.00200	0.05	0.000226	107	80 - 120				
Iron	8.861	0.200	5	3.71	103	80 - 120				
Lead	0.04677	0.00200	0.05	0.000684	92.2	80 - 120				
Selenium	0.0572	0.00200	0.05	0.002549	109	80 - 120				

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19041735

QC BATCH REPORT

Batch ID: 140402 (0) **Instrument: ICPMS04** **Method: ICP-MS METALS BY SW6020A**

MSD Sample ID: **HS19041541-02MSD** Units: **mg/L** Analysis Date: **01-May-2019 16:29**
Client ID: Run ID: **ICPMS04_337643** SeqNo: **5058727** PrepDate: **01-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05366	0.00200	0.05	0.000317	107	80 - 120	0.05356	0.194	20	
Arsenic	0.05468	0.00200	0.05	0.001266	107	80 - 120	0.05424	0.808	20	
Cadmium	0.05527	0.00200	0.05	0.000226	110	80 - 120	0.05387	2.56	20	
Iron	8.757	0.200	5	3.71	101	80 - 120	8.861	1.18	20	
Lead	0.04691	0.00200	0.05	0.000684	92.4	80 - 120	0.04677	0.286	20	
Selenium	0.05778	0.00200	0.05	0.002549	110	80 - 120	0.0572	1.01	20	

PDS Sample ID: **HS19041541-02PDS** Units: **mg/L** Analysis Date: **01-May-2019 16:31**
Client ID: Run ID: **ICPMS04_337643** SeqNo: **5058728** PrepDate: **01-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09155	0.00200	0.1	0.000317	91.2	75 - 125				
Arsenic	0.1048	0.00200	0.1	0.001266	104	75 - 125				
Cadmium	0.1052	0.00200	0.1	0.000226	105	75 - 125				
Iron	13.3	0.200	10	3.71	95.9	75 - 125				
Lead	0.1074	0.00200	0.1	0.000684	107	75 - 125				
Selenium	0.1091	0.00200	0.1	0.002549	107	75 - 125				

SD Sample ID: **HS19041541-02SD** Units: **mg/L** Analysis Date: **01-May-2019 16:25**
Client ID: Run ID: **ICPMS04_337643** SeqNo: **5058725** PrepDate: **01-May-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000317	0	10	
Arsenic	U	0.0100					0.001266	0	10	
Cadmium	U	0.0100					0.000226	0	10	
Iron	3.661	1.00					3.71	1.32	10	
Lead	U	0.0100					0.000684	0	10	
Selenium	U	0.0100					0.002549	0	10	

The following samples were analyzed in this batch:

HS19041735-02	HS19041735-04	HS19041735-06	HS19041735-08
HS19041735-10	HS19041735-12	HS19041735-14	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19041735

QC BATCH REPORT

Batch ID: 140436 (0) **Instrument: ICPMS06** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

MBLK Sample ID: **MBLK-140436** Units: **mg/L** Analysis Date: **02-May-2019 16:33**
Client ID: Run ID: **ICPMS06_337735** SeqNo: **5060765** PrepDate: **02-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Iron	U	0.200								
Lead	U	0.00200								
Selenium	U	0.00200								

LCS Sample ID: **LCS-140436** Units: **mg/L** Analysis Date: **02-May-2019 16:34**
Client ID: Run ID: **ICPMS06_337735** SeqNo: **5060766** PrepDate: **02-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05787	0.00200	0.05	0	116	80 - 120				
Arsenic	0.0571	0.00200	0.05	0	114	80 - 120				
Cadmium	0.05704	0.00200	0.05	0	114	80 - 120				
Iron	5.533	0.200	5	0	111	80 - 120				
Lead	0.05152	0.00200	0.05	0	103	80 - 120				
Selenium	0.05703	0.00200	0.05	0	114	80 - 120				

MS Sample ID: **HS19041731-01MS** Units: **mg/L** Analysis Date: **02-May-2019 16:39**
Client ID: Run ID: **ICPMS06_337735** SeqNo: **5060769** PrepDate: **02-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1051	0.00200	0.05	0.05374	103	75 - 125				
Arsenic	0.3697	0.00200	0.05	0.3335	72.4	75 - 125				SO
Cadmium	0.1143	0.00200	0.05	0.06848	91.7	75 - 125				
Iron	5.449	0.200	5	0.002442	109	75 - 125				
Lead	0.9865	0.00200	0.05	0.9955	-18.0	75 - 125				SO
Selenium	2.627	0.00200	0.05	2.773	-293	75 - 125				SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19041735

QC BATCH REPORT

Batch ID: 140436 (0) **Instrument: ICPMS06** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

MSD Sample ID: **HS19041731-01MSD** Units: **mg/L** Analysis Date: **02-May-2019 16:40**
Client ID: Run ID: **ICPMS06_337735** SeqNo: **5060770** PrepDate: **02-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1006	0.00200	0.05	0.05374	93.8	75 - 125	0.1051	4.38	20	
Arsenic	0.3605	0.00200	0.05	0.3335	53.9	75 - 125	0.3697	2.53	20	SO
Cadmium	0.113	0.00200	0.05	0.06848	89.1	75 - 125	0.1143	1.13	20	
Iron	5.317	0.200	5	0.002442	106	75 - 125	5.449	2.45	20	
Lead	1.006	0.00200	0.05	0.9955	21.6	75 - 125	0.9865	1.99	20	SO
Selenium	2.582	0.00200	0.05	2.773	-382	75 - 125	2.627	1.71	20	SEO

PDS Sample ID: **HS19041731-01PDS** Units: **mg/L** Analysis Date: **02-May-2019 16:42**
Client ID: Run ID: **ICPMS06_337735** SeqNo: **5060771** PrepDate: **02-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1396	0.00200	0.1	0.05374	85.9	75 - 125				
Cadmium	0.158	0.00200	0.1	0.06848	89.5	75 - 125				
Iron	9.908	0.200	10	0.002442	99.1	75 - 125				

PDS Sample ID: **HS19041731-01PDS** Units: **mg/L** Analysis Date: **03-May-2019 13:39**
Client ID: Run ID: **ICPMS06_337804** SeqNo: **5061775** PrepDate: **02-May-2019** DF: **20**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	2.297	0.0400	2	0.2848	101	75 - 125				
Lead	2.758	0.0400	2	0.8521	95.3	75 - 125				
Selenium	3.975	0.0400	2	2.283	84.6	75 - 125				

SD Sample ID: **HS19041731-01SD** Units: **mg/L** Analysis Date: **03-May-2019 16:32**
Client ID: Run ID: **ICPMS06_337804** SeqNo: **5062246** PrepDate: **02-May-2019** DF: **100**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Arsenic	0.2989	0.200					0.2848	4.96	10	
Lead	0.899	0.200					0.8521	5.5	10	
Selenium	2.466	0.200					2.283	8.03	10	

The following samples were analyzed in this batch:

HS19041735-01	HS19041735-03	HS19041735-05	HS19041735-07
HS19041735-09	HS19041735-11	HS19041735-13	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19041735**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020
Texas	TX104704231-19-23	30-Apr-2020

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19041735

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19041735-01	20190426-NSF-PV73inlet-30MW3-D	Login	4/30/2019 4:46:33 PM	JRM	MET103
HS19041735-02	20190426-NSF-PV73inlet-30MW3-T	Login	4/30/2019 4:46:33 PM	JRM	MET103
HS19041735-03	20190426-NSF-PV73mid-30MW3-D	Login	4/30/2019 4:46:33 PM	JRM	MET103
HS19041735-04	20190426-NSF-PV73mid-30MW3-T	Login	4/30/2019 4:46:33 PM	JRM	MET103
HS19041735-05	20190426-NSF-PV73out-30MW3-D	Login	4/30/2019 4:46:33 PM	JRM	MET103
HS19041735-06	20190426-NSF-PV73out-30MW3-T	Login	4/30/2019 4:46:33 PM	JRM	MET103
HS19041735-07	20190426-NSF-PV66inlet-30FD-D	Login	4/30/2019 4:46:33 PM	JRM	MET103
HS19041735-08	20190426-NSF-PV66inlet-30FD-T	Login	4/30/2019 4:46:33 PM	JRM	MET103
HS19041735-09	20190426-NSF-PV66inlet-30FD-D-DUP	Login	4/30/2019 4:46:33 PM	JRM	MET103
HS19041735-10	20190426-NSF-PV66inlet-30FD-T-DUP	Login	4/30/2019 4:46:33 PM	JRM	MET103
HS19041735-11	20190426-NSF-PV66mid-30FD-D	Login	4/30/2019 4:46:33 PM	JRM	MET103
HS19041735-12	20190426-NSF-PV66mid-30FD-T	Login	4/30/2019 4:46:33 PM	JRM	MET103
HS19041735-13	20190426-NSF-PV66out-30DFD-D	Login	4/30/2019 4:46:33 PM	JRM	MET103
HS19041735-14	20190426-NSF-PV66out-30FD-T	Login	4/30/2019 4:46:33 PM	JRM	MET103

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19041735
Date/Time Received: **30-Apr-2019 09:42**
Received by: **PMG**

Checklist completed by: *Jared R. Makan* eSignature 30-Apr-2019 Date
Reviewed by: *Dane J. Wacasey* eSignature 2-May-2019 Date

Matrices: **Water**
Carrier name: **FedEx International Priority**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	2 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	21.8c/21.8c UC/C	IR25	
Cooler(s)/Kit(s):	44075		
Date/Time sample(s) sent to storage:	04/30/2019 16:50		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

HS19041735

Golder Associates
Exide Column Studies

Chain of Custody Form

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ALS Environmental

ALS Project Manager:

Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086-06	Project Name	Exide Column Studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086-06	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suite 260	Address	13515 Barrett Parkway Drive, Suite 260	E	ICP TW (6020A total metals (6)): Pb, Cd, Sb, Se, As, Fe
				F	ICP DISS (6020A diss metals (6)-FldFltr): Pb, Cd, Sb, Se, As, Fe
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	G	
Phone	314 984-8800	Phone	314 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address		J	

No	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190426-NSF-PV73inlet-30MW3-D	04-26-19	9:00 PM	GW	2	1						X					
2	20190426-NSF-PV73inlet-30MW3-T	04-26-19	9:00 PM	GW	2	1					X						
3	20190426-NSF-PV73mid-30MW3-D	04-26-19	8:00 PM	GW	2	1						X					
4	20190426-NSF-PV73mid-30MW3-T	04-26-19	8:00 PM	GW	2	1					X						
5	20190426-NSF-PV73out-30MW3-D	04-26-19	2:00 PM	GW	2	1						X					
6	20190426-NSF-PV73out-30MW3-T	04-26-19	2:00 PM	GW	2	1					X						
7	20190426-NSF-PV66inlet-30FD-D	04-26-19	9:00 PM	GW	2	1						X					
8	20190426-NSF-PV66inlet-30FD-T	04-26-19	9:00 PM	GW	2	1					X						
9	20190426-NSF-PV66inlet-30FD-D-DUP	04-26-19	9:00 PM	GW	2	1						X					
10	20190426-NSF-PV66inlet-30FD-T-DUP	04-26-19	9:00 PM	GW	2	1					X						

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method: FedEx

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ Other _____ ☐ 2 Wk Days ☐ 24 Hour

Results Due Date: STD 5-DAY TAT

Relinquished by: Giovanna Llamosas	Date: 2019/04/29	15:30:00	Received by:	Notes:	
Relinquished by:	Date:	Time:	Received by (Laboratory): 4/30/19 09:42	Cooler Temp. 21.8 4.2°	QC Package: (Check Box Below)
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):		☐ Level II: Standard QC ☒ TRRP-Checklist ☐ Level III: Std QC + Raw Data ☐ TRRP Level IV ☐ Level IV: SW846 CLP-Like ☐ Other:

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035 <11-8.0

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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Chain of Custody Form

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HS19041735

Golder Associates
Exide Column Studies

Work Order #:

ALS Project Manager:

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086-06	Project Name	Exide Column Studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086-06	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suite 260	Address	13515 Barrett Parkway Drive, Suite 260	E	ICP TW (6020A total metals (6)): Pb, Cd, Sb, Se, As, Fe
				F	ICP DISS (6020A diss metals (6)-FldFltr): Pb, Cd, Sb, Se, As, Fe
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	G	
Phone	314 984-8800	Phone	314 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
11	20190426-NSF-PV66mid-30FD-D	04-26-19	8:00 PM	GW	2	1						X					
12	20190426-NSF-PV66mid-30FD-T	04-26-19	8:00 PM	GW	2	1					X						
13	20190426-NSF-PV66out-30FD-D	04-26-19	2:00 PM	GW	2	1						X					
14	20190426-NSF-PV66out-30FD-T	04-26-19	2:00 PM	GW	2	1					X						
15																	
16																	
17																	
18																	
19																	
20																	

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method: FedEx

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ Other ____ ☐ 2 Wk Days ☐ 24 Hour

Results Due Date: STD 5-DAY TAT

Relinquished by: Giovanna Llamosas	Date: 2019/04/29	15:30:00	Received by:	Notes:	
Relinquished by:	Date:	Time:	Received by (Laboratory): 4/30/19 09:42	Cooler Temp. 21.8° 25°	QC Package: (Check Box Below)
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):		Level II: Standard QC; Level III: Std QC + Raw Data; Level IV: SW846 CLP-Like; Other:

x TRRP-Checklist ☐ TRRP Level IV

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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4407S

ORIGIN ID:YUXA (514) 383-0990
Audrey Etheves
Golder Associates Ltd
7250 rue du Mile End
3e etage
MONTREAL, PQ H2R3A4
CANADA, CA

SHIP DATE: 29APR19
ACTWGT: 6.14 KG
CAD: 108680724/INET4102

BILL RECIPIENT
EIN/VAT:

TO Dane Wacasey
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

(281) 530-5656

FedEx Express

(US)

AWB

J19101900720uv

NH SGRA

PKG:CUSTOMER

TRK# 7750 8291 0345

Form 0430

10:30A
INTL PRIORITY

REF:
DESC1:Échantillon d'eau
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: Audrey Etheves
T/C: R 967554812
D/T: R 967554812

Ces marchandises, cette technologie ou ce logiciel ont été exportés du Canada conformément à la réglementation sur l'administration des exportations. Toute modification contraire à la loi canadienne est interdite. La Convention de Varsovie peut s'appliquer et elle régit, et dans la grande majorité des cas, elle limite la responsabilité de Federal Express pour toute perte, retard ou dommage causé à votre envoi. Sous réserve des conditions et modalités du contrat.

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2. Placez l'étiquette dans la pochette d'expédition et fixez-la à votre paquet.

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

CUSTODY SEAL
Date: 29/04/19 Time: 15:30
Name: Sébastien Lamarre
Company: Golder Associates

Seal Broken By: SM
Date: 04/30/19

44075

APR 30 2019

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

CUSTODY SEAL
Date: 29/04/19 Time: 15:30
Name: Sébastien Lamarre
Company: Golder Associates

Seal Broken By: SM
Date: 04/30/19

FedEx
TRK# 7750 8291 0345
0430

0A
INTL PRIORITY CLR
CLR
77099
TX-US
IAH

NH SGRA

ORIGIN ID:YUXA (514) 383-0990
AUDREY ETHEVES
GOLDER ASSOCIATES LTD
7250 RUE DU MILE END
3E ETAGE
MONTREAL, PQ H2R3A4
CANADA CA

SHIP DATE: 29APR19
ACTWGT: 6.14 KG
CAD: 108680724/INET4102

BILL RECIPIENT

TO **DANE WACASEY**
ALS HOUSTON LABORATORY
10450 STANCLIFF RD
STE 210
HOUSTON TX 77099 (US)
(281) 530-5656 REF:
INV.
PO: DEPT

565J1/D66C/23AD

FedEx Express

E

J191019010702uv

TRK# 0430 7750 8291 0345

10:30A
INTL PRIORITY

NH SGRA

77099
TX-US IAH

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10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

May 10, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19050331**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 12 sample(s) on May 07, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DANE.WACASEY
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19050331**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19050331**	

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 05/10/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19050331				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 140641,140642				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?			X		
		Were analytical duplicates analyzed at the appropriate frequency?			X		
		Were RPDs or relative standard deviations within the laboratory QC limits?			X		
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 05/10/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19050331				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 140641,140642				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			2
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports	
Laboratory Name: ALS Laboratory Group	LRC Date: 05/10/2019
Project Name: Exide Column Studies	Laboratory Job Number: HS19050331
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 140641,140642

ER#[5]	Description
1	Batch 140641, Metals Method SW6020, sample 20190503-NSF-PV75inlet-30MW11-T, MS and or MSD recovered outside the control limit for Lead and Selenium, however, the result in the parent sample is greater than 4x the spike amount. Batch 140642, Dissolved Metals Method SW6020, sample 20190503-NSF-PV75inlet-30MW11-D MS and or MSD recovered outside the control limit for Arsenic and Lead, however, the result in the parent sample is greater than 4x the spike amount.
2	See Run Log and CCB Exceptions Report.

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050331
Start Date: 08-May-2019 End Date: 09-May-2019

Run ID:ICPMS05_338069
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
LLICV2	1	08-May-2019 14:48	019SMPL.d	AS CD FE PB SB SE
LLICV5	1	08-May-2019 14:51	020LICV.d	AS CD FE PB SB SE
ICB	1	08-May-2019 14:53	021_ICB.d	AS CD FE PB SB SE
ICV	1	08-May-2019 14:55	022_ICV.d	AS CD FE PB SB SE
ICSA	1	08-May-2019 15:02	023ICSA.d	AS CD FE PB SB SE
ICSAB	1	08-May-2019 15:05	024ICSB.d	AS CD FE PB SB SE
CCV 1	1	08-May-2019 15:55	035_CCV.d	AS CD FE PB SB SE
CCB 1	1	08-May-2019 15:57	036_CCB.d	AS CD FE PB SB SE
CCV 2	1	08-May-2019 16:31	047_CCV.d	AS CD FE PB SB SE
CCB 2	1	08-May-2019 16:34	048_CCB.d	AS CD FE PB SB SE
CCV 3	1	08-May-2019 17:05	059_CCV.d	AS CD FE PB SB SE
CCB 3	1	08-May-2019 17:08	060_CCB.d	AS CD FE PB SB SE
ICCV 4	1	08-May-2019 17:41	074_ICV.d	AS CD FE PB SB SE
LLCCV2	1	08-May-2019 17:44	075SMPL.d	AS CD FE PB SB SE
LLCCV5	1	08-May-2019 17:46	076LICV.d	AS CD FE PB SB SE
ICCB 4	1	08-May-2019 17:55	079_ICB.d	AS CD FE PB SB SE
CCV 5	1	08-May-2019 18:25	090_CCV.d	AS CD FE PB SB SE
CCB 5	1	08-May-2019 18:27	091_CCB.d	AS CD FE PB SB SE
CCV 6	1	08-May-2019 18:56	102_CCV.d	AS CD FE PB SB SE
CCB 6	1	08-May-2019 18:58	103_CCB.d	AS CD FE PB SB SE
CCV 7	1	08-May-2019 19:23	114_CCV.d	AS CD FE PB SB SE
CCB 7	1	08-May-2019 19:26	115_CCB.d	AS CD FE PB SB SE
CCV 8	1	08-May-2019 19:51	126_CCV.d	AS CD FE PB SB SE
CCB 8	1	08-May-2019 19:54	127_CCB.d	AS CD FE PB SB SE
CCV 9	1	08-May-2019 22:43	131_CCV.d	AS CD FE PB SB SE
CCB 9	1	08-May-2019 22:51	134_CCB.d	AS CD FE PB SB SE
MBLK-140641	1	08-May-2019 22:56	136SMPL.d	AS CD FE PB SB SE
LCS-140641	1	08-May-2019 22:59	137SMPL.d	AS CD FE PB SB SE
20190503-NSF-PV75inlet-30MW11-T	1	08-May-2019 23:01	138SMPL.d	AS CD FE PB SB
20190503-NSF-PV75inlet-30MW11-TSD	5	08-May-2019 23:03	139SMPL.d	AS CD FE PB SB
20190503-NSF-PV75inlet-30MW11-TMS	1	08-May-2019 23:06	140SMPL.d	AS CD FE PB SB SE
20190503-NSF-PV75inlet-30MW11-TMSD	1	08-May-2019 23:10	142SMPL.d	AS CD FE PB SB SE
20190503-NSF-PV75inlet-30MW11-TPDS	1	08-May-2019 23:13	143SMPL.d	AS CD FE PB SB
CCV 10	1	08-May-2019 23:17	145_CCV.d	AS CD FE PB SB SE
CCB 10	1	08-May-2019 23:20	146_CCB.d	AS CD FE PB SB SE
20190503-NSF-PV75mid-30MW11-T	1	08-May-2019 23:22	147SMPL.d	CD FE PB SB SE
20190503-NSF-PV75out-30MW11-T	1	08-May-2019 23:24	148SMPL.d	CD FE PB SB SE
20190503-NSF-PV76inlet-controlFD-T	1	08-May-2019 23:29	150SMPL.d	CD FE PB SB
20190503-NSF-PV76mid-controlFD-T	1	08-May-2019 23:31	151SMPL.d	CD FE PB SB
20190503-NSF-PV76out-controlFD-T	1	08-May-2019 23:34	152SMPL.d	CD FE PB SB
CCB 11	1	08-May-2019 23:48	158_CCB.d	AS CD FE PB SB SE
CCV 11	1	08-May-2019 23:53	160_CCV.d	AS CD FE PB SB SE
ICCV 12	1	09-May-2019 00:23	171_ICV.d	AS CD FE PB SB SE
LLCCV2	1	09-May-2019 00:25	172SMPL.d	AS CD FE PB SB SE
LLCCV5	1	09-May-2019 00:28	173LICV.d	AS CD FE PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050331

Run ID:ICPMS05_338069
Instrument:ICPMS05
Method:SW6020

CCB 3	Date: 08-May-2019 17:08	Seq: 5067540	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.418	0.4	2	

CCB 6	Date: 08-May-2019 18:58	Seq: 5067839	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	15.42	12	200	

CCB 8	Date: 08-May-2019 19:54	Seq: 5067863	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	14.09	12	200	

CCB 10	Date: 08-May-2019 23:20	Seq: 5067910	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.7	0.4	2	

CCB 11	Date: 08-May-2019 23:48	Seq: 5067922	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.41	0.4	2	

CCB 13	Date: 09-May-2019 00:51	Seq: 5067965	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Antimony	0.425	0.4	2	
Iron	16.33	12	200	

CCB 14	Date: 09-May-2019 01:18	Seq: 5067933	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	38.76	12	200	

CCB 15	Date: 09-May-2019 01:46	Seq: 5067945	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Iron	18.15	12	200	

CCB 16	Date: 09-May-2019 02:07	Seq: 5067971	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Arsenic	0.452	0.4	2	
Iron	13.73	12	200	

CCB 17	Date: 09-May-2019 02:26	Seq: 5067979	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Arsenic	0.432	0.4	2	
Iron	14.22	12	200	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050331
Start Date: 08-May-2019 End Date: 09-May-2019

Run ID:ICPMS06_338017
Instrument:ICPMS06
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
20190503-NSF-PV75inlet-30MW11-DMS	1	08-May-2019 23:10	244SMPL.d	AS CD FE PB SB SE
20190503-NSF-PV75inlet-30MW11-DMSD	1	08-May-2019 23:12	245SMPL.d	AS CD FE PB SB SE
20190503-NSF-PV75inlet-30MW11-DPDS	1	08-May-2019 23:13	246SMPL.d	AS CD FE PB SB
CCV 19	1	08-May-2019 23:15	247_CCV.d	AS CD FE PB SB SE
CCB 19	1	08-May-2019 23:16	248_CCB.d	AS CD FE PB SB SE
20190503-NSF-PV75mid-30MW11-D	1	08-May-2019 23:18	249SMPL.d	AS CD FE PB SB SE
20190503-NSF-PV75out-30MW11-D	1	08-May-2019 23:19	250SMPL.d	AS CD FE PB SB SE
20190503-NSF-PV76inlet-controlFD-D	1	08-May-2019 23:22	252SMPL.d	AS CD FE PB SB
20190503-NSF-PV76mid-controlFD-D	1	08-May-2019 23:24	253SMPL.d	AS CD FE PB SB
20190503-NSF-PV76out-controlFD-D	1	08-May-2019 23:25	254SMPL.d	AS CD FE PB SB
CCV 20	1	08-May-2019 23:30	257_CCV.d	AS CD FE PB SB SE
CCB 20	1	08-May-2019 23:31	258_CCB.d	AS CD FE PB SB SE
CCV 21	1	08-May-2019 23:43	266_CCV.d	AS CD FE PB SB SE
CCB 21	1	08-May-2019 23:44	267_CCB.d	AS CD FE PB SB SE
ICCV 22	1	09-May-2019 00:09	284_ICV.d	AS CD FE PB SB SE
LLICCV2	1	09-May-2019 00:10	285LCV2.d	AS CD FE PB SB SE
LLICCV5	1	09-May-2019 00:12	286LCV5.d	AS CD FE PB SB SE
ICCB 22	1	09-May-2019 00:13	287_ICB.d	AS CD FE PB SB SE
CCV 23	1	09-May-2019 00:25	295_CCV.d	AS CD FE PB SB SE
CCB 23	1	09-May-2019 00:27	296_CCB.d	AS CD FE PB SB SE
CCV 24	1	09-May-2019 00:43	307_CCV.d	AS CD FE PB SB SE
CCB 24	1	09-May-2019 00:44	308_CCB.d	AS CD FE PB SB SE
ICSA	1	09-May-2019 00:46	309ICSA.d	AS CD FE PB SB SE
ICSAB	1	09-May-2019 00:48	310ICSB.d	AS CD FE PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050331

Run ID:ICPMS06_338017
Instrument:ICPMS06
Method:SW6020

CCB 2	Date: 08-May-2019 11:17	Seq: 5066275	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Arsenic	-0.406	0.4	2	

CCB 3	Date: 08-May-2019 11:42	Seq: 5066342	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Arsenic	-0.419	0.4	2	

CCB 20	Date: 08-May-2019 23:31	Seq: 5068051	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Selenium	1.277	1.1	2	

CCB 21	Date: 08-May-2019 23:44	Seq: 5068060	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Selenium	1.218	1.1	2	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19050331

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19050331-01	20190503-NSF-PV75inlet-30MW11-D	Groundwater		03-May-2019 20:55	07-May-2019 08:54	☐
HS19050331-02	20190503-NSF-PV75inlet-30MW11-T	Groundwater		03-May-2019 20:55	07-May-2019 08:54	☐
HS19050331-03	20190503-NSF-PV75mid-30MW11-D	Groundwater		03-May-2019 20:37	07-May-2019 08:54	☐
HS19050331-04	20190503-NSF-PV75mid-30MW11-T	Groundwater		03-May-2019 20:37	07-May-2019 08:54	☐
HS19050331-05	20190503-NSF-PV75out-30MW11-D	Groundwater		03-May-2019 14:30	07-May-2019 08:54	☐
HS19050331-06	20190503-NSF-PV75out-30MW11-T	Groundwater		03-May-2019 14:30	07-May-2019 08:54	☐
HS19050331-07	20190503-NSF-PV76inlet-controlFD-D	Groundwater		03-May-2019 20:55	07-May-2019 08:54	☐
HS19050331-08	20190503-NSF-PV76inlet-controlFD-T	Groundwater		03-May-2019 20:55	07-May-2019 08:54	☐
HS19050331-09	20190503-NSF-PV76mid-controlFD-D	Groundwater		03-May-2019 20:37	07-May-2019 08:54	☐
HS19050331-10	20190503-NSF-PV76mid-controlFD-T	Groundwater		03-May-2019 20:37	07-May-2019 08:54	☐
HS19050331-11	20190503-NSF-PV76out-controlFD-D	Groundwater		03-May-2019 14:30	07-May-2019 08:54	☐
HS19050331-12	20190503-NSF-PV76out-controlFD-T	Groundwater		03-May-2019 14:30	07-May-2019 08:54	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190503-NSF-PV75inlet-30MW11-D
Collection Date: 03-May-2019 20:55

ANALYTICAL REPORT
WorkOrder:HS19050331
Lab ID:HS19050331-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 08-May-2019		Analyst: JHD
Antimony	**0.117**		**0.000400**	**0.00200**	**mg/L**	1	08-May-2019 23:05
Arsenic	**0.207**		**0.000400**	**0.00200**	**mg/L**	1	08-May-2019 23:05
Cadmium	**0.0509**		**0.000200**	**0.00200**	**mg/L**	1	08-May-2019 23:05
Iron	U		0.0120	0.200	mg/L	1	08-May-2019 23:05
Lead	**0.0245**		**0.000600**	**0.00200**	**mg/L**	1	08-May-2019 23:05
Selenium	**2.17**		**0.0220**	**0.0400**	**mg/L**	20	09-May-2019 16:21

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190503-NSF-PV75inlet-30MW11-T
Collection Date: 03-May-2019 20:55

ANALYTICAL REPORT
WorkOrder:HS19050331
Lab ID:HS19050331-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 08-May-2019		Analyst: JC
Antimony	**0.121**		**0.000400**	**0.00200**	**mg/L**	1	08-May-2019 23:01
Arsenic	**0.227**		**0.000400**	**0.00200**	**mg/L**	1	08-May-2019 23:01
Cadmium	**0.0574**		**0.000200**	**0.00200**	**mg/L**	1	08-May-2019 23:01
Iron	**0.889**		**0.0120**	**0.200**	**mg/L**	1	08-May-2019 23:01
Lead	**0.553**		**0.000600**	**0.00200**	**mg/L**	1	08-May-2019 23:01
Selenium	**2.20**		**0.0110**	**0.0200**	**mg/L**	10	09-May-2019 13:38

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190503-NSF-PV75mid-30MW11-D
Collection Date: 03-May-2019 20:37

ANALYTICAL REPORT
WorkOrder:HS19050331
Lab ID:HS19050331-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 08-May-2019		Analyst: JHD
Antimony	**0.00232**		**0.000400**	**0.00200**	**mg/L**	1	08-May-2019 23:18
Arsenic	**0.000889**	J	**0.000400**	**0.00200**	**mg/L**	1	08-May-2019 23:18
Cadmium	U		0.000200	0.00200	mg/L	1	08-May-2019 23:18
Iron	**0.180**	J	**0.0120**	**0.200**	**mg/L**	1	08-May-2019 23:18
Lead	U		0.000600	0.00200	mg/L	1	08-May-2019 23:18
Selenium	**0.00375**		**0.00110**	**0.00200**	**mg/L**	1	08-May-2019 23:18

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190503-NSF-PV75mid-30MW11-T
Collection Date: 03-May-2019 20:37

ANALYTICAL REPORT
WorkOrder:HS19050331
Lab ID:HS19050331-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 08-May-2019		Analyst: JC
Antimony	**0.00257**		**0.000400**	**0.00200**	**mg/L**	1	08-May-2019 23:22
Arsenic	U		0.000400	0.00200	mg/L	1	09-May-2019 13:26
Cadmium	U		0.000200	0.00200	mg/L	1	08-May-2019 23:22
Iron	**2.36**		**0.0120**	**0.200**	**mg/L**	1	08-May-2019 23:22
Lead	U		0.000600	0.00200	mg/L	1	08-May-2019 23:22
Selenium	**0.00371**		**0.00110**	**0.00200**	**mg/L**	1	08-May-2019 23:22

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190503-NSF-PV75out-30MW11-D
Collection Date: 03-May-2019 14:30

ANALYTICAL REPORT
WorkOrder:HS19050331
Lab ID:HS19050331-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 08-May-2019		Analyst: JHD
Antimony	**0.000430**	J	**0.000400**	**0.00200**	**mg/L**	1	08-May-2019 23:19
Arsenic	**0.000472**	J	**0.000400**	**0.00200**	**mg/L**	1	08-May-2019 23:19
Cadmium	U		0.000200	0.00200	mg/L	1	08-May-2019 23:19
Iron	**0.0234**	J	**0.0120**	**0.200**	**mg/L**	1	08-May-2019 23:19
Lead	U		0.000600	0.00200	mg/L	1	08-May-2019 23:19
Selenium	**0.00160**	J	**0.00110**	**0.00200**	**mg/L**	1	08-May-2019 23:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190503-NSF-PV75out-30MW11-T
Collection Date: 03-May-2019 14:30

ANALYTICAL REPORT
WorkOrder:HS19050331
Lab ID:HS19050331-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 08-May-2019		Analyst: JC
Antimony	**0.000567**	J	**0.000400**	**0.00200**	**mg/L**	1	08-May-2019 23:24
Arsenic	U		0.000400	0.00200	mg/L	1	09-May-2019 13:28
Cadmium	U		0.000200	0.00200	mg/L	1	08-May-2019 23:24
Iron	**2.57**		**0.0120**	**0.200**	**mg/L**	1	08-May-2019 23:24
Lead	U		0.000600	0.00200	mg/L	1	08-May-2019 23:24
Selenium	**0.00151**	J	**0.00110**	**0.00200**	**mg/L**	1	08-May-2019 23:24

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190503-NSF-PV76inlet-controlFD-D
Collection Date: 03-May-2019 20:55

ANALYTICAL REPORT
WorkOrder:HS19050331
Lab ID:HS19050331-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 08-May-2019		Analyst: JHD
Antimony	**0.0945**		**0.000400**	**0.00200**	**mg/L**	1	08-May-2019 23:22
Arsenic	**0.259**		**0.000400**	**0.00200**	**mg/L**	1	08-May-2019 23:22
Cadmium	**0.0510**		**0.000200**	**0.00200**	**mg/L**	1	08-May-2019 23:22
Iron	U		0.0120	0.200	mg/L	1	08-May-2019 23:22
Lead	**0.212**		**0.000600**	**0.00200**	**mg/L**	1	08-May-2019 23:22
Selenium	**2.20**		**0.0220**	**0.0400**	**mg/L**	20	09-May-2019 16:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190503-NSF-PV76inlet-controlFD-T
Collection Date: 03-May-2019 20:55

ANALYTICAL REPORT
WorkOrder:HS19050331
Lab ID:HS19050331-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 08-May-2019		Analyst: JC
Antimony	**0.0945**		**0.000400**	**0.00200**	**mg/L**	1	08-May-2019 23:29
Arsenic	**0.271**		**0.000400**	**0.00200**	**mg/L**	1	09-May-2019 13:30
Cadmium	**0.0609**		**0.000200**	**0.00200**	**mg/L**	1	08-May-2019 23:29
Iron	**0.229**		**0.0120**	**0.200**	**mg/L**	1	08-May-2019 23:29
Lead	**0.536**		**0.000600**	**0.00200**	**mg/L**	1	08-May-2019 23:29
Selenium	**2.24**		**0.0220**	**0.0400**	**mg/L**	20	09-May-2019 14:41

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190503-NSF-PV76mid-controlFD-D
Collection Date: 03-May-2019 20:37

ANALYTICAL REPORT
WorkOrder:HS19050331
Lab ID:HS19050331-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 08-May-2019		Analyst: JHD
Antimony	**0.0845**		**0.000400**	**0.00200**	**mg/L**	1	08-May-2019 23:24
Arsenic	**0.246**		**0.000400**	**0.00200**	**mg/L**	1	08-May-2019 23:24
Cadmium	**0.0464**		**0.000200**	**0.00200**	**mg/L**	1	08-May-2019 23:24
Iron	U		0.0120	0.200	mg/L	1	08-May-2019 23:24
Lead	**0.00360**		**0.000600**	**0.00200**	**mg/L**	1	08-May-2019 23:24
Selenium	**2.25**		**0.0220**	**0.0400**	**mg/L**	20	09-May-2019 16:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190503-NSF-PV76mid-controlFD-T
Collection Date: 03-May-2019 20:37

ANALYTICAL REPORT
WorkOrder:HS19050331
Lab ID:HS19050331-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 08-May-2019		Analyst: JC
Antimony	**0.0802**		**0.000400**	**0.00200**	**mg/L**	1	08-May-2019 23:31
Arsenic	**0.247**		**0.000400**	**0.00200**	**mg/L**	1	09-May-2019 13:33
Cadmium	**0.0530**		**0.000200**	**0.00200**	**mg/L**	1	08-May-2019 23:31
Iron	**0.0343**	J	**0.0120**	**0.200**	**mg/L**	1	08-May-2019 23:31
Lead	**0.0280**		**0.000600**	**0.00200**	**mg/L**	1	08-May-2019 23:31
Selenium	**2.10**		**0.0220**	**0.0400**	**mg/L**	20	09-May-2019 14:44

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190503-NSF-PV76out-controlFD-D
Collection Date: 03-May-2019 14:30

ANALYTICAL REPORT
WorkOrder:HS19050331
Lab ID:HS19050331-11
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 08-May-2019		Analyst: JHD
Antimony	**0.0891**		**0.000400**	**0.00200**	**mg/L**	1	08-May-2019 23:25
Arsenic	**0.265**		**0.000400**	**0.00200**	**mg/L**	1	08-May-2019 23:25
Cadmium	**0.0479**		**0.000200**	**0.00200**	**mg/L**	1	08-May-2019 23:25
Iron	U		0.0120	0.200	mg/L	1	08-May-2019 23:25
Lead	**0.00190**	J	**0.000600**	**0.00200**	**mg/L**	1	08-May-2019 23:25
Selenium	**2.15**		**0.0220**	**0.0400**	**mg/L**	20	09-May-2019 16:33

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190503-NSF-PV76out-controlFD-T
Collection Date: 03-May-2019 14:30

ANALYTICAL REPORT
WorkOrder:HS19050331
Lab ID:HS19050331-12
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 08-May-2019		Analyst: JC
Antimony	**0.0808**		**0.000400**	**0.00200**	**mg/L**	1	08-May-2019 23:34
Arsenic	**0.253**		**0.000400**	**0.00200**	**mg/L**	1	09-May-2019 14:27
Cadmium	**0.0538**		**0.000200**	**0.00200**	**mg/L**	1	08-May-2019 23:34
Iron	**0.0228**	J	**0.0120**	**0.200**	**mg/L**	1	08-May-2019 23:34
Lead	**0.0127**		**0.000600**	**0.00200**	**mg/L**	1	08-May-2019 23:34
Selenium	**2.22**		**0.0220**	**0.0400**	**mg/L**	20	09-May-2019 14:46

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050331

Batch ID: 140641 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19050331-02	1	10	10 (mL)	1
HS19050331-04	1	10	10 (mL)	1
HS19050331-06	1	10	10 (mL)	1
HS19050331-08	1	10	10 (mL)	1
HS19050331-10	1	10	10 (mL)	1
HS19050331-12	1	10	10 (mL)	1

Batch ID: 140642 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19050331-01	1	10	10 (mL)	1
HS19050331-03	1	10	10 (mL)	1
HS19050331-05	1	10	10 (mL)	1
HS19050331-07	1	10	10 (mL)	1
HS19050331-09	1	10	10 (mL)	1
HS19050331-11	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050331

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 140641	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19050331-02	20190503-NSF-PV75inlet-30MW11-T	03 May 2019 20:55		08 May 2019 12:00	09 May 2019 13:38	10
HS19050331-02	20190503-NSF-PV75inlet-30MW11-T	03 May 2019 20:55		08 May 2019 12:00	08 May 2019 23:01	1
HS19050331-04	20190503-NSF-PV75mid-30MW11-T	03 May 2019 20:37		08 May 2019 12:00	09 May 2019 13:26	1
HS19050331-04	20190503-NSF-PV75mid-30MW11-T	03 May 2019 20:37		08 May 2019 12:00	08 May 2019 23:22	1
HS19050331-06	20190503-NSF-PV75out-30MW11-T	03 May 2019 14:30		08 May 2019 12:00	09 May 2019 13:28	1
HS19050331-06	20190503-NSF-PV75out-30MW11-T	03 May 2019 14:30		08 May 2019 12:00	08 May 2019 23:24	1
HS19050331-08	20190503-NSF-PV76inlet-controlFD-T	03 May 2019 20:55		08 May 2019 12:00	09 May 2019 14:41	20
HS19050331-08	20190503-NSF-PV76inlet-controlFD-T	03 May 2019 20:55		08 May 2019 12:00	09 May 2019 13:30	1
HS19050331-08	20190503-NSF-PV76inlet-controlFD-T	03 May 2019 20:55		08 May 2019 12:00	08 May 2019 23:29	1
HS19050331-10	20190503-NSF-PV76mid-controlFD-T	03 May 2019 20:37		08 May 2019 12:00	09 May 2019 14:44	20
HS19050331-10	20190503-NSF-PV76mid-controlFD-T	03 May 2019 20:37		08 May 2019 12:00	09 May 2019 13:33	1
HS19050331-10	20190503-NSF-PV76mid-controlFD-T	03 May 2019 20:37		08 May 2019 12:00	08 May 2019 23:31	1
HS19050331-12	20190503-NSF-PV76out-controlFD-T	03 May 2019 14:30		08 May 2019 12:00	09 May 2019 14:46	20
HS19050331-12	20190503-NSF-PV76out-controlFD-T	03 May 2019 14:30		08 May 2019 12:00	09 May 2019 14:27	1
HS19050331-12	20190503-NSF-PV76out-controlFD-T	03 May 2019 14:30		08 May 2019 12:00	08 May 2019 23:34	1
Batch ID 140642	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS19050331-01	20190503-NSF-PV75inlet-30MW11-D	03 May 2019 20:55		08 May 2019 12:00	09 May 2019 16:21	20
HS19050331-01	20190503-NSF-PV75inlet-30MW11-D	03 May 2019 20:55		08 May 2019 12:00	08 May 2019 23:05	1
HS19050331-03	20190503-NSF-PV75mid-30MW11-D	03 May 2019 20:37		08 May 2019 12:00	08 May 2019 23:18	1
HS19050331-05	20190503-NSF-PV75out-30MW11-D	03 May 2019 14:30		08 May 2019 12:00	08 May 2019 23:19	1
HS19050331-07	20190503-NSF-PV76inlet-controlFD-D	03 May 2019 20:55		08 May 2019 12:00	09 May 2019 16:28	20
HS19050331-07	20190503-NSF-PV76inlet-controlFD-D	03 May 2019 20:55		08 May 2019 12:00	08 May 2019 23:22	1
HS19050331-09	20190503-NSF-PV76mid-controlFD-D	03 May 2019 20:37		08 May 2019 12:00	09 May 2019 16:31	20
HS19050331-09	20190503-NSF-PV76mid-controlFD-D	03 May 2019 20:37		08 May 2019 12:00	08 May 2019 23:24	1
HS19050331-11	20190503-NSF-PV76out-controlFD-D	03 May 2019 14:30		08 May 2019 12:00	09 May 2019 16:33	20
HS19050331-11	20190503-NSF-PV76out-controlFD-D	03 May 2019 14:30		08 May 2019 12:00	08 May 2019 23:25	1

WorkOrder: HS19050331
InstrumentID: ICPMS06
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000461	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000438	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000484	0.000200	0.00200
A	Iron	7439-89-6	0.0500	0.0528	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000931	0.000600	0.00200
A	Selenium	7782-49-2	0.00250	0.00239	0.00110	0.00200

WorkOrder: HS19050331
InstrumentID: ICPMS05
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Selenium	7782-49-2	0.00250	0.00187	0.00110	0.00200

WorkOrder: HS19050331
InstrumentID: ICPMS05
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000493	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000344	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000538	0.000200	0.00200
A	Iron	7439-89-6	0.0500	0.0487	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000878	0.000600	0.00200
A	Selenium	7782-49-2	0.00250	0.00187	0.00110	0.00200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050331

QC BATCH REPORT

Batch ID: 140641 (0) **Instrument: ICPMS05** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLK-140641** Units: **mg/L** Analysis Date: **08-May-2019 22:56**
Client ID: Run ID: **ICPMS05_338069** SeqNo: **5067900** PrepDate: **08-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Iron	U	0.200								
Lead	U	0.00200								
Selenium	U	0.00200								

LCS Sample ID: **LCS-140641** Units: **mg/L** Analysis Date: **08-May-2019 22:59**
Client ID: Run ID: **ICPMS05_338069** SeqNo: **5067901** PrepDate: **08-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04807	0.00200	0.05	0	96.1	80 - 120				
Arsenic	0.05075	0.00200	0.05	0	101	80 - 120				
Cadmium	0.05045	0.00200	0.05	0	101	80 - 120				
Iron	4.82	0.200	5	0	96.4	80 - 120				
Lead	0.04899	0.00200	0.05	0	98.0	80 - 120				
Selenium	0.04955	0.00200	0.05	0	99.1	80 - 120				

MS Sample ID: **HS19050331-02MS** Units: **mg/L** Analysis Date: **08-May-2019 23:06**
Client ID: **20190503-NSF-PV75inlet-30MW11-T** Run ID: **ICPMS05_338069** SeqNo: **5067904** PrepDate: **08-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1716	0.00200	0.05	0.1209	101	80 - 120				
Arsenic	0.2835	0.00200	0.05	0.2265	114	80 - 120				O
Cadmium	0.1086	0.00200	0.05	0.05742	102	80 - 120				
Iron	5.696	0.200	5	0.8887	96.1	80 - 120				
Lead	0.6136	0.00200	0.05	0.5532	121	80 - 120				SO
Selenium	2.406	0.00200	0.05	2.311	190	80 - 120				SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050331

QC BATCH REPORT

Batch ID: 140641 (0) **Instrument: ICPMS05** **Method: ICP-MS METALS BY SW6020A**

MSD Sample ID: **HS19050331-02MSD** Units: **mg/L** Analysis Date: **08-May-2019 23:10**
Client ID: **20190503-NSF-PV75inlet-30MW11-T** Run ID: **ICPMS05_338069** SeqNo: **5067906** PrepDate: **08-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.168	0.00200	0.05	0.1209	94.3	80 - 120	0.1716	2.09	20	
Arsenic	0.2823	0.00200	0.05	0.2265	112	80 - 120	0.2835	0.444	20	O
Cadmium	0.1073	0.00200	0.05	0.05742	99.8	80 - 120	0.1086	1.16	20	
Iron	5.52	0.200	5	0.8887	92.6	80 - 120	5.696	3.13	20	
Lead	0.6196	0.00200	0.05	0.5532	133	80 - 120	0.6136	0.984	20	SO
Selenium	2.363	0.00200	0.05	2.311	105	80 - 120	2.406	1.79	20	EO

PDS Sample ID: **HS19050331-02PDS** Units: **mg/L** Analysis Date: **08-May-2019 23:13**
Client ID: **20190503-NSF-PV75inlet-30MW11-T** Run ID: **ICPMS05_338069** SeqNo: **5067907** PrepDate: **08-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.2149	0.00200	0.1	0.1209	94.0	75 - 125				
Arsenic	0.3483	0.00200	0.1	0.2265	122	75 - 125				
Cadmium	0.1531	0.00200	0.1	0.05742	95.7	75 - 125				
Iron	10.43	0.200	10	0.8887	95.4	75 - 125				
Lead	0.6747	0.00200	0.1	0.5532	122	75 - 125				O

PDS Sample ID: **HS19050331-02PDS** Units: **mg/L** Analysis Date: **09-May-2019 13:42**
Client ID: **20190503-NSF-PV75inlet-30MW11-T** Run ID: **ICPMS05_338124** SeqNo: **5068680** PrepDate: **08-May-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	3.269	0.0200	1	2.196	107	75 - 125				

SD Sample ID: **HS19050331-02SD** Units: **mg/L** Analysis Date: **08-May-2019 23:03**
Client ID: **20190503-NSF-PV75inlet-30MW11-T** Run ID: **ICPMS05_338069** SeqNo: **5067903** PrepDate: **08-May-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	0.1184	0.0100					0.1209	2.07	10	
Arsenic	0.213	0.0100					0.2265	5.97	10	
Cadmium	0.05689	0.0100					0.05742	0.923	10	
Iron	0.8665	1.00					0.8887	0	10	J
Lead	0.5466	0.0100					0.5532	1.18	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050331

QC BATCH REPORT

Batch ID: 140641 (0) **Instrument:** ICPMS05 **Method:** ICP-MS METALS BY SW6020A

SD Sample ID: **HS19050331-02SD** Units: **mg/L** Analysis Date: **09-May-2019 13:40**
Client ID: **20190503-NSF-PV75inlet-30MW11-T** Run ID: **ICPMS05_338124** SeqNo: **5068679** PrepDate: **08-May-2019** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Selenium	2.042	0.100					2.196	6.98	10	

The following samples were analyzed in this batch: HS19050331-02 HS19050331-04 HS19050331-06 HS19050331-08 HS19050331-10 HS19050331-12

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050331

QC BATCH REPORT

Batch ID: 140642 (0) **Instrument:** ICPMS06 **Method:** DISSOLVED METALS BY SW6020A (DISSOLVED)

MBLK Sample ID: **MBLK-140642** Units: **mg/L** Analysis Date: **08-May-2019 23:02**
Client ID: Run ID: **ICPMS06_338017** SeqNo: **5068031** PrepDate: **08-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Iron	U	0.200								
Lead	U	0.00200								
Selenium	U	0.00200								

LCS Sample ID: **LCS-140642** Units: **mg/L** Analysis Date: **08-May-2019 23:03**
Client ID: Run ID: **ICPMS06_338017** SeqNo: **5068032** PrepDate: **08-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04974	0.00200	0.05	0	99.5	80 - 120				
Arsenic	0.04825	0.00200	0.05	0	96.5	80 - 120				
Cadmium	0.04486	0.00200	0.05	0	89.7	80 - 120				
Iron	4.844	0.200	5	0	96.9	80 - 120				
Lead	0.04463	0.00200	0.05	0	89.3	80 - 120				
Selenium	0.04926	0.00200	0.05	0	98.5	80 - 120				

MS Sample ID: **HS19050331-01MS** Units: **mg/L** Analysis Date: **08-May-2019 23:10**
Client ID: **20190503-NSF-PV75inlet-30MW11-D** Run ID: **ICPMS06_338017** SeqNo: **5068037** PrepDate: **08-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1621	0.00200	0.05	0.1174	89.4	75 - 125				
Arsenic	0.2479	0.00200	0.05	0.2067	82.4	75 - 125				O
Cadmium	0.09387	0.00200	0.05	0.05092	85.9	75 - 125				
Iron	5.107	0.200	5	0.009291	102	75 - 125				
Lead	0.0729	0.00200	0.05	0.02448	96.8	75 - 125				
Selenium	2.397	0.00200	0.05	2.474	-155	75 - 125				SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050331

QC BATCH REPORT

Batch ID: 140642 (0) **Instrument:** ICPMS06 **Method:** DISSOLVED METALS BY SW6020A (DISSOLVED)

MSD Sample ID: **HS19050331-01MSD** Units: **mg/L** Analysis Date: **08-May-2019 23:12**
Client ID: **20190503-NSF-PV75inlet-30MW11-D** Run ID: **ICPMS06_338017** SeqNo: **5068038** PrepDate: **08-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1587	0.00200	0.05	0.1174	82.7	75 - 125	0.1621	2.1	20	
Arsenic	0.2428	0.00200	0.05	0.2067	72.2	75 - 125	0.2479	2.08	20	SO
Cadmium	0.09016	0.00200	0.05	0.05092	78.5	75 - 125	0.09387	4.03	20	
Iron	5.13	0.200	5	0.009291	102	75 - 125	5.107	0.458	20	
Lead	0.07108	0.00200	0.05	0.02448	93.2	75 - 125	0.0729	2.52	20	
Selenium	2.338	0.00200	0.05	2.474	-271	75 - 125	2.397	2.46	20	SEO

PDS Sample ID: **HS19050331-01PDS** Units: **mg/L** Analysis Date: **08-May-2019 23:13**
Client ID: **20190503-NSF-PV75inlet-30MW11-D** Run ID: **ICPMS06_338017** SeqNo: **5068039** PrepDate: **08-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.205	0.00200	0.1	0.1174	87.7	75 - 125				
Arsenic	0.2938	0.00200	0.1	0.2067	87.1	75 - 125				
Cadmium	0.1375	0.00200	0.1	0.05092	86.6	75 - 125				
Iron	10.6	0.200	10	0.009291	106	75 - 125				
Lead	0.1238	0.00200	0.1	0.02448	99.4	75 - 125				

PDS Sample ID: **HS19050331-01PDS** Units: **mg/L** Analysis Date: **09-May-2019 16:26**
Client ID: **20190503-NSF-PV75inlet-30MW11-D** Run ID: **ICPMS05_338124** SeqNo: **5069047** PrepDate: **08-May-2019** DF: **20**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	4.176	0.0400	2	2.169	100	75 - 125				

SD Sample ID: **HS19050331-01SD** Units: **mg/L** Analysis Date: **08-May-2019 23:06**
Client ID: **20190503-NSF-PV75inlet-30MW11-D** Run ID: **ICPMS06_338017** SeqNo: **5068034** PrepDate: **08-May-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	0.111	0.0100					0.1174	5.4	10	
Arsenic	0.1878	0.0100					0.2067	9.15	10	
Cadmium	0.05223	0.0100					0.05092	2.58	10	
Iron	U	1.00					0.009291	0	10	
Lead	0.02373	0.0100					0.02448	3.04	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050331

QC BATCH REPORT

Batch ID: 140642 (0) **Instrument:** ICPMS06 **Method:** DISSOLVED METALS BY SW6020A (DISSOLVED)

SD Sample ID: **HS19050331-01SD** Units: **mg/L** Analysis Date: **09-May-2019 16:24**
Client ID: **20190503-NSF-PV75inlet-30MW11-D** Run ID: **ICPMS05_338124** SeqNo: **5069046** PrepDate: **08-May-2019** DF: **100**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Selenium	2.167	0.200					2.169	0.0975	10	

The following samples were analyzed in this batch: HS19050331-01 HS19050331-03 HS19050331-05 HS19050331-07 HS19050331-09 HS19050331-11

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19050331**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020
Texas	TX104704231-19-23	30-Apr-2020

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19050331

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19050331-01	20190503-NSF-PV75inlet-30MW11-D	Login	5/7/2019 11:14:17 AM	NDR	MET103
HS19050331-02	20190503-NSF-PV75inlet-30MW11-T	Login	5/7/2019 11:14:17 AM	NDR	MET103
HS19050331-03	20190503-NSF-PV75mid-30MW11-D	Login	5/7/2019 11:14:17 AM	NDR	MET103
HS19050331-04	20190503-NSF-PV75mid-30MW11-T	Login	5/7/2019 11:14:17 AM	NDR	MET103
HS19050331-05	20190503-NSF-PV75out-30MW11-D	Login	5/7/2019 11:14:17 AM	NDR	MET103
HS19050331-06	20190503-NSF-PV75out-30MW11-T	Login	5/7/2019 11:14:17 AM	NDR	MET103
HS19050331-07	20190503-NSF-PV76inlet-controlFD-D	Login	5/7/2019 11:14:17 AM	NDR	MET103
HS19050331-08	20190503-NSF-PV76inlet-controlFD-T	Login	5/7/2019 11:14:17 AM	NDR	MET103
HS19050331-09	20190503-NSF-PV76mid-controlFD-D	Login	5/7/2019 11:14:17 AM	NDR	MET103
HS19050331-10	20190503-NSF-PV76mid-controlFD-T	Login	5/7/2019 11:14:17 AM	NDR	MET103
HS19050331-11	20190503-NSF-PV76out-controlFD-D	Login	5/7/2019 11:14:17 AM	NDR	MET103
HS19050331-12	20190503-NSF-PV76out-controlFD-T	Login	5/7/2019 11:14:17 AM	NDR	MET103

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19050331

Date/Time Received: **07-May-2019 08:54**
Received by: **NDR**

Checklist completed by: *Nilesh D. Ranchod* eSignature — 7-May-2019 Date

Reviewed by: *Dane J. Wacasey* eSignature — 7-May-2019 Date

Matrices: **Water**

Carrier name: **FedEx International Priority**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	2 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	20.6C UC/C	IR11
Cooler(s)/Kit(s):	25533	
Date/Time sample(s) sent to storage:	05/07/2019 12:30	

Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted:	Golder Associates	Date Contacted:	7-May-2019	Person Contacted:	Emily White
Contacted By:	369	Regarding:	Turnaround time		

Comments: COC lists 5 day TAT, Please use 3 day TAT for samples received 5/7/19

Corrective Action: Logged for 3 day TAT

ALS Environmental

Chain of Custody Form

Page 1 of 2

HS19050331

Golder Associates
Exide Column Studies

Customer Information		Project Information		ALS Project Manager:	
PO Number	130-2086-06	Project Name	Exide Column Studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086-06	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suite 260	Address	13515 Barrett Parkway Drive, Suite 260	E	ICP TW (6020A total metals (6)): Pb, Cd, Sb, Se, As, Fe
				F	ICP DISS (6020A diss metals (6)-FldFltr): Pb, Cd, Sb, Se, As, Fe
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	G	
Phone	314 984-8800	Phone	314 984-8800	H	
Fax		Fax		I	
e-Mail Address	ewhite@golder.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190503-NSF-PV75inlet-30MW11-D	05-03-19	8:55 PM	GW	2	1						X					
2	20190503-NSF-PV75inlet-30MW11-T	05-03-19	8:55 PM	GW	2	1					X						
3	20190503-NSF-PV75mid-30MW11-D	05-03-19	8:37 PM	GW	2	1						X					
4	20190503-NSF-PV75mid-30MW11-T	05-03-19	8:37 PM	GW	2	1					X						
5	20190503-NSF-PV75out-30MW11-D	05-03-19	2:30 PM	GW	2	1						X					
6	20190503-NSF-PV75out-30MW11-T	05-03-19	2:30 PM	GW	2	1					X						
7	20190503-NSF-PV76inlet-controlFD-D	05-03-19	8:55 PM	GW	2	1						X					
8	20190503-NSF-PV76inlet-controlFD-T	05-03-19	8:55 PM	GW	2	1					X						
9	20190503-NSF-PV76mid-controlFD-D	05-03-19	8:37 PM	GW	2	1						X					
10	20190503-NSF-PV76mid-controlFD-T	05-03-19	8:37 PM	GW	2	1					X						

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method: FedEx

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ Other _____

Results Due Date: STD 5-DAY TAT

Relinquished by: Giovanna Llamosas	Date: 2019/05/03	15:30:00	Received by:	Notes: ☐ 2 Wk Days ☐ 24 Hour	
Relinquished by:	Date: 5/7/19	Time: 08:24	Received by (Laboratory):	Cooler Temp. 4°C	QC Package: (Check Box Below)
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	20.6	Level II: Standard QC; Level III: Std QC + Raw Data; Level IV: SW846 CLP-Like; Other:

QC Package: (Check Box Below)

	Level II: Standard QC	x	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other:		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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25533 LK# 11 COC2

ALS Environmental

Chain of Custody Form

Page 2 of 2

HS19050331

Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information	
PO Number	130-2086-06	Project Name	Exide Column Studies
Work Order		Project Number	130-2086-06
Company Name	Golder Associates	Bill To Company	Golder Associates
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P
Address	13515 Barrett Parkway Drive, Suite 260	Address	13515 Barrett Parkway Drive, Suite 260
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021
Phone	314 984-8800	Phone	314 984-8800
Fax		Fax	
e-Mail Address	ewhite@golder.com	e-Mail Address	

Parameter/Method Request for Analysis

A	300 W (300Cl, SO4, NO3-48h HT)
B	TDS W 2540C (2540C TDS)
C	ALK W 2320B (2320B alkalinity)
D	HARD (2340B hardness (calc))
E	ICP TW (6020A total metals (6)): Pb, Cd, Sb, Se, As, Fe
F	ICP DISS (6020A diss metals (6)-FldFltr): Pb, Cd, Sb, Se, As, Fe
G	
H	
I	
J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
11	20190503-NSF-PV76out-controlFD-D	05-03-19	2:30 PM	GW	2	1						X					
12	20190503-NSF-PV76out-controlFD-T	05-03-19	2:30 PM	GW	2	1					X						
13																	
14																	
15																	
16																	
17																	
18																	
19																	
20																	

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method: FedEx

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☑ Other _____

Results Due Date: STD 5-DAY TAT

Relinquished by: Giovanna Llamosas	Date: 2019/05/03	15:30:00	Received by:	Notes:
Relinquished by:	Date: 5.7.19	Time: 0850	Received by (Laboratory):	Cooler Temp. 4°C
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	26.6

QC Package: (Check Box Below)

	Level II: Standard QC	x	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other:		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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IR # 1 CFO

ORIGIN ID:YUOR (514) 393-0990
Audrey Eleves
Golder Associates Ltd
7275 rue du Mile End
3e etage
MONTREAL, PQ H2R3A4
CA
MONTREAL, CA

SHIP DATE: 06MAY19
ACTWGT: 3.70 LB
CAD: 106807724/INET4102

TO Dane Wacasey
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

BILL RECIPIENT
EMWAT

(281) 530-5656

FedEx Express

(US)

AWB

JI810190107200

NH SGRA

PKG-CUSTOMER

TRK# 7751 4057 4890

Form 0430

10:30A
INTL PRIORITY
REF
DESC1 Échantillon d'eau
DESC2
DESC3
DESC4

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: Audrey Eleves
TIC: R 967554812
DIT: R 967554812

COPIE DU DESTINATAIRE - VEUILLEZ LA GLISSER DANS LA POCHETTE

Après l'impression de cette étiquette :
COPIE DU BORDEREAU FEDEX - VEUILLEZ LA PLACER DERRIÈRE LA COPIE DU DESTINATAIRE
1. Pliez la page imprimée le long de la ligne horizontale.
2. Placez l'étiquette dans la pochette d'expédition et fixez-la à votre paquet

L

ALS Environmental
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

25533

CUSTODY SEAL
Date: 2019/05/03 Time: 15:30
Name: Adriane Blanchard
Company: Golder Associates

Seal Broken By: SM
Date: 05/07/19

25533 MAY 07 2019

ALS Environmental
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
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25533

CUSTODY SEAL
Date: 2019/05/03 Time: 15:30
Name: Adriane Blanchard
Company: Golder Associates

Seal Broken By: SM
Date: 05/07/19

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

May 10, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19050338**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 12 sample(s) on May 07, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DANE.WACASEY
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19050338**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19050338**	

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 05/10/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19050338				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 140641,140642				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?	X				
		Were analytical duplicates analyzed at the appropriate frequency?	X				
		Were RPDs or relative standard deviations within the laboratory QC limits?	X				
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 05/10/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19050338				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 140641,140642				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			2
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports		
Laboratory Name: ALS Laboratory Group		LRC Date: 05/10/2019
Project Name: Exide Column Studies		Laboratory Job Number: HS19050338
Reviewer Name: Dane Wacasey		Prep Batch Number(s): 140641,140642
ER#[5]	**Description**	
1	Batch 140641, Metals Method SW6020, sample HS19050331-02, MS and MSD were performed on unrelated sample. Batch 140642, Dissolved Metals Method SW6020, sample.HS19050331-01, MS and MSD were performed on unrelated sample.	
2	See Run Log and CCB Exceptions Report	

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050338
Start Date: 08-May-2019 End Date: 09-May-2019

Run ID:ICPMS05_338069
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
LLICV2	1	08-May-2019 14:48	019SMPL.d	AS FE SB SE
LLICV5	1	08-May-2019 14:51	020LICV.d	AS FE SB SE
ICB	1	08-May-2019 14:53	021_ICB.d	AS CD FE PB SB SE
ICV	1	08-May-2019 14:55	022_ICV.d	AS CD FE PB SB SE
ICSA	1	08-May-2019 15:02	023ICSA.d	AS FE SB SE
ICSAB	1	08-May-2019 15:05	024ICSB.d	AS FE SB SE
CCV 1	1	08-May-2019 15:55	035_CCV.d	AS CD FE PB SB SE
CCB 1	1	08-May-2019 15:57	036_CCB.d	AS CD FE PB SB SE
CCV 2	1	08-May-2019 16:31	047_CCV.d	AS CD FE PB SB SE
CCB 2	1	08-May-2019 16:34	048_CCB.d	AS CD FE PB SB SE
CCV 3	1	08-May-2019 17:05	059_CCV.d	AS CD FE PB SB SE
CCB 3	1	08-May-2019 17:08	060_CCB.d	AS CD FE PB SB SE
ICCV 4	1	08-May-2019 17:41	074_ICV.d	AS CD FE PB SB SE
LLCCV2	1	08-May-2019 17:44	075SMPL.d	AS FE SB SE
LLCCV5	1	08-May-2019 17:46	076LICV.d	AS FE SB SE
ICCB 4	1	08-May-2019 17:55	079_ICB.d	AS CD FE PB SB SE
CCV 5	1	08-May-2019 18:25	090_CCV.d	AS CD FE PB SB SE
CCB 5	1	08-May-2019 18:27	091_CCB.d	AS CD FE PB SB SE
CCV 6	1	08-May-2019 18:56	102_CCV.d	AS CD FE PB SB SE
CCB 6	1	08-May-2019 18:58	103_CCB.d	AS CD FE PB SB SE
CCV 7	1	08-May-2019 19:23	114_CCV.d	AS CD FE PB SB SE
CCB 7	1	08-May-2019 19:26	115_CCB.d	AS CD FE PB SB SE
CCV 8	1	08-May-2019 19:51	126_CCV.d	AS CD FE PB SB SE
CCB 8	1	08-May-2019 19:54	127_CCB.d	AS CD FE PB SB SE
CCV 9	1	08-May-2019 22:43	131_CCV.d	AS CD FE PB SB SE
CCB 9	1	08-May-2019 22:51	134_CCB.d	AS CD FE PB SB SE
MBLK-140641	1	08-May-2019 22:56	136SMPL.d	AS CD FE PB SB SE
LCS-140641	1	08-May-2019 22:59	137SMPL.d	AS CD FE PB SB SE
ZZZZZZSD	5	08-May-2019 23:03	139SMPL.d	AS CD FE PB SB
ZZZZZZMS	1	08-May-2019 23:06	140SMPL.d	AS CD FE PB SB SE
ZZZZZZMSD	1	08-May-2019 23:10	142SMPL.d	AS CD FE PB SB SE
ZZZZZZPDS	1	08-May-2019 23:13	143SMPL.d	AS CD FE PB SB
CCV 10	1	08-May-2019 23:17	145_CCV.d	AS CD FE PB SB SE
CCB 10	1	08-May-2019 23:20	146_CCB.d	AS CD FE PB SB SE
CCB 11	1	08-May-2019 23:48	158_CCB.d	AS CD FE PB SB SE
CCV 11	1	08-May-2019 23:53	160_CCV.d	AS CD FE PB SB SE
ICCV 12	1	09-May-2019 00:23	171_ICV.d	AS CD FE PB SB SE
LLCCV2	1	09-May-2019 00:25	172SMPL.d	AS FE SB SE
LLCCV5	1	09-May-2019 00:28	173LICV.d	AS FE SB SE
ICCB 12	1	09-May-2019 00:30	174_ICB.d	AS CD FE PB SB SE
CCV 13	1	09-May-2019 00:49	182_CCV.d	AS CD FE PB SB SE
CCB 13	1	09-May-2019 00:51	183_CCB.d	AS CD FE PB SB SE
CCV 14	1	09-May-2019 01:16	194_CCV.d	AS CD FE PB SB SE
CCB 14	1	09-May-2019 01:18	195_CCB.d	AS CD FE PB SB SE
CCV 15	1	09-May-2019 01:44	206_CCV.d	AS CD FE PB SB SE
CCB 15	1	09-May-2019 01:46	207_CCB.d	AS CD FE PB SB SE
20190503-NSF-PV83inlet-30MW3-T	1	09-May-2019 01:49	208SMPL.d	AS FE SB
20190503-NSF-PV83mid-30MW3-T	1	09-May-2019 01:51	209SMPL.d	AS FE SB SE
20190503-NSF-PV83out-30MW3-T	1	09-May-2019 01:53	210SMPL.d	AS FE SB SE
20190503-NSF-PV76inlet-30FD-T	1	09-May-2019 01:56	211SMPL.d	AS FE SB

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050338
Start Date: 08-May-2019 End Date: 09-May-2019

Run ID:ICPMS05_338069
Instrument:ICPMS05
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
20190503-NSF-PV76mid-30FD-T	1	09-May-2019 01:58	212SMPL.d	AS FE SB SE
20190503-NSF-PV76out-30FD-T	1	09-May-2019 02:00	213SMPL.d	AS FE SB SE
CCV 16	1	09-May-2019 02:05	215_CCV.d	AS CD FE PB SB SE
CCB 16	1	09-May-2019 02:07	216_CCB.d	AS CD FE PB SB SE
CCV 17	1	09-May-2019 02:24	223_CCV.d	AS CD FE PB SB SE
CCB 17	1	09-May-2019 02:26	224_CCB.d	AS CD FE PB SB SE
LLICV2	1	09-May-2019 02:28	225SMPL.d	AS CD FE PB SB SE
LLICV5	1	09-May-2019 02:31	226LICV.d	AS CD FE PB SB SE
ICSA	1	09-May-2019 02:33	227ICSA.d	AS FE SB SE
ICSAB	1	09-May-2019 02:36	228ICSB.d	AS FE SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050338

Run ID:ICPMS05_338069
Instrument:ICPMS05
Method:SW6020

CCB 3	Date: 08-May-2019 17:08	Seq: 5067540		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.418	0.4	2	
CCB 6	Date: 08-May-2019 18:58	Seq: 5067839		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Iron	15.42	12	200	
CCB 8	Date: 08-May-2019 19:54	Seq: 5067863		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Iron	14.09	12	200	
CCB 10	Date: 08-May-2019 23:20	Seq: 5067910		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.7	0.4	2	
CCB 11	Date: 08-May-2019 23:48	Seq: 5067922		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.41	0.4	2	
CCB 13	Date: 09-May-2019 00:51	Seq: 5067965		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Antimony	0.425	0.4	2	
	Iron	16.33	12	200	
CCB 14	Date: 09-May-2019 01:18	Seq: 5067933		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Iron	38.76	12	200	
CCB 15	Date: 09-May-2019 01:46	Seq: 5067945		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Iron	18.15	12	200	
CCB 16	Date: 09-May-2019 02:07	Seq: 5067971		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Arsenic	0.452	0.4	2	
	Iron	13.73	12	200	
CCB 17	Date: 09-May-2019 02:26	Seq: 5067979		D/F: 1	Units: ug/L
	Analyte	**Result**	**MDL**	**Report Limit**	
	Arsenic	0.432	0.4	2	
	Iron	14.22	12	200	

FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050338
Start Date: 08-May-2019 End Date: 09-May-2019

Run ID:ICPMS06_338017
Instrument:ICPMS06
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
ZZZZZZPDS	1	08-May-2019 23:13	246SMPL.d	AS CD FE PB SB
CCV 19	1	08-May-2019 23:15	247_CCV.d	AS CD FE PB SB SE
CCB 19	1	08-May-2019 23:16	248_CCB.d	AS CD FE PB SB SE
CCV 20	1	08-May-2019 23:30	257_CCV.d	AS CD FE PB SB SE
CCB 20	1	08-May-2019 23:31	258_CCB.d	AS CD FE PB SB SE
20190503-NSF-PV83inlet-30MW3-D	1	08-May-2019 23:32	259SMPL.d	AS CD FE PB SB
20190503-NSF-PV83mid-30MW3-D	1	08-May-2019 23:34	260SMPL.d	AS CD FE PB SB SE
20190503-NSF-PV83out-30MW3-D	1	08-May-2019 23:36	261SMPL.d	AS CD FE PB SB SE
20190503-NSF-PV76inlet-30FD-D	1	08-May-2019 23:37	262SMPL.d	AS CD FE PB SB
20190503-NSF-PV76mid-30FD-D	1	08-May-2019 23:39	263SMPL.d	AS CD FE PB SB SE
20190503-NSF-PV76out-30FD-D	1	08-May-2019 23:40	264SMPL.d	AS CD FE PB SB SE
CCV 21	1	08-May-2019 23:43	266_CCV.d	AS CD FE PB SB SE
CCB 21	1	08-May-2019 23:44	267_CCB.d	AS CD FE PB SB SE
ICCV 22	1	09-May-2019 00:09	284_ICV.d	AS CD FE PB SB SE
LLICCV2	1	09-May-2019 00:10	285LCV2.d	AS CD FE PB SB SE
LLICCV5	1	09-May-2019 00:12	286LCV5.d	AS CD FE PB SB SE
ICCB 22	1	09-May-2019 00:13	287_ICB.d	AS CD FE PB SB SE
CCV 23	1	09-May-2019 00:25	295_CCV.d	AS CD FE PB SB SE
CCB 23	1	09-May-2019 00:27	296_CCB.d	AS CD FE PB SB SE
CCV 24	1	09-May-2019 00:43	307_CCV.d	AS CD FE PB SB SE
CCB 24	1	09-May-2019 00:44	308_CCB.d	AS CD FE PB SB SE
ICSA	1	09-May-2019 00:46	309ICSA.d	AS CD FE PB SB SE
ICSAB	1	09-May-2019 00:48	310ICSB.d	AS CD FE PB SB SE

CCB EXCEPTIONS REPORT

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050338

Run ID:ICPMS06_338017
Instrument:ICPMS06
Method:SW6020

CCB 2	Date: 08-May-2019 11:17	Seq: 5066275	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Arsenic	-0.406	0.4	2	

CCB 3	Date: 08-May-2019 11:42	Seq: 5066342	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Arsenic	-0.419	0.4	2	

CCB 20	Date: 08-May-2019 23:31	Seq: 5068051	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Selenium	1.277	1.1	2	

CCB 21	Date: 08-May-2019 23:44	Seq: 5068060	D/F: 1	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	
Selenium	1.218	1.1	2	

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19050338

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19050338-01	20190503-NSF-PV83inlet-30MW3-D	Groundwater		03-May-2019 20:55	07-May-2019 08:54	☐
HS19050338-02	20190503-NSF-PV83inlet-30MW3-T	Groundwater		03-May-2019 20:55	07-May-2019 08:54	☐
HS19050338-03	20190503-NSF-PV83mid-30MW3-D	Groundwater		03-May-2019 20:37	07-May-2019 08:54	☐
HS19050338-04	20190503-NSF-PV83mid-30MW3-T	Groundwater		03-May-2019 20:37	07-May-2019 08:54	☐
HS19050338-05	20190503-NSF-PV83out-30MW3-D	Groundwater		03-May-2019 14:30	07-May-2019 08:54	☐
HS19050338-06	20190503-NSF-PV83out-30MW3-T	Groundwater		03-May-2019 14:30	07-May-2019 08:54	☐
HS19050338-07	20190503-NSF-PV76inlet-30FD-D	Groundwater		03-May-2019 20:55	07-May-2019 08:54	☐
HS19050338-08	20190503-NSF-PV76inlet-30FD-T	Groundwater		03-May-2019 20:55	07-May-2019 08:54	☐
HS19050338-09	20190503-NSF-PV76mid-30FD-D	Groundwater		03-May-2019 20:37	07-May-2019 08:54	☐
HS19050338-10	20190503-NSF-PV76mid-30FD-T	Groundwater		03-May-2019 20:37	07-May-2019 08:54	☐
HS19050338-11	20190503-NSF-PV76out-30FD-D	Groundwater		03-May-2019 14:30	07-May-2019 08:54	☐
HS19050338-12	20190503-NSF-PV76out-30FD-T	Groundwater		03-May-2019 14:30	07-May-2019 08:54	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190503-NSF-PV83inlet-30MW3-D
Collection Date: 03-May-2019 20:55

ANALYTICAL REPORT
WorkOrder:HS19050338
Lab ID:HS19050338-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 08-May-2019		Analyst: JHD
Antimony	**0.163**		**0.000400**	**0.00200**	**mg/L**	1	08-May-2019 23:32
Arsenic	**0.237**		**0.000400**	**0.00200**	**mg/L**	1	08-May-2019 23:32
Cadmium	**0.0578**		**0.000200**	**0.00200**	**mg/L**	1	08-May-2019 23:32
Iron	U		0.0120	0.200	mg/L	1	08-May-2019 23:32
Lead	**0.140**		**0.000600**	**0.00200**	**mg/L**	1	08-May-2019 23:32
Selenium	**2.20**		**0.0220**	**0.0400**	**mg/L**	20	09-May-2019 16:35

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190503-NSF-PV83inlet-30MW3-T
Collection Date: 03-May-2019 20:55

ANALYTICAL REPORT
WorkOrder:HS19050338
Lab ID:HS19050338-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 08-May-2019		Analyst: JC
Antimony	**0.190**		**0.000400**	**0.00200**	**mg/L**	1	09-May-2019 01:49
Arsenic	**0.265**		**0.000400**	**0.00200**	**mg/L**	1	09-May-2019 01:49
Cadmium	**0.0650**		**0.000400**	**0.00400**	**mg/L**	2	09-May-2019 15:18
Iron	**1.15**		**0.0120**	**0.200**	**mg/L**	1	09-May-2019 01:49
Lead	**1.39**		**0.00120**	**0.00400**	**mg/L**	2	09-May-2019 15:18
Selenium	**2.18**		**0.0220**	**0.0400**	**mg/L**	20	09-May-2019 15:44

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190503-NSF-PV83mid-30MW3-D
Collection Date: 03-May-2019 20:37

ANALYTICAL REPORT
WorkOrder:HS19050338
Lab ID:HS19050338-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 08-May-2019		Analyst: JHD
Antimony	**0.0329**		**0.000400**	**0.00200**	**mg/L**	1	08-May-2019 23:34
Arsenic	**0.000872**	J	**0.000400**	**0.00200**	**mg/L**	1	08-May-2019 23:34
Cadmium	U		0.000200	0.00200	mg/L	1	08-May-2019 23:34
Iron	**0.947**		**0.0120**	**0.200**	**mg/L**	1	08-May-2019 23:34
Lead	U		0.000600	0.00200	mg/L	1	08-May-2019 23:34
Selenium	**0.955**		**0.00110**	**0.00200**	**mg/L**	1	08-May-2019 23:34

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190503-NSF-PV83mid-30MW3-T
Collection Date: 03-May-2019 20:37

ANALYTICAL REPORT
WorkOrder:HS19050338
Lab ID:HS19050338-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 08-May-2019		Analyst: JC
Antimony	**0.0345**		**0.000400**	**0.00200**	**mg/L**	1	09-May-2019 01:51
Arsenic	**0.000511**	J	**0.000400**	**0.00200**	**mg/L**	1	09-May-2019 01:51
Cadmium	U		0.000200	0.00200	mg/L	1	09-May-2019 15:02
Iron	**4.37**		**0.0120**	**0.200**	**mg/L**	1	09-May-2019 01:51
Lead	U		0.000600	0.00200	mg/L	1	09-May-2019 15:02
Selenium	**0.963**		**0.00110**	**0.00200**	**mg/L**	1	09-May-2019 01:51

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190503-NSF-PV83out-30MW3-D
Collection Date: 03-May-2019 14:30

ANALYTICAL REPORT
WorkOrder:HS19050338
Lab ID:HS19050338-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 08-May-2019		Analyst: JHD
Antimony	**0.00253**		**0.000400**	**0.00200**	**mg/L**	1	08-May-2019 23:36
Arsenic	**0.000682**	J	**0.000400**	**0.00200**	**mg/L**	1	08-May-2019 23:36
Cadmium	U		0.000200	0.00200	mg/L	1	08-May-2019 23:36
Iron	**0.0123**	J	**0.0120**	**0.200**	**mg/L**	1	08-May-2019 23:36
Lead	U		0.000600	0.00200	mg/L	1	08-May-2019 23:36
Selenium	**0.134**		**0.00110**	**0.00200**	**mg/L**	1	08-May-2019 23:36

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190503-NSF-PV83out-30MW3-T
Collection Date: 03-May-2019 14:30

ANALYTICAL REPORT
WorkOrder:HS19050338
Lab ID:HS19050338-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 08-May-2019		Analyst: JC
Antimony	**0.00296**		**0.000400**	**0.00200**	**mg/L**	1	09-May-2019 01:53
Arsenic	U		0.000400	0.00200	mg/L	1	09-May-2019 01:53
Cadmium	U		0.000200	0.00200	mg/L	1	09-May-2019 15:04
Iron	**3.52**		**0.0120**	**0.200**	**mg/L**	1	09-May-2019 01:53
Lead	U		0.000600	0.00200	mg/L	1	09-May-2019 15:04
Selenium	**0.127**		**0.00110**	**0.00200**	**mg/L**	1	09-May-2019 01:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190503-NSF-PV76inlet-30FD-D
Collection Date: 03-May-2019 20:55

ANALYTICAL REPORT
WorkOrder:HS19050338
Lab ID:HS19050338-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 08-May-2019		Analyst: JHD
Antimony	**0.0824**		**0.000400**	**0.00200**	**mg/L**	1	08-May-2019 23:37
Arsenic	**0.143**		**0.000400**	**0.00200**	**mg/L**	1	08-May-2019 23:37
Cadmium	**0.0418**		**0.000200**	**0.00200**	**mg/L**	1	08-May-2019 23:37
Iron	U		0.0120	0.200	mg/L	1	08-May-2019 23:37
Lead	**0.0159**		**0.000600**	**0.00200**	**mg/L**	1	08-May-2019 23:37
Selenium	**2.25**		**0.0220**	**0.0400**	**mg/L**	20	09-May-2019 16:38

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190503-NSF-PV76inlet-30FD-T
Collection Date: 03-May-2019 20:55

ANALYTICAL REPORT
WorkOrder:HS19050338
Lab ID:HS19050338-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 08-May-2019		Analyst: JC
Antimony	**0.107**		**0.000400**	**0.00200**	**mg/L**	1	09-May-2019 01:56
Arsenic	**0.245**		**0.000400**	**0.00200**	**mg/L**	1	09-May-2019 01:56
Cadmium	**0.0593**		**0.000400**	**0.00400**	**mg/L**	2	09-May-2019 15:42
Iron	**2.52**		**0.0120**	**0.200**	**mg/L**	1	09-May-2019 01:56
Lead	**0.922**		**0.00120**	**0.00400**	**mg/L**	2	09-May-2019 15:42
Selenium	**2.27**		**0.0220**	**0.0400**	**mg/L**	20	09-May-2019 15:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190503-NSF-PV76mid-30FD-D
Collection Date: 03-May-2019 20:37

ANALYTICAL REPORT
WorkOrder:HS19050338
Lab ID:HS19050338-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 08-May-2019		Analyst: JHD
Antimony	**0.00458**		**0.000400**	**0.00200**	**mg/L**	1	08-May-2019 23:39
Arsenic	**0.000878**	J	**0.000400**	**0.00200**	**mg/L**	1	08-May-2019 23:39
Cadmium	U		0.000200	0.00200	mg/L	1	08-May-2019 23:39
Iron	**1.10**		**0.0120**	**0.200**	**mg/L**	1	08-May-2019 23:39
Lead	U		0.000600	0.00200	mg/L	1	08-May-2019 23:39
Selenium	**0.631**		**0.00110**	**0.00200**	**mg/L**	1	08-May-2019 23:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190503-NSF-PV76mid-30FD-T
Collection Date: 03-May-2019 20:37

ANALYTICAL REPORT
WorkOrder:HS19050338
Lab ID:HS19050338-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 08-May-2019		Analyst: JC
Antimony	**0.00545**		**0.000400**	**0.00200**	**mg/L**	1	09-May-2019 01:58
Arsenic	**0.000733**	J	**0.000400**	**0.00200**	**mg/L**	1	09-May-2019 01:58
Cadmium	U		0.000200	0.00200	mg/L	1	09-May-2019 15:06
Iron	**6.90**		**0.0120**	**0.200**	**mg/L**	1	09-May-2019 01:58
Lead	U		0.000600	0.00200	mg/L	1	09-May-2019 15:06
Selenium	**0.650**		**0.00110**	**0.00200**	**mg/L**	1	09-May-2019 01:58

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190503-NSF-PV76out-30FD-D
Collection Date: 03-May-2019 14:30

ANALYTICAL REPORT
WorkOrder:HS19050338
Lab ID:HS19050338-11
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 08-May-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	08-May-2019 23:40
Arsenic	**0.000501**	J	**0.000400**	**0.00200**	**mg/L**	1	08-May-2019 23:40
Cadmium	U		0.000200	0.00200	mg/L	1	08-May-2019 23:40
Iron	U		0.0120	0.200	mg/L	1	08-May-2019 23:40
Lead	U		0.000600	0.00200	mg/L	1	08-May-2019 23:40
Selenium	**0.00607**		**0.00110**	**0.00200**	**mg/L**	1	08-May-2019 23:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190503-NSF-PV76out-30FD-T
Collection Date: 03-May-2019 14:30

ANALYTICAL REPORT
WorkOrder:HS19050338
Lab ID:HS19050338-12
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 08-May-2019		Analyst: JC
Antimony	**0.000438**	J	**0.000400**	**0.00200**	**mg/L**	1	09-May-2019 02:00
Arsenic	**0.000633**	J	**0.000400**	**0.00200**	**mg/L**	1	09-May-2019 02:00
Cadmium	U		0.000200	0.00200	mg/L	1	09-May-2019 15:09
Iron	**4.74**		**0.0120**	**0.200**	**mg/L**	1	09-May-2019 02:00
Lead	U		0.000600	0.00200	mg/L	1	09-May-2019 15:09
Selenium	**0.00598**		**0.00110**	**0.00200**	**mg/L**	1	09-May-2019 02:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050338

Batch ID: 140641 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19050338-02	1	10	10 (mL)	1
HS19050338-04	1	10	10 (mL)	1
HS19050338-06	1	10	10 (mL)	1
HS19050338-08	1	10	10 (mL)	1
HS19050338-10	1	10	10 (mL)	1
HS19050338-12	1	10	10 (mL)	1

Batch ID: 140642 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19050338-01	1	10	10 (mL)	1
HS19050338-03	1	10	10 (mL)	1
HS19050338-05	1	10	10 (mL)	1
HS19050338-07	1	10	10 (mL)	1
HS19050338-09	1	10	10 (mL)	1
HS19050338-11	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050338

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 140641	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19050338-02	20190503-NSF-PV83inlet-30MW3-T	03 May 2019 20:55		08 May 2019 12:00	09 May 2019 15:44	20
HS19050338-02	20190503-NSF-PV83inlet-30MW3-T	03 May 2019 20:55		08 May 2019 12:00	09 May 2019 15:18	2
HS19050338-02	20190503-NSF-PV83inlet-30MW3-T	03 May 2019 20:55		08 May 2019 12:00	09 May 2019 01:49	1
HS19050338-04	20190503-NSF-PV83mid-30MW3-T	03 May 2019 20:37		08 May 2019 12:00	09 May 2019 15:02	1
HS19050338-04	20190503-NSF-PV83mid-30MW3-T	03 May 2019 20:37		08 May 2019 12:00	09 May 2019 01:51	1
HS19050338-06	20190503-NSF-PV83out-30MW3-T	03 May 2019 14:30		08 May 2019 12:00	09 May 2019 15:04	1
HS19050338-06	20190503-NSF-PV83out-30MW3-T	03 May 2019 14:30		08 May 2019 12:00	09 May 2019 01:53	1
HS19050338-08	20190503-NSF-PV76inlet-30FD-T	03 May 2019 20:55		08 May 2019 12:00	09 May 2019 15:47	20
HS19050338-08	20190503-NSF-PV76inlet-30FD-T	03 May 2019 20:55		08 May 2019 12:00	09 May 2019 15:42	2
HS19050338-08	20190503-NSF-PV76inlet-30FD-T	03 May 2019 20:55		08 May 2019 12:00	09 May 2019 01:56	1
HS19050338-10	20190503-NSF-PV76mid-30FD-T	03 May 2019 20:37		08 May 2019 12:00	09 May 2019 15:06	1
HS19050338-10	20190503-NSF-PV76mid-30FD-T	03 May 2019 20:37		08 May 2019 12:00	09 May 2019 01:58	1
HS19050338-12	20190503-NSF-PV76out-30FD-T	03 May 2019 14:30		08 May 2019 12:00	09 May 2019 15:09	1
HS19050338-12	20190503-NSF-PV76out-30FD-T	03 May 2019 14:30		08 May 2019 12:00	09 May 2019 02:00	1
Batch ID 140642	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS19050338-01	20190503-NSF-PV83inlet-30MW3-D	03 May 2019 20:55		08 May 2019 12:00	09 May 2019 16:35	20
HS19050338-01	20190503-NSF-PV83inlet-30MW3-D	03 May 2019 20:55		08 May 2019 12:00	08 May 2019 23:32	1
HS19050338-03	20190503-NSF-PV83mid-30MW3-D	03 May 2019 20:37		08 May 2019 12:00	08 May 2019 23:34	1
HS19050338-05	20190503-NSF-PV83out-30MW3-D	03 May 2019 14:30		08 May 2019 12:00	08 May 2019 23:36	1
HS19050338-07	20190503-NSF-PV76inlet-30FD-D	03 May 2019 20:55		08 May 2019 12:00	09 May 2019 16:38	20
HS19050338-07	20190503-NSF-PV76inlet-30FD-D	03 May 2019 20:55		08 May 2019 12:00	08 May 2019 23:37	1
HS19050338-09	20190503-NSF-PV76mid-30FD-D	03 May 2019 20:37		08 May 2019 12:00	08 May 2019 23:39	1
HS19050338-11	20190503-NSF-PV76out-30FD-D	03 May 2019 14:30		08 May 2019 12:00	08 May 2019 23:40	1

WorkOrder: HS19050338
InstrumentID: ICPMS06
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000461	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000438	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000484	0.000200	0.00200
A	Iron	7439-89-6	0.0500	0.0528	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000931	0.000600	0.00200
A	Selenium	7782-49-2	0.00250	0.00239	0.00110	0.00200

WorkOrder: HS19050338
InstrumentID: ICPMS05
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Selenium	7782-49-2	0.00250	0.00187	0.00110	0.00200

WorkOrder: HS19050338
InstrumentID: ICPMS05
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000493	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000344	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000538	0.000200	0.00200
A	Iron	7439-89-6	0.0500	0.0487	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000878	0.000600	0.00200
A	Selenium	7782-49-2	0.00250	0.00187	0.00110	0.00200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050338

QC BATCH REPORT

Batch ID: 140641 (0) **Instrument: ICPMS05** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLK-140641** Units: **mg/L** Analysis Date: **08-May-2019 22:56**
Client ID: Run ID: **ICPMS05_338069** SeqNo: **5067900** PrepDate: **08-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Iron	U	0.200								
Lead	U	0.00200								
Selenium	U	0.00200								

LCS Sample ID: **LCS-140641** Units: **mg/L** Analysis Date: **08-May-2019 22:59**
Client ID: Run ID: **ICPMS05_338069** SeqNo: **5067901** PrepDate: **08-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04807	0.00200	0.05	0	96.1	80 - 120				
Arsenic	0.05075	0.00200	0.05	0	101	80 - 120				
Cadmium	0.05045	0.00200	0.05	0	101	80 - 120				
Iron	4.82	0.200	5	0	96.4	80 - 120				
Lead	0.04899	0.00200	0.05	0	98.0	80 - 120				
Selenium	0.04955	0.00200	0.05	0	99.1	80 - 120				

MS Sample ID: **HS19050331-02MS** Units: **mg/L** Analysis Date: **08-May-2019 23:06**
Client ID: Run ID: **ICPMS05_338069** SeqNo: **5067904** PrepDate: **08-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1716	0.00200	0.05	0.1209	101	80 - 120				
Arsenic	0.2835	0.00200	0.05	0.2265	114	80 - 120				O
Cadmium	0.1086	0.00200	0.05	0.05742	102	80 - 120				
Iron	5.696	0.200	5	0.8887	96.1	80 - 120				
Lead	0.6136	0.00200	0.05	0.5532	121	80 - 120				SO
Selenium	2.406	0.00200	0.05	2.311	190	80 - 120				SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050338

QC BATCH REPORT

Batch ID: 140641 (0) **Instrument: ICPMS05** **Method: ICP-MS METALS BY SW6020A**

MSD Sample ID: **HS19050331-02MSD** Units: **mg/L** Analysis Date: **08-May-2019 23:10**
Client ID: Run ID: **ICPMS05_338069** SeqNo: **5067906** PrepDate: **08-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.168	0.00200	0.05	0.1209	94.3	80 - 120	0.1716	2.09	20	
Arsenic	0.2823	0.00200	0.05	0.2265	112	80 - 120	0.2835	0.444	20	O
Cadmium	0.1073	0.00200	0.05	0.05742	99.8	80 - 120	0.1086	1.16	20	
Iron	5.52	0.200	5	0.8887	92.6	80 - 120	5.696	3.13	20	
Lead	0.6196	0.00200	0.05	0.5532	133	80 - 120	0.6136	0.984	20	SO
Selenium	2.363	0.00200	0.05	2.311	105	80 - 120	2.406	1.79	20	EO

PDS Sample ID: **HS19050331-02PDS** Units: **mg/L** Analysis Date: **08-May-2019 23:13**
Client ID: Run ID: **ICPMS05_338069** SeqNo: **5067907** PrepDate: **08-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.2149	0.00200	0.1	0.1209	94.0	75 - 125				
Arsenic	0.3483	0.00200	0.1	0.2265	122	75 - 125				
Cadmium	0.1531	0.00200	0.1	0.05742	95.7	75 - 125				
Iron	10.43	0.200	10	0.8887	95.4	75 - 125				
Lead	0.6747	0.00200	0.1	0.5532	122	75 - 125				O

PDS Sample ID: **HS19050331-02PDS** Units: **mg/L** Analysis Date: **09-May-2019 13:42**
Client ID: Run ID: **ICPMS05_338124** SeqNo: **5068680** PrepDate: **08-May-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	3.269	0.0200	1	2.196	107	75 - 125				

SD Sample ID: **HS19050331-02SD** Units: **mg/L** Analysis Date: **08-May-2019 23:03**
Client ID: Run ID: **ICPMS05_338069** SeqNo: **5067903** PrepDate: **08-May-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	0.1184	0.0100					0.1209	2.07	10	
Arsenic	0.213	0.0100					0.2265	5.97	10	
Cadmium	0.05689	0.0100					0.05742	0.923	10	
Iron	0.8665	1.00					0.8887	0	10	J
Lead	0.5466	0.0100					0.5532	1.18	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050338

QC BATCH REPORT

Batch ID: 140641 (0) **Instrument: ICPMS05** **Method: ICP-MS METALS BY SW6020A**

SD Sample ID: **HS19050331-02SD** Units: **mg/L** Analysis Date: **09-May-2019 13:40**
Client ID: Run ID: **ICPMS05_338124** SeqNo: **5068679** PrepDate: **08-May-2019** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Selenium	2.042	0.100					2.196	6.98	10	

The following samples were analyzed in this batch: HS19050338-02 HS19050338-04 HS19050338-06 HS19050338-08 HS19050338-10 HS19050338-12

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050338

QC BATCH REPORT

Batch ID: 140642 (0) **Instrument: ICPMS06** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

MBLK Sample ID: **MBLK-140642** Units: **mg/L** Analysis Date: **08-May-2019 23:02**
Client ID: Run ID: **ICPMS06_338017** SeqNo: **5068031** PrepDate: **08-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Iron	U	0.200								
Lead	U	0.00200								
Selenium	U	0.00200								

LCS Sample ID: **LCS-140642** Units: **mg/L** Analysis Date: **08-May-2019 23:03**
Client ID: Run ID: **ICPMS06_338017** SeqNo: **5068032** PrepDate: **08-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.04974	0.00200	0.05	0	99.5	80 - 120				
Arsenic	0.04825	0.00200	0.05	0	96.5	80 - 120				
Cadmium	0.04486	0.00200	0.05	0	89.7	80 - 120				
Iron	4.844	0.200	5	0	96.9	80 - 120				
Lead	0.04463	0.00200	0.05	0	89.3	80 - 120				
Selenium	0.04926	0.00200	0.05	0	98.5	80 - 120				

MS Sample ID: **HS19050331-01MS** Units: **mg/L** Analysis Date: **08-May-2019 23:10**
Client ID: Run ID: **ICPMS06_338017** SeqNo: **5068037** PrepDate: **08-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1621	0.00200	0.05	0.1174	89.4	75 - 125				
Arsenic	0.2479	0.00200	0.05	0.2067	82.4	75 - 125				O
Cadmium	0.09387	0.00200	0.05	0.05092	85.9	75 - 125				
Iron	5.107	0.200	5	0.009291	102	75 - 125				
Lead	0.0729	0.00200	0.05	0.02448	96.8	75 - 125				
Selenium	2.397	0.00200	0.05	2.474	-155	75 - 125				SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050338

QC BATCH REPORT

Batch ID: 140642 (0) **Instrument: ICPMS06** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

MSD Sample ID: **HS19050331-01MSD** Units: **mg/L** Analysis Date: **08-May-2019 23:12**
Client ID: Run ID: **ICPMS06_338017** SeqNo: **5068038** PrepDate: **08-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1587	0.00200	0.05	0.1174	82.7	75 - 125	0.1621	2.1	20	
Arsenic	0.2428	0.00200	0.05	0.2067	72.2	75 - 125	0.2479	2.08	20	SO
Cadmium	0.09016	0.00200	0.05	0.05092	78.5	75 - 125	0.09387	4.03	20	
Iron	5.13	0.200	5	0.009291	102	75 - 125	5.107	0.458	20	
Lead	0.07108	0.00200	0.05	0.02448	93.2	75 - 125	0.0729	2.52	20	
Selenium	2.338	0.00200	0.05	2.474	-271	75 - 125	2.397	2.46	20	SEO

PDS Sample ID: **HS19050331-01PDS** Units: **mg/L** Analysis Date: **08-May-2019 23:13**
Client ID: Run ID: **ICPMS06_338017** SeqNo: **5068039** PrepDate: **08-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.205	0.00200	0.1	0.1174	87.7	75 - 125				
Arsenic	0.2938	0.00200	0.1	0.2067	87.1	75 - 125				
Cadmium	0.1375	0.00200	0.1	0.05092	86.6	75 - 125				
Iron	10.6	0.200	10	0.009291	106	75 - 125				
Lead	0.1238	0.00200	0.1	0.02448	99.4	75 - 125				

PDS Sample ID: **HS19050331-01PDS** Units: **mg/L** Analysis Date: **09-May-2019 16:26**
Client ID: Run ID: **ICPMS05_338124** SeqNo: **5069047** PrepDate: **08-May-2019** DF: **20**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	4.176	0.0400	2	2.169	100	75 - 125				

SD Sample ID: **HS19050331-01SD** Units: **mg/L** Analysis Date: **08-May-2019 23:06**
Client ID: Run ID: **ICPMS06_338017** SeqNo: **5068034** PrepDate: **08-May-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	0.111	0.0100					0.1174	5.4	10	
Arsenic	0.1878	0.0100					0.2067	9.15	10	
Cadmium	0.05223	0.0100					0.05092	2.58	10	
Iron	U	1.00					0.009291	0	10	
Lead	0.02373	0.0100					0.02448	3.04	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050338

QC BATCH REPORT

Batch ID: 140642 (0) **Instrument: ICPMS06** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

SD Sample ID: **HS19050331-01SD** Units: **mg/L** Analysis Date: **09-May-2019 16:24**
Client ID: Run ID: **ICPMS05_338124** SeqNo: **5069046** PrepDate: **08-May-2019** DF: **100**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Selenium	2.167	0.200					2.169	0.0975	10	

The following samples were analyzed in this batch: HS19050338-01 HS19050338-03 HS19050338-05 HS19050338-07 HS19050338-09 HS19050338-11

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19050338**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020
Texas	TX104704231-19-23	30-Apr-2020

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19050338

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19050338-01	20190503-NSF-PV83inlet-30MW3-D	Login	5/7/2019 11:34:05 AM	NDR	MET053
HS19050338-02	20190503-NSF-PV83inlet-30MW3-T	Login	5/7/2019 11:34:05 AM	NDR	MET053
HS19050338-03	20190503-NSF-PV83mid-30MW3-D	Login	5/7/2019 11:34:05 AM	NDR	MET053
HS19050338-04	20190503-NSF-PV83mid-30MW3-T	Login	5/7/2019 11:34:05 AM	NDR	MET053
HS19050338-05	20190503-NSF-PV83out-30MW3-D	Login	5/7/2019 11:34:05 AM	NDR	MET053
HS19050338-06	20190503-NSF-PV83out-30MW3-T	Login	5/7/2019 11:34:05 AM	NDR	MET053
HS19050338-07	20190503-NSF-PV76inlet-30FD-D	Login	5/7/2019 11:34:05 AM	NDR	MET053
HS19050338-08	20190503-NSF-PV76inlet-30FD-T	Login	5/7/2019 11:34:05 AM	NDR	MET053
HS19050338-09	20190503-NSF-PV76mid-30FD-D	Login	5/7/2019 11:34:05 AM	NDR	MET053
HS19050338-10	20190503-NSF-PV76mid-30FD-T	Login	5/7/2019 11:34:05 AM	NDR	MET053
HS19050338-11	20190503-NSF-PV76out-30FD-D	Login	5/7/2019 11:34:05 AM	NDR	MET053
HS19050338-12	20190503-NSF-PV76out-30FD-T	Login	5/7/2019 11:34:05 AM	NDR	MET053

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19050338
Date/Time Received: **07-May-2019 08:54**
Received by: **NDR**

Checklist completed by: *Nilesh D. Ranchod* eSignature 7-May-2019 Date
Reviewed by: *Dane J. Wacasey* eSignature 7-May-2019 Date

Matrices: **Water**
Carrier name: **FedEx International Priority**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	2 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	20.6C UC/C		IR11
Cooler(s)/Kit(s):	25533		
Date/Time sample(s) sent to storage:	05/07/2019 12:30		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Golder Associates Date Contacted: 7-May-2019 Person Contacted: Emily White
Contacted By: 369 Regarding: Turnaround time

Comments: COC lists 5 day TAT, Please use 3 day TAT for samples received 5/7/19

Corrective Action: Logged for 3 day TAT

ALS Environmental

Chain of Custody Form

Page 1 of 2

HS19050338

Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information		Parameter/Method Request for Analysis	
PO Number	130-2086-06	Project Name	Exide Column Studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086-06	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suite 260	Address	13515 Barrett Parkway Drive, Suite 260	E	ICP TW (6020A total metals (6)): Pb, Cd, Sb, Se, As, Fe
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	F	ICP DISS (6020A diss metals (6)-FldFltr): Pb, Cd, Sb, Se, As, Fe
Phone	314 984-8800	Phone	314 984-8800	G	
Fax		Fax		H	
e-Mail Address	ewhite@golder.com	e-Mail Address		I	
				J	

lo	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190503-NSF-PV83inlet-30MW3-D	05-03-19	8:55 PM	GW	2	1						X					
2	20190503-NSF-PV83inlet-30MW3-T	05-03-19	8:55 PM	GW	2	1					X						
3	20190503-NSF-PV83mid-30MW3-D	05-03-19	8:37 PM	GW	2	1						X					
4	20190503-NSF-PV83mid-30MW3-T	05-03-19	8:37 PM	GW	2	1					X						
5	20190503-NSF-PV83out-30MW3-D	05-03-19	2:30 PM	GW	2	1						X					
6	20190503-NSF-PV83out-30MW3-T	05-03-19	2:30 PM	GW	2	1					X						
7	20190503-NSF-PV76inlet-30FD-D	05-03-19	8:55 PM	GW	2	1						X					
8	20190503-NSF-PV76inlet-30FD-T	05-03-19	8:55 PM	GW	2	1					X						
9	20190503-NSF-PV76mid-30FD-D	05-03-19	8:37 PM	GW	2	1						X					
0	20190503-NSF-PV76mid-30FD-T	05-03-19	8:37 PM	GW	2	1					X						

mpler(s): Please Print & Sign
ovanna Llamosas

Shipment Method: FedEx

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☑ Other ☐ 2 Wk Days ☐ 24 Hour

Results Due Date: STD 5-DAY TAT

nquished by: vanna Llamosas	Date: 2019/05/06	15:30:00	Received by:	Notes:	
nquished by:	Date: 5/7/19	Time: 0534	Received by (Laboratory):	Cooler Temp. 4°C	QC Package: (Check Box Below)
ged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	20.6.	Level II: Standard QC; Level III: Std QC + Raw Data; Level IV: SW846 CLP-Like; Other:

QC Package: (Check Box Below)

	Level II: Standard QC	x	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other:		

servative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

e: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

25533

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ALS Environmental

Chain of Custody Form

Page 2 of 2

HS19050338

Golder Associates
Exide Column Studies

Customer Information		Project Information		ALS Project Manager:
PO Number	130-2086-06	Project Name	Exide Column Studies	
Work Order		Project Number	130-2086-06	
Company Name	Golder Associates	Bill To Company	Golder Associates	
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	
Address	13515 Barrett Parkway Drive, Suite 260	Address	13515 Barrett Parkway Drive, Suite 260	
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	
Phone	314 984-8800	Phone	314 984-8800	
Fax		Fax		
e-Mail Address	ewhite@golder.com	e-Mail Address		

Analysis Request Method

A	300 W (300Cl, SO4, NO3-48h HT)
B	TDS W 2540C (2540C TDS)
C	ALK W 2320B (2320B alkalinity)
D	HARD (2340B hardness (calc))
E	ICP TW (6020A total metals (6)): Pb, Cd, Sb, Se, As, Fe
F	ICP DISS (6020A diss metals (6)-FldFltr): Pb, Cd, Sb, Se, As, Fe
G	
H	
I	
J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
11	20190503-NSF-PV76out-30FD-D	05-03-19	2:30 PM	GW	2	1						X					
12	20190503-NSF-PV76out-30FD-T	05-03-19	2:30 PM	GW	2	1					X						
13																	
14																	
15																	
16																	
17																	
18																	
19																	
20																	

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method: FedEx

Required Turnaround Time: ☐ STD 10 Wk Days ☑ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hours ☑ Other _____

Results Due Date: STD 5-DAY TAT

Relinquished by: Giovanna Llamosas	Date: 2019/05/03	15:30:00	Received by:	Notes:
Relinquished by:	Date: 5/7/19	Time: 08:52	Received by (Laboratory): Non	Cooler Temp. 4cc
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	206

QC Package: (Check Box Below)

	Level II: Standard QC	x	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other:		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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ORIGIN ID:YUXA (514) 365-0990
Audrey Elheves
Gidder Associates Ltd
7250 rue du Mile End
3e etage
MONTREAL, PQ H2R3A4
CANADA, CA

SHIP DATE: 06MAY19
ACTWGT: 13.70 LB
CAD: 10868072/INET4102

BILL RECIPIENT
ENVOYÉ

TO Dane Wacasey
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

(281) 530-5656

FedEx Express

(US)

AWB

J19010500/ZOAX

NH SGRA

PKG/CUSTOMER

TRK# 7751 4057 4890

Form 0430

10:30A
INTL PRIORITY

REF:
DESC1: Échantillon d'eau
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: Audrey Elheves
TIC: R 967554812
DIT: R 967554812

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ALS Environmental
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel: +1 281 530 5656
Fax: +1 281 530 5887

CUSTODY SEAL

Date: 2019-05-05 Time: 15:30
Name: Jacqueline Edwards
Company: ALS Houston Laboratory

Seal Broken By: SM
Date: 05/07/19

MAY 07 2019

ALS Environmental
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel: +1 281 530 5656
Fax: +1 281 530 5887

CUSTODY SEAL

Date: 2019-05-05 Time: 15:30
Name: Jacqueline Edwards
Company: ALS Houston Laboratory

Seal Broken By: SM
Date: 05/07/19

Après l'impression de cette étiquette :
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10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

May 14, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19050692**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 12 sample(s) on May 11, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19050692**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS19050692**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 05/14/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19050692				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 140778,140779				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?			X		
		Were analytical duplicates analyzed at the appropriate frequency?			X		
		Were RPDs or relative standard deviations within the laboratory QC limits?			X		
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				2
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 05/14/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19050692				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 140778,140779				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		X			3
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports		
Laboratory Name: ALS Laboratory Group		LRC Date: 05/14/2019
Project Name: Exide Column Studies		Laboratory Job Number: HS19050692
Reviewer Name: Dane Wacasey		Prep Batch Number(s): 140778,140779
ER#[5]	**Description**	
1	Batch 140778, Metals Method SW6020, sample 20190509-NSF-PV91inlet-30MW3-D, MS and or MSD recovered outside the control limits for Antimony due to suspect matrix effect. For Lead and Selenium the result in the parent sample is greater than 4x the spike amount. Batch 140779, Metals Method SW6020, sample 20190509-NSF-PV91inlet-30MW3-T, MS and or MSD recovered outside the control limits for Arsenic, Lead and Selenium, however, the result in the parent sample is greater than 4x the spike amount.	
3	Batch 140779, Metals Method SW6020, samples diluted due to high sodium cotent.	
3	Batch 140779, Metals Method SW6020, sample 20190509-NSF-PV91inlet-30MW3-T, PDS recovered outside the control limit for Lead, however, the result in the parent sample is greater than 4x the spike amount.	

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19050692

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19050692-01	20190509-NSF-PV91inlet-30MW3-D	Groundwater		09-May-2019 20:50	11-May-2019 09:18	☐
HS19050692-02	20190509-NSF-PV91inlet-30MW3-T	Groundwater		09-May-2019 20:50	11-May-2019 09:18	☐
HS19050692-03	20190509-NSF-PV91mid-30MW3-D	Groundwater		09-May-2019 20:40	11-May-2019 09:18	☐
HS19050692-04	20190509-NSF-PV91mid-30MW3-T	Groundwater		09-May-2019 20:40	11-May-2019 09:18	☐
HS19050692-05	20190509-NSF-PV91out-30MW3-D	Groundwater		09-May-2019 14:15	11-May-2019 09:18	☐
HS19050692-06	20190509-NSF-PV91out-30MW3-T	Groundwater		09-May-2019 14:15	11-May-2019 09:18	☐
HS19050692-07	20190509-NSF-PV84inlet-30FD-D	Groundwater		09-May-2019 20:50	11-May-2019 09:18	☐
HS19050692-08	20190509-NSF-PV84inlet-30FD-T	Groundwater		09-May-2019 20:50	11-May-2019 09:18	☐
HS19050692-09	20190509-NSF-PV84mid-30FD-D	Groundwater		09-May-2019 20:40	11-May-2019 09:18	☐
HS19050692-10	20190509-NSF-PV84mid-30FD-T	Groundwater		09-May-2019 20:40	11-May-2019 09:18	☐
HS19050692-11	20190509-NSF-PV84out-30FD-D	Groundwater		09-May-2019 14:15	11-May-2019 09:18	☐
HS19050692-12	20190509-NSF-PV84out-30FD-T	Groundwater		09-May-2019 14:15	11-May-2019 09:18	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190509-NSF-PV91inlet-30MW3-D
Collection Date: 09-May-2019 20:50

ANALYTICAL REPORT
WorkOrder:HS19050692
Lab ID:HS19050692-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 13-May-2019		Analyst: JHD
Antimony	**0.0877**		**0.00400**	**0.0200**	**mg/L**	10	14-May-2019 13:44
Arsenic	**0.285**		**0.000400**	**0.00200**	**mg/L**	1	13-May-2019 17:09
Cadmium	**0.0614**		**0.000200**	**0.00200**	**mg/L**	1	13-May-2019 17:09
Iron	U		0.0120	0.200	mg/L	1	13-May-2019 17:09
Lead	**0.418**		**0.00600**	**0.0200**	**mg/L**	10	14-May-2019 13:44
Selenium	**2.15**		**0.0110**	**0.0200**	**mg/L**	10	14-May-2019 13:44

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190509-NSF-PV91inlet-30MW3-T
Collection Date: 09-May-2019 20:50

ANALYTICAL REPORT
WorkOrder:HS19050692
Lab ID:HS19050692-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 13-May-2019		Analyst: JHD
Antimony	**0.106**		**0.00200**	**0.0100**	**mg/L**	5	14-May-2019 15:17
Arsenic	**0.304**		**0.00200**	**0.0100**	**mg/L**	5	14-May-2019 15:17
Cadmium	**0.0774**		**0.00100**	**0.0100**	**mg/L**	5	14-May-2019 15:17
Iron	**1.46**		**0.0600**	**1.00**	**mg/L**	5	14-May-2019 15:17
Lead	**2.36**		**0.00300**	**0.0100**	**mg/L**	5	14-May-2019 15:17
Selenium	**2.19**		**0.00550**	**0.0100**	**mg/L**	5	14-May-2019 15:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190509-NSF-PV91mid-30MW3-D
Collection Date: 09-May-2019 20:40

ANALYTICAL REPORT
WorkOrder:HS19050692
Lab ID:HS19050692-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 13-May-2019		Analyst: JHD
Antimony	**0.0291**		**0.000400**	**0.00200**	**mg/L**	1	13-May-2019 17:27
Arsenic	U		0.000400	0.00200	mg/L	1	13-May-2019 17:27
Cadmium	U		0.000200	0.00200	mg/L	1	13-May-2019 17:27
Iron	**2.96**		**0.0120**	**0.200**	**mg/L**	1	13-May-2019 17:27
Lead	U		0.000600	0.00200	mg/L	1	13-May-2019 17:27
Selenium	**1.17**		**0.00110**	**0.00200**	**mg/L**	1	13-May-2019 17:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190509-NSF-PV91mid-30MW3-T
Collection Date: 09-May-2019 20:40

ANALYTICAL REPORT
WorkOrder:HS19050692
Lab ID:HS19050692-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 13-May-2019		Analyst: JHD
Antimony	**0.0285**		**0.00200**	**0.0100**	**mg/L**	5	14-May-2019 14:48
Arsenic	U		0.00200	0.0100	mg/L	5	14-May-2019 14:48
Cadmium	U		0.00100	0.0100	mg/L	5	14-May-2019 14:48
Iron	**8.31**		**0.0600**	**1.00**	**mg/L**	5	14-May-2019 14:48
Lead	U		0.00300	0.0100	mg/L	5	14-May-2019 14:48
Selenium	**1.02**		**0.00550**	**0.0100**	**mg/L**	5	14-May-2019 14:48

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190509-NSF-PV91out-30MW3-D
Collection Date: 09-May-2019 14:15

ANALYTICAL REPORT
WorkOrder:HS19050692
Lab ID:HS19050692-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 13-May-2019		Analyst: JHD
Antimony	**0.00401**		**0.000400**	**0.00200**	**mg/L**	1	13-May-2019 17:57
Arsenic	U		0.000400	0.00200	mg/L	1	13-May-2019 17:57
Cadmium	U		0.000200	0.00200	mg/L	1	13-May-2019 17:57
Iron	**0.224**		**0.0120**	**0.200**	**mg/L**	1	13-May-2019 17:57
Lead	U		0.000600	0.00200	mg/L	1	13-May-2019 17:57
Selenium	**0.269**		**0.00110**	**0.00200**	**mg/L**	1	13-May-2019 17:57

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190509-NSF-PV91out-30MW3-T
Collection Date: 09-May-2019 14:15

ANALYTICAL REPORT
WorkOrder:HS19050692
Lab ID:HS19050692-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 13-May-2019		Analyst: JHD
Antimony	**0.00410**	J	**0.00200**	**0.0100**	**mg/L**	5	14-May-2019 14:50
Arsenic	U		0.00200	0.0100	mg/L	5	14-May-2019 14:50
Cadmium	U		0.00100	0.0100	mg/L	5	14-May-2019 14:50
Iron	**7.03**		**0.0600**	**1.00**	**mg/L**	5	14-May-2019 14:50
Lead	U		0.00300	0.0100	mg/L	5	14-May-2019 14:50
Selenium	**0.218**		**0.00550**	**0.0100**	**mg/L**	5	14-May-2019 14:50

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190509-NSF-PV84inlet-30FD-D
Collection Date: 09-May-2019 20:50

ANALYTICAL REPORT
WorkOrder:HS19050692
Lab ID:HS19050692-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 13-May-2019		Analyst: JHD
Antimony	**0.140**		**0.000400**	**0.00200**	**mg/L**	1	13-May-2019 17:59
Arsenic	**0.265**		**0.000400**	**0.00200**	**mg/L**	1	13-May-2019 17:59
Cadmium	**0.0596**		**0.000200**	**0.00200**	**mg/L**	1	13-May-2019 17:59
Iron	U		0.0120	0.200	mg/L	1	13-May-2019 17:59
Lead	**0.272**		**0.000600**	**0.00200**	**mg/L**	1	13-May-2019 17:59
Selenium	**2.25**		**0.0220**	**0.0400**	**mg/L**	20	14-May-2019 13:48

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190509-NSF-PV84inlet-30FD-T
Collection Date: 09-May-2019 20:50

ANALYTICAL REPORT
WorkOrder:HS19050692
Lab ID:HS19050692-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 13-May-2019		Analyst: JHD
Antimony	**0.149**		**0.00200**	**0.0100**	**mg/L**	5	14-May-2019 14:51
Arsenic	**0.316**		**0.00200**	**0.0100**	**mg/L**	5	14-May-2019 14:51
Cadmium	**0.0715**		**0.00100**	**0.0100**	**mg/L**	5	14-May-2019 14:51
Iron	**1.36**		**0.0600**	**1.00**	**mg/L**	5	14-May-2019 14:51
Lead	**2.36**		**0.00300**	**0.0100**	**mg/L**	5	14-May-2019 14:51
Selenium	**2.33**		**0.00550**	**0.0100**	**mg/L**	5	14-May-2019 14:51

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190509-NSF-PV84mid-30FD-D
Collection Date: 09-May-2019 20:40

ANALYTICAL REPORT
WorkOrder:HS19050692
Lab ID:HS19050692-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 13-May-2019		Analyst: JHD
Antimony	**0.00146**	J	**0.000400**	**0.00200**	**mg/L**	1	13-May-2019 18:00
Arsenic	U		0.000400	0.00200	mg/L	1	13-May-2019 18:00
Cadmium	U		0.000200	0.00200	mg/L	1	13-May-2019 18:00
Iron	**1.58**		**0.0120**	**0.200**	**mg/L**	1	13-May-2019 18:00
Lead	U		0.000600	0.00200	mg/L	1	13-May-2019 18:00
Selenium	**0.753**		**0.00110**	**0.00200**	**mg/L**	1	13-May-2019 18:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190509-NSF-PV84mid-30FD-T
Collection Date: 09-May-2019 20:40

ANALYTICAL REPORT
WorkOrder:HS19050692
Lab ID:HS19050692-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 13-May-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	14-May-2019 14:56
Arsenic	U		0.00200	0.0100	mg/L	5	14-May-2019 14:56
Cadmium	U		0.00100	0.0100	mg/L	5	14-May-2019 14:56
Iron	**7.90**		**0.0600**	**1.00**	**mg/L**	5	14-May-2019 14:56
Lead	U		0.00300	0.0100	mg/L	5	14-May-2019 14:56
Selenium	**0.664**		**0.00550**	**0.0100**	**mg/L**	5	14-May-2019 14:56

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190509-NSF-PV84out-30FD-D
Collection Date: 09-May-2019 14:15

ANALYTICAL REPORT
WorkOrder:HS19050692
Lab ID:HS19050692-11
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 13-May-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	13-May-2019 18:03
Arsenic	U		0.000400	0.00200	mg/L	1	13-May-2019 18:03
Cadmium	U		0.000200	0.00200	mg/L	1	13-May-2019 18:03
Iron	U		0.0120	0.200	mg/L	1	13-May-2019 18:03
Lead	U		0.000600	0.00200	mg/L	1	13-May-2019 18:03
Selenium	**0.00507**		**0.00110**	**0.00200**	**mg/L**	1	13-May-2019 18:03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190509-NSF-PV84out-30FD-T
Collection Date: 09-May-2019 14:15

ANALYTICAL REPORT
WorkOrder:HS19050692
Lab ID:HS19050692-12
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 13-May-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	14-May-2019 14:57
Arsenic	U		0.00200	0.0100	mg/L	5	14-May-2019 14:57
Cadmium	U		0.00100	0.0100	mg/L	5	14-May-2019 14:57
Iron	**4.55**		**0.0600**	**1.00**	**mg/L**	5	14-May-2019 14:57
Lead	U		0.00300	0.0100	mg/L	5	14-May-2019 14:57
Selenium	U		0.00550	0.0100	mg/L	5	14-May-2019 14:57

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050692

Batch ID: 140778 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19050692-01	1	10	10 (mL)	1
HS19050692-03	1	10	10 (mL)	1
HS19050692-05	1	10	10 (mL)	1
HS19050692-07	1	10	10 (mL)	1
HS19050692-09	1	10	10 (mL)	1
HS19050692-11	1	10	10 (mL)	1

Batch ID: 140779 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19050692-02	1	10	10 (mL)	1
HS19050692-04	1	10	10 (mL)	1
HS19050692-06	1	10	10 (mL)	1
HS19050692-08	1	10	10 (mL)	1
HS19050692-10	1	10	10 (mL)	1
HS19050692-12	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050692

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 140778	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS19050692-01	20190509-NSF-PV91inlet-30MW3-D	09 May 2019 20:50		13 May 2019 12:00	14 May 2019 13:44	10
HS19050692-01	20190509-NSF-PV91inlet-30MW3-D	09 May 2019 20:50		13 May 2019 12:00	13 May 2019 17:09	1
HS19050692-03	20190509-NSF-PV91mid-30MW3-D	09 May 2019 20:40		13 May 2019 12:00	13 May 2019 17:27	1
HS19050692-05	20190509-NSF-PV91out-30MW3-D	09 May 2019 14:15		13 May 2019 12:00	13 May 2019 17:57	1
HS19050692-07	20190509-NSF-PV84inlet-30FD-D	09 May 2019 20:50		13 May 2019 12:00	14 May 2019 13:48	20
HS19050692-07	20190509-NSF-PV84inlet-30FD-D	09 May 2019 20:50		13 May 2019 12:00	13 May 2019 17:59	1
HS19050692-09	20190509-NSF-PV84mid-30FD-D	09 May 2019 20:40		13 May 2019 12:00	13 May 2019 18:00	1
HS19050692-11	20190509-NSF-PV84out-30FD-D	09 May 2019 14:15		13 May 2019 12:00	13 May 2019 18:03	1
Batch ID 140779	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19050692-02	20190509-NSF-PV91inlet-30MW3-T	09 May 2019 20:50		13 May 2019 12:00	14 May 2019 15:17	5
HS19050692-04	20190509-NSF-PV91mid-30MW3-T	09 May 2019 20:40		13 May 2019 12:00	14 May 2019 14:48	5
HS19050692-06	20190509-NSF-PV91out-30MW3-T	09 May 2019 14:15		13 May 2019 12:00	14 May 2019 14:50	5
HS19050692-08	20190509-NSF-PV84inlet-30FD-T	09 May 2019 20:50		13 May 2019 12:00	14 May 2019 14:51	5
HS19050692-10	20190509-NSF-PV84mid-30FD-T	09 May 2019 20:40		13 May 2019 12:00	14 May 2019 14:56	5
HS19050692-12	20190509-NSF-PV84out-30FD-T	09 May 2019 14:15		13 May 2019 12:00	14 May 2019 14:57	5

WorkOrder: HS19050692
InstrumentID: ICPMS06
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000461	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000438	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000484	0.000200	0.00200
A	Iron	7439-89-6	0.0500	0.0528	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000931	0.000600	0.00200
A	Selenium	7782-49-2	0.00250	0.00239	0.00110	0.00200

WorkOrder: HS19050692
InstrumentID: ICPMS06
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000461	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000438	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000484	0.000200	0.00200
A	Iron	7439-89-6	0.0500	0.0528	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000931	0.000600	0.00200
A	Selenium	7782-49-2	0.00250	0.00239	0.00110	0.00200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050692

QC BATCH REPORT

Batch ID: 140778 (0) **Instrument:** ICPMS06 **Method:** DISSOLVED METALS BY SW6020A (DISSOLVED)

MBLK Sample ID: **MBLK-140778** Units: **mg/L** Analysis Date: **13-May-2019 17:07**
Client ID: Run ID: **ICPMS06_338296** SeqNo: **5073178** PrepDate: **13-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Iron	U	0.200								
Lead	U	0.00200								
Selenium	U	0.00200								

LCS Sample ID: **LCS-140778** Units: **mg/L** Analysis Date: **13-May-2019 17:08**
Client ID: Run ID: **ICPMS06_338296** SeqNo: **5073179** PrepDate: **13-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.0532	0.00200	0.05	0	106	80 - 120				
Arsenic	0.05254	0.00200	0.05	0	105	80 - 120				
Cadmium	0.0538	0.00200	0.05	0	108	80 - 120				
Iron	5.239	0.200	5	0	105	80 - 120				
Lead	0.0519	0.00200	0.05	0	104	80 - 120				
Selenium	0.05364	0.00200	0.05	0	107	80 - 120				

MS Sample ID: **HS19050692-01MS** Units: **mg/L** Analysis Date: **13-May-2019 17:12**
Client ID: **20190509-NSF-PV91inlet-30MW3-D** Run ID: **ICPMS06_338296** SeqNo: **5073182** PrepDate: **13-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1622	0.00200	0.05	0.09318	138	75 - 125				S
Arsenic	0.3418	0.00200	0.05	0.2849	114	75 - 125				O
Cadmium	0.1103	0.00200	0.05	0.06142	97.7	75 - 125				
Iron	4.866	0.200	5	0.005985	97.2	75 - 125				
Lead	0.5699	0.00200	0.05	0.495	150	75 - 125				SO
Selenium	2.668	0.00200	0.05	2.593	150	75 - 125				SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050692

QC BATCH REPORT

Batch ID: 140778 (0) **Instrument:** ICPMS06 **Method:** DISSOLVED METALS BY SW6020A (DISSOLVED)

MSD Sample ID: **HS19050692-01MSD** Units: **mg/L** Analysis Date: **13-May-2019 17:14**
Client ID: **20190509-NSF-PV91inlet-30MW3-D** Run ID: **ICPMS06_338296** SeqNo: **5073183** PrepDate: **13-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1684	0.00200	0.05	0.09318	150	75 - 125	0.1622	3.75	20	S
Arsenic	0.3384	0.00200	0.05	0.2849	107	75 - 125	0.3418	1.02	20	O
Cadmium	0.1036	0.00200	0.05	0.06142	84.4	75 - 125	0.1103	6.21	20	
Iron	4.97	0.200	5	0.005985	99.3	75 - 125	4.866	2.12	20	
Lead	0.5006	0.00200	0.05	0.495	11.3	75 - 125	0.5699	12.9	20	SO
Selenium	2.709	0.00200	0.05	2.593	232	75 - 125	2.668	1.51	20	SEO

PDS Sample ID: **HS19050692-01PDS** Units: **mg/L** Analysis Date: **14-May-2019 13:46**
Client ID: **20190509-NSF-PV91inlet-30MW3-D** Run ID: **ICPMS06_338370** SeqNo: **5074200** PrepDate: **13-May-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	1.277	0.0200	1	0.08774	119	75 - 125				
Lead	1.561	0.0200	1	0.4175	114	75 - 125				
Selenium	3.228	0.0200	1	2.153	107	75 - 125				

PDS Sample ID: **HS19050692-01PDS** Units: **mg/L** Analysis Date: **13-May-2019 17:15**
Client ID: **20190509-NSF-PV91inlet-30MW3-D** Run ID: **ICPMS06_338296** SeqNo: **5073184** PrepDate: **13-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.3766	0.00200	0.1	0.2849	91.7	75 - 125				
Cadmium	0.1587	0.00200	0.1	0.06142	97.3	75 - 125				
Iron	9.847	0.200	10	0.005985	98.4	75 - 125				

SD Sample ID: **HS19050692-01SD** Units: **mg/L** Analysis Date: **14-May-2019 13:45**
Client ID: **20190509-NSF-PV91inlet-30MW3-D** Run ID: **ICPMS06_338370** SeqNo: **5074199** PrepDate: **13-May-2019** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	0.09172	0.100					0.08774	0	10	J
Lead	0.4064	0.100					0.4175	2.65	10	
Selenium	2.141	0.100					2.153	0.579	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050692

QC BATCH REPORT

Batch ID: **140778 (0)** **Instrument:** **ICPMS06** **Method:** **DISSOLVED METALS BY SW6020A (DISSOLVED)**

SD Sample ID: **HS19050692-01SD** Units: **mg/L** Analysis Date: **13-May-2019 17:11**
Client ID: **20190509-NSF-PV91inlet-30MW3-D** Run ID: **ICPMS06_338296** SeqNo: **5073181** PrepDate: **13-May-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Arsenic	0.2567	0.0100					0.2849	9.9	10	
Cadmium	0.05969	0.0100					0.06142	2.82	10	
Iron	U	1.00					0.005985	0	10	

The following samples were analyzed in this batch: HS19050692-01 HS19050692-03 HS19050692-05 HS19050692-07 HS19050692-09 HS19050692-11

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050692

QC BATCH REPORT

Batch ID: 140779 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLK-140779** Units: **mg/L** Analysis Date: **14-May-2019 15:15**
Client ID: Run ID: **ICPMS06_338370** SeqNo: **5074406** PrepDate: **13-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Iron	U	0.200								
Lead	U	0.00200								
Selenium	U	0.00200								

LCS Sample ID: **LCS-140779** Units: **mg/L** Analysis Date: **13-May-2019 23:51**
Client ID: Run ID: **ICPMS06_338296** SeqNo: **5073389** PrepDate: **13-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05314	0.00200	0.05	0	106	80 - 120				
Arsenic	0.05307	0.00200	0.05	0	106	80 - 120				
Cadmium	0.0529	0.00200	0.05	0	106	80 - 120				
Iron	5.266	0.200	5	0	105	80 - 120				
Lead	0.05094	0.00200	0.05	0	102	80 - 120				
Selenium	0.05418	0.00200	0.05	0	108	80 - 120				

MS Sample ID: **HS19050692-02MS** Units: **mg/L** Analysis Date: **14-May-2019 15:20**
Client ID: **20190509-NSF-PV91inlet-30MW3-T** Run ID: **ICPMS06_338370** SeqNo: **5074409** PrepDate: **13-May-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1538	0.0100	0.05	0.09747	113	80 - 120				
Arsenic	0.3578	0.0100	0.05	0.2845	147	80 - 120				SO
Cadmium	0.122	0.0100	0.05	0.07548	92.9	80 - 120				
Iron	6.54	1.00	5	1.4	103	80 - 120				
Lead	2.378	0.0100	0.05	2.208	340	80 - 120				SO
Selenium	2.219	0.0100	0.05	2.123	192	80 - 120				SO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050692

QC BATCH REPORT

Batch ID: 140779 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

MSD Sample ID: **HS19050692-02MSD** Units: **mg/L** Analysis Date: **14-May-2019 15:21**
Client ID: **20190509-NSF-PV91inlet-30MW3-T** Run ID: **ICPMS06_338370** SeqNo: **5074410** PrepDate: **13-May-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1528	0.0100	0.05	0.09747	111	80 - 120	0.147	3.89	20	
Arsenic	0.3501	0.0100	0.05	0.2845	131	80 - 120	0.3369	3.84	20	SO
Cadmium	0.1242	0.0100	0.05	0.07548	97.4	80 - 120	0.1194	3.89	20	
Iron	6.506	1.00	5	1.4	102	80 - 120	6.158	5.49	20	
Lead	2.489	0.0100	0.05	2.208	562	80 - 120	2.328	6.7	20	SO
Selenium	2.198	0.0100	0.05	2.123	150	80 - 120	2.186	0.575	20	SO

PDS Sample ID: **HS19050692-02PDS** Units: **mg/L** Analysis Date: **14-May-2019 15:23**
Client ID: **20190509-NSF-PV91inlet-30MW3-T** Run ID: **ICPMS06_338370** SeqNo: **5074411** PrepDate: **13-May-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.59	0.0100	0.5	0.09747	98.5	75 - 125				
Arsenic	0.8049	0.0100	0.5	0.2845	104	75 - 125				
Cadmium	0.5502	0.0100	0.5	0.07548	94.9	75 - 125				
Iron	52.36	1.00	50	1.4	102	75 - 125				
Lead	3.063	0.0100	0.5	2.208	171	75 - 125				SO
Selenium	2.683	0.0100	0.5	2.123	112	75 - 125				O

SD Sample ID: **HS19050692-02SD** Units: **mg/L** Analysis Date: **14-May-2019 15:18**
Client ID: **20190509-NSF-PV91inlet-30MW3-T** Run ID: **ICPMS06_338370** SeqNo: **5074408** PrepDate: **13-May-2019** DF: **25**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	0.1039	0.0500					0.09747	6.65	10	
Arsenic	0.3078	0.0500					0.2845	8.18	10	
Cadmium	0.08015	0.0500					0.07548	6.18	10	
Iron	1.436	5.00					1.4	0	10	J
Lead	2.24	0.0500					2.208	1.46	10	
Selenium	2.145	0.0500					2.123	1.02	10	

The following samples were analyzed in this batch: HS19050692-02 HS19050692-04 HS19050692-06 HS19050692-08 HS19050692-10 HS19050692-12

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19050692**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020
Texas	TX104704231-19-23	30-Apr-2020

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19050692
Date/Time Received: **11-May-2019 09:18**
Received by: **PMG**

Checklist completed by: *Paresh M. Giga* eSignature 11-May-2019 Date
Reviewed by: *Dane J. Wacasey* eSignature 13-May-2019 Date

Matrices: **Groundwater**
Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	2 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:None
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	18.1c U/c	IR25	
Cooler(s)/Kit(s):	44602		
Date/Time sample(s) sent to storage:	5/11/19 12:05		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

ALS Environmental

Chain of Custody Form

Page 1 of 2

HS19050692

Golder Associates
Exide Column Studies

Customer Information		Project Information		ALS Project Manager:	
PO Number	130-2086-06	Project Name	Exide Column Studies	A	300 W (300Cl, SO4, NO3-48h HT)
Work Order		Project Number	130-2086-06	B	TDS W 2540C (2540C TDS)
Company Name	Golder Associates	Bill To Company	Golder Associates	C	ALK W 2320B (2320B alkalinity)
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	D	HARD (2340B hardness (calc))
Address	13515 Barrett Parkway Drive, Suite 260	Address	13515 Barrett Parkway Drive, Suite 260	E	ICP TW (6020A total metals (6)): Pb, Cd, Sb, Se, As, Fe
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	F	ICP DISS (6020A diss metals (6)-FldFltr): Pb, Cd, Sb, Se, As, Fe
Phone	314 984-8800	Phone	314 984-8800	G	
Fax		Fax		H	
e-Mail Address	ewhite@golder.com	e-Mail Address		I	
				J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190509-NSF-PV91inlet-30MW3-D	05-09-19	8:50 PM	GW	2	1						X					
2	20190509-NSF-PV91inlet-30MW3-T	05-09-19	8:50 PM	GW	2	1					X						
3	20190509-NSF-PV91mid-30MW3-D	05-09-19	8:40 PM	GW	2	1						X					
4	20190509-NSF-PV91mid-30MW3-T	05-09-19	8:40 PM	GW	2	1					X						
5	20190509-NSF-PV91out-30MW3-D	05-09-19	2:15 PM	GW	2	1						X					
6	20190509-NSF-PV91out-30MW3-T	05-09-19	2:15 PM	GW	2	1					X						
7	20190509-NSF-PV84inlet-30FD-D	05-09-19	8:50 PM	GW	2	1						X					
8	20190509-NSF-PV84inlet-30FD-T	05-09-19	8:50 PM	GW	2	1					X						
9	20190509-NSF-PV84mid-30FD-D	05-09-19	8:40 PM	GW	2	1						X					
10	20190509-NSF-PV84mid-30FD-T	05-09-19	8:40 PM	GW	2	1					X						

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method: FedEx

Required Turnaround Time: ☐STD 10 Wk Days ☐5 Wk Days ☐Other ☑24 Hour

Results Due Date: URGENT 24-HOURS TAT

Relinquished by:	Date:	Time:	Received by:
Giovanna Llamosas	2019/05/09	15:30:00	
Relinquished by:	Date:	Time:	Received by (Laboratory): 5/11/19 09:18
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes:

Cooler Temp. 18.1° 4.2°

QC Package: (Check Box Below)

	Level II: Standard QC	x	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other:		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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44602

ALS Environmental

Chain of Custody Form

Page 2 of 2

HS19050692

Golder Associates
Exide Column Studies

ALS Project Manager:

Customer Information		Project Information	
PO Number	130-2086-06	Project Name	Exide Column Studies
Work Order		Project Number	130-2086-06
Company Name	Golder Associates	Bill To Company	Golder Associates
Send Report To	Emily White	Invoice Attn	Tammy Kurzmack Exide A/P
Address	13515 Barrett Parkway Drive, Suite 260	Address	13515 Barrett Parkway Drive, Suite 260
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021
Phone	314 984-8800	Phone	314 984-8800
Fax		Fax	
e-Mail Address	ewhite@golder.com	e-Mail Address	

A	300 W (300Cl, SO4, NO3-48h HT)
B	TDS W 2540C (2540C TDS)
C	ALK W 2320B (2320B alkalinity)
D	HARD (2340B hardness (calc))
E	ICP TW (6020A total metals (6)): Pb, Cd, Sb, Se, As, Fe
F	ICP DISS (6020A diss metals (6)-FldFltr): Pb, Cd, Sb, Se, As, Fe
G	
H	
I	
J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
11	20190509-NSF-PV84out-30FD-D	05-09-19	2:15 PM	GW	2	1						X					
12	20190509-NSF-PV84out-30FD-T	05-09-19	2:15 PM	GW	2	1					X						
13																	
14																	
15																	
16																	
17																	
18																	
19																	
20																	

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method: FedEx

Required Turnaround Time: ☐STD 10 Wk Days ☐5 Wk Days ☐2 Wk Days ☑24 Hour ☐Other ____

Results Due Date: URGENT 24-HOURS TAT

Relinquished by: Giovanna Llamosas	Date: 2019/05/09	15:30:00	Received by:	Notes:
Relinquished by:	Date:	Time:	Received by (Laboratory):	Cooler Temp.
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	

QC Package: (Check Box Below)

	Level II: Standard QC	x	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other:		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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ORIGIN ID:YUXA (514) 383-0990
AUDREY ETHEVES
GOLDER ASSOCIATES LTD
7250 RUE DU MILE END
3E ETAGE
MONTREAL, PQ H2R3A4
CANADA CA

SHIP DATE: 10MAY19
ACTWGT: 13.75 LB
CAD: 108680724/INET4102

BILL RECIPIENT

TO **DANE WACASEY**
ALS HOUSTON LABORATORY
10450 STANCLIFF RD
STE 210
HOUSTON TX 77099 **(US)**
(281) 530-5656 REF:
INV:
PO: DEPT:

565J1/D66C/234D

FedEx Express

J181018070/3W

TRK# 0430 **7751 8994 6549**

SATURDAY 12:00P
INTL PRIORITY

X0 SGRA

77099
TX-US IAH

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DÉFINITIONS. Dans le présent terme de transport aérien, « nous », « notre », « vos » et « FedEx » ont rapportent à Federal Express Corporation, ses filiales, successeurs et ayants droit/ayants. mandataires, fournisseurs et prestataires indépendants. « Vous » et « votre » ont rapportent à l'expéditeur, ses employés, donneurs d'ordre et mandataires. Si l'envoi ne provient pas des États-Unis, vous convenez d'expédition est conclu avec la filiale, le successeur ou les prestataires indépendants de FedEx ayant à l'origine accepté de procéder à l'expédition. « Colis » s'entend de tout conteneur ou de toute enveloppe dans nous acceptons d'effectuer la livraison, notamment les marchandises remises au transporteur par vous dans le but de tous systèmes automatisés, ordinateurs, numériques ou autres de transport. « Envoi » s'entend de tout colis mais dans le cadre d'une même liste de transport donnée. RÉFÉRENCE RELATIVE AU TRANSPORT AÉRIEN. La Convention de Varsovie et les conventions qui la modifient ou la complètent (collectivement, la Convention de Varsovie) régit et limite dans la plupart des cas la responsabilité de FedEx en cas de perte, retard ou dommage affectant votre envoi. La Convention de Varsovie s'applique à tout transport international effectué par FedEx, sauf si vous et nous convenons expressément du contraire. Le transport international s'entend de tout transport entre deux points situés dans deux États différents, ou entre deux points situés dans un même État si une escale est prévue dans un autre État, même si ce transport est effectué par d'autres transporteurs que FedEx. Le transport entre deux points situés aux États-Unis, y compris l'interposition d'une escale en dehors des États-Unis, est considéré comme un transport national et non international. RÉFÉRENCE RELATIVE AU TRANSPORT ROUTIER. La responsabilité de FedEx en cas de perte, retard ou dommage affectant votre envoi transporté par route (« CMR ») n'est soumise aux termes et conditions de la Convention de Varsovie, sauf dispositions contraires de la présente lettre de transport aérien. Conformément aux envois transportés exclusivement par voie terrestre, les clauses de la CMR prévalent en cas de conflit entre les dispositions de la CMR et celles de la présente lettre de transport aérien. LIMITATION DE RESPONSABILITÉ. La responsabilité maximale de FedEx en cas de dommage, perte, retard, manque, erreur de livraison, mélange de livraison, mécanismes inconnus ou défaut d'informations relatives à l'envoi est limitée par le présent Contrat et conformément au contrat d'expédition, à moins responsabilité n'est pas régie par la Convention de Varsovie, la CMR ou autres traités internationaux, tels dispositions intégrées dans, ou clauses. Veuillez vous référer au contrat d'expédition ci-joint ou document équivalent pour déterminer les limites contractuelles. FedEx ne propose pas de responsabilités supplémentaires contractuelles ni assurance. Tout litige, mais il vous est possible de payer des frais supplémentaires par tranche de 100 M/S supplémentaires (ou équivalent en monnaie locale du pays d'origine) de valeur d'expédition déclarée. Si la valeur d'expédition déclarée est supérieure, et des frais supplémentaires sont acquittés, la responsabilité de FedEx ne vous alors à la valeur la plus faible entre la valeur déclarée et les dommages réels. EXCLUSION DE RESPONSABILITÉ. FEDEX NE SAURAIT EN AUCUN CAS ÊTRE TENU POUR RESPONSABLE DE TOUT DOMMAGE DIRECT, INDIRECT, ACCESSOIRE, SPÉCIAL OU CONSÉCUTIF, SUPÉRIEUR À LA VALEUR DÉCLARÉE D'UN COLIS, SAUF DANS LA MESURE OÙ LA LOI INTERDIT UNE TELLE EXCLUSION. BÉNÉFICES OU LA VALEUR RÉELLE DE L'ENVOI, SI CELLE-CI EST INFÉRIEURE, QUE FEDEX AIT PU OU NON SAVOIR QUE DE TELS DOMMAGES POURRAIENT SURVENIR. FedEx ne saurait en aucun cas être tenu pour responsable de tous dommages, pertes, retards, manques, erreurs de livraison, défauts de livraison, informations inconnues ou défaut d'informations relativement aux envois de liquidités, devises ou autres marchandises interdites, événements hors de notre contrôle tels que les catastrophes naturelles, risques externes, conditions météorologiques, retards mécaniques, actes de terrorisme, guerre, grèves, désordres publics, mêlée, suppressions ou limitations des autorités publiques (notamment des douanes ou responsables de la santé publique) sont exclus. DÉFAUT DE GARANTIE. Nous n'accordons aucune garantie, expresse ou tacite, RECOURS EN CAS DE PERTE, DOMMAGE OU RETARD. TOUT RECOURS DOIT ÊTRE EXERCÉ PAR ÉCRIT ET DANS DES DÉLAIS STRICTS. VOIR NOS TARIFS. LE GUIDE DES SERVICES FEDEX EN VIGUEUR OU LES CONDITIONS STANDARD D'EXPÉDITION POUR PLUS D'INFORMATIONS. La Convention de Varsovie prévoit des procédures de recours écrites applicables en cas de dommages, retard ou délai de livraison des envois. En outre, l'expédition et la mise en application des dispositions relatives aux « délais de » de la Convention de Varsovie peuvent varier d'un pays à l'autre. Veuillez vous référer à la Convention pour déterminer les délais de recours applicables à votre envoi. Le droit à dommages-intérêts s'éteint, sauf si un recours est formé dans un délai de deux ans, comme spécifié dans la Convention. FedEx n'est pas tenu de répondre à un recours avant que tous les frais d'expédition n'aient été acquittés. Le montant du recours peut ne pas être déduit des frais d'expédition. Si la déclaration acceptée fonctionne sans aucun dommage sur le bulletin de livraison, FedEx considérera alors que la marchandise a été livrée dans de bonnes conditions. Afin que nous puissions répondre aux demandes de dommages, nous vous demandons de mettre à notre disposition les conteneurs, cartons d'expédition et emballages d'origine à des fins d'inspection. DROIT IMPÉRATIF. Dans un pays tiers, des dispositions contenues ou d'être dans la présente lettre de transport aérien est à l'encontre des textes, lois, dispositions réglementaires, décrets ou décrets internationaux, le(des) dispositif(s) restent en vigueur dans le cadre du présent contrat dans la mesure où cela n'est pas annulé. Le fait que l'une des dispositions soit modifiée ou inapplicable n'affecte pas les autres parties de la présente lettre de transport aérien. Sauf indication contraire, © FEDEX EXPRESS CORPORATION, 2005 Corporate Avenue, Memphis, TN 38132, USA, est le premier transporteur du présent envoi.

ORIGIN ID:YUXA (514) 383-0990
Audrey Etheves
Golder Associates Ltd
7250 rue du Mile End
3e etage
MONTREAL, PQ H2R3A4
CANADA, CA

SHIP DATE: 10MAY19
ACTWGT: 13.75 LB
CAD: 108680724/INET4102

BILL RECIPIENT
EIN/VAT:

TO Dane Wacasey (281) 530-5656
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

FedEx Express

(US)

J19401901072Ouv

AWB

X0 SGRA

PKG:CUSTOMER

TRK# 7751 8994 6549

Form 0430

SATURDAY 12:00P
INTL PRIORITY

REF:
DESC1:Échantillon d'eau
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: Audrey Etheves
T/C: R 967554812
D/T: R 967554812

Ces marchandises, cette technologie ou ce logiciel ont été exportés du Canada conformément à la réglementation sur l'administration des exportations. Toute modification contraire à la loi canadienne est interdite. La Convention de Varsovie peut s'appliquer et elle régit, et dans la grande majorité des cas, elle limite la responsabilité de Federal Express pour toute perte, retard ou dommage causé à votre envoi. Sous réserve des conditions et modalités du contrat.

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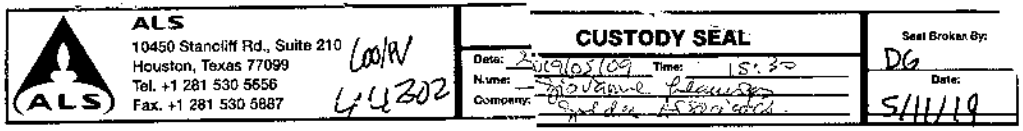
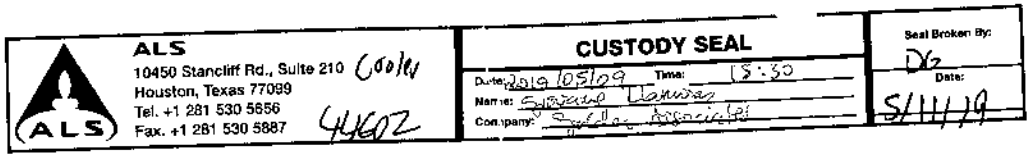

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
Cooler
44302
CUSTODY SEAL
Date: 2019/05/09
Time: 15:30
Name:
Company:
Seal Broken By:
DG
Date:
5/11/19


ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
Cooler
44602
CUSTODY SEAL
Date: 2019/05/09
Time: 15:30
Name:
Company:
Seal Broken By:
DG
Date:
5/11/19

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

May 14, 2019

Emily White
Golder Associates
13515 Barrett Parkway Drive, Suite 260
Ballwin, MO 63021

Work Order: **HS19050693**

Laboratory Results for: **Exide Column Studies**

Dear Emily,

ALS Environmental received 14 sample(s) on May 11, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates	**TRRP Laboratory Data Package Cover Page**
Project:	Exide Column Studies	
WorkOrder:	**HS19050693**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates
Project:	Exide Column Studies
WorkOrder:	**HS19050693**

TRRP Laboratory Data Package Cover Page

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 05/14/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19050693				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 140778,140779				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?			X		
		Were analytical duplicates analyzed at the appropriate frequency?			X		
		Were RPDs or relative standard deviations within the laboratory QC limits?			X		
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				2
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 05/14/2019				
Project Name: Exide Column Studies			Laboratory Job Number: HS19050693				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 140778,140779				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?	X				
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		X			3
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports	
Laboratory Name: ALS Laboratory Group	LRC Date: 05/14/2019
Project Name: Exide Column Studies	Laboratory Job Number: HS19050693
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 140778,140779

ER#[5]	Description
1	Batch 140778, Metals Method SW6020, sample HS19050692-02, MS and MSD were performed on unrelated sample. Batch 140779, Metals Method SW6020, sample HS19050692-02, MS and MSD were performed on unrelated sample.
2	Batch 140779, Metals Method SW6020, samples diluted due to high sodium content.
3	Batch 140779, Metals Method SW6020, sample HS19050692-01, Serial Dilution was performed on unrelated sample.

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19050693

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19050693-01	20190509-NSF-PV83inlet-30MW11-D	Groundwater		09-May-2019 20:50	11-May-2019 09:18	☐
HS19050693-02	20190509-NSF-PV83inlet-30MW11-T	Groundwater		09-May-2019 20:50	11-May-2019 09:18	☐
HS19050693-03	20190509-NSF-PV83mid-30MW11-D	Groundwater		09-May-2019 20:40	11-May-2019 09:18	☐
HS19050693-04	20190509-NSF-PV83mid-30MW-11-T	Groundwater		09-May-2019 20:40	11-May-2019 09:18	☐
HS19050693-05	20190509-NSF-PV83out-30MW11-D	Groundwater		09-May-2019 14:15	11-May-2019 09:18	☐
HS19050693-06	20190509-NSF-PV83out-30MW11-T	Groundwater		09-May-2019 14:15	11-May-2019 09:18	☐
HS19050693-07	20190509-NSF-PV84inlet-controlFD-D	Groundwater		09-May-2019 20:50	11-May-2019 09:18	☐
HS19050693-08	20190509-NSF-PV84inlet-controlFD-T	Groundwater		09-May-2019 20:50	11-May-2019 09:18	☐
HS19050693-09	20190509-NSF-PV84mid-controlFD-D	Groundwater		09-May-2019 20:40	11-May-2019 09:18	☐
HS19050693-10	20190509-NSF-PV84mid-controlFD-T	Groundwater		09-May-2019 20:40	11-May-2019 09:18	☐
HS19050693-11	20190509-NSF-PV84out-controlFD-D	Groundwater		09-May-2019 14:15	11-May-2019 09:18	☐
HS19050693-12	20190509-NSF-PV84out-controlFD-T	Groundwater		09-May-2019 14:15	11-May-2019 09:18	☐
HS19050693-13	20190509-NSF-PV84inlet-controlFD-D-DUP	Groundwater		09-May-2019 20:50	11-May-2019 09:18	☐
HS19050693-14	20190509-NSF-PV84inlet-controlFD-T-DUP	Groundwater		09-May-2019 20:50	11-May-2019 09:18	☐

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190509-NSF-PV83inlet-30MW11-D
Collection Date: 09-May-2019 20:50

ANALYTICAL REPORT
WorkOrder:HS19050693
Lab ID:HS19050693-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 13-May-2019		Analyst: JHD
Antimony	**0.0876**		**0.000400**	**0.00200**	**mg/L**	1	13-May-2019 18:05
Arsenic	**0.298**		**0.000400**	**0.00200**	**mg/L**	1	13-May-2019 18:05
Cadmium	**0.0635**		**0.000200**	**0.00200**	**mg/L**	1	13-May-2019 18:05
Iron	U		0.0120	0.200	mg/L	1	13-May-2019 18:05
Lead	**0.773**		**0.000600**	**0.00200**	**mg/L**	1	13-May-2019 18:05
Selenium	**1.70**		**0.0220**	**0.0400**	**mg/L**	20	14-May-2019 13:49

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190509-NSF-PV83inlet-30MW11-T
Collection Date: 09-May-2019 20:50

ANALYTICAL REPORT
WorkOrder:HS19050693
Lab ID:HS19050693-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 13-May-2019		Analyst: JHD
Antimony	**0.0796**		**0.00200**	**0.0100**	**mg/L**	5	14-May-2019 14:59
Arsenic	**0.286**		**0.00200**	**0.0100**	**mg/L**	5	14-May-2019 14:59
Cadmium	**0.0627**		**0.00100**	**0.0100**	**mg/L**	5	14-May-2019 14:59
Iron	**0.623**	J	**0.0600**	**1.00**	**mg/L**	5	14-May-2019 14:59
Lead	**1.43**		**0.00300**	**0.0100**	**mg/L**	5	14-May-2019 14:59
Selenium	**2.17**		**0.00550**	**0.0100**	**mg/L**	5	14-May-2019 14:59

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190509-NSF-PV83mid-30MW11-D
Collection Date: 09-May-2019 20:40

ANALYTICAL REPORT
WorkOrder:HS19050693
Lab ID:HS19050693-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 13-May-2019		Analyst: JHD
Antimony	**0.00266**		**0.000400**	**0.00200**	**mg/L**	1	13-May-2019 18:07
Arsenic	**0.000481**	J	**0.000400**	**0.00200**	**mg/L**	1	13-May-2019 18:07
Cadmium	U		0.000200	0.00200	mg/L	1	13-May-2019 18:07
Iron	**1.53**		**0.0120**	**0.200**	**mg/L**	1	13-May-2019 18:07
Lead	U		0.000600	0.00200	mg/L	1	13-May-2019 18:07
Selenium	**0.00232**		**0.00110**	**0.00200**	**mg/L**	1	13-May-2019 18:07

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190509-NSF-PV83mid-30MW-11-T
Collection Date: 09-May-2019 20:40

ANALYTICAL REPORT
WorkOrder:HS19050693
Lab ID:HS19050693-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 13-May-2019		Analyst: JHD
Antimony	**0.00296**	J	**0.00200**	**0.0100**	**mg/L**	5	14-May-2019 15:47
Arsenic	U		0.00200	0.0100	mg/L	5	14-May-2019 15:47
Cadmium	U		0.00100	0.0100	mg/L	5	14-May-2019 15:47
Iron	**5.47**		**0.0600**	**1.00**	**mg/L**	5	14-May-2019 15:47
Lead	U		0.00300	0.0100	mg/L	5	14-May-2019 15:47
Selenium	U		0.00550	0.0100	mg/L	5	14-May-2019 15:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190509-NSF-PV83out-30MW11-D
Collection Date: 09-May-2019 14:15

ANALYTICAL REPORT
WorkOrder:HS19050693
Lab ID:HS19050693-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 13-May-2019		Analyst: JHD
Antimony	U		0.000400	0.00200	mg/L	1	13-May-2019 18:14
Arsenic	U		0.000400	0.00200	mg/L	1	13-May-2019 18:14
Cadmium	U		0.000200	0.00200	mg/L	1	13-May-2019 18:14
Iron	**0.0608**	J	**0.0120**	**0.200**	**mg/L**	1	13-May-2019 18:14
Lead	U		0.000600	0.00200	mg/L	1	13-May-2019 18:14
Selenium	**0.00180**	J	**0.00110**	**0.00200**	**mg/L**	1	13-May-2019 18:14

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190509-NSF-PV83out-30MW11-T
Collection Date: 09-May-2019 14:15

ANALYTICAL REPORT
WorkOrder:HS19050693
Lab ID:HS19050693-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 13-May-2019		Analyst: JHD
Antimony	U		0.00200	0.0100	mg/L	5	14-May-2019 15:48
Arsenic	U		0.00200	0.0100	mg/L	5	14-May-2019 15:48
Cadmium	U		0.00100	0.0100	mg/L	5	14-May-2019 15:48
Iron	**4.85**		**0.0600**	**1.00**	**mg/L**	5	14-May-2019 15:48
Lead	U		0.00300	0.0100	mg/L	5	14-May-2019 15:48
Selenium	U		0.00550	0.0100	mg/L	5	14-May-2019 15:48

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190509-NSF-PV84inlet-controlFD-D
Collection Date: 09-May-2019 20:50

ANALYTICAL REPORT
WorkOrder:HS19050693
Lab ID:HS19050693-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 13-May-2019		Analyst: JHD
Antimony	**0.0917**		**0.000400**	**0.00200**	**mg/L**	1	13-May-2019 18:17
Arsenic	**0.0839**		**0.000400**	**0.00200**	**mg/L**	1	13-May-2019 18:17
Cadmium	**0.0650**		**0.000200**	**0.00200**	**mg/L**	1	13-May-2019 18:17
Iron	U		0.0120	0.200	mg/L	1	13-May-2019 18:17
Lead	**0.863**		**0.000600**	**0.00200**	**mg/L**	1	13-May-2019 18:17
Selenium	**2.11**		**0.0220**	**0.0400**	**mg/L**	20	14-May-2019 13:51

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190509-NSF-PV84inlet-controlFD-T
Collection Date: 09-May-2019 20:50

ANALYTICAL REPORT
WorkOrder:HS19050693
Lab ID:HS19050693-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 13-May-2019		Analyst: JHD
Antimony	**0.0860**		**0.00200**	**0.0100**	**mg/L**	5	14-May-2019 15:50
Arsenic	**0.0807**		**0.00200**	**0.0100**	**mg/L**	5	14-May-2019 15:50
Cadmium	**0.0669**		**0.00100**	**0.0100**	**mg/L**	5	14-May-2019 15:50
Iron	**0.552**	J	**0.0600**	**1.00**	**mg/L**	5	14-May-2019 15:50
Lead	**1.30**		**0.00300**	**0.0100**	**mg/L**	5	14-May-2019 15:50
Selenium	**2.23**		**0.00550**	**0.0100**	**mg/L**	5	14-May-2019 15:50

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190509-NSF-PV84mid-controlFD-D
Collection Date: 09-May-2019 20:40

ANALYTICAL REPORT
WorkOrder:HS19050693
Lab ID:HS19050693-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 13-May-2019		Analyst: JHD
Antimony	**0.0834**		**0.000400**	**0.00200**	**mg/L**	1	13-May-2019 18:18
Arsenic	**0.0932**		**0.000400**	**0.00200**	**mg/L**	1	13-May-2019 18:18
Cadmium	**0.0596**		**0.000200**	**0.00200**	**mg/L**	1	13-May-2019 18:18
Iron	U		0.0120	0.200	mg/L	1	13-May-2019 18:18
Lead	**0.0181**		**0.000600**	**0.00200**	**mg/L**	1	13-May-2019 18:18
Selenium	**1.95**		**0.0220**	**0.0400**	**mg/L**	20	14-May-2019 13:52

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190509-NSF-PV84mid-controlFD-T
Collection Date: 09-May-2019 20:40

ANALYTICAL REPORT
WorkOrder:HS19050693
Lab ID:HS19050693-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 13-May-2019		Analyst: JHD
Antimony	**0.0722**		**0.00200**	**0.0100**	**mg/L**	5	14-May-2019 15:59
Arsenic	**0.0847**		**0.00200**	**0.0100**	**mg/L**	5	14-May-2019 15:59
Cadmium	**0.0566**		**0.00100**	**0.0100**	**mg/L**	5	14-May-2019 15:59
Iron	U		0.0600	1.00	mg/L	5	14-May-2019 15:59
Lead	**0.0217**		**0.00300**	**0.0100**	**mg/L**	5	14-May-2019 15:59
Selenium	**2.14**		**0.00550**	**0.0100**	**mg/L**	5	14-May-2019 15:59

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190509-NSF-PV84out-controlFD-D
Collection Date: 09-May-2019 14:15

ANALYTICAL REPORT
WorkOrder:HS19050693
Lab ID:HS19050693-11
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 13-May-2019		Analyst: JHD
Antimony	**0.0754**		**0.000400**	**0.00200**	**mg/L**	1	13-May-2019 18:21
Arsenic	**0.0937**		**0.000400**	**0.00200**	**mg/L**	1	13-May-2019 18:21
Cadmium	**0.0606**		**0.000200**	**0.00200**	**mg/L**	1	13-May-2019 18:21
Iron	U		0.0120	0.200	mg/L	1	13-May-2019 18:21
Lead	**0.000744**	J	**0.000600**	**0.00200**	**mg/L**	1	13-May-2019 18:21
Selenium	**2.00**		**0.0220**	**0.0400**	**mg/L**	20	14-May-2019 14:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190509-NSF-PV84out-controlFD-T
Collection Date: 09-May-2019 14:15

ANALYTICAL REPORT
WorkOrder:HS19050693
Lab ID:HS19050693-12
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 13-May-2019		Analyst: JHD
Antimony	**0.0748**		**0.00200**	**0.0100**	**mg/L**	5	14-May-2019 16:00
Arsenic	**0.0955**		**0.00200**	**0.0100**	**mg/L**	5	14-May-2019 16:00
Cadmium	**0.0604**		**0.00100**	**0.0100**	**mg/L**	5	14-May-2019 16:00
Iron	**0.107**	J	**0.0600**	**1.00**	**mg/L**	5	14-May-2019 16:00
Lead	U		0.00300	0.0100	mg/L	5	14-May-2019 16:00
Selenium	**2.38**		**0.00550**	**0.0100**	**mg/L**	5	14-May-2019 16:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190509-NSF-PV84inlet-controlFD-D-DUP
Collection Date: 09-May-2019 20:50

ANALYTICAL REPORT
WorkOrder:HS19050693
Lab ID:HS19050693-13
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 13-May-2019		Analyst: JHD
Antimony	**0.0857**		**0.000400**	**0.00200**	**mg/L**	1	13-May-2019 18:23
Arsenic	**0.0776**		**0.000400**	**0.00200**	**mg/L**	1	13-May-2019 18:23
Cadmium	**0.0678**		**0.000200**	**0.00200**	**mg/L**	1	13-May-2019 18:23
Iron	U		0.0120	0.200	mg/L	1	13-May-2019 18:23
Lead	**0.896**		**0.000600**	**0.00200**	**mg/L**	1	13-May-2019 18:23
Selenium	**1.95**		**0.0220**	**0.0400**	**mg/L**	20	14-May-2019 14:08

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates
Project: Exide Column Studies
Sample ID: 20190509-NSF-PV84inlet-controlFD-T-DUP
Collection Date: 09-May-2019 20:50

ANALYTICAL REPORT
WorkOrder:HS19050693
Lab ID:HS19050693-14
Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 13-May-2019		Analyst: JHD
Antimony	**0.0893**		**0.00200**	**0.0100**	**mg/L**	5	14-May-2019 16:02
Arsenic	**0.0870**		**0.00200**	**0.0100**	**mg/L**	5	14-May-2019 16:02
Cadmium	**0.0671**		**0.00100**	**0.0100**	**mg/L**	5	14-May-2019 16:02
Iron	**0.624**	J	**0.0600**	**1.00**	**mg/L**	5	14-May-2019 16:02
Lead	**1.35**		**0.00300**	**0.0100**	**mg/L**	5	14-May-2019 16:02
Selenium	**2.32**		**0.00550**	**0.0100**	**mg/L**	5	14-May-2019 16:02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050693

Batch ID: 140778 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19050693-01	1	10	10 (mL)	1
HS19050693-03	1	10	10 (mL)	1
HS19050693-05	1	10	10 (mL)	1
HS19050693-07	1	10	10 (mL)	1
HS19050693-09	1	10	10 (mL)	1
HS19050693-11	1	10	10 (mL)	1
HS19050693-13	1	10	10 (mL)	1

Batch ID: 140779 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19050693-02	1	10	10 (mL)	1
HS19050693-04	1	10	10 (mL)	1
HS19050693-06	1	10	10 (mL)	1
HS19050693-08	1	10	10 (mL)	1
HS19050693-10	1	10	10 (mL)	1
HS19050693-12	1	10	10 (mL)	1
HS19050693-14	1	10	10 (mL)	1

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050693

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 140778	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS19050693-01	20190509-NSF-PV83inlet-30MW11-D	09 May 2019 20:50		13 May 2019 12:00	14 May 2019 13:49	20
HS19050693-01	20190509-NSF-PV83inlet-30MW11-D	09 May 2019 20:50		13 May 2019 12:00	13 May 2019 18:05	1
HS19050693-03	20190509-NSF-PV83mid-30MW11-D	09 May 2019 20:40		13 May 2019 12:00	13 May 2019 18:07	1
HS19050693-05	20190509-NSF-PV83out-30MW11-D	09 May 2019 14:15		13 May 2019 12:00	13 May 2019 18:14	1
HS19050693-07	20190509-NSF-PV84inlet-controlFD-D	09 May 2019 20:50		13 May 2019 12:00	14 May 2019 13:51	20
HS19050693-07	20190509-NSF-PV84inlet-controlFD-D	09 May 2019 20:50		13 May 2019 12:00	13 May 2019 18:17	1
HS19050693-09	20190509-NSF-PV84mid-controlFD-D	09 May 2019 20:40		13 May 2019 12:00	14 May 2019 13:52	20
HS19050693-09	20190509-NSF-PV84mid-controlFD-D	09 May 2019 20:40		13 May 2019 12:00	13 May 2019 18:18	1
HS19050693-11	20190509-NSF-PV84out-controlFD-D	09 May 2019 14:15		13 May 2019 12:00	14 May 2019 14:06	20
HS19050693-11	20190509-NSF-PV84out-controlFD-D	09 May 2019 14:15		13 May 2019 12:00	13 May 2019 18:21	1
HS19050693-13	20190509-NSF-PV84inlet-controlFD-D-DUP	09 May 2019 20:50		13 May 2019 12:00	14 May 2019 14:08	20
HS19050693-13	20190509-NSF-PV84inlet-controlFD-D-DUP	09 May 2019 20:50		13 May 2019 12:00	13 May 2019 18:23	1
Batch ID 140779	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19050693-02	20190509-NSF-PV83inlet-30MW11-T	09 May 2019 20:50		13 May 2019 12:00	14 May 2019 14:59	5
HS19050693-04	20190509-NSF-PV83mid-30MW-11-T	09 May 2019 20:40		13 May 2019 12:00	14 May 2019 15:47	5
HS19050693-06	20190509-NSF-PV83out-30MW11-T	09 May 2019 14:15		13 May 2019 12:00	14 May 2019 15:48	5
HS19050693-08	20190509-NSF-PV84inlet-controlFD-T	09 May 2019 20:50		13 May 2019 12:00	14 May 2019 15:50	5
HS19050693-10	20190509-NSF-PV84mid-controlFD-T	09 May 2019 20:40		13 May 2019 12:00	14 May 2019 15:59	5
HS19050693-12	20190509-NSF-PV84out-controlFD-T	09 May 2019 14:15		13 May 2019 12:00	14 May 2019 16:00	5
HS19050693-14	20190509-NSF-PV84inlet-controlFD-T-DUP	09 May 2019 20:50		13 May 2019 12:00	14 May 2019 16:02	5

WorkOrder: HS19050693
InstrumentID: ICPMS06
Test Code: ICP_DISS
Test Number: SW6020 (dissolved)
Test Name: Dissolved Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000461	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000438	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000484	0.000200	0.00200
A	Iron	7439-89-6	0.0500	0.0528	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000931	0.000600	0.00200
A	Selenium	7782-49-2	0.00250	0.00239	0.00110	0.00200

WorkOrder: HS19050693
InstrumentID: ICPMS06
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000461	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000438	0.000400	0.00200
A	Cadmium	7440-43-9	0.000500	0.000484	0.000200	0.00200
A	Iron	7439-89-6	0.0500	0.0528	0.0120	0.200
A	Lead	7439-92-1	0.00100	0.000931	0.000600	0.00200
A	Selenium	7782-49-2	0.00250	0.00239	0.00110	0.00200

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050693

QC BATCH REPORT

Batch ID: 140778 (0) **Instrument: ICPMS06** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

MBLK Sample ID: **MBLK-140778** Units: **mg/L** Analysis Date: **13-May-2019 17:07**
Client ID: Run ID: **ICPMS06_338296** SeqNo: **5073178** PrepDate: **13-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Iron	U	0.200								
Lead	U	0.00200								
Selenium	U	0.00200								

LCS Sample ID: **LCS-140778** Units: **mg/L** Analysis Date: **13-May-2019 17:08**
Client ID: Run ID: **ICPMS06_338296** SeqNo: **5073179** PrepDate: **13-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.0532	0.00200	0.05	0	106	80 - 120				
Arsenic	0.05254	0.00200	0.05	0	105	80 - 120				
Cadmium	0.0538	0.00200	0.05	0	108	80 - 120				
Iron	5.239	0.200	5	0	105	80 - 120				
Lead	0.0519	0.00200	0.05	0	104	80 - 120				
Selenium	0.05364	0.00200	0.05	0	107	80 - 120				

MS Sample ID: **HS19050692-01MS** Units: **mg/L** Analysis Date: **13-May-2019 17:12**
Client ID: Run ID: **ICPMS06_338296** SeqNo: **5073182** PrepDate: **13-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1622	0.00200	0.05	0.09318	138	75 - 125				S
Arsenic	0.3418	0.00200	0.05	0.2849	114	75 - 125				O
Cadmium	0.1103	0.00200	0.05	0.06142	97.7	75 - 125				
Iron	4.866	0.200	5	0.005985	97.2	75 - 125				
Lead	0.5699	0.00200	0.05	0.495	150	75 - 125				SO
Selenium	2.668	0.00200	0.05	2.593	150	75 - 125				SEO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050693

QC BATCH REPORT

Batch ID: 140778 (0) **Instrument: ICPMS06** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

MSD Sample ID: **HS19050692-01MSD** Units: **mg/L** Analysis Date: **13-May-2019 17:14**
Client ID: Run ID: **ICPMS06_338296** SeqNo: **5073183** PrepDate: **13-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1684	0.00200	0.05	0.09318	150	75 - 125	0.1622	3.75	20	S
Arsenic	0.3384	0.00200	0.05	0.2849	107	75 - 125	0.3418	1.02	20	O
Cadmium	0.1036	0.00200	0.05	0.06142	84.4	75 - 125	0.1103	6.21	20	
Iron	4.97	0.200	5	0.005985	99.3	75 - 125	4.866	2.12	20	
Lead	0.5006	0.00200	0.05	0.495	11.3	75 - 125	0.5699	12.9	20	SO
Selenium	2.709	0.00200	0.05	2.593	232	75 - 125	2.668	1.51	20	SEO

PDS Sample ID: **HS19050692-01PDS** Units: **mg/L** Analysis Date: **14-May-2019 13:46**
Client ID: Run ID: **ICPMS06_338370** SeqNo: **5074200** PrepDate: **13-May-2019** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	1.277	0.0200	1	0.08774	119	75 - 125				
Lead	1.561	0.0200	1	0.4175	114	75 - 125				
Selenium	3.228	0.0200	1	2.153	107	75 - 125				

PDS Sample ID: **HS19050692-01PDS** Units: **mg/L** Analysis Date: **13-May-2019 17:15**
Client ID: Run ID: **ICPMS06_338296** SeqNo: **5073184** PrepDate: **13-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.3766	0.00200	0.1	0.2849	91.7	75 - 125				
Cadmium	0.1587	0.00200	0.1	0.06142	97.3	75 - 125				
Iron	9.847	0.200	10	0.005985	98.4	75 - 125				

SD Sample ID: **HS19050692-01SD** Units: **mg/L** Analysis Date: **14-May-2019 13:45**
Client ID: Run ID: **ICPMS06_338370** SeqNo: **5074199** PrepDate: **13-May-2019** DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	0.09172	0.100					0.08774	0	10	J
Lead	0.4064	0.100					0.4175	2.65	10	
Selenium	2.141	0.100					2.153	0.579	10	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050693

QC BATCH REPORT

Batch ID: 140778 (0) **Instrument: ICPMS06** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

SD Sample ID: **HS19050692-01SD** Units: **mg/L** Analysis Date: **13-May-2019 17:11**
Client ID: Run ID: **ICPMS06_338296** SeqNo: **5073181** PrepDate: **13-May-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Arsenic	0.2567	0.0100					0.2849	9.9	10	
Cadmium	0.05969	0.0100					0.06142	2.82	10	
Iron	U	1.00					0.005985	0	10	

The following samples were analyzed in this batch: HS19050693-01 HS19050693-03 HS19050693-05 HS19050693-07 HS19050693-09 HS19050693-11 HS19050693-13

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050693

QC BATCH REPORT

Batch ID: 140779 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLK-140779** Units: **mg/L** Analysis Date: **14-May-2019 15:15**
Client ID: Run ID: **ICPMS06_338370** SeqNo: **5074406** PrepDate: **13-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Cadmium	U	0.00200								
Iron	U	0.200								
Lead	U	0.00200								
Selenium	U	0.00200								

LCS Sample ID: **LCS-140779** Units: **mg/L** Analysis Date: **13-May-2019 23:51**
Client ID: Run ID: **ICPMS06_338296** SeqNo: **5073389** PrepDate: **13-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05314	0.00200	0.05	0	106	80 - 120				
Arsenic	0.05307	0.00200	0.05	0	106	80 - 120				
Cadmium	0.0529	0.00200	0.05	0	106	80 - 120				
Iron	5.266	0.200	5	0	105	80 - 120				
Lead	0.05094	0.00200	0.05	0	102	80 - 120				
Selenium	0.05418	0.00200	0.05	0	108	80 - 120				

MS Sample ID: **HS19050692-02MS** Units: **mg/L** Analysis Date: **14-May-2019 15:20**
Client ID: Run ID: **ICPMS06_338370** SeqNo: **5074409** PrepDate: **13-May-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1538	0.0100	0.05	0.09747	113	80 - 120				
Arsenic	0.3578	0.0100	0.05	0.2845	147	80 - 120				SO
Cadmium	0.122	0.0100	0.05	0.07548	92.9	80 - 120				
Iron	6.54	1.00	5	1.4	103	80 - 120				
Lead	2.378	0.0100	0.05	2.208	340	80 - 120				SO
Selenium	2.219	0.0100	0.05	2.123	192	80 - 120				SO

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: HS19050693

QC BATCH REPORT

Batch ID: 140779 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

MSD Sample ID: **HS19050692-02MSD** Units: **mg/L** Analysis Date: **14-May-2019 15:21**
Client ID: Run ID: **ICPMS06_338370** SeqNo: **5074410** PrepDate: **13-May-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1528	0.0100	0.05	0.09747	111	80 - 120	0.147	3.89	20	
Arsenic	0.3501	0.0100	0.05	0.2845	131	80 - 120	0.3369	3.84	20	SO
Cadmium	0.1242	0.0100	0.05	0.07548	97.4	80 - 120	0.1194	3.89	20	
Iron	6.506	1.00	5	1.4	102	80 - 120	6.158	5.49	20	
Lead	2.489	0.0100	0.05	2.208	562	80 - 120	2.328	6.7	20	SO
Selenium	2.198	0.0100	0.05	2.123	150	80 - 120	2.186	0.575	20	SO

PDS Sample ID: **HS19050692-02PDS** Units: **mg/L** Analysis Date: **14-May-2019 15:23**
Client ID: Run ID: **ICPMS06_338370** SeqNo: **5074411** PrepDate: **13-May-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.59	0.0100	0.5	0.09747	98.5	75 - 125				
Arsenic	0.8049	0.0100	0.5	0.2845	104	75 - 125				
Cadmium	0.5502	0.0100	0.5	0.07548	94.9	75 - 125				
Iron	52.36	1.00	50	1.4	102	75 - 125				
Lead	3.063	0.0100	0.5	2.208	171	75 - 125				SO
Selenium	2.683	0.0100	0.5	2.123	112	75 - 125				O

SD Sample ID: **HS19050692-02SD** Units: **mg/L** Analysis Date: **14-May-2019 15:18**
Client ID: Run ID: **ICPMS06_338370** SeqNo: **5074408** PrepDate: **13-May-2019** DF: **25**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	0.1039	0.0500					0.09747	6.65	10	
Arsenic	0.3078	0.0500					0.2845	8.18	10	
Cadmium	0.08015	0.0500					0.07548	6.18	10	
Iron	1.436	5.00					1.4	0	10	J
Lead	2.24	0.0500					2.208	1.46	10	
Selenium	2.145	0.0500					2.123	1.02	10	

The following samples were analyzed in this batch:

HS19050693-02	HS19050693-04	HS19050693-06	HS19050693-08
HS19050693-10	HS19050693-12	HS19050693-14	

Client: Golder Associates
Project: Exide Column Studies
WorkOrder: **HS19050693**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020
Texas	TX104704231-19-23	30-Apr-2020

Client: Golder Associates
Project: Exide Column Studies
Work Order: HS19050693

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19050693-01	20190509-NSF-PV83inlet-30MW11-D	Login	5/11/2019 11:59:52 AM	PMG	MET073

Sample Receipt Checklist

Client Name: Golder St Louis
Work Order: HS19050693

Date/Time Received: **11-May-2019 09:18**
Received by: **PMG**

Checklist completed by: *Paresh M. Giga* eSignature — 11-May-2019 Date

Reviewed by: *Dane J. Wacasey* eSignature — 13-May-2019 Date

Matrices: **Groundwater**

Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	2 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:None
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	18.1c U/c	IR25	
Cooler(s)/Kit(s):	44602		
Date/Time sample(s) sent to storage:	5/11/19 12:15		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

ALS Environmental

Chain of Custody Form

Page 1 of 2

HS19050693

Golder Associates
Exide Column Studies

Customer Information		Project Information		ALS Project Manager:	
PO Number	130-2086-06	Project Name	Exide Column Studies		
Work Order		Project Number	130-2086-06		
Company Name	Golder Associates	Bill To Company	Golder Associates		
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P		
Address	13515 Barrett Parkway Drive, Suite 260	Address	13515 Barrett Parkway Drive, Suite 260		
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021		
Phone	314 984-8800	Phone	314 984-8800		
Fax		Fax			
e-Mail Address	ewhite@golder.com	e-Mail Address			

Analytical Request for Analysis

A	300 W (300Cl, SO4, NO3-48h HT)
B	TDS W 2540C (2540C TDS)
C	ALK W 2320B (2320B alkalinity)
D	HARD (2340B hardness (calc))
E	ICP TW (6020A total metals (6)): Pb, Cd, Sb, Se, As, Fe
F	ICP DISS (6020A diss metals (6)-FldFltr): Pb, Cd, Sb, Se, As, Fe
G	
H	
I	
J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190509-NSF-PV83inlet-30MW11-D	05-09-19	8:50 PM	GW	2	1						X					
2	20190509-NSF-PV83inlet-30MW11-T	05-09-19	8:50 PM	GW	2	1					X						
3	20190509-NSF-PV83mid-30MW11-D	05-09-19	8:40 PM	GW	2	1						X					
4	20190509-NSF-PV83mid-30MW11-T	05-09-19	8:40 PM	GW	2	1					X						
5	20190509-NSF-PV83out-30MW11-D	05-09-19	2:15 PM	GW	2	1						X					
6	20190509-NSF-PV83out-30MW11-T	05-09-19	2:15 PM	GW	2	1					X						
7	20190509-NSF-PV84inlet-controlFD-D	05-09-19	8:50 PM	GW	2	1						X					
8	20190509-NSF-PV84inlet-controlFD-T	05-09-19	8:50 PM	GW	2	1					X						
9	20190509-NSF-PV84mid-controlFD-D	05-09-19	8:40 PM	GW	2	1						X					
10	20190509-NSF-PV84mid-controlFD-T	05-09-19	8:40 PM	GW	2	1					X						

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method: FedEx

Required Turnaround Time: ☐ STD 10 Wk Days ☐ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date: URGENT 24-HOURS TAT

Relinquished by: Giovanna Llamosas	Date: 2019/05/09	15:30:00	Received by:	Notes:	
Relinquished by:	Date:	Time:	Received by (Laboratory): 5/10/19 09:18	Cooler Temp. 18.1 4.2Y	QC Package: (Check Box Below)
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):		Level II: Standard QC / x TRRP-Checklist
					Level III: Std QC + Raw Data / TRRP Level IV
					Level IV: SW846 CLP-Like
					Other:

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

4U602

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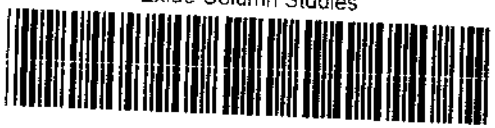
Chain of Custody Form

Page 2 of 2

HS19050693

Golder Associates
Exide Column Studies



Customer Information		Project Information		ALS Project Manager:
PO Number	130-2086-06	Project Name	Exide Column Studies	
Work Order		Project Number	130-2086-06	
Company Name	Golder Associates	Bill To Company	Golder Associates	
Send Report To	Emily White	Invoice Attn.	Tammy Kurzmack Exide A/P	
Address	13515 Barrett Parkway Drive, Suite 260	Address	13515 Barrett Parkway Drive, Suite 260	
City/State/Zip	Ballwin, MO 63021	City/State/Zip	Ballwin, MO 63021	
Phone	314 984-8800	Phone	314 984-8800	
Fax		Fax		
e-Mail Address	ewhite@golder.com	e-Mail Address		

	Parameter/Method Request for Analysis
A	300 W (300Cl, SO4, NO3-48h HT)
B	TDS W 2540C (2540C TDS)
C	ALK W 2320B (2320B alkalinity)
D	HARD (2340B hardness (calc))
E	ICP TW (6020A total metals (6)): Pb, Cd, Sb, Se, As, Fe
F	ICP DISS (6020A diss metals (6)-FldFltr): Pb, Cd, Sb, Se, As, Fe
G	
H	
I	
J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
11	20190509-NSF-PV84out-controlFD-D	05-09-19	2:15 PM	GW	2	1						X					
12	20190509-NSF-PV84out-controlFD-T	05-09-19	2:15 PM	GW	2	1					X						
13	20190509-NSF-PV84inlet-controlFD-D-DUP	05-09-19	8:50 PM	GW	2	1						X					
14	20190509-NSF-PV84inlet-controlFD-T-DUP	05-09-19	8:50 PM	GW	2	1					X						
15																	
16																	
17																	
18																	
19																	
20																	

Sampler(s): Please Print & Sign
Giovanna Llamosas

Shipment Method: FedEx

Required Turnaround Time: ☐ STD 10 Wk Days ☐ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date: URGENT 24-HOURS TAT

Notes:

Relinquished by: Giovanna Llamosas	Date: 2019/05/09	15:30:00	Received by:	
Relinquished by:	Date:	Time:	Received by (Laboratory):	
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	

Cooler Temp.

QC Package: (Check Box Below)

	Level II: Standard QC	x	TRRP-Checklist
	Level III: Std QC + Raw Data		TRRP Level IV
	Level IV: SW846 CLP-Like		
	Other:		

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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ORIGIN ID:YUXA (514) 383-0990
AUDREY ETHEVES
GOLDER ASSOCIATES LTD
7250 RUE DU MILE END
3E ETAGE
MONTREAL, PQ H2R3A4
CANADA CA

SHIP DATE: 10MAY19
ACTWGT: 13.75 LB
CAD: 108680724/INET4102

BILL RECIPIENT

TO DANE WACASEY
ALS HOUSTON LABORATORY
10450 STANCLIFF RD
STE 210
HOUSTON TX 77099 (US)
(281) 530-5656 REF:
INV:
PO: DEPT:

565J1/D56C/23AD

FedEx Express

E

J15101901070200

TRK# 0430 7751 8994 6549

SATURDAY 12:00P
INTL PRIORITY

X0 SGRA

77099
TX-US IAH

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COPIE DU DESTINATAIRE - VEUILLEZ LA PLACER DEVANT LA POCHETTE
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2. Placez l'étiquette dans la pochette d'expédition et fixez-la à votre paquet.

ORIGIN ID:YUXA (514) 383-0990
Audrey Etheves
Golder Associates Ltd
7250 rue du Mile End
3e etage
MONTREAL, PQ H2R3A4
CANADA, CA

SHIP DATE: 10MAY19
ACTWGT: 13.75 LB
CAD: 108680724/INET4102

BILL RECIPIENT
EIN/VAT:

TO Dane Wacasey
ALS Houston Laboratory
10450 STANCLIFF RD
STE 210
HOUSTON, TX 77099
UNITED STATES, US

(281) 530-5656

FedEx Express

(US)

J19101901072Dv

AWB

X0 SGRA

PKG:CUSTOMER

TRK# 7751 8994 6549

Form
0430

SATURDAY 12:00P
INTL PRIORITY

REF:
DESC1:Échantillon d'eau
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 0.00 CAD

SIGN: Audrey Etheves
T/C: R 967554812
D/T: R 967554812

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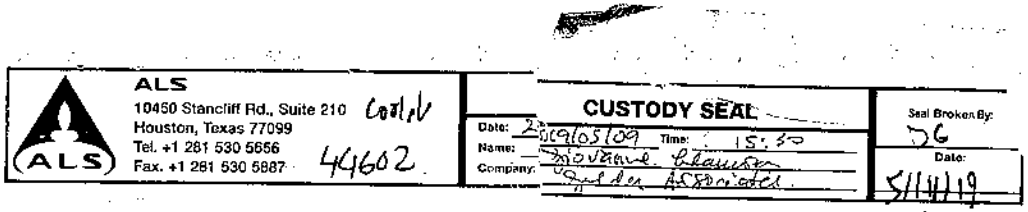


ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

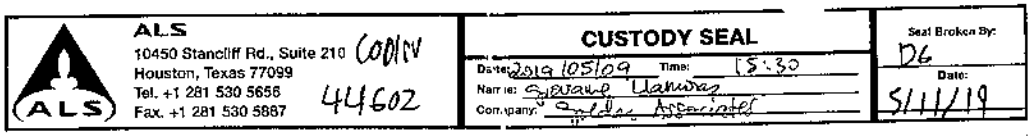
Cooler

44602

CUSTODY SEAL

Date: 20190510 Time: 15:30
Name: Giovanni Llanos
Company: Golder Associates

Seal Broken By: DG
Date: 5/14/19



ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

Cooler

44602

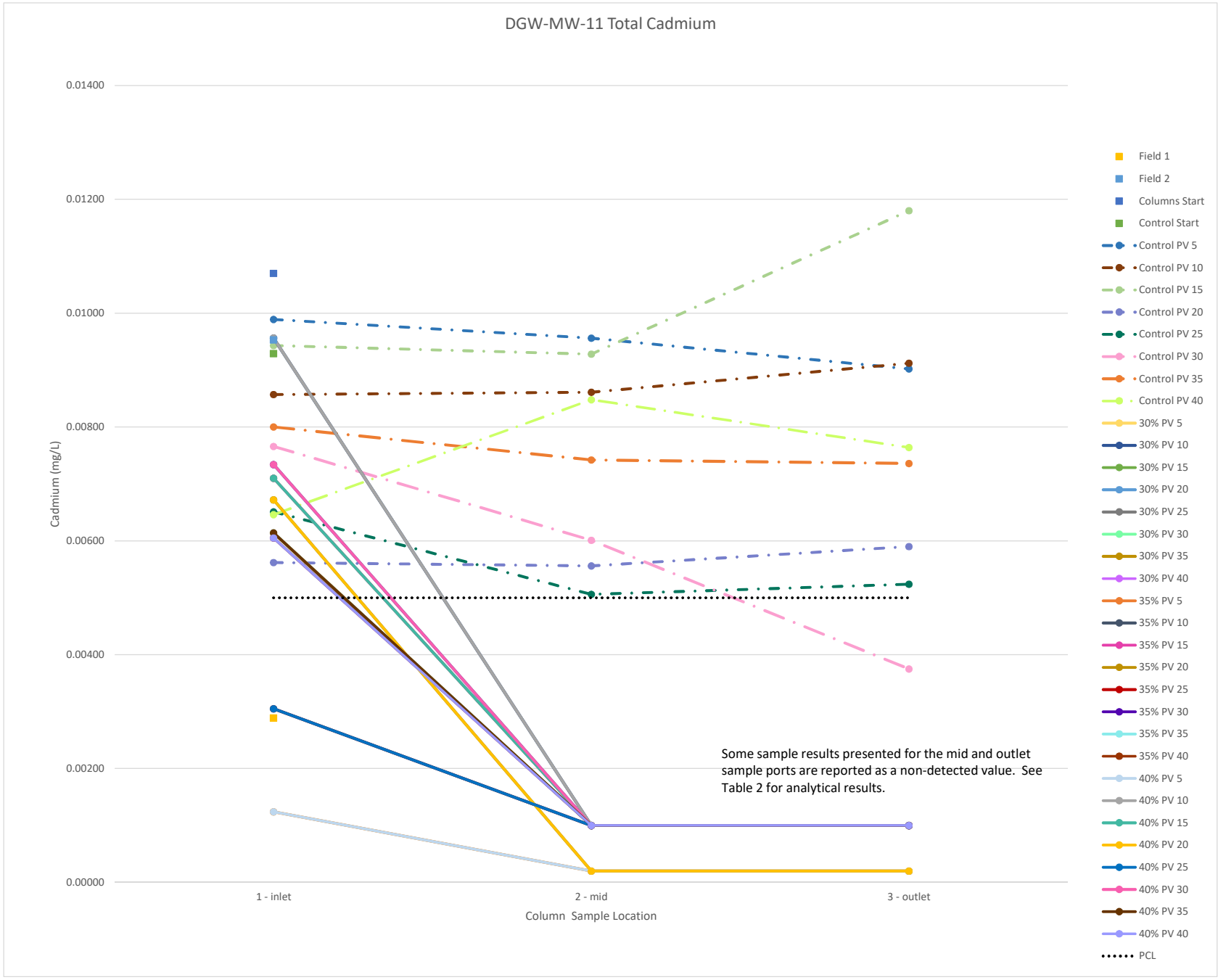
CUSTODY SEAL

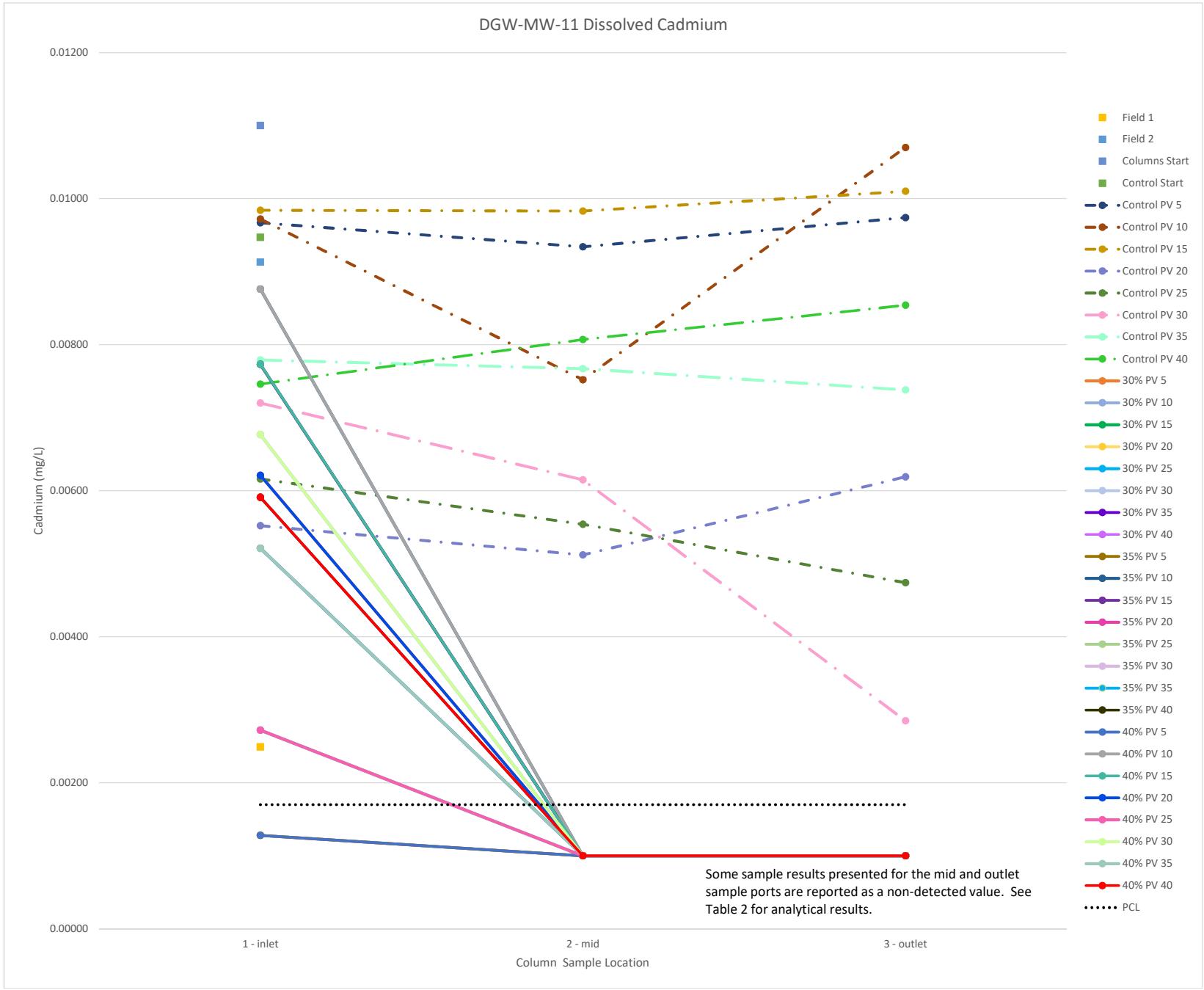
Date: 20190510 Time: 15:30
Name: Giovanni Llanos
Company: Golder Associates

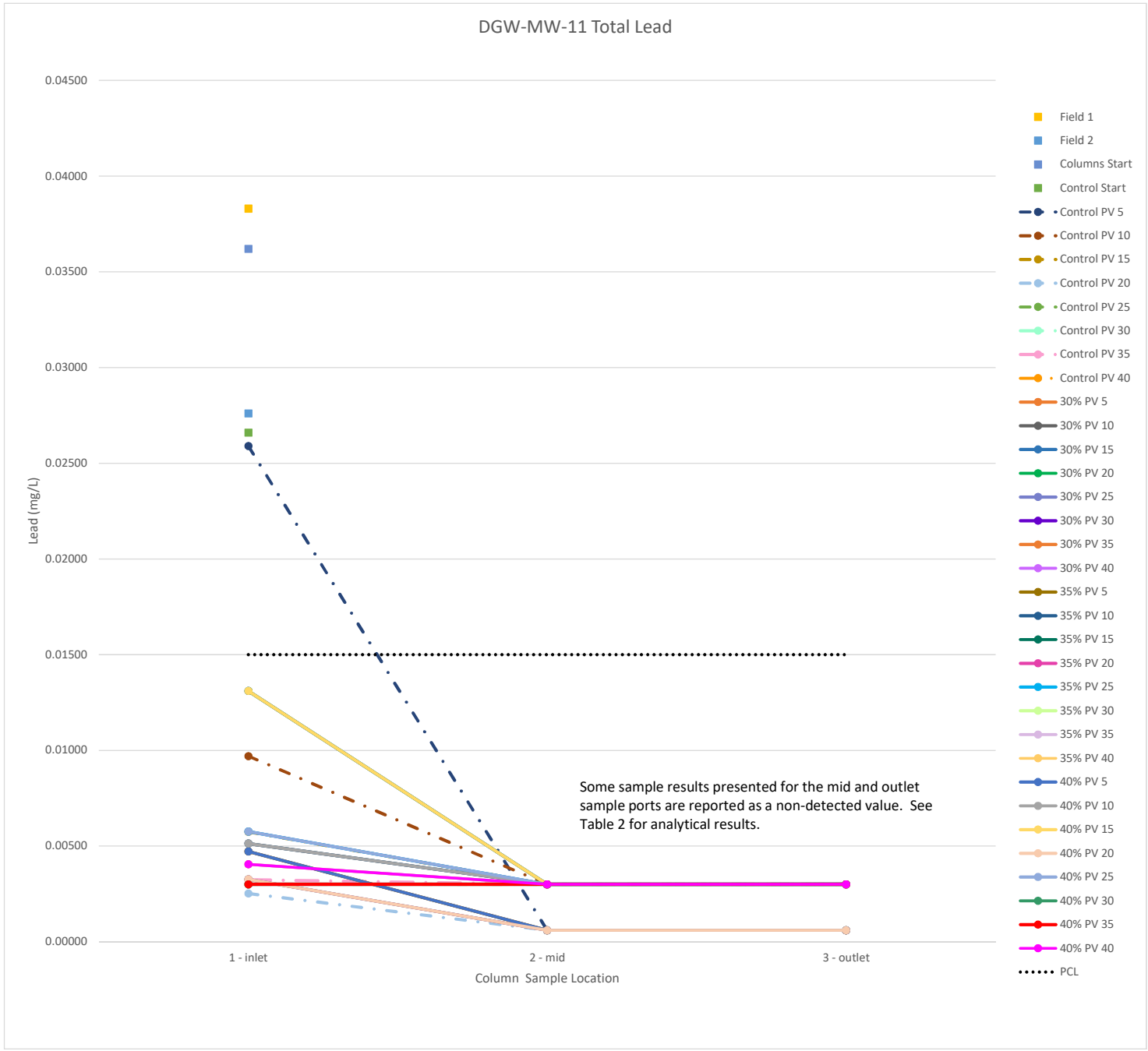
Seal Broken By: DG
Date: 5/14/19

APPENDIX C

Column Trend Plots


DGW-MW-11 Total Cadmium
0.01400
0.01200
0.01000
0.00800
0.00600
0.00400
0.00200
0.00000
Cadmium (mg/L)
1 - inlet
2 - mid
3 - outlet
Column Sample Location
Some sample results presented for the mid and outlet sample ports are reported as a non-detected value. See Table 2 for analytical results.
Field 1
Field 2
Columns Start
Control Start
Control PV 5
Control PV 10
Control PV 15
Control PV 20
Control PV 25
Control PV 30
Control PV 35
Control PV 40
30% PV 5
30% PV 10
30% PV 15
30% PV 20
30% PV 25
30% PV 30
30% PV 35
30% PV 40
35% PV 5
35% PV 10
35% PV 15
35% PV 20
35% PV 25
35% PV 30
35% PV 35
35% PV 40
40% PV 5
40% PV 10
40% PV 15
40% PV 20
40% PV 25
40% PV 30
40% PV 35
40% PV 40
PCL


DGW-MW-11 Dissolved Cadmium
0.01200
0.01000
0.00800
0.00600
0.00400
0.00200
0.00000
Cadmium (mg/L)
1 - inlet
2 - mid
3 - outlet
Column Sample Location
Some sample results presented for the mid and outlet sample ports are reported as a non-detected value. See Table 2 for analytical results.
Field 1
Field 2
Columns Start
Control Start
Control PV 5
Control PV 10
Control PV 15
Control PV 20
Control PV 25
Control PV 30
Control PV 35
Control PV 40
30% PV 5
30% PV 10
30% PV 15
30% PV 20
30% PV 25
30% PV 30
30% PV 35
30% PV 40
35% PV 5
35% PV 10
35% PV 15
35% PV 20
35% PV 25
35% PV 30
35% PV 35
35% PV 40
40% PV 5
40% PV 10
40% PV 15
40% PV 20
40% PV 25
40% PV 30
40% PV 35
40% PV 40
PCL


DGW-MW-11 Total Lead
0.04500
0.04000
0.03500
0.03000
0.02500
0.02000
0.01500
0.01000
0.00500
0.00000
Lead (mg/L)
1 - inlet
2 - mid
3 - outlet
Column Sample Location
Some sample results presented for the mid and outlet sample ports are reported as a non-detected value. See Table 2 for analytical results.
Field 1
Field 2
Columns Start
Control Start
Control PV 5
Control PV 10
Control PV 15
Control PV 20
Control PV 25
Control PV 30
Control PV 35
Control PV 40
30% PV 5
30% PV 10
30% PV 15
30% PV 20
30% PV 25
30% PV 30
30% PV 35
30% PV 40
35% PV 5
35% PV 10
35% PV 15
35% PV 20
35% PV 25
35% PV 30
35% PV 35
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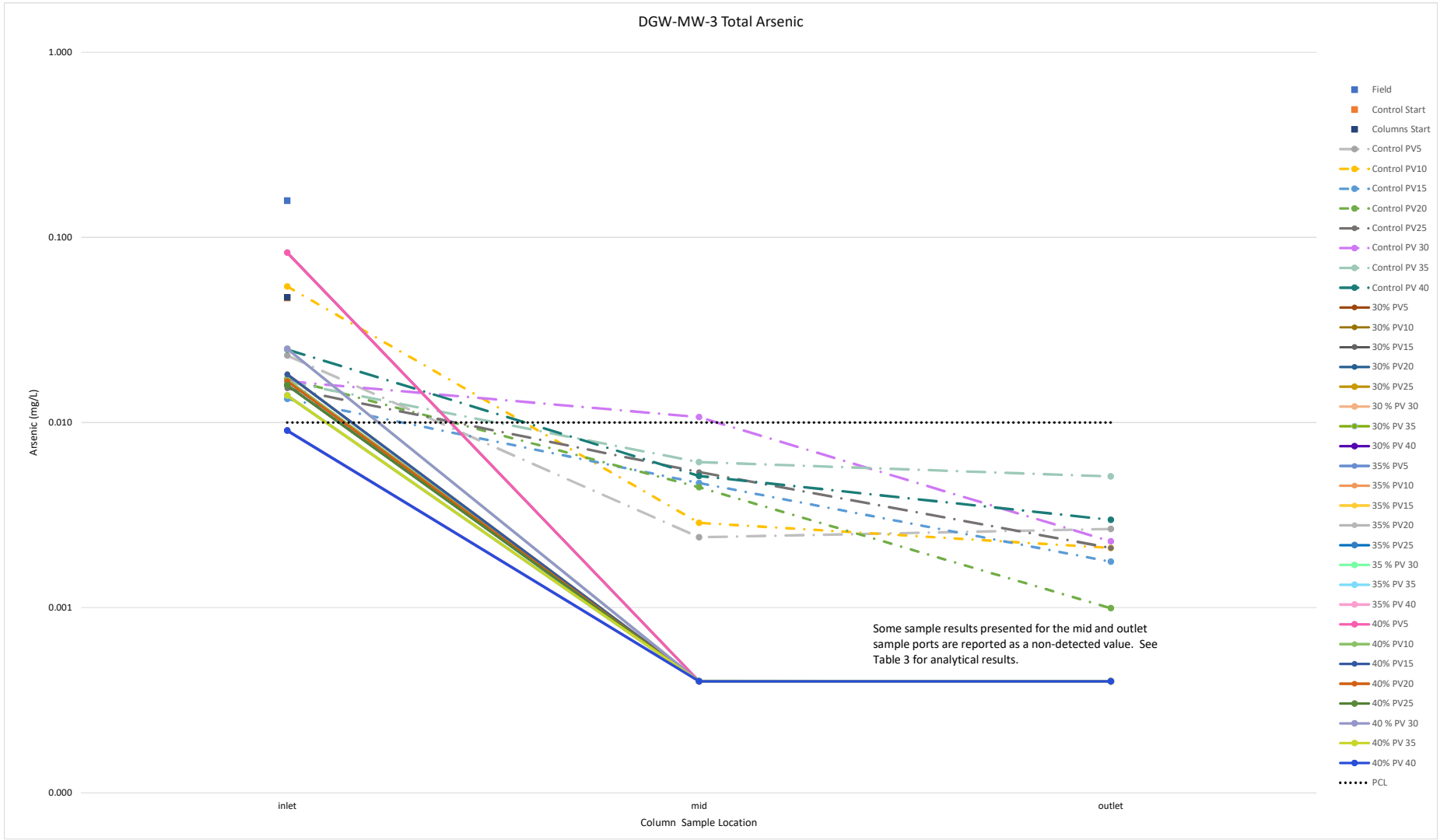
40% PV 25
40% PV 30
40% PV 35
40% PV 40
PCL


DGW-MW-3 Total Arsenic
1.000
0.100
0.010
0.001
0.000
Arsenic (mg/L)
inlet
mid
outlet
Column Sample Location
Some sample results presented for the mid and outlet sample ports are reported as a non-detected value. See Table 3 for analytical results.
Field
Control Start
Columns Start
Control PV5
Control PV10
Control PV15
Control PV20
Control PV25
Control PV 30
Control PV 35
Control PV 40
30% PV5
30% PV10
30% PV15
30% PV20
30% PV25
30 % PV 30
30% PV 35
30% PV 40
35% PV5
35% PV10
35% PV15
35% PV20
35% PV25
35 % PV 30
35% PV 35
35% PV 40
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40% PV10
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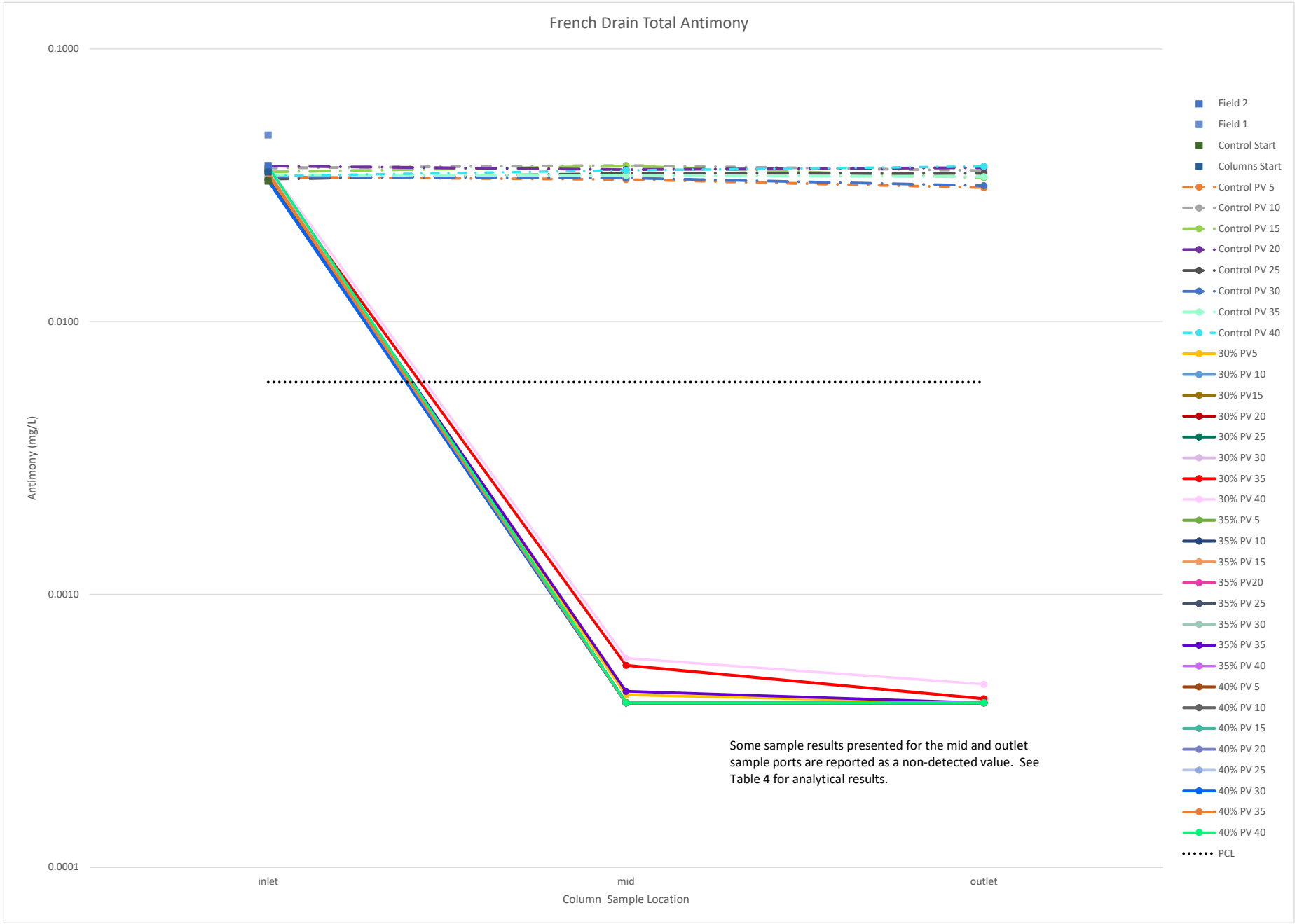
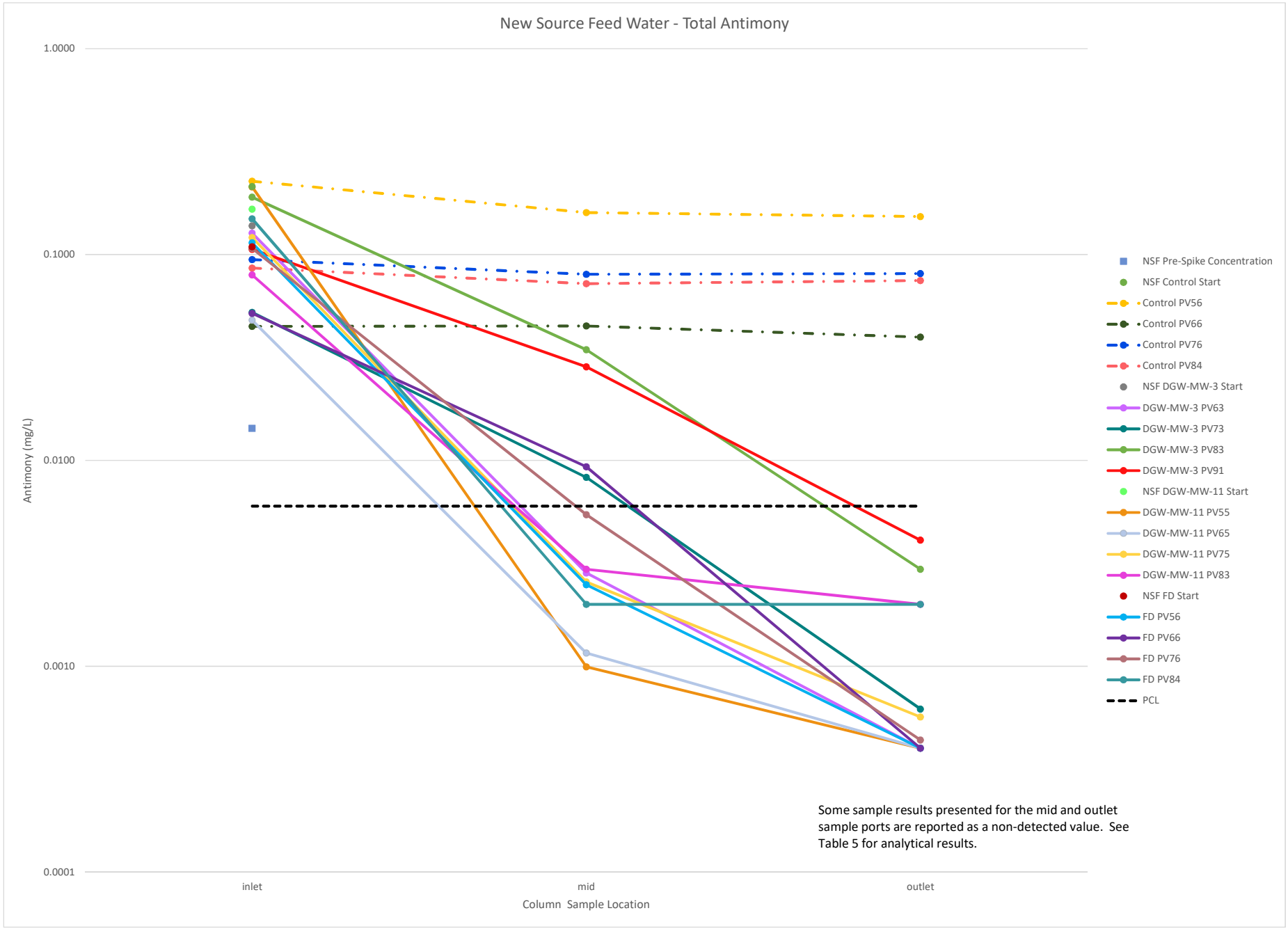
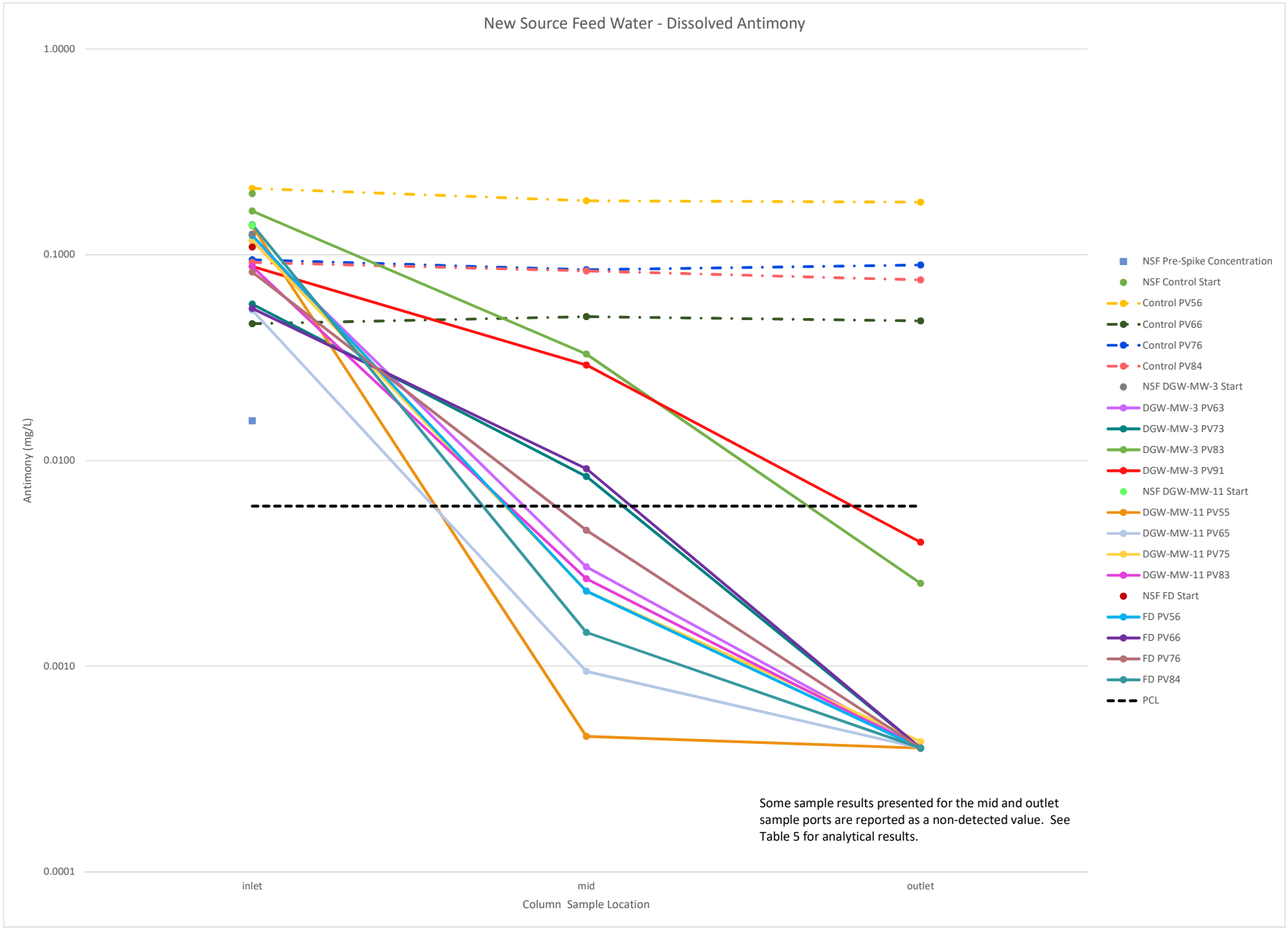
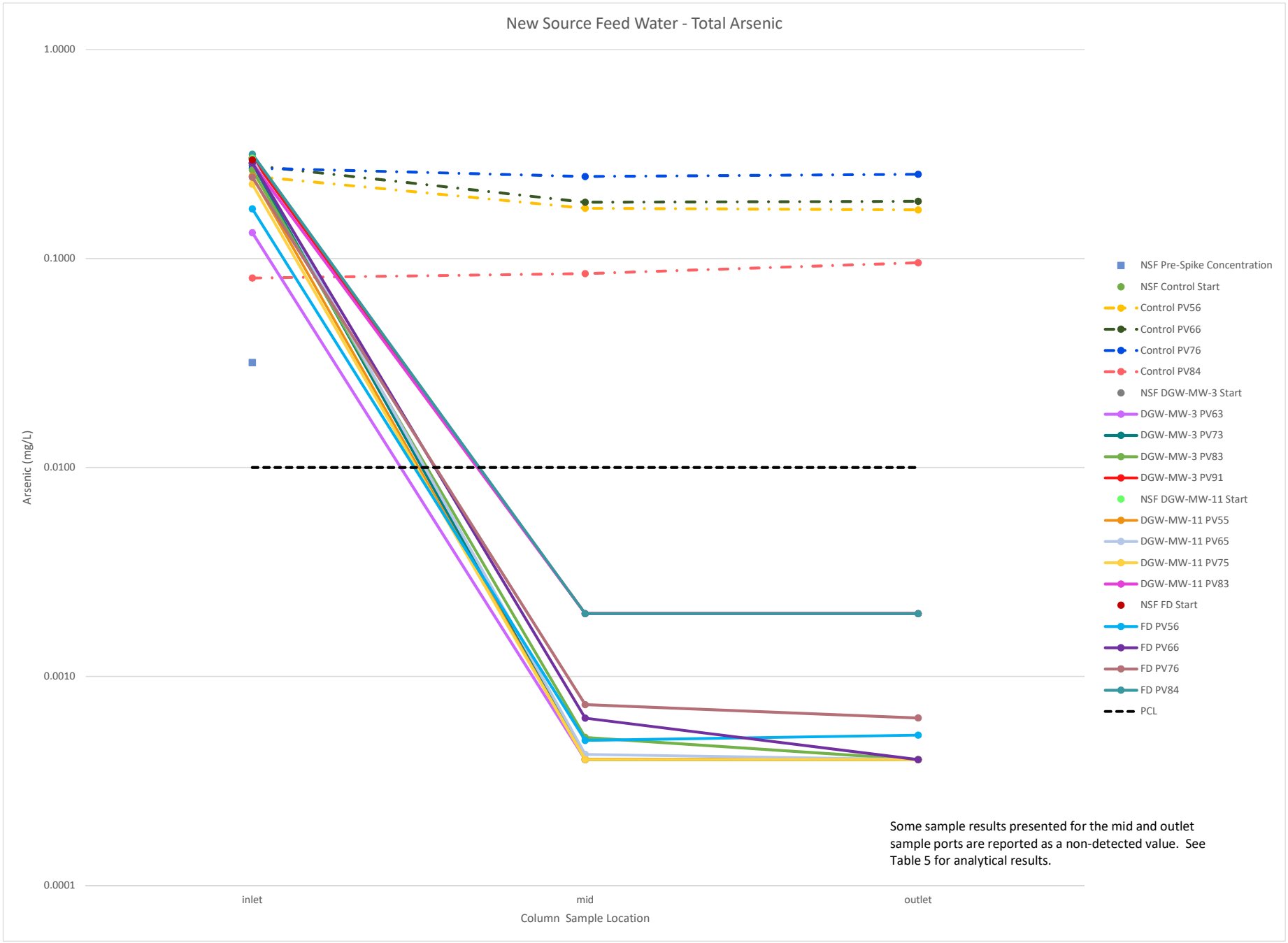
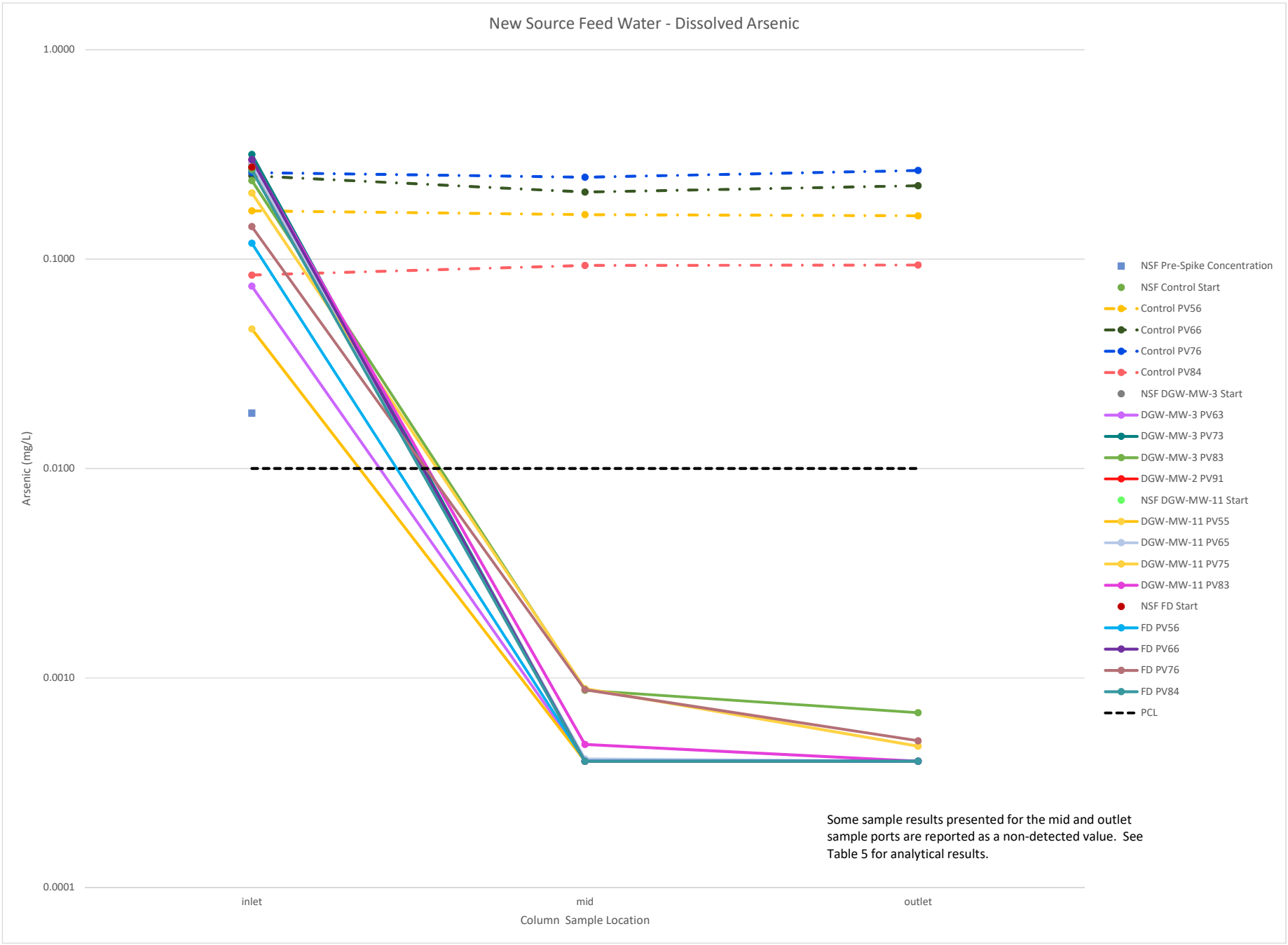
40% PV20
40% PV25
40 % PV 30
40% PV 35
40% PV 40
PCL

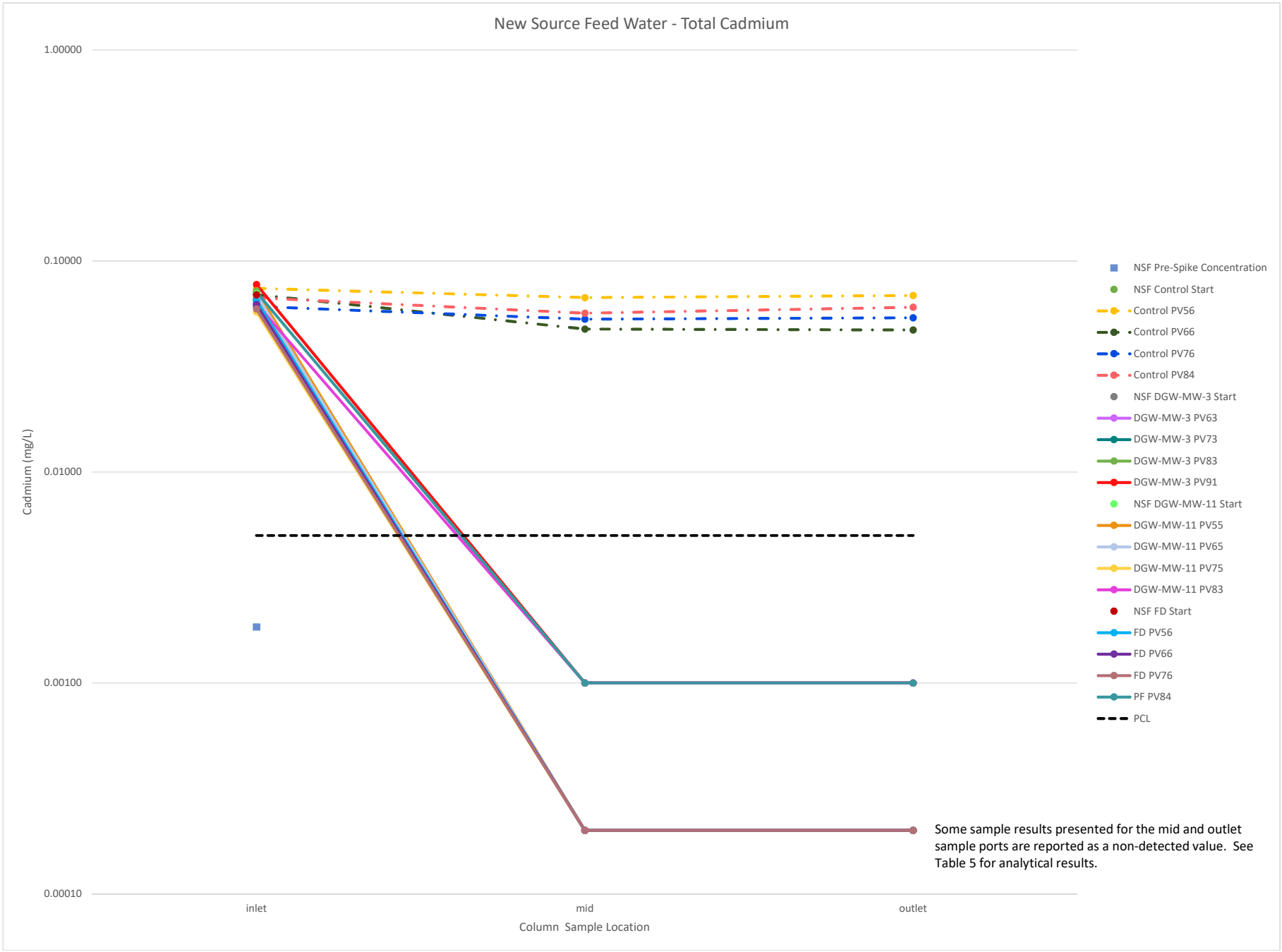

French Drain Total Antimony
0.1000
0.0100
0.0010
0.0001
Antimony (mg/L)
inlet
mid
outlet
Column Sample Location
Some sample results presented for the mid and outlet sample ports are reported as a non-detected value. See Table 4 for analytical results.
Field 2
Field 1
Control Start
Columns Start
Control PV 5
Control PV 10
Control PV 15
Control PV 20
Control PV 25
Control PV 30
Control PV 35
Control PV 40
30% PV5
30% PV 10
30% PV15
30% PV 20
30% PV 25
30% PV 30
30% PV 35
30% PV 40
35% PV 5
35% PV 10
35% PV 15
35% PV20
35% PV 25
35% PV 30
35% PV 35
35% PV 40
40% PV 5
40% PV 10
40% PV 15
40% PV 20
40% PV 25
40% PV 30
40% PV 35
40% PV 40
PCL


New Source Feed Water - Total Antimony
1.0000
0.1000
0.0100
0.0010
0.0001
Antimony (mg/L)
inlet
mid
outlet
Column Sample Location
NSF Pre-Spike Concentration
NSF Control Start
Control PV56
Control PV66
Control PV76
Control PV84
NSF DGW-MW-3 Start
DGW-MW-3 PV63
DGW-MW-3 PV73
DGW-MW-3 PV83
DGW-MW-3 PV91
NSF DGW-MW-11 Start
DGW-MW-11 PV55
DGW-MW-11 PV65
DGW-MW-11 PV75
DGW-MW-11 PV83
NSF FD Start
FD PV56
FD PV66
FD PV76
FD PV84
PCL
Some sample results presented for the mid and outlet sample ports are reported as a non-detected value. See Table 5 for analytical results.


New Source Feed Water - Dissolved Antimony
1.0000
0.1000
0.0100
0.0010
0.0001
Antimony (mg/L)
inlet
mid
outlet
Column Sample Location
NSF Pre-Spike Concentration
NSF Control Start
Control PV56
Control PV66
Control PV76
Control PV84
NSF DGW-MW-3 Start
DGW-MW-3 PV63
DGW-MW-3 PV73
DGW-MW-3 PV83
DGW-MW-3 PV91
NSF DGW-MW-11 Start
DGW-MW-11 PV55
DGW-MW-11 PV65
DGW-MW-11 PV75
DGW-MW-11 PV83
NSF FD Start
FD PV56
FD PV66
FD PV76
FD PV84
PCL
Some sample results presented for the mid and outlet sample ports are reported as a non-detected value. See Table 5 for analytical results.


New Source Feed Water - Total Arsenic
1.0000
0.1000
0.0100
0.0010
0.0001
Arsenic (mg/L)
inlet
mid
outlet
Column Sample Location
NSF Pre-Spike Concentration
NSF Control Start
Control PV56
Control PV66
Control PV76
Control PV84
NSF DGW-MW-3 Start
DGW-MW-3 PV63
DGW-MW-3 PV73
DGW-MW-3 PV83
DGW-MW-3 PV91
NSF DGW-MW-11 Start
DGW-MW-11 PV55
DGW-MW-11 PV65
DGW-MW-11 PV75
DGW-MW-11 PV83
NSF FD Start
FD PV56
FD PV66
FD PV76
FD PV84
PCL
Some sample results presented for the mid and outlet sample ports are reported as a non-detected value. See Table 5 for analytical results.


New Source Feed Water - Dissolved Arsenic
1.0000
0.1000
0.0100
0.0010
0.0001
Arsenic (mg/L)
inlet
mid
outlet
Column Sample Location
NSF Pre-Spike Concentration
NSF Control Start
Control PV56
Control PV66
Control PV76
Control PV84
NSF DGW-MW-3 Start
DGW-MW-3 PV63
DGW-MW-3 PV73
DGW-MW-3 PV83
DGW-MW-2 PV91
NSF DGW-MW-11 Start
DGW-MW-11 PV55
DGW-MW-11 PV65
DGW-MW-11 PV75
DGW-MW-11 PV83
NSF FD Start
FD PV56
FD PV66
FD PV76
FD PV84
PCL
Some sample results presented for the mid and outlet sample ports are reported as a non-detected value. See Table 5 for analytical results.


New Source Feed Water - Total Cadmium
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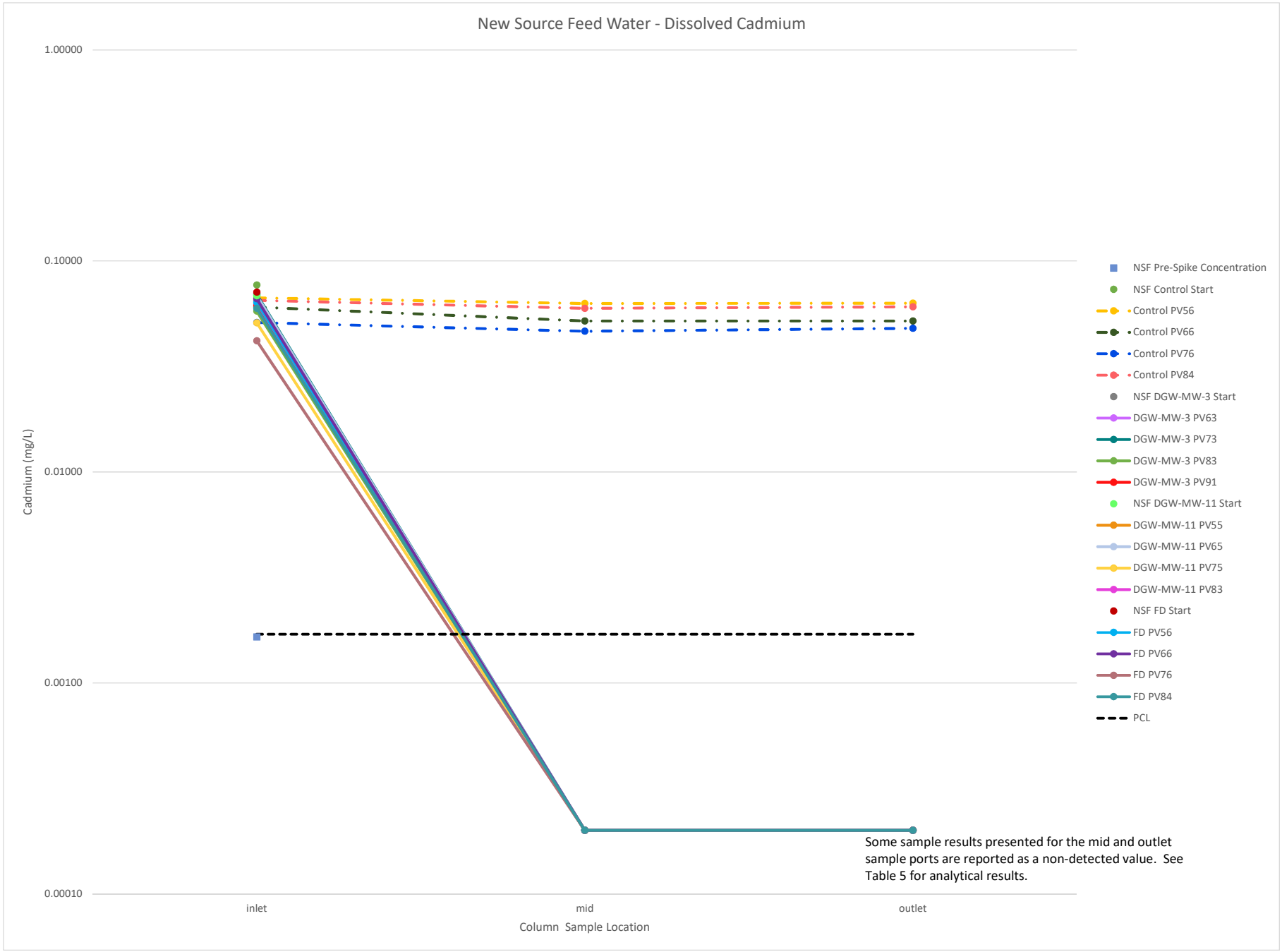
0.10000
0.01000
0.00100
0.00010
Cadmium (mg/L)
inlet
mid
outlet
Column Sample Location
NSF Pre-Spike Concentration
NSF Control Start
Control PV56
Control PV66
Control PV76
Control PV84
NSF DGW-MW-3 Start
DGW-MW-3 PV63
DGW-MW-3 PV73
DGW-MW-3 PV83
DGW-MW-3 PV91
NSF DGW-MW-11 Start
DGW-MW-11 PV55
DGW-MW-11 PV65
DGW-MW-11 PV75
DGW-MW-11 PV83
NSF FD Start
FD PV56
FD PV66
FD PV76
PF PV84
PCL
Some sample results presented for the mid and outlet sample ports are reported as a non-detected value. See Table 5 for analytical results.


New Source Feed Water - Dissolved Cadmium
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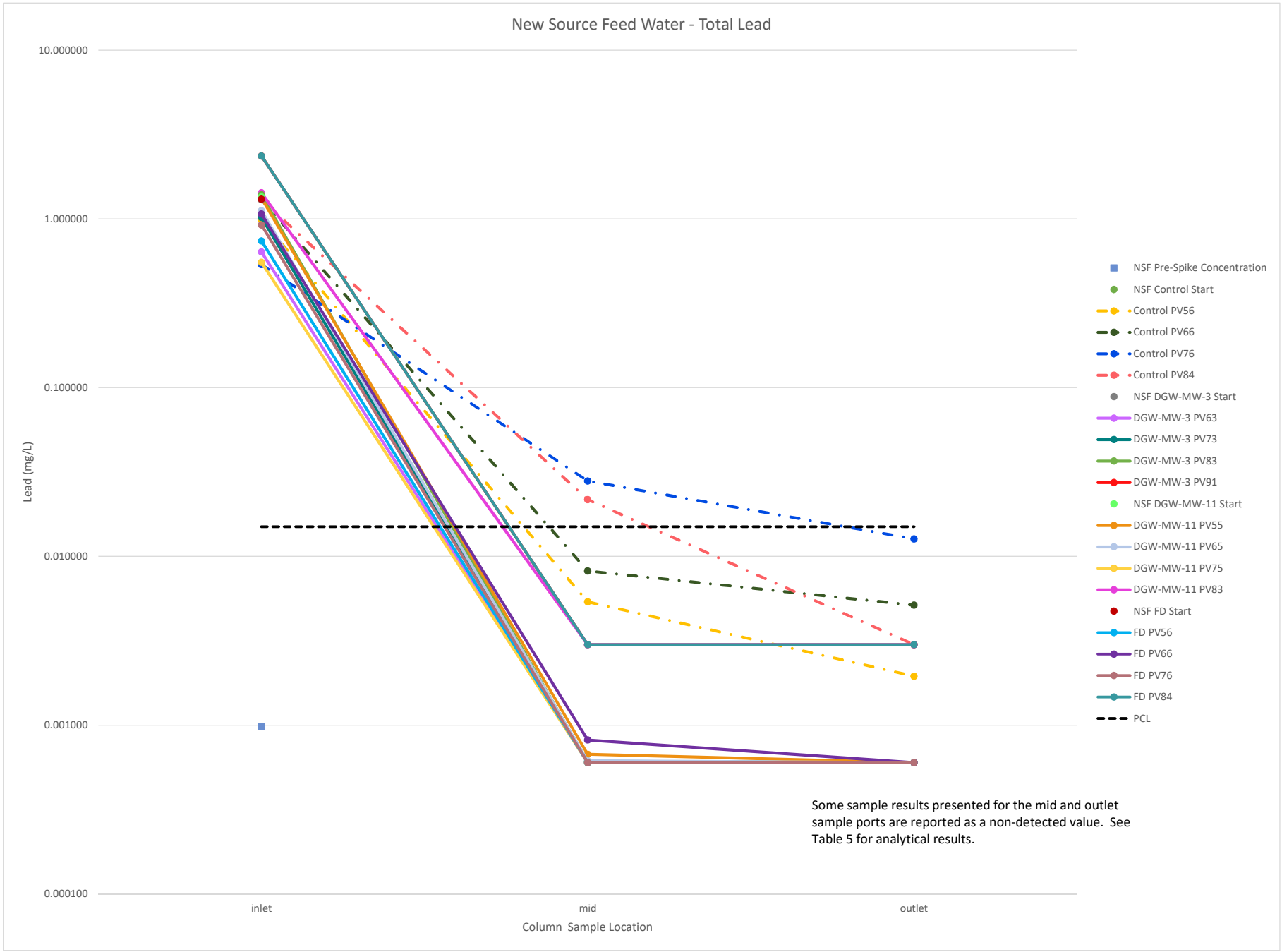
0.01000
0.00100
0.00010
Cadmium (mg/L)
inlet
mid
outlet
Column Sample Location
NSF Pre-Spike Concentration
NSF Control Start
Control PV56
Control PV66
Control PV76
Control PV84
NSF DGW-MW-3 Start
DGW-MW-3 PV63
DGW-MW-3 PV73
DGW-MW-3 PV83
DGW-MW-3 PV91
NSF DGW-MW-11 Start
DGW-MW-11 PV55
DGW-MW-11 PV65
DGW-MW-11 PV75
DGW-MW-11 PV83
NSF FD Start
FD PV56
FD PV66
FD PV76
FD PV84
PCL
Some sample results presented for the mid and outlet sample ports are reported as a non-detected value. See Table 5 for analytical results.


New Source Feed Water - Total Lead
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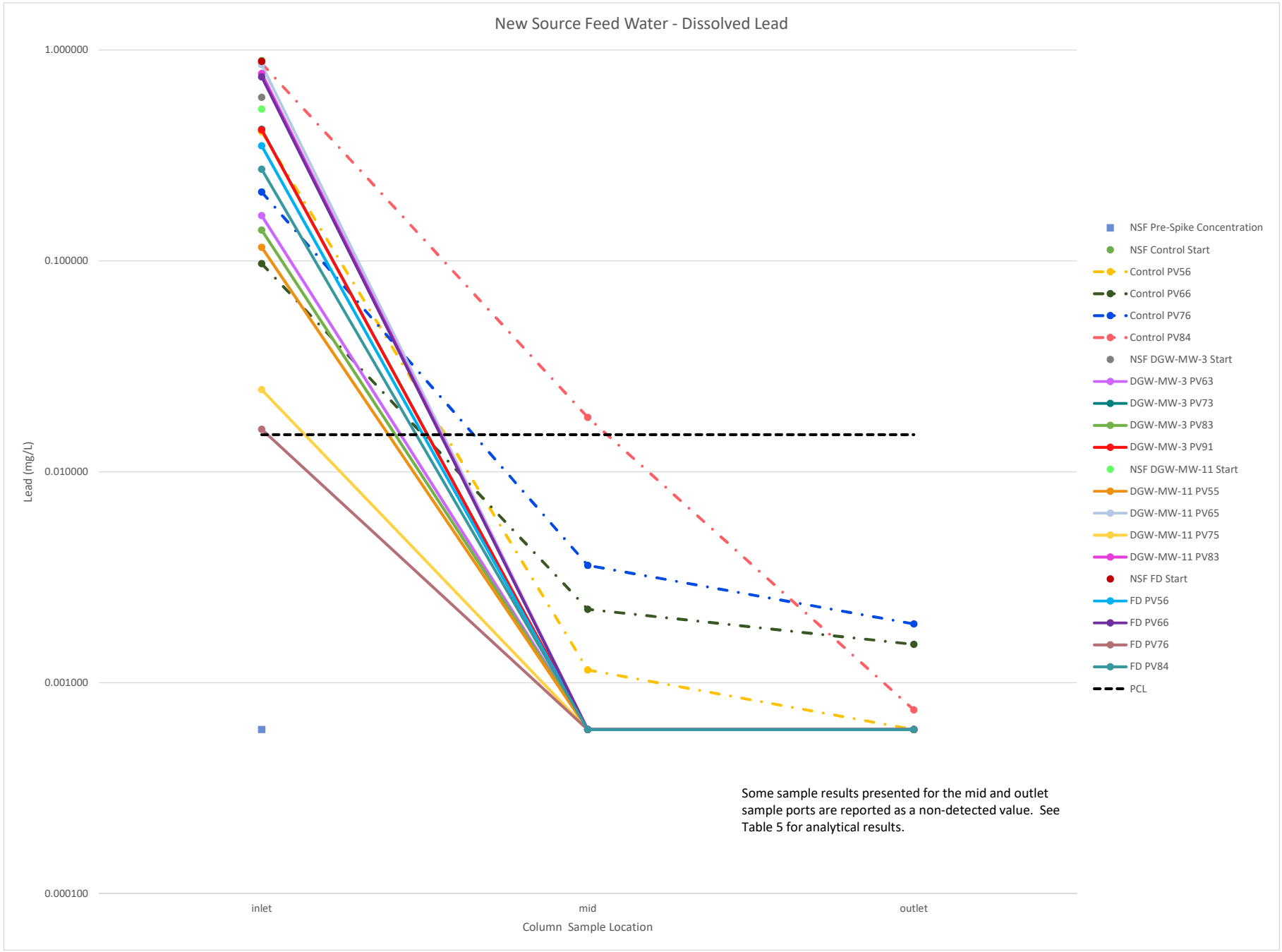
1.000000
0.100000
0.010000
0.001000
0.000100
Lead (mg/L)
inlet
mid
outlet
Column Sample Location
NSF Pre-Spike Concentration
NSF Control Start
Control PV56
Control PV66
Control PV76
Control PV84
NSF DGW-MW-3 Start
DGW-MW-3 PV63
DGW-MW-3 PV73
DGW-MW-3 PV83
DGW-MW-3 PV91
NSF DGW-MW-11 Start
DGW-MW-11 PV55
DGW-MW-11 PV65
DGW-MW-11 PV75
DGW-MW-11 PV83
NSF FD Start
FD PV56
FD PV66
FD PV76
FD PV84
PCL
Some sample results presented for the mid and outlet sample ports are reported as a non-detected value. See Table 5 for analytical results.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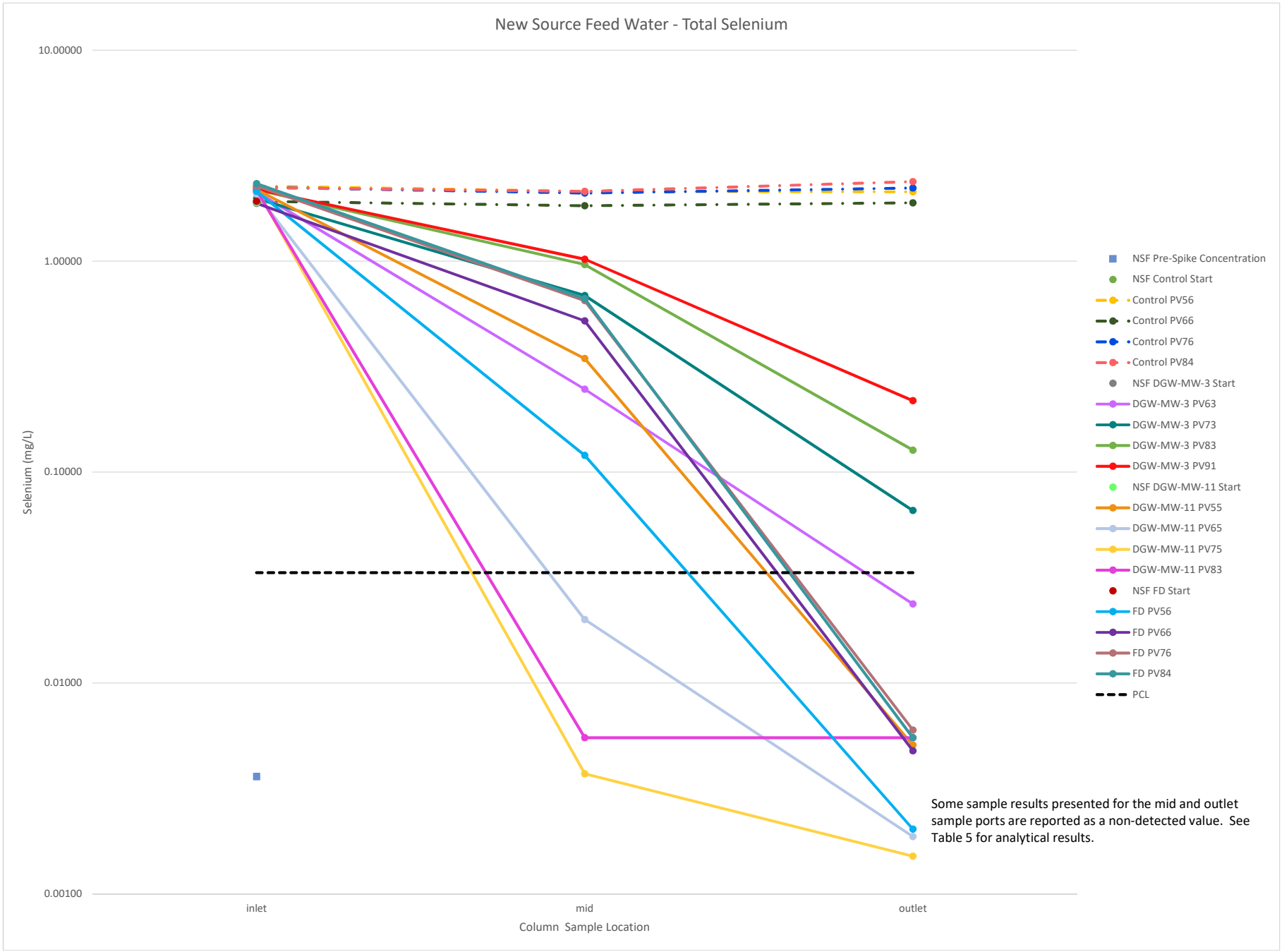
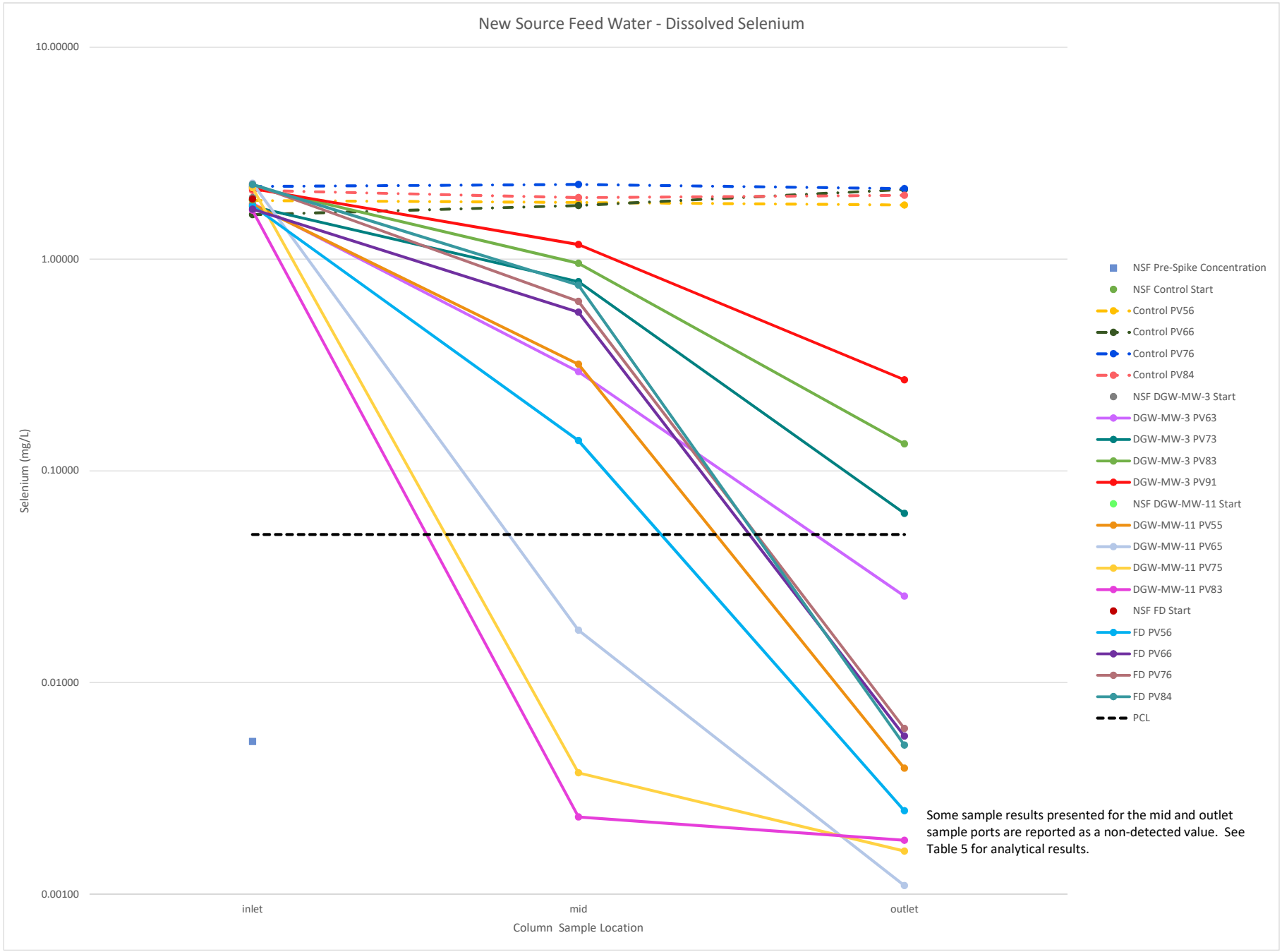
1.000000
0.100000
0.010000
0.001000
0.000100
Lead (mg/L)
inlet
mid
outlet
Column Sample Location
NSF Pre-Spike Concentration
NSF Control Start
Control PV56
Control PV66
Control PV76
Control PV84
NSF DGW-MW-3 Start
DGW-MW-3 PV63
DGW-MW-3 PV73
DGW-MW-3 PV83
DGW-MW-3 PV91
NSF DGW-MW-11 Start
DGW-MW-11 PV55
DGW-MW-11 PV65
DGW-MW-11 PV75
DGW-MW-11 PV83
NSF FD Start
FD PV56
FD PV66
FD PV76
FD PV84
PCL
Some sample results presented for the mid and outlet sample ports are reported as a non-detected value. See Table 5 for analytical results.


New Source Feed Water - Total Selenium
10.00000
1.00000
0.10000
0.01000
0.00100
Selenium (mg/L)
inlet
mid
outlet
Column Sample Location
NSF Pre-Spike Concentration
NSF Control Start
Control PV56
Control PV66
Control PV76
Control PV84
NSF DGW-MW-3 Start
DGW-MW-3 PV63
DGW-MW-3 PV73
DGW-MW-3 PV83
DGW-MW-3 PV91
NSF DGW-MW-11 Start
DGW-MW-11 PV55
DGW-MW-11 PV65
DGW-MW-11 PV75
DGW-MW-11 PV83
NSF FD Start
FD PV56
FD PV66
FD PV76
FD PV84
PCL
Some sample results presented for the mid and outlet sample ports are reported as a non-detected value. See Table 5 for analytical results.


New Source Feed Water - Dissolved Selenium
10.00000
1.00000
0.10000
0.01000
0.00100
Selenium (mg/L)
inlet
mid
outlet
Column Sample Location
NSF Pre-Spike Concentration
NSF Control Start
Control PV56
Control PV66
Control PV76
Control PV84
NSF DGW-MW-3 Start
DGW-MW-3 PV63
DGW-MW-3 PV73
DGW-MW-3 PV83
DGW-MW-3 PV91
NSF DGW-MW-11 Start
DGW-MW-11 PV55
DGW-MW-11 PV65
DGW-MW-11 PV75
DGW-MW-11 PV83
NSF FD Start
FD PV56
FD PV66
FD PV76
FD PV84
PCL
Some sample results presented for the mid and outlet sample ports are reported as a non-detected value. See Table 5 for analytical results.

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APPENDIX 3.7

GROUNDWATER REMEDY DESIGN REPORT

GROUNDWATER REMEDY DESIGN REPORT

Exide Frisco Recycling Facility
7471 Old 5th Street, Frisco, Texas 75034-5047
TCEQ SWR No. 30516
TCEQ Hazardous Waste Permit No. HW-50206
TCEQ Agreed Order Docket No. 2011-1712-IHW-E
EPA ID No. TXD006451090
Customer No. CN600129779
Regulated Entity No. RN100218643

R Bryan Luper
5-31-19

GOLDER ASSOCIATES INC.
Professional Engineering Firm
Registration Number F-2578

Submitted to:

Mr. Brad Weaver
Director, Remediation
Exide Technologies
P.O. Box 250
7471 5th Street
Frisco, TX 75034

Submitted by:

Golder Associates Inc.
13515 Barrett Parkway Drive, Suite 260, Ballwin, Missouri, USA 63021

+1 314 984-8800

130-2086-06

May 2019

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RBryan Luper
5-31-19

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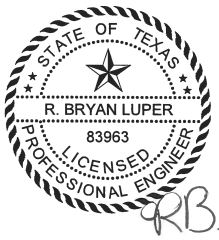

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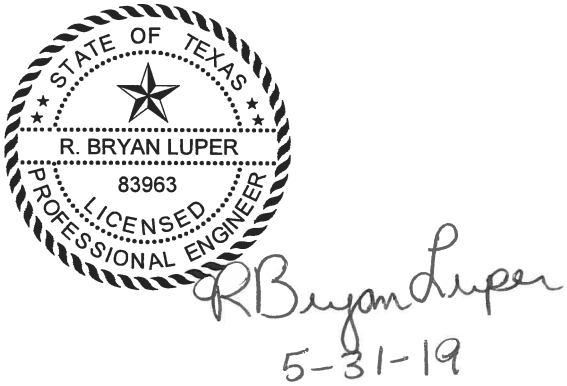

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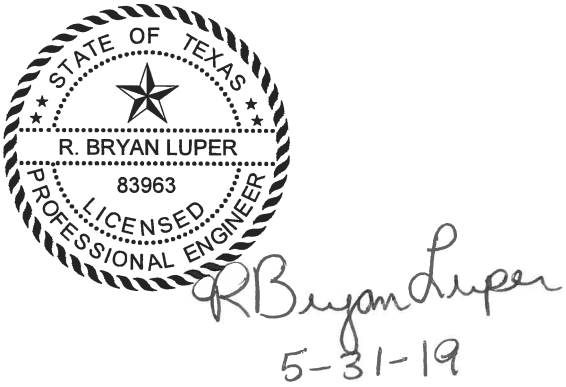


1.0 INTRODUCTION

Golder Associates Inc. (Golder) has prepared this Groundwater Remedy Design (GRD) Report for the Exide Technologies, Inc. (Exide) Former Operating Plant (FOP or Site) located at 7471 Old 5th Street in Frisco, Texas (Figure 1). This report has been prepared in conjunction with the Groundwater Remedy Evaluation (GRE) Report (included as Appendix 3.2 to the FOP Response Action Plan [RAP]) and the Deep Groundwater Preliminary Design Investigation (DGW) Report (Appendix 3.1 to the FOP RAP) which summarizes the field work completed from May to August 2018 in support of next steps for Exide's FRC Part B RCRA Permit Renewal Application with a Major Amendment and Compliance Plan (referred to throughout as the "Part B RCRA Permit Renewal Application".

In the GRE, Golder recommended a Funnel & Gate Permeable Reactive Barrier (PRB) Wall for the groundwater protection element at the Site as both a component of the Corrective Action Program at the Site and a component of the CAMU design. In-Situ Chemical Reduction (ISCR) using Zero-Valent Iron (ZVI) is a proven technology for removing arsenic, antimony, cadmium, lead and selenium, the relevant Contaminants of Concerns (COCs). Figure 2 shows the various components of the groundwater remedy, including bentonite enhanced concrete slurry wall sections (the funnels) running roughly adjacent to Stewart Creek and the North Tributary, sheet-pile sections near the northwest corner of the Remediation Consolidation Area (RCA), a PRB located at the "gate" area of the funnels and a Sump Reactor that can treat and transfer groundwater to the PRB from an area near the RCA (see Figure 3). Figure 4 shows the funnel and gate system layout in plan-view, including the location of the slurry wall sections, the sheet pile sections (needed where slurry walls can't be constructed), the PRB, the Sump Reactor, the transfer piping and the discharge channels. Figure 5 shows the funnel and gate system profiles.

This GRD report provides the background and details for the design, operation, maintenance and monitoring of the proposed funnel and gate system. This GRD follows as an outline, the "Final Design Guidance for Application of Permeable Reactive Barriers for Groundwater Remediation," prepared by the Air Force Research Laboratory, Tyndall Air Force Base, Florida. The overall methodology for PRB design involves the steps detailed in the following Sections:

- Section 2: Preliminary assessment
- Section 3: Site characterization
- Section 4: Reactive media selection
- Section 5: Treatability testing
- Section 6: Modeling and engineering design
- Section 7: Construction method
- Section 8: Monitoring plan.

2.0 PRELIMINARY ASSESSMENT

A preliminary assessment of potentially applicable groundwater remediation alternatives was conducted as described in the GRE. Following the guidance, factors to consider in determining the suitability for PRB application are listed below.

- Contaminant Type
- Plume Size and Distribution
- Aquifer Depth
- Geotechnical Considerations.
- Competent Aquitard
- Groundwater Velocity

During the development of the GRE, numerous treatment and control technologies were preliminarily screened in relation to Site specific considerations such as the types of contaminants to be treated and the technologies' compatibility with hydro-geo-chemical conditions at the Site. Any potentially applicable groundwater remedy selected for implementation at the Site will be paired with a low-permeability engineered cap/cover system that will be placed atop the RCA, the North Disposal Area (NDA) and the Slag Landfill following final placement of excavated soils and sediments.

Following the GRE preliminary screening, several technologies such as chemical oxidation, thermal destruction and vapor extraction were found to be incompatible with Site conditions. The following treatment or control technologies are considered the most appropriate for the Site conditions and were selected for a more detailed review:

- PRB
  - ISCR
  - In-situ bio-sequestration
- Slurry wall & hydraulic control with ex-situ chemical treatment
- Monitored natural attenuation

Based on our evaluation, Golder recommended a Funnel & Gate PRB Wall (Alternative 3 of the GRE) for the groundwater protection element at the Site as both a component of the Corrective Action Program at the Site and a component of the CAMU design.

As stated above, ISCR using ZVI is a proven technology for removing arsenic, antimony, cadmium, lead and selenium, the relevant COCs. The application of ISCR using a PRB is a proven and accepted remedy. Although PRB technology has been used for approximately 20 years and has been used at over 120 sites (ITRC, 2005), to the extent it is may be viewed as a somewhat newer technology, the CAMU criteria specifically encourage the incorporation of innovative technologies into the CAMU design [40 CFR 264.552(c)(6)].

3.0 SITE CHARACTERIZATION

The following are the key aspects of Site characterization for PRB design:

- Hydrogeology of the site
- Contaminant distribution in the groundwater
- Geochemical composition of the groundwater
- Geotechnical and topographic features.

As noted in the guidance, seasonal variations in such factors as flow and rainfall events can affect some of these site features, so monthly data (though quarterly is recommended by the guidance) will be collected over a period of two years to observe the changes in the current groundwater flow patterns at the Site (see Section 8: Monitoring and Maintenance).

The following sections provide detailed information on each of the key components of Site characterization.

3.1 Site Hydrogeology

3.1.1 Site Geology

Soils encountered as part of the DGW were generally like those encountered from the borings advanced and recorded at the Site during previous investigations. The geology encountered at the Site generally consists of approximately 10 to 30 feet of moist to wet, clay-rich, colluvial soils (Quaternary undivided surficial deposits) overlying the Eagle Ford Shale Formation. Colluvium is a general term used to define soil material and rock debris that accumulates at the base of slopes due to erosional forces such as slides, slumps, sheet-floods, or debris flows. It is typically characterized by heterogeneous and poorly sorted material. The colluvial soils at the Site typically consist of clay or silty clay with minor occurrences of gravelly clay (gravel suspended in a clay matrix), sand, and clayey gravel lenses. Detailed regional and Site-specific geology is presented in Part B, Attachment G as part of the Permit Renewal.

Fence diagrams were created to depict the geology and hydrogeology of the FOP as shown on Figures 6 -8. The location of each fence-diagram section is shown on the inset (lower right) of each Figure. Cross section AA-AA' is presented as Figure 6 and details the lithology and remediation elements (i.e. slurry wall) along the northern portion of the funnel and gate system, running along the edge of the NDA and the Slag Landfill. Figure 7 details the lithology and remediation elements along the cross section cut through the Sump Reactor location (including the adjacent sheet piling). Figure 8 details the lithology and remediation elements (PRB and discharge channels) along the cross section cut through the PRB at the western end of the funnel and gate system.

For simplicity, the data from new and existing boring logs was used to group the varying colluvial soils into two primary types of units above bedrock, a unit consisting of clay and silty clay, and a unit consisting of all soils containing more coarse-grained components including gravelly/sandy clay, gravelly/sandy silty clay, silt, sandy silt, and silty sand. When grouped in this manner, the presence of potentially more transmissive units near the ground surface as well as deeper above bedrock is apparent.

3.1.2 Hydraulic Gradient

Based on groundwater levels recorded during the five weeks of the elevation survey, the groundwater flow direction at the RCA flows primarily south and west towards Stewart Creek. Based on the June 12, 2018 data,

groundwater flows to the south at a gradient of 0.029 feet per foot (ft/ft) (as measured from MW-30 towards MW-26) and to the west at a gradient of 0.026 ft/ft (as measured from MW-30 towards DGW-MW-5).

3.1.3 Hydraulic Conductivity

Hydraulic conductivities at the Site ranged from 1.8E-02 to 2.1E-06 centimeters per second (cm/s) with the highest hydraulic conductivities measured in wells with the most coarse-grained soils and the lowest hydraulic conductivities measured in wells with the least amount of coarse-grained material. The geometric mean of hydraulic conductivity for all wells in the vicinity of the FOP is 4.4E-04 cm/s. The wells were grouped into two groups based on a detailed review of boring logs (more detail is presented in boring logs than in fence diagrams as the fence diagrams were simplified as discussed above). New wells that were installed targeting the deeper transmissive unit and had higher hydraulic conductivities had a hydraulic conductivity geometric mean of 2.3E-03 cm/s (DGW-MW-1 through DGW-MW-10).

3.1.4 Porosity

The porosity (n) of an aquifer material is the percentage of the rock or soil/sediment that consists of void space. The porosity of a sample of aquifer material is normally determined in the laboratory by submerging a dried sample in a known volume of water until it is saturated. The volume of voids is equal to the original water volume less the volume in the chamber after the saturated sample is removed. This method excludes very small and non-interconnected pores, thus providing the effective porosity of the sample.

For the groundwater modeling conducted in support of this funnel and gate design, a porosity for the overburden sediments was assumed to be 0.30. For the design of the PRB and the Sump Reactor, the porosity of the ZVI-sand mixes used in the column studies was measured in the laboratory, and were reported to be:

Table 1: Measured Porosity of Column ZVI Sand Mixes

Mixture	Porosity
% w/w of ZVI	**%**
0 (clean Ottawa Sand)	40.9
30	35.2
35	34.6
40	33.2

3.1.5 Groundwater Flow

Groundwater flow directions are determined using a water-table or potentiometric surface map based on water-level measurements made at the site. Groundwater flow is perpendicular to the equipotential lines expressed on a map as contours of water-table or potentiometric surface elevation. The historic groundwater flow maps are provided in the 2014 Affected Property Assessment Report (attachment H to the May 2019 RCRA Permit Renewal Application) and indicate general groundwater flow across the Site in a southwesterly direction, discharging to Stewart Creek.

From the DGW Investigation, it was shown that:

- A vertically and horizontally discontinuous shallow water-bearing transmissive unit is present in the central portion of the proposed RCA inside of the flood wall. The water in this unit has historically had detections of cadmium and lead above the Protective Concentration Limits (PCLs) (e.g. MW-32, MW-33 and MW-34), which were also documented in DGW-MW-11S during the DGW PDI. This shallow unit was not observed at DGW-MW-8, DGW-MW-5, DGW-MW-4, DGW-MW-3, and DGW-MW-2 where no shallow coarse-grained materials were observed; and was not present in other locations where shallower coarse-grained materials were observed but were not water-bearing [DGW-MW-6, DGW-MW-7, DGW-MW-1, and DGW-MW-9]). This shallow (and often previously referred to as perched) groundwater moves horizontally toward Stewart Creek and is captured by the existing French Drain System (FDS) and flood wall system.
- A deeper water-bearing transmissive unit has been documented on both the inside and outside of the flood wall (MW-16S, MW-17, DGW-MW-5, MW-46, MW-26, DGW-MW-11, DGW-MW-10, MW-29, DGW-MW-4, MW-27, DGW-MW-3, and DGW-MW-2). This unit is generally present above bedrock, or above a smaller discontinuous unit of more fine-grained soils (clay) and is hydraulically connected to Stewart Creek (as the shale base of this unit is also the base of Stewart Creek in some areas). Groundwater moving through this unit flows to the south or west toward Stewart Creek at a rate of 0.057 to 0.072 meters per day as calculated below using the Darcy velocity equation for calculation of groundwater flux (also shown below).

Table 2: Estimated Darcy Velocities

Gradient Location	Monitoring Well Locations	Elevation (ft above mean sea level)	Elevation Difference (ft)	Distance Between Wells (ft)	Groundwater Gradient (ft/ft)	Hydraulic Conductivity Geometric Mean (cm/s)	(υ) Darcy Velocity (m/day)	(υ_{avg}) Average Darcy Velocity (m/day)
South	MW-30	633.84	7.50	260.45	0.029	0.0023	0.057	0.065
	MW-26	626.34						
West	MW-30	633.84	13.74	378.89	0.036		0.072	
	DGW-MW-5	620.10						

- There are monitoring wells positioned in downgradient locations to assess contaminant migration. The exception to this is downgradient of DGW-MW-10 and DGW-MW-11 where PCL exceedances for antimony, arsenic, cadmium, lead and selenium were observed and the closest downgradient well (MW-26) which does not have PCL exceedances but may not be positioned in a location to adequately assess migration from DGW-MW-11. Arsenic exceeded the PCL at both DGW-MW-2 and DGW-MW-3 but the exceedances at DGW-MW-3 were an order of magnitude higher and MW-27 is positioned downgradient of DGW-MW-3. Well installation immediately downgradient from MW-46 is not possible based on access but MW-26 is downgradient from the related plume. Surface water monitoring data for Stewart Creek have not indicated exceedances above applicable PCLs (see 2014 APAR included as Attachment H to the May 2019 RCRA Permit Renewal Application).
- The shallower unit is separated from the deeper transmissive unit in most places, although it is recognized that there may be areas of the FOP where granular fill and debris, utilities, or the former stream channel of Stewart Creek or the North Tributary provide a pathway between the shallower

and deeper units. The presence of these pathways between the shallower and deeper units may be the contributing factor to the PCL exceedances of lead, cadmium and antimony in the wells screened in the deeper transmissive unit in the central portion of the proposed RCA (MW-46, DGW-MW-11 and MW-30). It is noted that lead and cadmium concentrations in MW-46 and MW-30 have historically fluctuated and are not consistently above the PCL. It is also noted that there are no PCL exceedances in the wells installed closest to where the former path of Stewart Creek intersects the current path of Stewart Creek (where it would be assumed that water moving through the former Stewart Creek stream channel would be closest to discharging to surface water (see current and historic results for MW-24 and DGW-MW-9).

- In the areas to the east and the west of the FOP/proposed RCA and outside of the flood wall, there were no exceedances identified in deeper downgradient wells (MW-16S, MW-17, DGW-MW-5, MW-44, DGW-MW-1, and DGW-MW-9) and there has been no indication of the presence of shallow water moving between the proposed RCA location and Stewart Creek (no water-bearing unit was identified during recent investigation activities at DGW-MW-5, DGW-MW-1, and DGW-MW-9).
- In the area of the proposed PRB gate, boreholes 2019-BH-01 through 2019-BH-04 also indicated a predominantly clay matrix with minor occurrence of discrete transmissive units/layers. Borehole 2019-BH-01 shows approximately 23 ft of “CL” clay with a 7.5 ft thick more silty clay layer from elevation 615 ft above mean sea level (MSL) to 623 ft MSL. At 2019-BH-02, 22 of 24 feet of soil column was clay, with a 2-foot thick sand and silty-clay with gravel ‘seam’ at about 619 ft MSL and a ½ foot thick sand laying directly atop bedrock at 613 ft MSL. At 2019-BH-03, there is about 22.5 feet of clay with a thin layer of sand atop bedrock and at 2019-BH-04, there was about 23 feet of clay with a thin clayey silt with trace of sand ‘seam’ at 620.5 ft MSL. Standing water was only reported at 2019-BH-04.

3.1.6 PRB Area Long-Term Pumping Test

A 48-hour pumping test was conducted at monitoring well DGW-MW-12 (see Appendix 3.5 of the FOP RAP). Analyses of extraction flow rate, drawdown, rate of drawdown vs time performed at DGW-MW-12 yielded a near-well transmissivity value of approximately 6E-06 (m^2/s) and a corresponding hydraulic conductivity value of 2E-04 cm/s over the saturated interval of the well, which is similar to estimates from slug testing. The longer duration of the pumping test relative to a slug test allowed for identification of the flow regime beyond several borehole diameters from DGW-MW-12. Applying the pressure derivative method (Bourdet et al., 1983) to the DGW-MW-12 pumping test data indicated the presence of low-flow/no-flow boundaries in the vicinity of the well, with a positive unit-slope in the late-time pressure response of the pressure derivative data plot, consistent with the observed hydro-stratigraphy at 2019-BH-01 through 04 (a predominantly clay matrix with 2 minor and discontinuous transmissive layers at about 619-623 ft MSL and directly atop bedrock at around 613-614 ft MSL.

3.2 Contaminant Distribution

Total and dissolved antimony, arsenic, cadmium, lead, and selenium were compared to their respective Critical PCLs. TPH was collected at select monitoring wells near the former diesel AST (DGW-MW-2, DGW-MW-3, DGW-MW-4, DGW-MW-10, DGW-MW-10S and MW-29) and compared to the respective Critical PCL (0.98 milligrams per Liter [mg/L]). Groundwater data is presented below for each metal followed by an evaluation of exceedances of the Critical PCL for each well.

3.2.1 Lead

Total lead concentrations detected between 2014 and 2019 ranged from not detected (less than 0.000600 mg/L) to 0.0390 mg/L and dissolved lead concentrations ranged from not detected (less than 0.000600 mg/L) to 0.0411mg/L. The critical PCL for lead is 0.015 mg/L (for both total and dissolved). Lead exceeded the critical PCL in five of 26 wells, three in the deeper unit in the vicinity of the RCA, one in the shallow unit in the vicinity of the RCA, and MW-10 to the east (cross gradient/upgradient) of the proposed RCA (which was not confirmed upon resampling). Exceedances ranged between 0.0225 and 0.0411 mg/L. None of the lead PCL exceedances were in the wells immediately along Stewart Creek (outside of the flood wall).

3.2.2 Cadmium

Total cadmium concentrations detected between 2014 and 2019 ranged from not detected (less than 0.000200 mg/L) to 0.0254 mg/L and dissolved cadmium concentrations ranged from not detected (less than 0.000200 mg/L) to 0.0259 mg/l. The PCLs for cadmium are 0.005 mg/L (total) and 0.0017 mg/L (dissolved). There were PCL exceedances in three of 26 wells, one in the shallow unit and two in the deeper unit near the proposed RCA. None of the cadmium PCL exceedances were in the wells immediately along Stewart Creek (outside of the flood wall).

3.2.3 Arsenic

Total arsenic concentrations detected between 2014 and 2019 ranged from not detected (less than 0.000200 mg/L) to 0.100 mg/L and dissolved arsenic concentrations ranged from not detected (less than 0.000200 mg/L) to 0.103 mg/L. The critical PCL (for both total and dissolved) arsenic is 0.010 mg/L. There were PCL exceedances in eight of 26 wells (all in the deeper unit) near the proposed RCA. Arsenic was detected outside of the flood wall adjacent to Stewart Creek in only one location (close to but slightly above the 0.010 mg/L PCL [detections were 0.0112 mg/L for total and 0.0102 mg/L for dissolved] in MW-27, as discussed further in Section 5.2.8).

3.2.4 Antimony

Total antimony concentrations detected between t 2014 and 2019 ranged from less than 0.00400 mg/L (not detected) to 0.0240 mg/L and dissolved antimony concentrations ranged from less than 0.00400 mg/L (not detected) to 0.0245 mg/L. Antimony detections exceeded the critical PCL (0.006 mg/L for both total and dissolved) in two wells (one in the shallow unit and one in the deeper unit) near the proposed RCA. None of the antimony PCL exceedances were in the wells immediately along Stewart Creek (outside of the flood wall).

3.2.5 Selenium

Total selenium concentrations detected between 2014 and 2019, ranged from less than 0.00110 mg/L (not detected) to 0.0325 mg/L and dissolved selenium concentrations detected during the PDI ranged from less than 0.00110 mg/L (not detected) to 0.0269 mg/L. There were no exceedances of the critical PCL (0.05 mg/L for both total and dissolved).

3.2.6 Location-Specific Discussion

The following monitoring wells had detections of Site COCs above their respective PCLs:

- DGW-MW-2: Total arsenic (0.0132 mg/L) and dissolved arsenic (0.0127 mg/L) were detected above their critical PCLs of 0.01 mg/L.
- DGW-MW-3: Total arsenic (0.100 mg/L) and dissolved arsenic (0.103 mg/L) were detected above their critical PCLs of 0.010 mg/L. In addition, TPH was detected above the critical PCL for TX 1005

method. The sample was further analyzed per TRRP guidance using the TX 1006 method. Results of the TX 1006 analysis were all below the method quantitation limit (MQL).

- DGW-MW-6: Total arsenic (0.0134 mg/L) and dissolved arsenic (0.0136 mg/L) were detected above their critical PCLs of 0.010 mg/L.
- DGW-MW-7: Total arsenic (0.0218 mg/L) and dissolved arsenic (0.0209 mg/L) were detected above their critical PCLs of 0.010 mg/L.
- DGW-MW-10: Total arsenic (0.0113 mg/L) and dissolved arsenic (0.0112 mg/L) were detected above their critical PCLs of 0.010 mg/L.
- DGW-MW-11: Total cadmium (0.0254 mg/L) and dissolved cadmium (0.0259 mg/L) were detected above their respective critical PCLs of 0.005 mg/L (total) and 0.0017 mg/L (dissolved). Total lead (0.0362 mg/L) and dissolved lead (0.0338 mg/L) were detected above their critical PCLs of 0.015 mg/L.
- DGW-MW-11S: Total antimony (0.0240 mg/L) and dissolved antimony (0.0245 mg/L) were detected above their critical PCLs of 0.006 mg/L. Dissolved cadmium (0.00382 mg/L) was detected above the critical PCL of 0.0017 mg/L. Total lead (0.0285 mg/L) and dissolved lead (0.0411 mg/L) were detected above their critical PCLs of 0.015 mg/L.
- MW-10: Total lead (0.0390 mg/L) was detected above the critical PCL of 0.015 mg/L during the May 2018 DGW PDI investigation. This was the first detection of lead at MW-10 over the critical PCL since March 2005. Prior to the May 2018 DGW PDI, MW-10 was last sampled as part of the Affected Property Report Assessment (APAR) investigations in March 2013 and no COCs were detected above their respective critical PCLs. MW-10 was resampled on August 1, 2018 to confirm the critical PCL exceedance from the May 2018 DGW PDI. Results from the August 2018 resampling event were below the critical PCL for total and dissolved lead.
- MW-27: Total arsenic (0.0112 mg/L) and dissolved arsenic (0.0102 mg/L) were detected above the critical PCL for arsenic (0.010 mg/L) during the DGW PDI. This was the first time arsenic was sampled at MW-27. Prior to the DGW PDI, MW-27 was last sampled for total and dissolved lead and cadmium during the APAR investigation in February 2014. Additional analyses including polycyclic aromatic hydrocarbons and TPH (TX 1005) were collected in April 2013 (and there were no exceedances).
- MW-30: Total antimony (0.00868 mg/L) and dissolved antimony (0.00885 mg/L) were detected above the critical PCL for antimony (0.006 mg/L) during the DGW PDI. Total arsenic (0.0657 mg/L) and dissolved arsenic (0.0166 mg/L) were detected above the critical PCL for arsenic (0.01 mg/L) during the DGW PDI. Total lead (0.0225 mg/L) was detected above the critical PCL for lead (0.015 mg/L) during the DGW PDI. These detections were the first exceedances of lead detected at MW-30. Previously, MW-30 was only analyzed for total and dissolved cadmium and lead. MW-30 is located within the NDA and north of the proposed RCA and was last sampled as part of the APAR investigation in April 2013.
- MW-31: Total arsenic (0.0106 mg/L) and dissolved arsenic (0.0101 mg/L) were detected above the critical PCL for arsenic (0.01 mg/L) during the DGW PDI. Previously, MW-31 was only analyzed for

total and dissolved cadmium and lead and no COCs were detected above their respective critical PCLs. MW-31 is located beneath the former Battery Storage Building and within the proposed RCA. MW-31 was last sampled as part of the APAR investigation in May 2013.

- MW-46: Total lead (0.0354 mg/L) was detected above the critical PCL for lead (0.015 mg/L) during the DGW PDI. Dissolved cadmium (0.00219 mg/L) was detected above the critical PCL for dissolved cadmium (0.0017 mg/L) during the DGW PDI. During the APAR investigation, MW-46 had an exceedance of the critical PCLs for dissolved cadmium (0.00190 mg/L) and dissolved lead (0.0259 mg/L) in January 2014. The well was subsequently resampled in February and March 2014and neither dissolved cadmium nor dissolved lead were detected over their respective critical PCLs.

A protective concentration level exceedance (PCLE) plume map was developed and is presented as RAP Figure 1A-8.

3.3 Site Geochemistry

Monitoring wells were also sampled for total and dissolved calcium, iron, and magnesium, alkalinity, chloride, sulfate, nitrate/nitrite, total organic carbon, and dissolved organic carbon during the PDI and during groundwater sampling performed in support of the column studies. Results for these parameters are described below:

- Total calcium concentrations ranged from 93.9 to 830 mg/L. Dissolved calcium concentrations ranged from 98.2 to 546 mg/L.
- Total iron concentrations ranged from 0.0631 mg/L to 73.5 mg/L. Dissolved iron concentrations ranged from 0.012 mg/L to 69.3 mg/L.
- Total magnesium concentrations ranged from 6.3 mg/L to 302 mg/L and dissolved magnesium concentrations ranged from 6.3 mg/L to 323 mg/L.
- Total alkalinity ranged from 170 mg/L to 803 mg/L.
- Chloride concentrations ranged from 32.4 mg/L to 1,780 mg/L.
- Sulfate concentrations ranged from 127 mg/L to 5,010 mg/L.
- Nitrate was detected in five wells and concentrations ranged from less than 0.0300 mg/L (not detected) to 7.62 mg/L.
- Total organic carbon ranged from 1.26 mg/L to 19.9 mg/L.
- Dissolved organic carbon ranged from 1.67 to 18.5 mg/L.

A discussion of remediation design parameters in relationship to the remedial alternatives analysis is included in the Groundwater Remedy Evaluation (GRE) as Appendix 3.2 of the FOP RAP.

3.4 Geotechnical and Topographic Considerations

Aboveground factors that could impede the access of construction equipment to the site, such as the presence of buildings or overhead utility lines, should be identified while choosing prospective locations for the PRB. Underground factors that could impede the construction of the PRB, such as the presence of consolidated sediments or rocks, also need to be identified. Information related to topographic and geotechnical considerations has been included in this design, specifically including the items discussed below.

According to Golder Associates' 2014 Affected Property Assessment Report for the Site (the 2014 APAR, which is included as Attachment H to the Part B RCRA Permit Renewal Application), the Site is located within a shallow valley created by the drainages of two streams that flow in a general east to west direction through the Site. The on-site streams include Stewart Creek, which runs along the south side of the former production area, and an unnamed tributary of Stewart Creek (the North Tributary), which runs north of the NDA and the Slag Landfill.

The confluence of these streams occurs northwest of the Site's former production area. Beyond the western boundary of the Site, Stewart Creek flows to the southwest and eventually into Lake Lewisville, located approximately 4.5 miles to the southwest of the Site. The surface water elevation on Lake Lewisville is approximately 515 feet MSL and has a 0.4% average stream-bed slope.

In general, the ground surface at the Site slopes either towards Stewart Creek or the North Tributary. Based on survey data from the Site, the maximum ground surface elevation of the facility is approximately 685 feet MSL in the southeastern portion of the Site at an outcrop of the Austin Group (the Austin Chalk). Based on survey data from the Site, the minimum ground surface elevation of the facility is approximately 610 feet MSL at Stewart Creek near the western boundary of the Site.

Over the length of the slurry wall and PRB gate sections, most are in areas with adequate working accessibility. In areas adjacent to Stewart Creek and the southern edge of the FOP, the working area is slightly constricted by existing concrete slabs of variable height and the presence of the existing flood wall at the Site. Plans include the use of temporary fill to these areas to create a platform upon which equipment can work. The slurry wall will be set back from the flood wall to allow space for excavation and to provide a setback for structural stability of the flood wall. Following completion of the construction of the funnel and gate PRB, temporary fil (and other temporary construction features) will be removed and handled according to the Operations and Maintenance Plan for the FOP, which is included as Appendix L to Attachment C (Closure Plan) to the May 2019 RCRA Permit Renewal Application.

4.0 REACTIVE MEDIA SELECTION

4.1 Types of Reactive Media Available

Several different types of reactive metal media are available for use in PRBs and were discussed in detail in the GRE. Briefly, they include:

- Granular Zero-Valent Metal
- Granular Iron
- Other Zero-Valent Metals
- Granular Iron with an (Geochemical) Amendment
- Bimetallic Media
- Colloidal Iron
- Ferrous Iron-Containing Compounds
- Media that Impart Adsorptive and Biological Capability

4.1.1 Design Media

Golder reviewed various literature references regarding the applicability of ISCR for the Site COCs. The following metal COCs were identified and information is summarized below:

- For lead (Pb), the “removal mechanism is believed to be a two-step interaction including both the physical adsorption of Pb(II) on the surface or inner layers of the ZVI particles and the subsequent reduction of Pb(II) to Pb(0) by ZVI” (from USEPA CLU-IN Website). Fiore and Zanetti (2009) researched the ability of ZVI to treat acid mine drainage water that contained among other ions Al, Ba, Cu, Cr, Fe, Mn, Pb, and Zn. All these ions were removed in the ZVI column to levels below local regulatory levels.
- For arsenic (As), research has shown that the removal of the arsenic species by Fe(0) is attributed to electrochemical reduction of As(III) to sparsely soluble As(0) and adsorption of As(III) and As(V) to iron hydroxides formed on the Fe(0) surface under anoxic conditions. Adsorption of both arsenic (III) and arsenic (V) appears to be the key mechanism when ZVI is used (Manning et al. 2002). Arsenic forms inner sphere complexes with ZVI corrosion products, including ferrous hydroxide, mixed valence iron oxides and hydroxides and ferric oxyhydroxides (Manning et al. 2002). Arsenic (III) and arsenic (V) that are adsorbed onto ZVI surfaces are consequently occluded by successive layers of corrosion products (Kanel et al. 2006, as stated in ITRC 2011).
- For antimony (Sb) and selenium (Se), Li et.al. (2017) identified effective removal by ZVI. In samples of the spent ZVI collected iron from the reactor during a 4-month period (with an average retention time of 3-4 days) and analyzed via the methods of acid-digestion, XRF and XPS to characterize compositions of the ZVI after reactions, twelve elements (Fe, As, Cu, Cr, Ni, Co, Zn, Pb, Sb, Se, Au, Tl) were identified in the reacted ZVI. The relative abundance in the solid phase followed a similar order as in the influent wastewater. Iron, copper and arsenic were the major elements along with relatively large amounts of As, Cu, Fe, Na, O and C on the solid surface. Three other elements, Se, Sb and TI were also found in the solids. Further, as reported by Sheng et.al. (2017), “several studies have demonstrated that zero-valent iron (ZVI) was convenient for the

effective sequestration of Se(IV)/Se(VI). With ZVI oxidization to Fe2þ and Fe3þ, Se(IV)/Se(VI) can be reduced to Se(0)/Se(-II), followed by precipitation as sparingly soluble Se or FeSe".

- For cadmium (Cd), enhanced in-situ bioremediation (bio-sequestration) addresses contaminated groundwater by utilizing existing microorganisms in the subsurface to stimulate biological reduction of sulfate and the addition of carbon sources to the groundwater system subsequently generates solid-phase cadmium sulfide (cadmium immobilization). The introduction of an organic carbon amendment (e.g., lactate, ethanol, or emulsified oil) into the subsurface provides an energy source for indigenous, sulfate-reducing microorganisms to convert existing sulfate in groundwater to sulfide. Cadmium then forms insoluble cadmium sulfide precipitates, or co-precipitates with iron sulfide (DiToro, 1990), which will then precipitate from solution and be bound in the geologic formation. Sequestering the cadmium in a non-mobile form will significantly reduce the concentration and mobility of cadmium in groundwater. Cadmium/iron-cadmium sulfides are relatively stable mineral phases provided that the groundwater system geochemistry (pH and oxidation reduction potential [ORP]) remains relatively constant through time. which is expected to be the case at the Site.
- Though zinc (Zn) is not a Site COC, experiments with ZVI using zinc are relevant because the chemical process documented is also applicable to the Site COCs. In packed column experiments, (Kishimoto et al. 2011) found that the removal of Zn by ZVI occurred with the oxidation of the ZVI to produce ferrous iron ions (Fe+2). The Fe+2 is further oxidized to Fe+3 and precipitated as iron hydroxide onto the surface of the ZVI. The Zn is adsorbed by or co-precipitated with the iron hydroxide. The iron hydroxide is finally transformed into iron oxide. This process of oxidation, precipitation, adsorption, and transformation is applicable to the Site COCs.

4.2 Selected Candidate Media

The rationale for selecting the candidate media is described in detail in the GRE (Appendix 3.2 of the FOP RAP). Briefly, zero-valent iron (ZVI) was selected as the candidate media primarily because all Site COCs (antimony, arsenic, cadmium, lead and selenium) have been demonstrated to be treated by ZVI via a number of removal mechanisms including:

- physical adsorption on the surface or inner layers of the ZVI particles (sorption/complexation)
- chemical reduction to less soluble compounds (reductive precipitation)
- chemical reduction and adsorption to iron hydroxides (co-precipitation with iron oxyhydroxides)
- bio-sequestration

Additionally, following the guidance, Section 4.0, discusses the various factors to be considered (below as primary bullets), with a corresponding sub-bullet briefly describing our evaluation:

- Reactivity. A medium that affords lower half-lives (faster degradation rates) is preferred.
  - Golder reviewed published literature, vendor information and selected a product (Hepure) that has been reported to have more rapid degradation rates than other vendor products. Golder used the Hepure product in the column studies and it was demonstrated to remove all Site COCs
- Stability. Length of time that a reactive medium or that mixed media will maintain reactivity is an important concern.

- There is little long-term data (e.g. decades time frame) on reactivity. Extrapolating reported degradation rates suggests that the PRB and the Sump Reactor can be constructed with 30-45 years of ZVI treatment. The Hepure vendor suggests their product's reactivity is greater than 10 years. As a contingency, the PRB and Sump Reactor will be monitored and if indicated by set criteria, a rejuvenation event (i.e. acid washing or the ZVI) will be performed.

- Availability and Cost. A cheaper medium is preferred over a more expensive medium, especially if any differences in performance are reported to be slight.
  - The Hepure product is readily available, and the cost differential of ZVI material from various vendors is not significant. The Hepure product is available in 1,000-pound super sacks which is helpful in product movement on-Site during construction
- Hydraulic Performance. The particle size of the reactive medium should be sufficient to ensure required hydraulic capture by the barrier
  - The effective particle size of the Hepure Ferox PRB ZVI is a very uniform 325 millimeters, with a consistent particle density of 7.86 grams/cubic centimeter and a bulk-density of 2.92 grams/cubic centimeter. The Hepure product can be mixed with sand of variable size fraction to create a mixture of ZVI/sand for emplacement in the PRB and Sump Reactor. The hydraulic conductivity of the ZVI/sand mix will be at least 1.0 x 10-02 cm/sec and no greater than 1.0 x 10-01 cm/sec.
- Environmental Compatibility. The reactive medium should not introduce harmful byproducts into the downgradient environment.
  - The candidate reactive medium is not known to create harmful byproducts
- Construction Method. Some innovative construction methods, such as jetting, may require a finer particle size of the reactive medium.
  - The construction method proposed for the PRB (braced excavation) is routine and typical and will allow for emplacement of the ZVI/sand mix without the need for alternate construction methods.

Additional considerations identified in the guidance include, in general, suitable reactive media should exhibit the following properties:

- Sufficient reactivity to degrade the contaminants with an economically viable flow through thickness (residence time) in the reactive cell.
  - The Hepure product was column tested using Site groundwater and found to be successful in treating Site COCs at flow rates and residence times comparable to field conditions.
- Ability to retain this reactivity under site-specific geochemical conditions for an economically viable period of time (several years or decades).
  - The Hepure product was column tested using Site groundwater and found to be successful in treating Site COCs at l flow rates and residence times comparable to field conditions. Additionally, the column tests simulated elevated concentrations of Site COCs (spiked concentrations, but still in a Site groundwater matrix) at faster flow rates (lower residence time) and reported continued treatment of Site COCs

- Appropriate particle size to create a porosity and hydraulic conductivity that allows the creation of a reactive cell which captures the targeted plume width.
  - The Hepure product has consistent grain size, and given its bulk and particle densities, would have a porosity of approximately 37%. Mixed with sand (of appropriated grain size), a net hydraulic conductivity of the ZVI/sand mix will be at least 1.0E-02 cm/sec and no greater than 1.0E-01 cm/sec.
- Ability to retain the porosity and hydraulic conductivity at or above minimum specified levels over long periods of time, through the inhibition of precipitate formation under site geochemical conditions.
  - Given the anticipated influent concentrations of Site COCs, the potential precipitation mass relative to the total available porosity is very small. The more common mechanism that reduces hydraulic conductivity in the candidate reactive media is the formation of thin layers of precipitated material that “bridges” porosity.
- Environmentally compatible reaction products (e.g., Fe2+, Fe3+, oxides, oxyhydroxides, and carbonates).
  - The recognized mechanisms for Site COC treatment using ZVI include sorption/complexation, reductive precipitation, co-precipitation with iron oxyhydroxides and bio-sequestration.
  - Column studies performed using Site groundwater indicated no adverse reactions with the ZVI material.
- Easy availability at a reasonable price.
  - The Hepure product is readily available at a reasonable price.

5.0 TREATABILITY TESTING

Golder prepared a Permeable Reactive Barrier Wall Column Study Report for the Site. The Report in its entirety is provided as Appendix 3.6 to the FOP RAP and includes the rationale and methodology that were used while performing column studies to determine information regarding the longevity, composition, and performance of a PRB at the Site.

The Column Studies Report presents the results of groundwater sampling performed since the completion of the PDI that were used during the column studies. The Report also outlines the methodology for the column studies, analyses, and conclusions of the study noted in the guidance, following identification of candidate reactive media, batch tests can be performed to quickly screen several candidate media., but column tests are more representative of dynamic field conditions than batch tests and provide more accurate design information.

Column tests were conducted in Golder's testing laboratory in Montreal, Canada to determine the final reactive media mix of zero-valent iron and sand, evaluate COC removal rates media longevity and the potential for fouling/scaling. As recommended, all column tests were performed with groundwater obtained from the Site to generate representative design data.

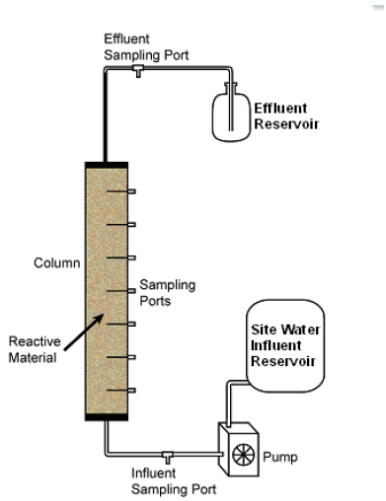
5.1 Column Test Setup

Based on sampling results described above and in the Permeable Reactive Barrier Wall Column Study Report (included as Appendix 3.6 to FOP RAP), DGW-MW-3, DGW-MW-11, and the FDS were chosen for use in the columns studies. These locations were chosen in consideration of concentrations exceeding critical PCLs for Site COCs, location relative to the proposed RCA and FOP and groundwater yield.

- DGW-MW-3 was chosen to represent concentrations of arsenic in groundwater exceeding the critical PCL. Arsenic concentrations in DGW-MW-3 were consistent based on all three sampling events in 2018 (May, August, and November).
- DGW-MW-11 was chosen to represent concentrations of lead and cadmium in groundwater (both total and dissolved) exceeding the critical PCL. In May 2018, detections of both total and dissolved cadmium at DGW-MW-11 were the highest concentrations measured in deep groundwater at the Site.
- The FDS was chosen to represent shallow groundwater conditions as well as concentrations of antimony in groundwater (both total and dissolved) exceeding the critical PCL. Concentrations of total and dissolved antimony were generally consistent between the November 2018 and December 2018 sampling events.

For each of the three water sources (DGW-MW-3, DGW-MW-11, and the FDS), three micron-scale zero valent iron (ZVI) mixtures (30%, 35% and 40% ZVI by weight with Ottawa sand) were evaluated in three separate columns to determine the design media for the funnel and gate treatment system. The column study objective is to evaluate ZVI:sand ratios resulting in the appropriate mix of material for the funnel and gate system. A fourth column with 100% sand (for each source) served as a control in the study to assess removal of the COCs through mechanisms not related to ZVI.

The following figure presents a general schematic of the column set-up used to conduct the tests:



Source: Permeable Reactive Barrier: Technology Update, ITRC, June 2011

To feed the columns, the Site groundwater was first transferred from the 1-liter field amber collection bottles directly into Tedlar bags in a piston mode (bag starts empty and fills over time) using a peristaltic pump at a low flow rate of approximately 0.1 L/min. This method was used in order to minimize air entrapment and subsequent metals precipitation in the bags. In addition, careful attention was taken to avoid aspiration of sediments from the bottles. Additionally, in order to keep the geochemical conditions similar to the in-situ Site conditions, the following measures were undertaken for the columns testing:

- Use of zero headspace on all sampling bottles
- Air vacuum the Tedlar bags prior filling
- Purge the air in the columns with carbon dioxide prior filling the column with groundwater to help remove oxygenated air trapped in the media pores.

Each source water was then supplied to the influent end of the column (bottom of column) at a constant flow velocity using a low-flow laboratory pump (Masterflex L/S pump) at a flow rate of approximately 0.06 - 0.1 mL/min. The column testing was performed in 5 cm diameter, 50 cm long clear polyvinyl chloride (PVC) pipes, each filled with 30%, 35% and 40% ratios of ZVI and sand by weight mix.

Each of these “original” columns were operated at a Darcy velocity slightly higher (5-7 centimeters/day [cm/day]) than the field groundwater Darcy velocity (4 cm/day). Increasing the flow rate accounted for the potential mounding (increased gradient) in the field at the treatment gate, due to the funnels “gathering” groundwater flow, and to perform more pore-volume exchanges in the test column per given time. Sampling ports were placed at 0 cm (influent), 25 cm depth (midpoint) and 50 cm depth (effluent, end of column). Each port represented a different residence time of groundwater in the reactive medium.

During sampling, precipitation was minimized by keeping low levels of dissolved oxygen in the sampling bottles. This was achieved by connecting the column exit port to a collection tube in order to reach the bottom of the bottles. Furthermore, bottles were covered by a plastic film to minimize contact of water with air. A geotextile was

also placed at the tip of the sampling tube as a screen for the iron columns, to prevent any sand or ZVI sediment reaching the sampling bottle.

The sand used as part of the treatability study was Ottawa sand 20-30 Mesh supplied from Fisher Scientific Company. The ZVI used in the column treatability study was Ferox PRB zero valent iron, consistent with the ZVI that is anticipated to be used to treat Site groundwater (e.g. Ferox PRB, Hepure Technologies, 95+purity, 297 µm particle size).

In mid-March 2019, prior to completion of the original study, column results for all three water types indicated no breakthrough was occurring in any of the columns containing ZVI indicating that the iron was not exhausted in terms of treating column study COCs. In order to better investigate the longevity of the PRB, an extended column study was proposed and is discussed below.

Following 40 pore volumes of flow through the original columns, additional Site water was collected from all three original sources (DGW-MW-3, DGW-MW-11, and the FDS) to extend the study. To introduce greater COC loading to the column, the “extended” column test groundwater was spiked to approximately two times the maximum concentration detected at the Site (using data presented in the 2014 APAR through January 2019), as follows:

- Antimony: spiked to a concentration of 0.0968 mg/L
- Arsenic: spiked to a concentration of 0.316 mg/L
- Cadmium: spiked to a concentration of 0.0772 mg/L
- Lead: spiked to a concentration of 1.388 mg/L
- Selenium: spiked to a concentration of 2.16 mg/L

5.2 Interpreting Column Data

Results from the initial column study showed reduction of Site COCs in all three ZVI mixtures below critical PCLs. Graphs presenting reduction data for each Site COC and the respective column are shown in Appendix C of 3.2 of the RAP. All three ZVI mixtures removed of the antimony, arsenic, chromium, lead and selenium to below PCLs with no breakthrough observed during the original study of over 40 pore volumes of simulated groundwater flow.

Results from the extended column studies simulated about increased hydraulic and COC concentration loading. Overall, the column studies simulated about 3.4 years of groundwater flow through the PRB, and over 25 years of COC loading. The results from the extended column study showed continued reduction of Site COCs in all three 30% (by weight) ZVI-sand mixtures during. Findings included:

- The extended column study simulated accelerated groundwater flow with increased COC concentrations (15 times anticipated conditions) which represented about 25 years of COC loading during the extended study.
- All three 30% ZVI-sand columns (DGW-MW-11, DGW-MW-3 and the FDS) removed the spiked arsenic, cadmium and lead to below PCLs with no breakthrough observed at the 25 cm or 50 cm sampling port during the extended study.
- Antimony (total and dissolved) did breakthrough at the 25 cm sampling port at concentrations exceeding the PCL after 26 pore volumes in the FDS column of the extended study and is near breakthrough at the 50 cm sampling port after 41 pore volumes in the DGC-MW-3 column.

- Selenium (total and dissolved) did breakthrough at the 25 cm sampling port at concentrations exceeding the PCL after 26 pore volumes in the FDS column of the extended study and broke through the 50 cm sampling port in the 30% ZVI-sand columns at concentrations exceeding the PCL after 33 pore volumes in the GDW-MW-3 column.

Antimony and selenium indicated exhaustion of the columns (for those compounds) between 33 -41 pore volumes of the extended test, potentially equivalent to about 20 years of COC loading. Arsenic, cadmium and lead indicated no exhaustion of the columns for those compounds over the initial and extended column studies.

The table below summarizes the anticipated design conditions and the original and extended column test conditions.

Table 3: PRB Design Conditions

	Design Condition at PRB	Original Column Test	Extended Column Test
Dimensions	100ft x 3 ft x 6ft	diameter = 5cm, length = 50cm	diameter = 5cm, length = 50 cm
Cross-sectional area of flow[1]	278,700 cm2	19.64 cm2	19.64 cm2
Saturated thickness	183 cm (6ft)	50 cm	50 cm
Pore volume (n = 0.33)	16,830 liters	0.324 liters	0.324 liters
Darcy flux	757 ml/min	0.06 – 0.10 ml/min	0.30 – 0.40 ml/min
Darcy flux per cm2	0.003 ml/min*cm2	0.003 – 0.005 ml/min*cm2	0.01 – 0.02 ml/min*cm2
Darcy velocity	4 cm/day	4 -7 cm/day	22 - 29 cm/day
Arsenic concentration	0.02 mg/l	0.01 – 0.08 mg/l	0.316 mg/l
Arsenic mass flux per cm2	32 ug/cm2*yr	32 – 53 ug/cm2*yr	315-420 ug/cm2*yr
Arsenic mass loading rate	---	near anticipated loading rate	10-15 x anticipated loading rate
Pore volumes per year	23.7	97 – 162	472 – 629
Pore volumes of simulated PRB	---	40	40
Years of simulated PRB	---	1.7	1.7
Arsenic flux simulated	---	1.7 yrs	25.5 yrs

5.3 Column Testing Conclusions

Using Site groundwater, the original and extended column studies simulated 3.4 years of groundwater flow through the PRB, and over 25 years of arsenic, cadmium and lead loading to the PRB without breakthrough at the 25 cm sampling port or the 50 cm sampling port indicating that ZVI is appropriate for treatment of Site COCs in

[1] The minimum flow path length for the PRB is 3 ft horizontally and 5 ft vertically. The minimum flow path length for a column is effectively 25 cm at the first sampling port, and the maximum would be at 50 cm at the last sampling port.

groundwater at Site conditions. Breakthrough of antimony and selenium at concentrations above the PCL occurred (or will occur soon) at the 50 cm sampling port after about 20 years of COC loading.

The column tests did not simulate 20-25 years of general chemistry loading (e.g. sulfate, magnesium) and therefore the longevity estimates need to be context against both iron demand from these compounds and their potential to precipitate and reduce the hydraulic conductivity of the reactive media (discussed in detail in Section 5.4).

5.4 Media Longevity

Three methods were used to estimate the longevity of the ZVI-sand mix for treating Site COCs:

- Arsenic removal capacities form published literature
- Stoichiometric based ZVI requirements to treat both COCs and other competing ions
- COC treatment data from Site-specific column studies

5.4.1 Published Literature

Arsenic removal capacities are empirically derived measurements of the mass of arsenic found “attached” to a given mass of zero-valent iron. The “attachment” is a lumped measurement of all potential mechanisms that can sequester arsenic and remove it from the source water. Units are typically mg-Arsenic per g-iron used in the column ore batch study of interest (mg-As/g-iron). The American Society of Civil Engineers summarized a number of these studies in a compendium book on zero-valet iron (ASCE, 2007). The ASCE summarized batch and column tests that used four types of zero-valent iron product (i.e. four different manufactures). The results indicated a range in arsenic removal capacities between 0.47 mg-As/g-iron to 7.5 mg-As/g-iron. Again, this is not a “rate” of removal, just a measure of how much arsenic was removed from the source water and deposited on the iron and is a minimum value as it is uncertain if the column/batch reactor media was at “exhaustion”. For an assumed arsenic removal capacity of 1 mg-As/g-iron (the lower end of the range, and more conservative), the iron demand for the design arsenic concentration of 20 ug/l and a design flow rate of 0.2 gallons per minute (gpm), the 30-year estimated iron load is 238,740 kg of zero-valent iron (~263 tons). If an arsenic removal capacity of 4 mg-As/g-iron is assumed, the 30-year estimated iron load 59,690 kg of zero-valent iron (~66 tons, see Attachment A)

5.4.2 Stoichiometric Calculations

Stoichiometric calculations provide a theoretical iron demand estimate. A 30-yr iron demand was using the following groundwater concentrations and a design flow rate of 0.2 gpm:

- Antimony = 3 ug/L
- Arsenic = 20 ug/l
- Cadmium= 2 ug/L
- Lead = 19 ug/L
- Calcium = 320 mg/l
- Iron = 4 mg/l
- Magnesium = 46 mg/l

- Sulfate = 1,400 mg/l
- Chloride = 190 mg/l
- Alkalinity = 488 mg/l
- Nitrate = 0.07 mg/l
- Total Organic Carbon = 6 mg/l

Based on these constituents and concentrations, the 30-year expected zero-valent iron demand is 20,868 kg (~23 tons, see Attachment A).

5.4.3 Column Studies

Results from the initial and extended column studies showed reduction of Site COCs in all three ZVI mixtures below critical PCLs. During the initial study, all three ZVI mixtures removed of the antimony, arsenic, chromium, lead and selenium to below PCLs with no breakthrough observed during the original study of over 40 pore volumes of simulated groundwater flow. The extended study increased hydraulic and COC concentration loading for an additional 40 pore volumes. Overall, the column studies simulated about 3.4 years of groundwater flow through the PRB, and over 25 years of COC loading. Antimony and selenium indicated exhaustion of the reactive media at about 20 years of COC loading. Arsenic, cadmium and lead indicated no exhaustion of the reactive media over the initial and extended column studies.

Like the removal capacity findings, the column test results indicated a minimum treatment capacity, but not a rate or a maximum because no breakthrough of arsenic, chromium and lead was reported at the 25 cm sampling port. Antimony and selenium appear to breakthrough a reactive media of 30%-40% by weight ZVI in about 20 years. Using the greater iron mix, a PRB and Reactor Sump constructed at 40% by weight iron (approximately 116 tons of iron total, see Attachment A), the PRB and Reactor Sump together should have more than enough capacity to meet the theoretical iron demand or the iron demand estimated from published values.

Caution should be exercised in interpreting the results of accelerated column tests. Aging the reactive medium with given pore volumes at high flow rates may not exactly mimic the condition of the reactive medium for the same pore volumes of lower flow rate in the field. Also, reactivity and porosity losses tend to be higher in the first part of the reactive medium.

6.0 MODELING AND ENGINEERING DESIGN

6.1 Groundwater Modeling

This section presents Golder's summary of groundwater modeling activities associated with the evaluation of hydrogeologic conditions and potential remedial designs at the Site.

A steady state groundwater flow model was developed and calibrated, following calibration, simulations of the proposed funnel and gate design were used to evaluate potential flow paths, groundwater elevations, the potential for flooding and mounding of groundwater, and the flux of water through the funnel and gate system. This section of the report follows the format below (with previously presented information referenced) for documenting a groundwater flow model and includes:

1) Objectives;
2) Groundwater Flow Model Development
   a. Model selection (numerical);
   b. Model Geometry
   c. Boundary Conditions
   d. Input Parameters
3) Model Calibration and Verification
4) Parameter Sensitivity analysis
5) Design Simulations
6) Summary

The conceptual model (including geology, hydrology, lithology and analytical data) used to support numerical model development is described in Section 3.0);

6.1.1 Objectives

The primary objective of the modeling was to simulate the groundwater flow conditions in the area surrounding the FOP to support evaluation of the remedy design as part of RAP for the Site.

The general scope of the groundwater modeling is to:

- Simulate the groundwater flow regimes for the area of the Site between the North Tributary and Stewart Creek;
- Predict the influence of the proposed cap and funnel/gate design on the groundwater flow regime;
- Inform the groundwater funnel and gate/PRB design;
- Predict if groundwater levels can be maintained at acceptable elevations with the proposed cap and funnel and gate/PRB design in place.

6.1.2 Groundwater Flow Model Development

6.1.2.1 Numerical Implementation

Golder developed the groundwater flow model for the site using the USGS MODFLOW-2005 Modular Three-Dimensional Finite-Difference Groundwater Flow Model (Harbaugh, 2005). The pre- and post-processing software used for the modeling was Groundwater Vistas (Vistas) Version 7.19 (Environmental Simulations Inc.).

Development of a numerical groundwater flow model involved the following steps:

- Definition of the model geometry including lateral and vertical extent, number of model layers, and grid spacing;
- Selection of input parameters such as hydraulic conductivity (horizontal and vertical) and precipitation recharge;

The following sections describe the steps used to develop the model.

6.1.2.2 Model Geometry

The finite-difference model grid location is shown on Figure 9**.** The model area (excluding no-flow cells) is approximately 1,900 feet (along x-axis) by 1,000 feet (along y-axis) at the widest points. The southwest corner of the model grid (model coordinates 0, 0) corresponds with Site coordinates 33°08'20.2"N and 96°49'55.8"W. The model grid is oriented parallel with cardinal directions. The model grid contains 311 rows and 426 columns. The grid cell size in the XY direction is uniform, at 5 feet by 5 feet across the entire model domain. Based on geologic and hydrogeologic conditions discussed in Section 3, the model utilizes one layer representing the unconsolidated quaternary sediments that lie above the Eagle Ford Shale aquiclude. The base of Layer 1 is the top of bedrock surface and ranges from 609 to 662 feet MSL. The surface topography is based on the Site lidar survey and ranges from 613 to 671 feet MSL. A cross section of model geometry along model row 117 is shown on Figure 10.

6.1.2.3 Model Boundary Conditions

Boundary conditions in groundwater models consist of physical and hydraulic boundaries within the model area. Physical boundary conditions are well-defined geologic and hydrologic features that influence groundwater flow patterns. The following sections describe the boundary conditions used in the model.

6.1.2.3.1 Constant Head Boundaries

Constant head boundaries (CHB) were assigned along streams in Layer 1 on the northern, southern, and western margins of the model to recreate the approximate constant hydraulic heads where long-term average stream water levels are expected to remain relatively constant. The constant heads are located at the outside edge of a model along Stewart Creek and the North Tributary. A CHB was simulated along the eastern model edge where groundwater flow is inferred to be generally perpendicular to the model boundary. The modeled CHBs are shown on Figure 11 and summarized on Table 4.

6.1.2.3.2 No Flow Boundaries

No flow boundaries were assigned to the following areas of the model:

- North of the North Tributary and south of Stewart Creek in Layer 1.
- Model bottom – The base of Layer 1 (the top of Eagle Ford Shale Aquiclude) is assumed to be a no flow boundary.

6.1.2.3.3 Horizontal Flow Barriers

A horizontal flow barrier (HFB) or wall is a condition that limits flow between adjacent cells based on an assigned thickness and hydrologic conductivity. Golder used the HFB boundary condition with an assigned thickness of 1 foot and a horizontal hydraulic conductivity (K) value of 0 to model proposed slurry walls in model simulations. No HFB’s were used in the calibration or verification models.

6.1.2.4 Model Input Parameters

The following paragraphs describe the input parameter data used for the model. Golder simulated steady state conditions in the model. Transient dependent parameters such as porosity and storage/storativity were not included in the model calibration process

6.1.2.4.1 Hydraulic Conductivity

Golder based hydraulic conductivity values for the Site model on slug and pumping test analysis results as discussed in Section 3.1.3. Golder used these results to assign initial hydraulic conductivity values to the groundwater flow model, and to check that the hydraulic conductivity values resulting from model calibration were within the range of values observed. Golder assigned a uniform Kx/Ky hydraulic conductivity value of 0.78 feet/day (2.8E-04 cm/s) and a Kz of 0.1 feet/day across the entire model area. This hydraulic conductivity is based on a best fit from model sensitivity analysis, is within range of measured conductivities, and is only slightly lower than the geometric mean of hydraulic conductivity for all wells in the vicinity of the FOP (4.4E-04 cm/s).

6.1.2.4.2 Precipitation Recharge

Precipitation recharge is the amount of precipitation that recharges the aquifer, which is generally the precipitation rate minus losses due to runoff and evapotranspiration. Recharge rates calculated for the Trinity Aquifer area range from 0.04 to 6.0 in/yr, with a recharge rate of 4.4 in/yr calculated through cross-section groundwater modeling specifically for the Dallas/Frisco area (Scanlon et al., 2002; Dutton et al., 1996). Recharge is likely limited in paved areas of the Site and is enhanced in unpaved areas of the Site that act as drainage swales or catchments. To simulate the localized effects of land use on precipitation recharge, Golder divided Layer 1 of the model into three precipitation recharge zones based on land use, as shown on Figure 12. Unpaved areas were simulated as Zone 1 with a recharge rate of 0.96 in/yr (0.00022 feet/day), paved areas were simulated as Zone 2 with a recharge rate of 0.48 in/yr (0.00011 feet/day), and unpaved drainage swales were simulated as Zone 3 with a recharge rate of 4.8 inches per year (0.0011 feet/day). The calibrated recharge properties are within the range of recharge values reported for the region.

6.1.2.4.3 Groundwater Extraction and Recharge Wells

No groundwater extraction or recharge wells are present on the Site, as such none were modeled.

6.1.3 Model Calibration and Verification

Model calibration consists of successive refinement of the model input data from initial assumptions/estimates to improve the fit between observed and model-predicted results. A solution of a groundwater flow problem requires information including aquifer parameters such as hydraulic conductivity, spatial boundary conditions, and the location and magnitude of applied stresses, such as recharge and drainage. A solution is attained only when the proper combination of the above parameters and inputs are selected such that the physical problem is accurately represented by the model. The calibrated model described below should be considered a limited hydrologic effort founded on the available information within the context of necessary simplifying assumptions.

The purpose of the calibration effort was to simulate "steady-state" groundwater flow conditions that approximate the general flow patterns inferred from June 12, 2018 groundwater level measurements. The model was calibrated through trial-and-error adjustment of model parameter values and through use of Model-Independent PEST, developed by Watermark Computing, to refine aquifer parameters. PEST allows model input parameters to be adjusted automatically over a given range until the model predicted head matches the observed head with the lowest possible numerical difference, referred to as the calibration residual (Doherty, 2018). Golder set the

allowable range of parameter adjustment in PEST to represent realistic values as determined by previously published literature for the region and aquifer tests at the Site.

At each well location, the residual was calculated in Groundwater Vistas. Positive residual values indicate simulated head values lower than measured elevations, while negative residual values indicate simulated head elevations higher than measured elevations.

As a measure of the accuracy of the model, Groundwater Vistas calculates summary statistics using calculated residuals, which are used as measures of error in the calibrated model. The residual mean (RM) is the arithmetic mean of all calculated residual values. The absolute residual mean (ARM) is the arithmetic mean of the absolute value of the residuals (i.e., all negative residuals are considered positive). The root mean square error (RMSE) is the square root of the mean of the squared value of target residuals. Other statistics such as the residual standard deviation (RSD) (i.e., the square root of the variance [the average of the squared deviations from the mean]), and the sum of squared residuals (SSR) (computed by squaring each residual and adding them together) can also be useful in evaluation of the calibration process. While calibrating the model, Golder selected parameters estimated by PEST that were within a valid range from published literature or aquifer testes and decreased both positive and negative residuals for all water levels and resulted in improved summary statistics.

6.1.3.1 Simulated Heads Calibrated to June 2018 Conditions

Groundwater level data for 39 monitoring points were entered as calibration targets in Layer 1. Measured water levels from June 12, 2018, as presented in Table 5, were used for calibration. The calibration point elevations were assigned to the model row and column corresponding to the well location for comparison to model groundwater level elevations.

The model files for June 2018 conditions use the root file name *Frisco_Exide_V7.1*. The simulated heads and residuals for targets screened in Layer 1 are presented in Figure 13. Based on the simulated contours of groundwater elevation, groundwater flows from the east toward the Site before it travels northwest or southwest into the North Tributary or Stewart Creek. The North Tributary is a gaining stream in the eastern half of the modeled area and a losing stream near its terminus, whereas Stewart Creek behaves as a gaining stream throughout the modeled area.

A comparison of model-predicted versus observed June 12, 2018 potentiometric heads for the 39 selected calibration points resulted in a RM of -0.07 feet and a RMSE of 1.85 feet. The calibration statistics for the are presented in Table 6. The RM of -0.07 feet, represents 0.3 percent of the total measured head difference for the model area (approximately 21 feet). The absolute residual mean for the model run is 1.49 feet, which is 7.2 percent of the total hydraulic head difference for the entire modeling area. The residual mean and the absolute residual mean are within the generally accepted standard of 10 percent of the total hydraulic head difference for the modeling area.

6.1.3.2 Water Balance

An effective measure of model calibration is the analysis of the water budget calculated by MODFLOW. The model provides flows across boundaries, flows to and from all sources and sinks, and flows generated by storage (Kresic, 1997). Inflows into the model include constant head boundaries at 167.8 ft^3/d and recharge at 408.3 167.8 ft^3/d. Outflows in the model include only constant head boundaries a 576.1 ft^3/d. The outflow deficit is 0.004 cubic feet per day (ft^3/d), which is equivalent to error between outflow and inflow estimates of approximately 0.0007 percent. This indicates that model inflows and outflows are balanced.

6.1.3.3 Numerical Model Verification

Model verification was performed using a second water level calibration data set from January 21, 2014. The model input parameter values defined in the June 12, 2018 simulation were maintained. The verification data is presented in Table 5. The model files for the January 21, 2018 Q1 conditions use the root file name *Frisco_Exide_V7.1*. Model verification results for the January 2014 conditions are presented in Table 6. The verification results indicate a RM of -0.02 feet, which represents 0.1 percent of the total hydraulic head difference for the model area. The absolute residual mean for this simulation was 1.31 feet, which is 6.6 percent of the total hydraulic head difference for the entire model area. The verification statistics suggests that the model is calibrated and verified.

6.1.4 Parameter Sensitivity Analysis

A sensitivity analysis was performed to assess the model's sensitivity to changes in aquifer parameters. This procedure is important because model calibration is an inherently non-unique process. Uncertainty assessment is considered important for estimation of aquifer parameters, including hydraulic conductivity of the aquifers and aquitards, the degree of interconnection between aquifers, and possible anisotropic conditions.

In a sensitivity analysis, the model input values are varied over a specific range and simulations. For each simulation, the calibration residuals are plotted as functions of the input values and type of sensitivity that the model has with respect to the modified input parameter (ASTM 2002). The results of the sensitivity analysis conducted of the Site model are presented in Attachment D. The sensitivity analysis included modifying the modeled input values and boundary conditions as follows:

- **Hydraulic conductivity:** Hydraulic conductivity values were modified using multipliers between 0.25 and 3.0 for vertical hydraulic conductivity (Kz) and for horizontal hydraulic conductivity (Kx).
- **Recharge:** Recharge values were modified using multipliers between 0.5 and 1.5.
- **Constant head:** Golder varied constant head values using addition and subtraction of 0.1-foot increments up to +1.0 feet and down to -1.0 feet.

6.1.5 Design Simulations

Using the calibrated model, Golder simulated the effects of the proposed funnel-and-gate configuration on the groundwater flow regime in a steady state model. Slurry walls and sheet piles were simulated in the model as impermeable horizontal flow barriers (HFB) with a hydraulic conductivity of zero. The cap over the Site was simulated as a recharge zone with a recharge rate of zero. The specific configuration of the PRB and downgradient secant discharge channels were not simulated in the model as their features are at too fine of a scale for the resolution of the model. Instead, Golder simulated the PRB and downgradient area as a zone of enhance hydraulic conductivity with a Kx/Ky of 10.0 ft/d and a Kz of 1.0. In addition, the Sump Reactor was not included in the model simulation as it has no net effect of water moving into or out of the funnel-and-gate or PRB. Starting heads for the simulations were obtained from runs of the calibration model. All other model parameters remained unchanged from the calibrated model. Boundary conditions and for the simulation model are shown in Figure 14.

The model simulation of the funnel and gate design indicate that system is viable and will allow ground water to flow through the funnel-and-gate system to the PRB while miniating groundwater elevations at acceptable levels. In addition, the model suggests that groundwater outside the funnel-and-gate will also be maintained at acceptable levels and will not cause localized flooding. The model simulation predicts groundwater elevations that

range from a high of 634 feet MSL at the upgradient side of the funnel-and-gate down to 620 feel MSL near the PRB. The flux through the funnel-and-gate measured in the model cell-by-cell flow mass balance is 33.2 ft^3/d and is balanced at both the upgradient and downgradient end of the funnel-and-gate. Results of the model simulation are shown in Figure 15.

6.1.6 Groundwater Modeling Summary

Through standard numerical groundwater modeling procedures, Golder designed and constructed a steady state groundwater flow model of the Site that is considered calibrated and verified, as determined by using the model to simulate recent conditions and an earlier time period. The numerical groundwater model simulation of the proposed funnel-and-gate system indicates the design is feasible and will produce acceptable results without flooding inside or outside of the funnel-and-gate system.

6.2 Engineering Design

6.2.1 Design Concentrations

The design concentrations were developed by taking an average of groundwater concentrations from wells sampled in 2018 and 2019 as well as shallow wells sampled in 2014 with detections above the PCLs (wells sampled in 2014 that did not have concentrations detected above the PCLs were not included in the average).

Table 7: Design Concentrations

Constituent	Fraction	Average of All Wells (ug/L)	Critical PCL (ug/L)	Notes
Lead	Total	18.9	15	
	Dissolved	6.7	15	Exceedances in 5 of 26 wells
Cadmium	Total	2.1	5	
	Dissolved	2.1	1.7	Exceedances in 3 of 26 wells
Arsenic	Total	20.0	10	
	Dissolved	18.0	10	Exceedances in 8 of 26 wells
Antimony	Total	3.3	6	
	Dissolved	3.1	6	Exceedances in 2 of 26 wells
Selenium	Total	N/A	50	
	Dissolved	N/A	50	No exceedances

6.2.2 Design Flow Rates

Based on the results of the numerical modeling, an average groundwater flux rate entering and leaving the funnel and gate system is approximately 0.2 gallons per minute (gpm) when applying the geometric mean hydraulic conductivity (obtained from slug- and pumping-tests at the Site). During sensitivity analysis, using the PEST simulation model (see Section 6.1), a ‘best-fit’ hydraulic conductivity (0.78 ft/day) was developed which resulted in an average groundwater flux rate through the funnels of 0.2 gpm.

6.2.3 Design of Reactive Media and PRB and Sump Reactor

Two “reactors” are designed for the funnel and gate groundwater protection system. One reactor will be a traditional style of permeable reaction barrier (PRB, basically a trench backfilled with reactive media) and one reactor will be a 15,000-gallon steel tank, perforated to act as a groundwater collection sump and backfilled with reactive media containing a ZVI/sand mix for the treatment of Site COCS. The PRB will be located west of the Slag Landfill and the Sump Reactor will be located near the northwest corner of the FOP (see Figures 3 and 4). Each of the reactors is capable of treating and discharging the entire design flow rate, providing redundancy and a safety of factor.

For arsenic, the anticipated average arsenic concentration is 0.020 mg/l. Given a flow rate of 0.2 gpm, the design arsenic mass loading rate over a 30-year time frame is 239 kg. Based on published values, stoichiometric values and column tests:

- For an arsenic removal capacity (ARC) of 4 mg-As/g-iron, the average of an ASCE study of various publications, the 30-year expected zero-valent iron demand is 59,690 kg of zero-valent iron (~66 tons)
- From a stoichiometric mass balance calculation, including Site COC metals and general chemistry compounds such as sulfate and nitrate, the 30-year expected zero-valent iron demand is 20,868 kg (~23 tons).
- For a 40% by weight ZVI-sand mixture, the expected zero-valent iron demand is 45,314 kg or 50 tons of iron for the anticipated PRB dimensions and the expected zero-valent iron demand is 60,156 kg or 66 tons of iron for the anticipated Reactor Sump dimensions.

Based on the estimated influent concentrations of Site COCs and the design flow rate, results from literature, vendor and column tests, a reactive media of Hepure Ferox PRB zero-valent iron and sand at a ratio of 40% by weight ZVI is selected as the design reactive media to be used in both the RPB and the Sump Reactor.

For factors of safety:

- For the ARC method, by using two reactors (PRB and Sump Reactor), the factor of safety is approximately 1.75.
- For the stoichiometric method, each reactor will meet the 30-year iron demand (~23 tons); by using two reactors (PRB and Sump Reactor), the factor of safety is over 5.
- From the column studies, no column had breakthrough of antimony, arsenic, chromium or lead after 27 years of simulated COC lading and 3.4 years of general chemistry loading. The first sampling point in the columns is one-half distance through the column (i.e. mass), and the factor of safety is 2 for the column studies.
- For the column studies, the 30% by weight iron columns had no breakthrough just as the 35% and 40% by weight columns, so the 30% columns might be considered adequate for 25 years. For the design, 40% by weight will be used, and the additional factor of safety is 0.55 above a 30% by weight mix.

For a design criterion of 40% by weight zero-valent iron and sand mix, the funnel and gate system will be constructed with a PRB and a Sump Reactor of the following dimension:

- PRB: As shown on Figures 8 and 16, the PRB is 102 ft in length and 3 ft in width. The height of the PRB is from bedrock (average 614 ft msl) to ground surface (average 635 ft msl). The PRB will be filled with ZVI-sand mix from bedrock up to an elevation of 630 ft msl. The minimum saturated thickness of the PRB will be from bedrock up to the discharge secant-wall “weir” elevation 621 ft msl for a saturated thickness of 6 ft. The discharge channel elevation (621 ft msl) is set below the anticipated groundwater elevation in the sump area (thus allowing for pipeline discharge via gravity flow only). This design also creates an “upflow” reactor condition. This keeps the reactive media saturated during low flow or no flow conditions. The PRB is engineered (e.g. iron demand) for a treatment zone of 6 feet of ZVI-sand mix, from bedrock (~614 ft msl) to the discharge channel elevation (621 ft msl). However, as noted above, the PRB will be filled with reactive media to an

elevation of 630 ft msl. This elevation was chosen to be above the historic groundwater elevations in the PRB area (~627 ft msl).

- Sump Reactor: 13 ft in diameter x 14 ft in height with an approximate volume of 15,000 gallons. Within the sump reactor, two (2) extraction wells are pre-constructed prior to backfilling with the ZVI-sand mix. These wells are screened at the at bottom of each well (approximately 610-615 ft msl) such that groundwater enters the open top of the tank (acting like a “sump”) and flows through the media a defined exit point or enters perforated opens on the tank sides and flows from the edge of the tank to the tank center and the extraction wells. With the tank set at bedrock elevation some 24 ft below ground surface, this design creates an “downflow” reactor condition. This keeps the reactive media saturated during low flow or no flow conditions.
- Transfer Pipe: The Sump Reactor will be connected to the PRB via a primary and a back-up pipe. Connecting the Sump Reactor to the PRB via a trench requires too great an elevation head differential for the system to work on gravity flow alone (Attachment B). The location of the pipe is shown on Figures 4 and 5. From the Sump Reactor, each extraction well will be plumbed to one of the transfer pipes (at the manhole just north of the sump reactor). A manual valve and flow meter will monitor the flow within each pipe. A Grundfos submersible pump will be used to prime the system. Once primed, groundwater should flow from the Sump Reactor (at water elevations 621-630 ft msl) to the PRB (which has an outlet control elevation of 621 ft msl). The transfer pipe from the Sump Reactor to the manhole will be emplaced using excavator trenching. The transfer pipe from the manhole to the PRB will be installed using horizontal drilling technology. Two (2) 6’-diameter outer pipes will each contain an inner 3”-diameter pipe that will carry the treated groundwater from the sump to the PRB. Once inside the PRB, each 3”-diameter pipe will be connected to an approximately 80-ft long distribution pipe, composed on alternating sections of solid and screened pipe. The estimated head loss for the piping layout are minimal (< 0.1 feet) and is provided in Attachment B.

6.2.4 Design of PRB Discharge Channels

Whether having originated from local groundwater flow into the PRB or Sump Reactor effluent bought to the PRB via pipeline, all groundwater flow into the PRB must discharge to the area west of the PRB without “day lighting” or other type of surface water expression on the hillslope down to Stewart Creek.

The conceptual design of the discharge channels is shown on Figure 8. The objective is to transport the PRB flow slightly away from the PRB and then vertically downward to the bedrock surface. The bedrock-soil interface is known to be more transmissive throughout the Site, and locally to the PRB, sand layers laying atop the bedrock have been reported, and the vertical boring may intercept other potential flow paths. By intercepting the bedrock surface pathway, the PRB treated effluent can discharge back into the groundwater system without day lighting on the sloping ground surface.

Discharge channels will be constructed by using overlapping large-diameter auger borings (“secant walls”). The first two borings go to the weir elevation of 621 ft msl and are backfilled with sand mix to elevation 624 and then a clay-fill to ground surface. The next two borings go to the bedrock surface and are backfilled from bedrock (~614 ft msl) to elevation 624 ft msl with a sand mix. The discharge sand mix will have hydraulic conductivity no less than 1E-02 cm/sec and no greater than 1E-01 cm/sec.

As provided in Attachment C, one channel of 3 ft width and a hydraulic conductivity of 5E-02 cm/sec, can transmit a flow rate of 0.14 gpm, assuming a hydraulic gradient of 0.4 (roughly 17 ft of media flow with a 6 ft drop in elevation head, as

shown on Figure 8 (~10 ft of horizontal flow plus ~7 ft of vertical flow with a drop in elevation of ~6 ft). Given the design flow rate is 0.20 gpm, the engineering design will use two (2) discharge secant walls.

6.2.5 Design of Slurry Wall and Sheet Pile Portions of Funnel and Gate

In-Situ Chemical Reduction using zero-valent iron is known to, and has been shown to during the column studies, remove arsenic, antimony, cadmium, lead and selenium through various physical-chemical reactions. To implement a chemical reduction technology at the scale of the RCA, Slag Landfill and NDA, a funnel and gate configuration was developed with two (2) long slurry wall sections adjacent to the North Tributary and Stewart Creek (Figure 2). The funnels provide protection of each stream by preventing the direct discharge of Site groundwater to the streams along the length of the Site without treatment, and the gate design allows groundwater to pass the funnel-and-gate system, while maintaining groundwater elevations at acceptable levels (i.e. below the level of the RCA concrete pad preventing saturation of deposited soils and sediments). In addition, groundwater outside the funnel-and-gate should also be maintained at acceptable levels and not cause localized flooding.

Groundwater modeling indicated that groundwater elevations that range from a high of 634 feet MSL at the upgradient side of the funnel-and-gate down to 620 feel MSL near the PRB can be maintained (on a mean annual basis) a flow rate of 0.2 gpm within the funnels as presented on Figure 2, with a steady-state groundwater elevation between 620-621 ft msl. Variations of the funnel design were simulated (e.g. width of the funnel opening or the reactive barrier, and the lengths of the slurry walls), and the presented alignment was a chosen based on maintaining acceptable groundwater elevation levels (621 ft msl at the PRB and 628 ft msl at the Sump Reactor, see Figure 15).

The use of sheet piling (Figure 3) in the western end of the RCA was chosen to replace slurry wall due to the lack of working space around the western end of the RCA and as a structural enhancement to the area where the Sump Reactor will be constructed as well as providing a no-flow barrier that can be constructed above current grade (and backfilled) as opposed to a slurry wall section in this area.

6.2.6 Cover System and Groundwater Remedy

Though not the focus of this report, there are additional remediation elements occurring at the Site as a part of the design for the final closure of the Site, one of which is the cover system for the RCA, Slag Landfill and NDA.

Figures 17, 18 and 19 provide details (as called-out on Figure 4) and show various funnel and gate system remedial elements (slurry wall, sheet pile wall and associated monitoring wells) and their connections, etc. to the capping system. Greater details are provided in the Closure Plan included as Attachment C to the May 2019 RCRA Permit Renewal Application.

7.0 CONSTRUCTION METHODS

Construction associated factors to consider in the design for the funnel and gate PRB included:

- Location, configuration, and dimensions of the funnel and gate PRB
  - The PRB location and general configuration and dimensions were developed in consideration of the Site features and the available distance to monitor groundwater between the PRB and the creek. Based on this, a PRB gate location (to the west of the Slag Landfill) has been proposed. This location provides a sufficient distance between the PRB discharged groundwater and either the North Tributary or Stewart Creek to perform groundwater monitoring. Additionally, the PRB configuration, along with the addition of slurry wall sections along the North Tributary and Stewart Creek, creates a hydraulically controlled local groundwater system.
- The depth of the aquitard and the depth below ground surface (bgs) that needs to be accessed
  - The Site aquitard is the Eagle Ford Shale Formation, occurring at about 10-30 ft bgs. The top of bedrock surface is the top of the Eagle Ford Shale. Under the RCA, Slag Landfill and NDA, the top of bedrock surface dips to the southwest towards Stewart Creek.
- Geotechnical considerations (such as presence of rocks or highly consolidated sediments) and construction methods available for installing the reactive cell(s) and funnel walls
  - Borehole logs were reviewed for the presence of variable permeabilities/conductivities/strength characteristic features within the more generally representative soils above bedrock at the Site. Identified features include gravel containing deposits laying directly on bedrock, thin (inches) to thick (4-6 feet) thick layers of more transmissive silty-clay. Additionally, at the Site scale, the characteristics of the former stream channels were considered during selection of the remedy. The groundwater remediation contractor will be prepared for the presence of features that can circumvent or short-circuit (via underflow, overflow or rapid through-pass) and prepared to seal/isolate/mitigate the features impact on the remedy. Examples include grouting upgradient and downgradient features present at the PRB wall faces or increasing the key-depth of the slurry wall. Subsurface conditions will be evaluated during construction of the slurry wall to ensure the slurry wall to the south of the RCA is extended past the former stream channels on the eastern side of the RCA. Utility corridors are also present in the FOP, including along the alignment of the southern slurry wall. The slurry wall with mitigate potential preferential pathways associated with these utility corridors and the contractor will work with Exide to be prepared to address these, where they are present.
  - Borehole logs were reviewed for general stability characteristics with respect to the construction of the PRB and braced excavation was selected as a construction method for the PRB. The low permeability “funnels”, a traditional slurry wall technique was selected. For this type of technique, the permanent backfill is a blend of soil, bentonite clay and/or concrete that is placed in a high slump condition. The high slump backfill is placed through the slurry to serve as the final barrier wall.
  - Site physical constraints (such as significant concrete thickness, proximity to Stewart Creek, proximity to other obstacles that inhibit slurry wall installation) were considered and a portion of the proposed slurry wall alignment will be constructed using sheet piling. As shown on Figures 2 and 3, the proposed sheet piling section is proposed immediately adjacent to the former battery storage area due to limited working

space and will extend north across the drainage swale and intersect the slurry wall near the Sump Reactor utility vault. As natural ground surface and groundwater flow is towards the southwest, the discharge channels will be slightly pointed to the southwest away from the PRB.

7.1 Slurry Wall Section Construction

The use of traditional slurry-wall construction techniques to create a" bentonite-enhanced concrete barrier wall" for the Site is appropriate given the Site conditions (shallow construction through predominantly clay material with some limited access at portions of the Site). The general steps the 'funnel' construction include, but are not limited to:

- Preparation of egress/ingress routes, on-Site transport corridors, working areas, stockpile areas, equipment areas, worker rest areas, others
- Survey proposed slurry wall locations and local features
- Mobilization (and subsequent demobilization)
- Erosion Control - Install and Remove Silt Fence
- Remove ~5' Diameter Drainage Pipe at North End - Clearing, Remove Pipes and Headwalls, Backfill and Compact.
- Weld Caps on Open End of 2 Culvert Pipes
- Construct Berms and Install Liners for Saturated Soils (use onsite soil for berms)
- Removal of Concrete Overlying Trench and Misc. Concrete Walls and Place Onsite
- Excavate and Plug Sewer and Other Utility Lines at Trench Limit
- Prepare Trench Areas - Cut and Fill as needed to prepare Trench Areas. Strip and Stockpile Topsoil
- Liquid Storage for Biopolymer
    - Frac Tank Mobilization
    - Frac Tank Rental
    - Frac Tank Cleaning
    - Frac Tank Demobilization
- Stage equipment for liquid transportation and disposal
- Construct slurry wall with backhoe excavator, fill excavation with biopolymer, place slurry wall backfill
- 3,100 feet, 2 feet in width and on average 20 feet in depth of Bentonite Enhanced Concrete Barrier Wall
- Install geotextile and import clay at top of PRB (depths variable across profile). Replace stripped topsoil
- Install 6" thick concrete with 6" compacted base-rock- assumed 5 feet wide doweled into adjacent slabs
- Restore work area to original elevation with imported backfill
- Seed and mulch open ground

7.2 Sheet Piling Section Construction

The use of sheet piling construction is proposed in the area of the Sump Reactor and in the areas where the slurry wall transitions to the inside of the flood wall and around the outside of the sump area. Installation of the sheet pile barrier will be completed using standard sheet pile installation techniques with the exception of applying a sealant to the joints. The wall will be constructed with PZC18or equivalent sheet piling with a water-swelling sealant (Adeka Ultra Seal A-30 or equivalent) applied to the interlocking joints prior to driving. The A-30 sealant consists of a two-part mixture (resin and catalyst) that is applied to the female portion of the joint interlock. Individual piles are driven with the male side (or the side without sealant applied) leading to prevent accumulation of soil or debris in the interlock. Sheet piles will be driven vertically to depth by means of a hydraulic percussion hammer or vibratory hammer. The flood wall will be cut and repaired where the sheet pile transitions from inside to outside.

7.3 Transfer Pipe Construction

The transfer pipe from the Sump Reactor will be installed using excavator trenching. The transfer pipe from the manhole to the PRB will be installed using horizontal drilling technology.

7.4 Reactive Gate Section Construction

The general steps in the PRB 'gate' construction include, but are not limited to:

- Preparation of egress/ingress routes, on-Site transport corridors, working areas, stockpile areas, equipment areas, worker rest areas, others
- Survey proposed Sump Reactor location and local features
- Excavate and/or peel-back approximately 5 feet of overburden soil/sediment to bring the working elevation of the PRB location to level 630 ft MSL
- Using "trench shoring excavation system" or a "slip rail shoring system" excavate to bedrock a 3-foot wide by approximately 15-foot deep by 100-foot long excavated trench
- Maintain a dry trench using dewatering if needed
- Clean and etch the top-of-bedrock surface
- Key the bottom of the PRB to the bedrock and seal potential preferential pathways (e.g. highly unconsolidated sediment bodies) using a bentonite/concrete mix, bring sealant layer to level elevation 616 ft MSL
- Install a 6-inch layer of reactive media (ZVI-sand mix) to elevation 617 ft MSL
- Install a distribution pipe, connections, etc. on the reactive media
- Pre-plumb the PRB with extraction wells and series of "access" wells (e.g. for monitoring within the ZVI/sand mix and to provide injection points for potential acid wash rejuvenation event)
- Install 13 feet of 40% by weight ZVI/sand mix layer to level elevation 630 ft MSL
- Cover PRB with geotextile and finish to original ground surface with clay-soil mix
- Install the discharge secant walls as discussed in Section 6.2.4.

- Finish work area with imported backfill
- Seed and mulch open ground

7.5 Sump Reactor Construction

The general steps in construction of the Sump Reactor are:

- Preparation of egress/ingress routes, on-Site transport corridors, working areas, stockpile areas, equipment areas, worker rest areas, others
- Survey proposed Sump Reactor location and local features
- Erosion Control - Install and Remove Silt Fence
- Provide for dewatering, including liquid storage, transportation and disposal
- Excavate and/or peel-back approximately 15 feet of overburden soil/sediment to bring the base elevation of the Sump Reactor location bedrock at about elevation 610 ft MSL
- Maintain a dry sump area using dewatering if needed
- Clean and etch the top-of-bedrock surface and grout the base to level elevation 610 ft MSL
- Install a 1-foot layer of bedding sand layer to level elevation 611 ft MSL
- Install the 15,000-gallon tank (approximately 13 feet in diameter and 14 feet in height)
- Pre-plumb the Sump Reactor with extraction well (in duplicate) and series of “access” wells (e.g. for monitoring within the ZVI/sand mix and to provide injection points for potential acid wash rejuvenation event)
- Install 14-feet of 40% by weight ZVI/sand mix layer to level elevation 625 ft MSL
- Cap the Sump Reactor with permeable fabric and backfill to ground surface with a permeable soil-sand mix
- Finish work area to target elevation of 634 ft MSL (after sump reactor and sheet pile installation in that area completed), with imported backfill
- Seed and mulch open ground

The construction sequence for the sheet piles and sump reactor will be coordinated so that the sump reactor is installed prior to the sheet pile but that the area is not backfilled until after the sheet pile is installed.

7.6 Construction QA/QC

Construction quality assurance and quality control measures are important to the construction of the funnel and gate PRB and must be followed so that the design criteria for the reactive media are achieved. Golder personnel will oversee all construction activities and perform the construction quality assurance monitoring and required testing. A QA/QC plan for the funnel and gate PRB installation will be submitted for Texas Commission on Environmental Quality (TCEQ) review and approval under separate cover following approval of the response action plan for the Site and prior to commencing construction activities.

8.0 OPERATIONS, MAINTENANCE & MONITORING

Once the construction of the barrier is complete, the barrier will need to be monitored for as long as the plume is present. Section 8.0 discusses PRB monitoring requirements in terms of the locations, frequency, and type of monitoring. Target contaminants (and their byproducts), hydraulic flow characteristics, and geochemistry (PRB longevity indicators) are the main categories of parameters that are monitored. A monitoring plan generally is prepared along with the design report, and both documents play a significant role in obtaining regulatory approval for PRB application.

8.1 Construction Performance Monitoring

There are several stages of monitoring and types of monitoring to be considered at the Site during pre-construction, construction and post-construction periods. Both groundwater elevation and groundwater quality will be monitored during all three (3) phases of the project.

- For the pre-construction period one round of groundwater elevation data across the Site will be collected within a week of commencing the construction activities (including well abandonment).
- For the funnel and gate post-construction period groundwater elevations will be measured monthly. These water elevation data will be used to monitor the hydraulic changes to the groundwater system as a result of constructing the slurry walls and PRB. Along with flow meter readings from the transfer lines, the overall Sump Reactor-PRB flow characteristics can me modified using the valving that restricts or permits the transmission of groundwater from the Sump Reactor to the PRB. These data will also be used to assess the potential for leaks or by-pass along the slurry wall lengths.

8.2 Post-Closure Performance Monitoring

For long-term monitoring of the funnel and gate system (following final capping of the RCA, Slag Landfill and NDA) groundwater monitoring will be completed as a part of site wide FOP Groundwater Monitoring Program. The FOP groundwater monitoring program is described in detail in Attachment L to the Part B RCRA Permit Renewal Application (FOP Groundwater Monitoring Plan).

The groundwater sampling events will be conducted in conjunction with quarterly and then semi-annual sampling events for the North CAMU so that water level data and background concentrations from the North CAMU wells can be used for comparison purposes.

8.3 Periodic Inspections

Annual inspections of the slurry wall perimeter, the sheet piling, the Sump Reactor area, the PRB area and the transfer piping vault will be conducted until closure.

8.4 ZVI Rejuvenation

From the engineering design, the mass of zero-valent iron is roughly equivalent to about 30 years of treatment, From the column tests, arsenic, cadmium and lead showed nearly 100 % removal over 25 simulated years, but selenium and antimony showed breakthrough about PCLs at about 20 years. Additionally, the potential for scaling/fouling as well as iron demand for reactions needs consideration. The required maintenance of the PRB and Sump Reactor are:

- If during the operation of the PRB breakthrough of metals concentrations in exceedance of 75% of the applicable PCLs at the first downgradient monitoring well are detected, a rejuvenation event will be performed.

As noted in the GRE, zero-valent iron may be rejuvenated by acid treatment (Zeng, et. al., 2008). Zeng showed that arsenic can be removed up to ratios of 15 mg-Arsenic/kg-iron within 500 to 1,000 minutes of contact time. For the range of arsenic removal capacities reported, 0.45 to 7.5 mg-arsenic/kg-iron, Zeng's results indicate these levels of mass would be desorbed within the first 100 minutes of the acid wash. The ability to acid wash and desorb arsenic using 100-200 mmol/L H3PO4 solution or KH2PO4 solution has a capacity to desorb as great or greater than the capacity of the ZVI to retain arsenic.

The general procedure for acid wash rejuvenation shall include:

- Prepare the Site (including but not limited to temporary frac tanks, decon area, supplies and equipment staging, etc.)
- Prepare the acid wash solution (100-200 mmol/L of H3PO4 solution or KH2PO4 solution).
- Use access wells for simultaneous injection of acid solution and extraction of pore water from ZVI/Sand mix. Inject acid solution into the reactors displacing existing pore water with acid solution, let it stand for 12 hours (720 minutes), agitate with hydraulic pulses on the injection wells
- Extract one pore volume of acid solution from the PRB and/or the Sump Reactor
- Sample and analyze the extracted liquid and dispose accordingly.

9.0 REFERENCES

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10.0 CLOSING

Golder appreciates the opportunity to assist Exide with this project. Please contact the undersigned if you have any questions or would like any additional information about this Report.

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TABLES

Table 4: Summary of Model Boundary Conditions - Exide Facility, Frisco TX

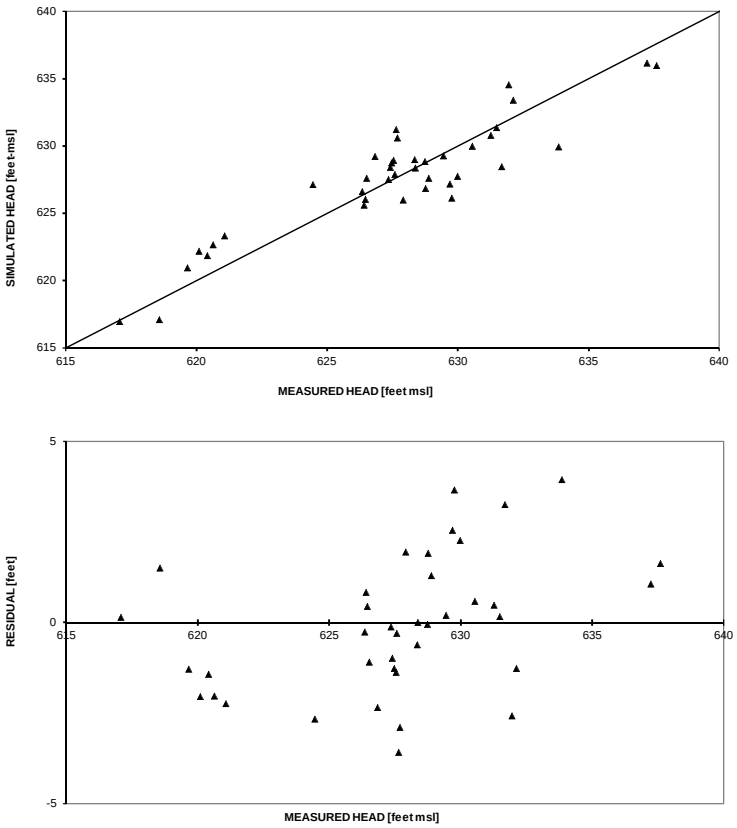
Constant Head Boundary Conditions			Min Head (ft msl)	Max Head (ft msl)
Reach	Layer	Description		
0	1	Stewart Creek (confluence w/ N. Trib.)	612.1	613.0
1	1	Stewart Creek (downstream)	613.0	620.0
2	1	Stewart Creek (midstream)	620.0	628.0
3	1	Stewart Creek (upstream)	628.0	628.8
5	1	North Tributary (downstream)	613.4	628.0
6	1	North Tributary (midstream)	628.0	628.5
7	1	North Tributary (midstream)	628.7	631.2
8	1	North Tributary (midstream)	631.2	631.5
9	1	North Tributary (upstream)	631.5	632.0
22	1	Upgradient Groundwater	640.6	640.6

Prepared by: LDA
Checked by: TGB
Reviewed by: THR

Table 5: Calibration Data Summary - June 2018 Conditions - Exide Facility, Frisco TX

Well ID	X [feet]	Y [feet]	Layer	Measured Head [feet msl]	Simulated Head [feet msl]	Weight [1]	Residual [feet]
B7N	2,480,687	7,102,463	1	631.93	634.52	1	-2.59
B9N	2,480,057	7,102,611	1	631.26	630.79	1	0.47
MW-16	2,479,410	7,102,233	1	617.06	616.92	1	0.14
MW-16S	2,479,403	7,102,241	1	618.56	617.06	1	1.50
MW-17	2,479,609	7,102,090	1	620.41	621.83	1	-1.42
MW-18	2,479,342	7,102,459	1	628.75	626.84	1	1.91
MW-22	2,480,047	7,102,441	1	631.48	631.32	1	0.16
MW-23	2,480,769	7,102,125	1	637.22	636.16	1	1.06
MW-26	2,479,876	7,101,865	1	626.34	626.61	1	-0.27
MW-27	2,480,260	7,101,675	1	627.40	628.39	1	-0.99
MW-29	2,480,042	7,101,742	1	627.57	627.87	1	-0.30
MW-39	2,479,631	7,102,473	1	627.34	627.47	1	-0.13
MW-40	2,479,900	7,102,568	1	628.35	628.98	1	-0.63
MW-44	2,480,550	7,101,660	1	626.83	629.19	1	-2.36
B5N	2,479,676	7,102,074	1	621.07	623.31	1	-2.24
MW-10	2,480,965	7,101,997	1	637.59	635.96	1	1.63
MW-21	2,480,491	7,102,519	1	632.12	633.40	1	-1.28
MW-24	2,479,613	7,102,133	1	620.63	622.66	1	-2.03
MW-30	2,480,011	7,102,086	1	633.84	629.90	1	3.94
MW-31	2,479,797	7,102,002	1	626.40	625.58	1	0.82
MW-32	2,479,831	7,101,921	1	627.90	625.96	1	1.94
MW-33	2,480,021	7,101,872	1	631.68	628.42	1	3.26
MW-34	2,480,097	7,101,877	1	629.44	629.24	1	0.20
MW-35	2,480,191	7,101,736	1	628.74	628.80	1	-0.06
MW-36	2,480,274	7,101,815	1	630.54	629.97	1	0.57
MW-46	2,479,834	7,101,919	1	626.45	626.01	1	0.44
DGW-MW-1	2,480,600	7,101,738	1	627.67	630.57	1	-2.90
DGW-MW-2	2,480,415	7,101,676	1	627.54	628.92	1	-1.38
DGW-MW-3	2,480,288	7,101,694	1	627.46	628.73	1	-1.27
DGW-MW-4	2,480,132	7,101,711	1	628.36	628.35	1	0.00
DGW-MW-5	2,479,632	7,102,077	1	620.10	622.14	1	-2.05
DGW-MW-6	2,479,880	7,102,081	1	629.97	627.71	1	2.26
DGW-MW-7	2,479,782	7,102,104	1	629.75	626.09	1	3.66
DGW-MW-8	2,479,511	7,102,210	1	619.65	620.94	1	-1.29
DGW-MW-9	2,480,655	7,101,771	1	627.63	631.21	1	-3.58
DGW-MW-10	2,479,984	7,101,804	1	628.88	627.60	1	1.28
DGW-MW-10S	2,479,986	7,101,802	1	626.51	627.61	1	-1.10
DGW-MW-11	2,479,920	7,101,855	1	624.45	627.13	1	-2.67
DGW-MW-11S	2,479,922	7,101,854	1	629.68	627.14	1	2.54

Statistics for June 2018 Targets			
	Unweighted		Unweighted
RM	-0.07	Minimum Residual:	-3.58
RSD	1.85	Maximum Residual:	3.94
SSR	133.14	Head Range:	20.53
ARM	1.49	RSD/Head Range:	0.09
As percentage of Head Range:			
RM	-0.3%		
RSD	9.0%		
ARM	7.3%		



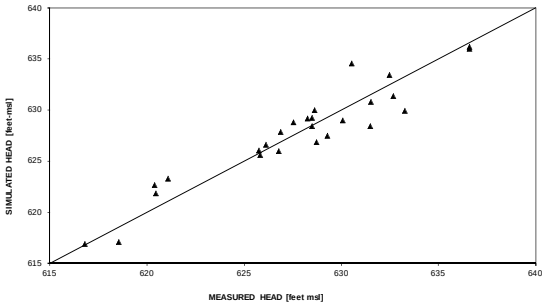
Notes:
Calibration output from model "Frisco_Exide_V7.0"
msl = mean sea level
RM = Residual mean
RSD = Residual Standard Deviation
SSR = Sum of Squared Residuals
ARM = Absolute Residual Mean

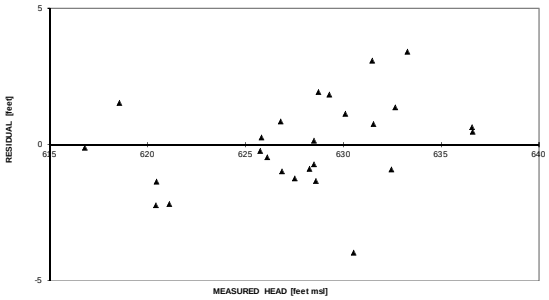
Prepared by: LDA
Checked by: TGB
Reviewed by: THR

Table 6: Verification Data Summary - January 2014 Conditions - Exide Facility, Frisco TX

Well ID	X [feet]	Y [feet]	Layer	Measured Head [feet msl]	Simulated Head [feet msl]	Weight [1]	Residual [feet]
B7N	2,480,687	7,102,463	1	630.55	634.52	1	-3.97
B9N	2,480,057	7,102,611	1	631.55	630.79	1	0.76
MW-16	2,479,410	7,102,233	1	616.81	616.92	1	-0.11
MW-16S	2,479,403	7,102,241	1	618.58	617.06	1	1.52
MW-17	2,479,609	7,102,090	1	620.47	621.83	1	-1.36
MW-18	2,479,342	7,102,459	1	628.75	626.84	1	1.91
MW-22	2,480,047	7,102,441	1	632.68	631.32	1	1.36
MW-23	2,480,769	7,102,125	1	636.63	636.16	1	0.47
MW-26	2,479,876	7,101,865	1	626.13	626.61	1	-0.48
MW-27	2,480,260	7,101,675	1	628.52	628.39	1	0.13
MW-29	2,480,042	7,101,742	1	626.89	627.87	1	-0.98
MW-39	2,479,631	7,102,473	1	629.29	627.47	1	1.82
MW-40	2,479,900	7,102,568	1	630.11	628.98	1	1.13
MW-44	2,480,550	7,101,660	1	628.29	629.19	1	-0.90
B5N	2,479,676	7,102,074	1	621.12	623.31	1	-2.19
MW-10	2,480,965	7,101,997	1	636.60	635.96	1	0.64
MW-21	2,480,491	7,102,519	1	632.49	633.40	1	-0.91
MW-24	2,479,613	7,102,133	1	620.42	622.66	1	-2.24
MW-30	2,480,011	7,102,086	1	633.30	629.90	1	3.40
MW-31	2,479,797	7,102,002	1	625.84	625.58	1	0.26
MW-32	2,479,831	7,101,921	1	626.80	625.96	1	0.84
MW-33	2,480,021	7,101,872	1	631.50	628.42	1	3.08
MW-34	2,480,097	7,101,877	1	628.52	629.24	1	-0.72
MW-35	2,480,191	7,101,736	1	627.55	628.80	1	-1.25
MW-36	2,480,274	7,101,815	1	628.63	629.97	1	-1.34
MW-46	2,479,834	7,101,919	1	625.77	626.01	1	-0.24

Statistics for January 2014 Targets			
	Unweighted		Unweighted
RM	0.02	Minimum Residual:	-3.97
RSD	1.64	Maximum Residual:	3.40
SSR	69.55	Head Range:	19.82
ARM	1.31	RSD/Head Range:	0.08
As percentage of Head Range:			
RM	0.1%		
RSD	8.3%		
ARM	6.6%		

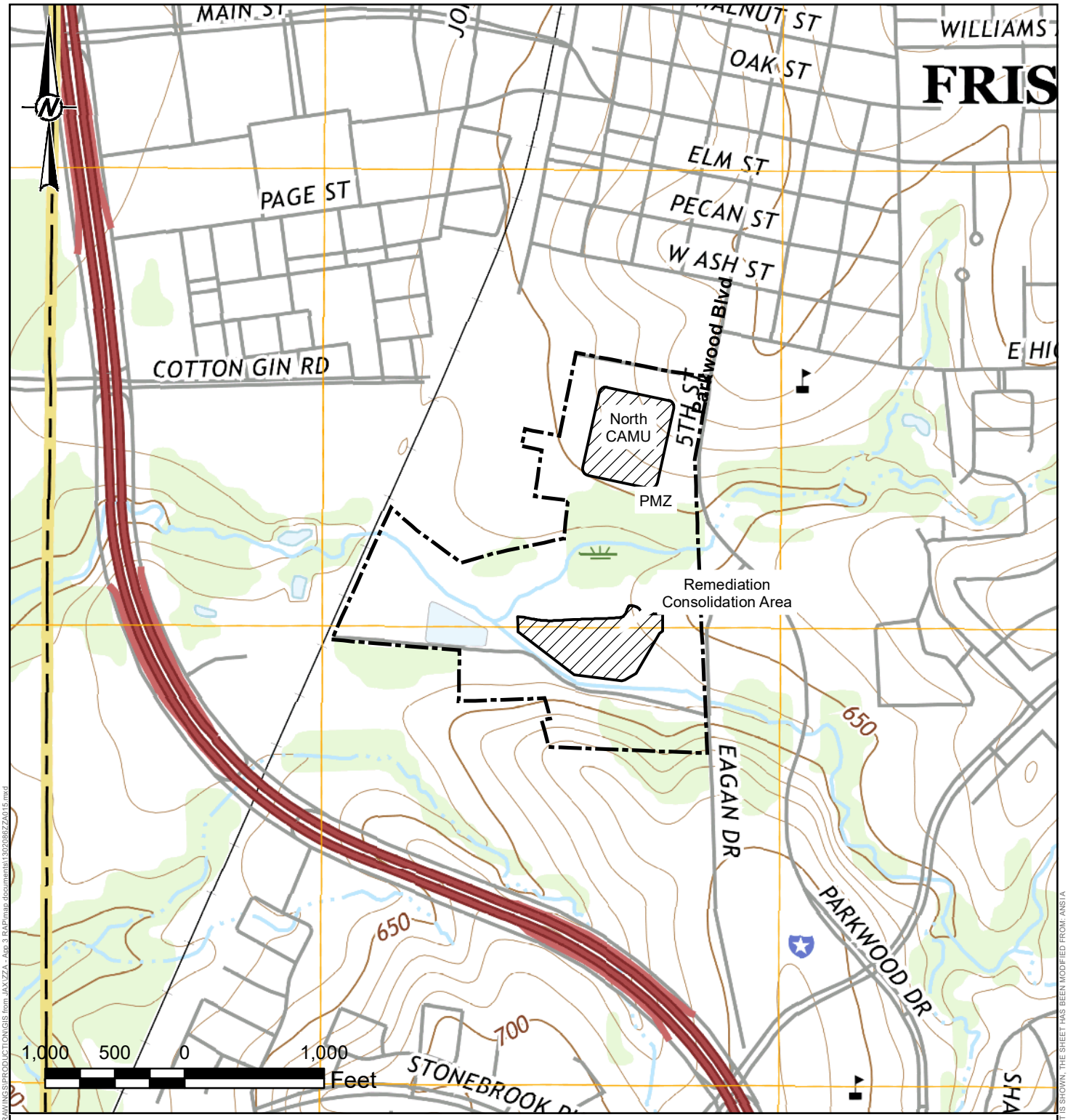




Notes:
Calibration output from model "Frisco_Exide_V7.1"
msl = mean sea level
RM = Residual mean
RSD = Residual Standard Deviation
SSR = Sum of Squared Residuals
ARM = Absolute Residual Mean

Prepared by: LDA
Checked by: TGB
Reviewed by: THR

FIGURES



LEGEND

- Corrective Action Management Unit
- Former Operating Plant Property Boundary

STATE OF TEXAS
R. BRYAN LUPER
83963
LICENSED PROFESSIONAL ENGINEER

5-31-19

REFERENCE

1. BASEMAP - USGS DIGITAL RASTER GRAPHIC FRISCO, TX 2016, UNITED STATES GEOLOGICAL SURVEY GEOPDF 2016

CLIENT
EXIDE TECHNOLOGIES

PROJECT
GROUNDWATER REMEDY DESIGN REPORT

TITLE
SITE LOCATION MAP

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-07
PREPARED	EFT
DESIGN	JWT
REVIEW	EPW
APPROVED	AMF

PROJECT No.	CONTROL	Rev.	FIGURE
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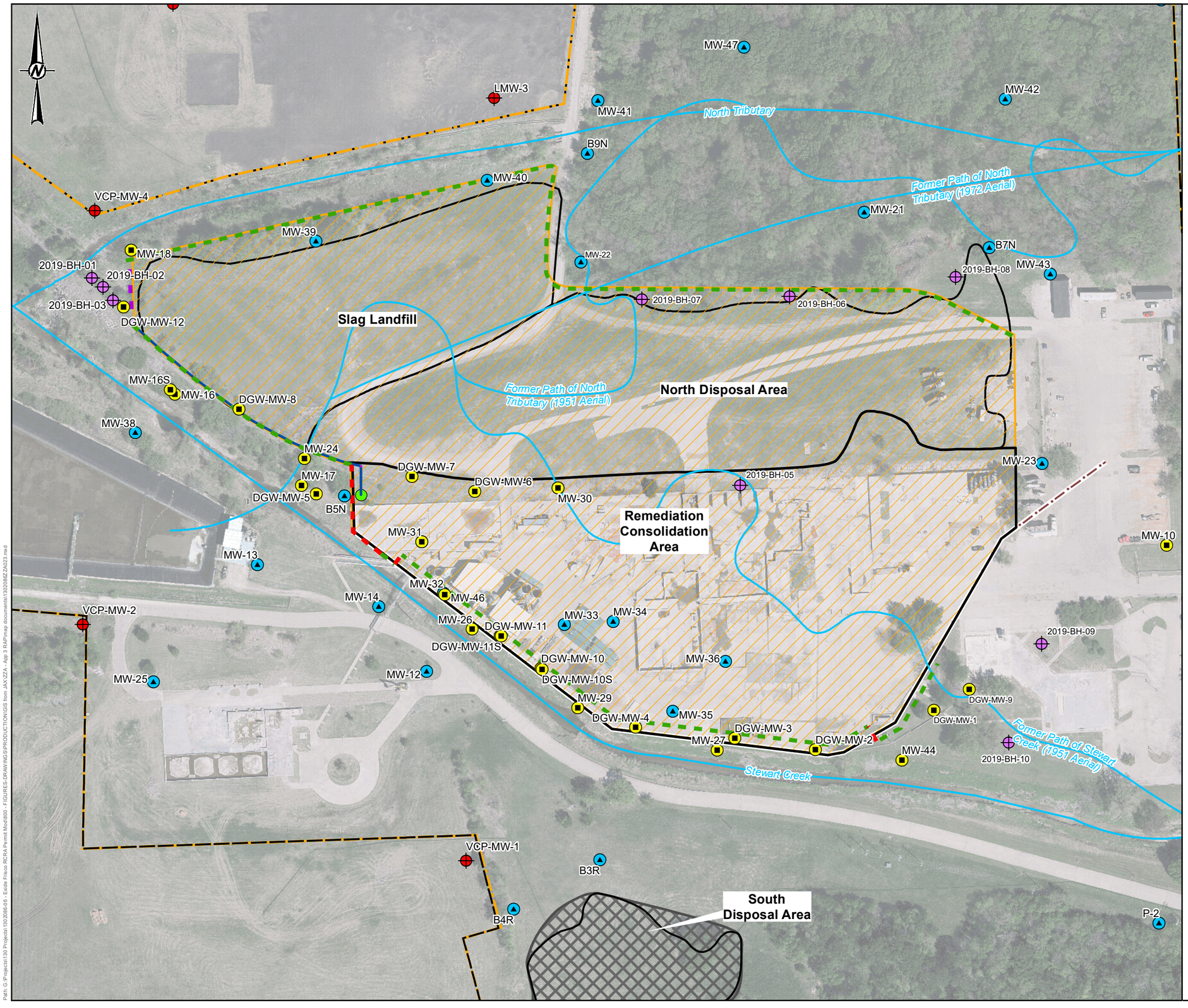

LEGEND

- DGW-PDI Monitoring Wells
- Additional FOP Monitoring Wells
- 2019 RAP Soil Boring
- Other Off-Site Monitoring Wells
- Surface Water Centerline
- Disposal Area
- Former Operating Plant Property Boundary
- Former Undeveloped Buffer Property
- Engineered Cap
- Cap Supplement
- Proposed Flood Wall
- Proposed PRB (Gate) Location
- Proposed Slurry Wall Locations
- Proposed Sheet Pile (Funnel) Location
- Reactor Sump Piping
- Manhole Cover
- Reactor Sump

STATE OF TEXAS
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83963
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5-31-19

150 75 0 150 Feet

REFERENCE

1. SITE FEATURES - GOLDER, 2014
2. DGW-PDI MONITORING WELL LOCATIONS & CREEK ELEVATIONS - BRITTAIN & CRAWFORD, 05/22/2018
3. AERIAL IMAGERY - PROVIDED BY DALLAS AERIAL SURVEY, DATED APRIL, 2017.
4. RAP - RESPONSE ACTION PLAN.
5. DGW-MW-12 AND 2019-BH'S DRILLED AND SURVEYED IN JANUARY 2019.

CLIENT
EXIDE TECHNOLOGIES

PROJECT
GROUNDWATER REMEDY DESIGN REPORT

TITLE
GROUNDWATER REMEDY LOCATION MAP - OVERVIEW

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-17
PREPARED	EFT
DESIGN	EPW
REVIEW	EPW
APPROVED	AMF/THR

PROJECT No.	CONTROL	Rev.	FIGURE
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI B

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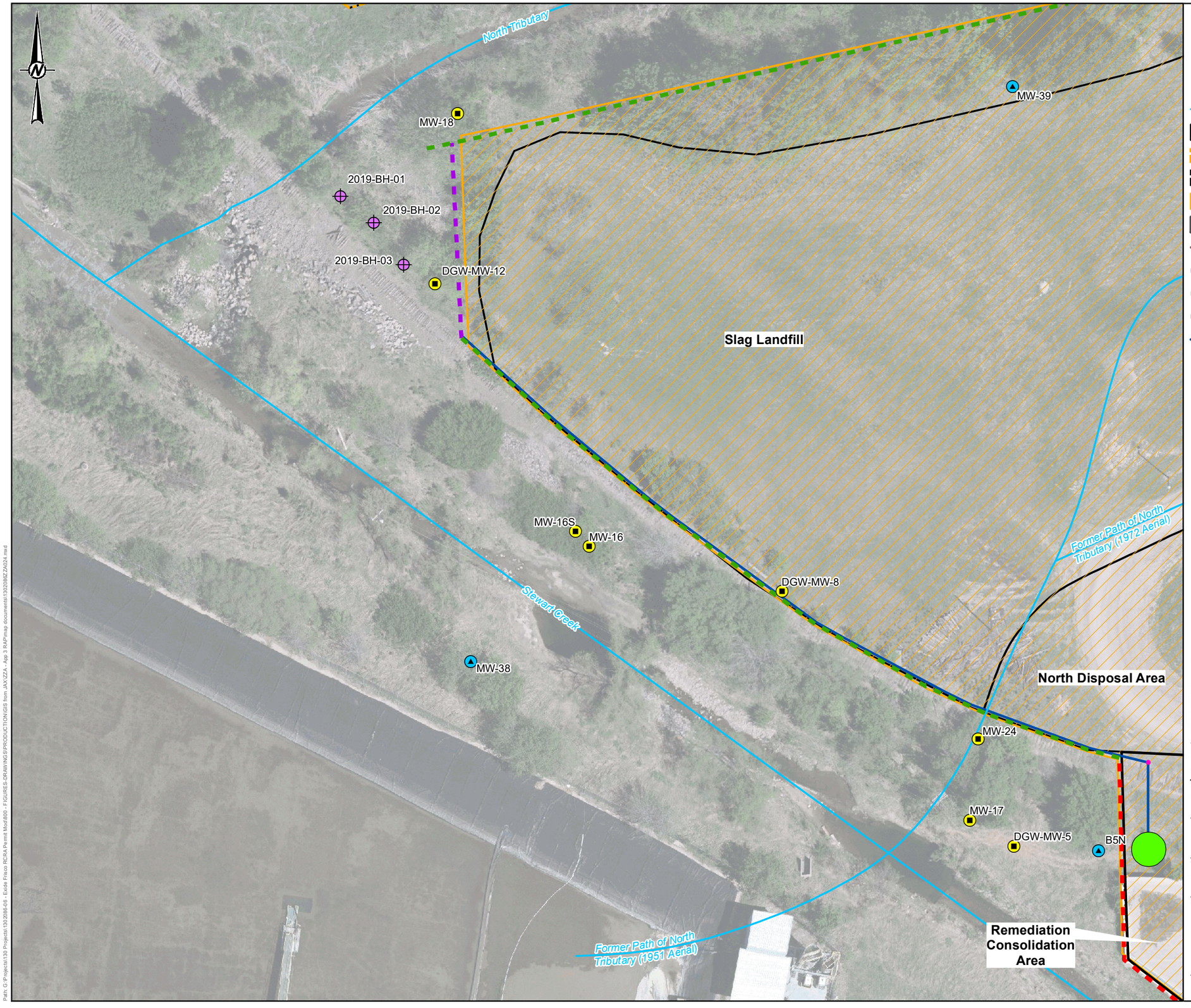

LEGEND

- DGW-PDI Monitoring Wells
- Additional FOP Monitoring Wells
- 2019 RAP Soil Boring
- Surface Water Centerline
- Disposal Area
- Former Operating Plant Property Boundary
- Former Undeveloped Buffer Property
- Engineered Cap
- Cap Supplement
- Proposed Flood Wall
- Proposed PRB (Gate) Location
- Proposed Slurry Wall Locations
- Proposed Sheet Pile (Funnel) Location
- Reactor Sump Piping
- Manhole Cover
- Reactor Sump

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PROFESSIONAL ENGINEER
5-31-19

50 25 0 50 Feet

REFERENCE

1. SITE FEATURES - GOLDER, 2014
2. DGW-PDI MONITORING WELL LOCATIONS & CREEK ELEVATIONS - BRITTAIN & CRAWFORD, 05/22/2018
3. AERIAL IMAGERY - PROVIDED BY DALLAS AERIAL SURVEY, DATED APRIL, 2017.
4. RAP - RESPONSE ACTION PLAN.
5. DGW-MW-12 AND 2019-BH'S DRILLED AND SURVEYED IN JANUARY 2019.

CLIENT
EXIDE TECHNOLOGIES

PROJECT
GROUNDWATER REMEDY DESIGN REPORT

TITLE
GROUNDWATER REMEDY LOCATION MAP - WEST AREA

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-08
PREPARED	EFT
DESIGN	EPW
REVIEW	EPW
APPROVED	AMF/THR

PROJECT No.	CONTROL	Rev.	FIGURE
13-02086-06	1302086ZZA024	0	3

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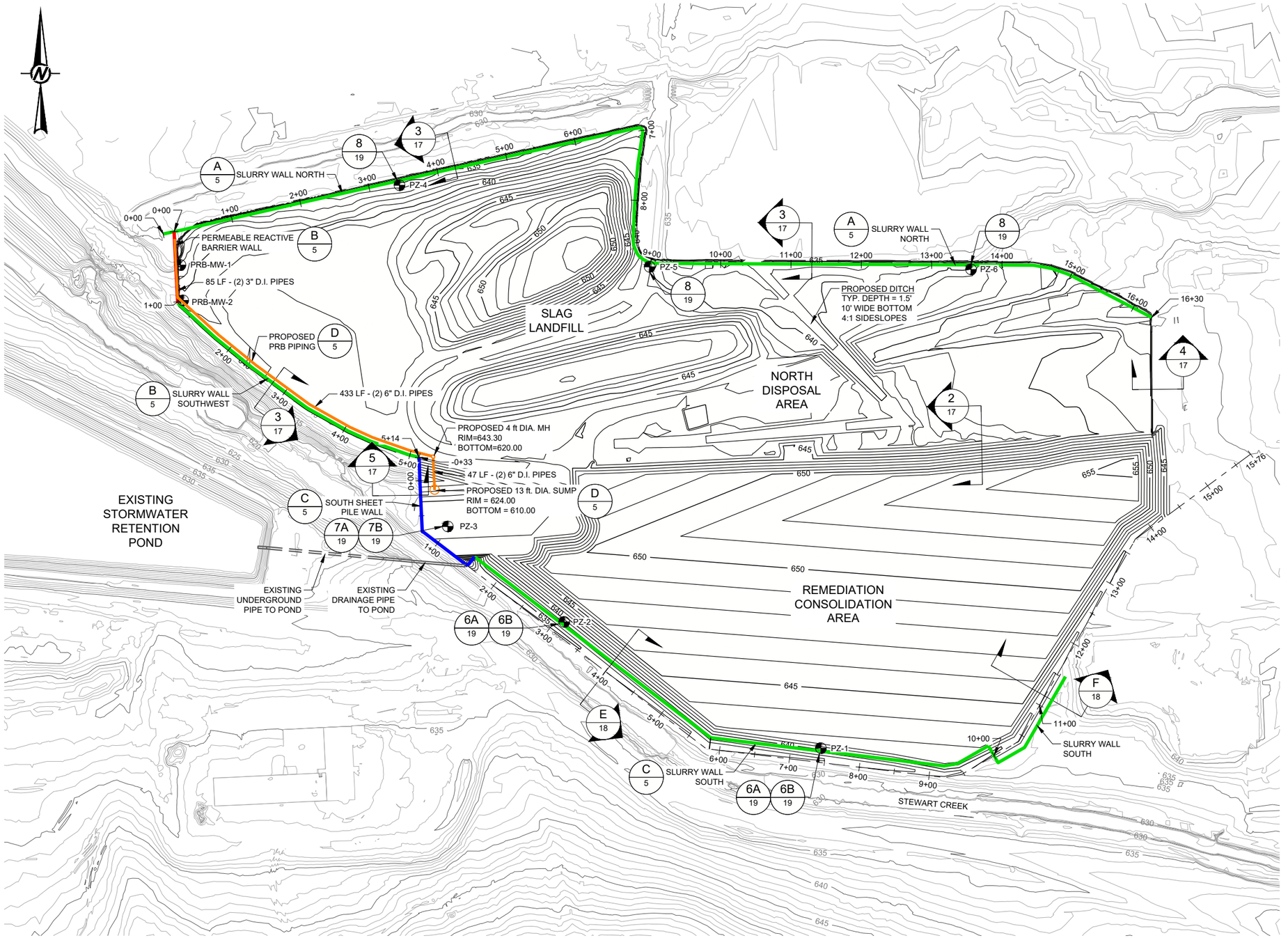

LEGEND

- EXISTING GRADE 10 ft CONTOUR
- EXISTING GRADE 2 ft CONTOUR
- PROPOSED CAP 10 ft CONTOUR
- PROPOSED CAP 2 ft CONTOUR
- PROPOSED SHEET PILE WALL
- PROPOSED PERMEABLE REACTIVE BARRIER WALL
- PROPOSED SLURRY WALL
- PROPOSED PRB PIPING

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R. BRYAN LUPER
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LICENSED PROFESSIONAL ENGINEER
5-31-19

ISSUED FOR PERMITTING PURPOSES ONLY

0 75 150
1" = 150' FEET

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
A	2019-05-28	ISSUED FOR PERMITTING PURPOSES ONLY	JVH	JVH	RBL	RBL

SEAL

GOLDER ASSOCIATES, INC
TEXAS REGISTRATION F-2578

CLIENT
EXIDE TECHNOLOGIES
EXIDE FRISCO RECYCLING CENTER
FRISCO, TEXAS

CONSULTANT
GOLDER
HOUSTON OFFICE - NORTH
14950 HEATHROW FOREST PKWY, STE 280
HOUSTON, TEXAS 77032
USA
[+1] (281) 821 6868
www.golder.com

PROJECT
RCRA PERMIT RENEWAL APPLICATION
GROUNDWATER REMEDY DESIGN REPORT
FRISCO, COLLIN COUNTY, TEXAS

TITLE
FUNNEL AND GATE SYSTEM LAYOUT - PLAN VIEW

PROJECT NO.	SCALE	REV.	FIGURE
130208606	AS SHOWN	A	4

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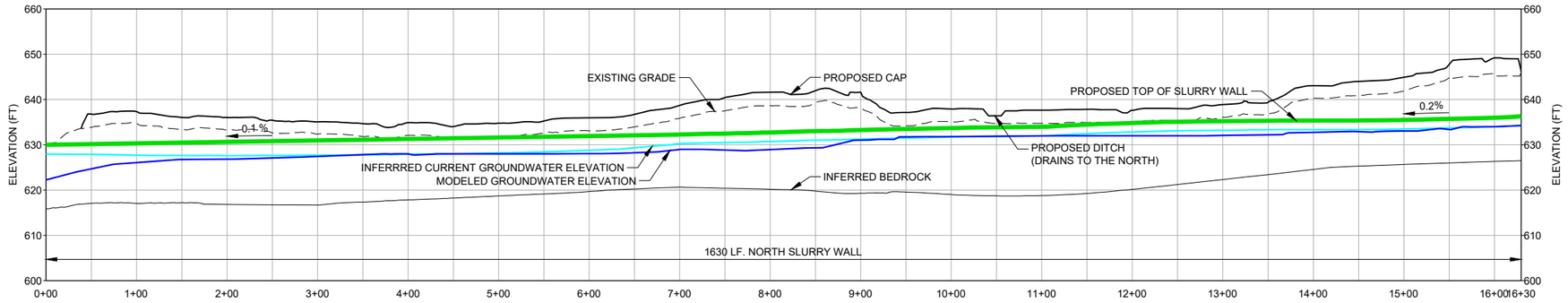
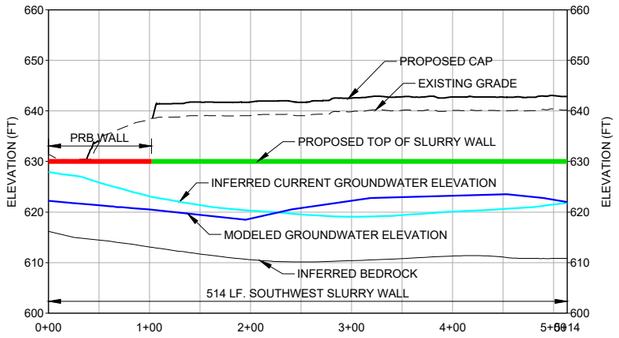


HORZ. SCALE = 1" = 150'
VERT. SCALE = 1" = 30'

A
5

SLURRY WALL NORTH



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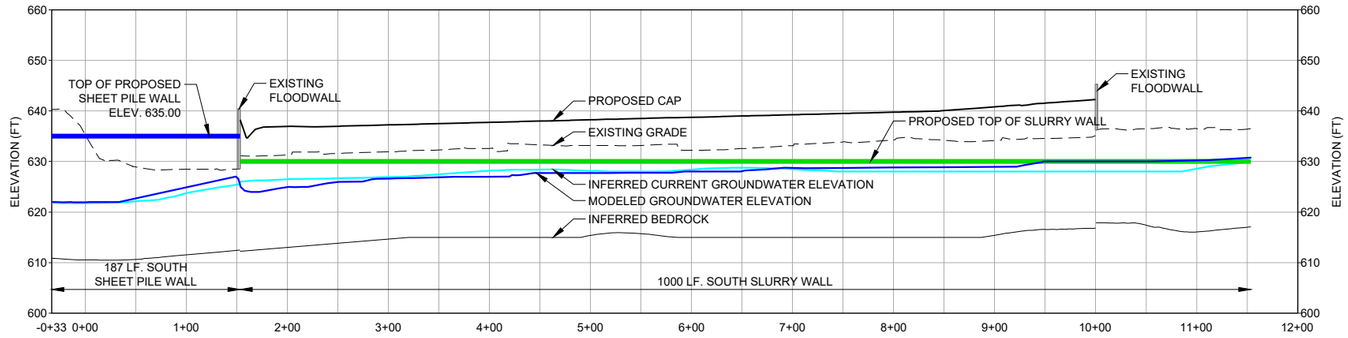
VERT. SCALE = 1" = 30'

B
5

SLURRY WALL SOUTHWEST



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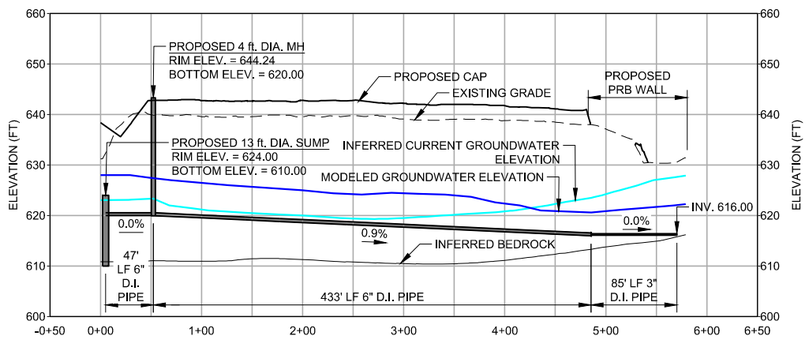
VERT. SCALE = 1" = 30'

C
5

SLURRY WALL SOUTH



HORZ. SCALE = 1" = 150'
VERT. SCALE = 1" = 30'

D
5

PROPOSED PRB PIPING

NOTES

1. Water level elevations presented in feet above mean sea level and collected on June 12, 2018.

STATE OF TEXAS
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PROFESSIONAL ENGINEER

5-31-19

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HORZ. SCALE = 0 75 150 (1" = 150' FEET)

VERT. SCALE = 0 15 30 (1" = 30' FEET)

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
A	2019-05-30	ISSUED FOR PERMITTING PURPOSES ONLY	JVH	JVH	RBL	RBL

SEAL

GOLDER ASSOCIATES, INC
TEXAS REGISTRATION F-2578

CLIENT
EXIDE TECHNOLOGIES
EXIDE FRISCO RECYCLING CENTER
FRISCO, TEXAS

CONSULTANT

GOLDER
HOUSTON OFFICE - NORTH
14950 HEATHROW FOREST PKWY, STE 280
HOUSTON, TEXAS 77032
USA
[+1] (281) 821 6868
www.golder.com

PROJECT
RCRA PERMIT RENEWAL APPLICATION
GROUNDWATER REMEDY DESIGN REPORT
FRISCO, COLLIN COUNTY, TEXAS

TITLE
FUNNEL AND GATE SYSTEM LAYOUT - PROFILES

PROJECT NO.	SCALE	REV.	FIGURE
130208606	AS SHOWN	A	5

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

1 in 0

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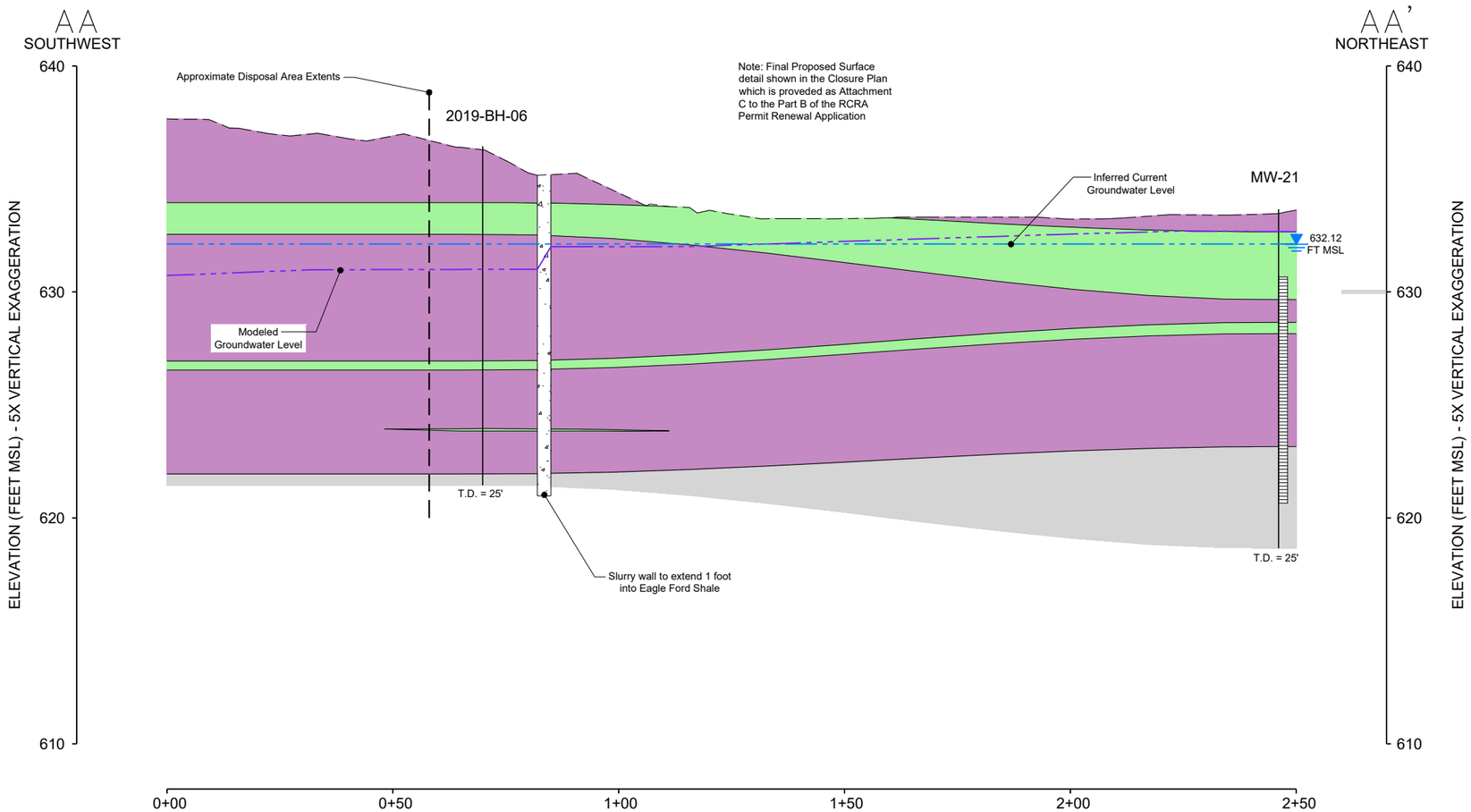


NOTES

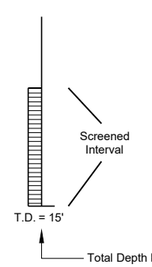
1. Ground surface taken from Dallas Aerial Survey in April 2017. Monitoring well ground surface elevations were surveyed by a licensed surveyor.
2. MSL - Above mean sea level.

GENERALIZED LITHOLOGIC ABBREVIATIONS

- (CH) CLAY and (CL) SILTY CLAY
- (CH) Gravelly/Sandy CLAY and (CL) Gravelly/Sandy SILTY CLAY
- EAGLE FORD SHALE

EXPLANATION

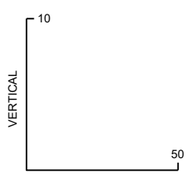
Monitoring Well Construction



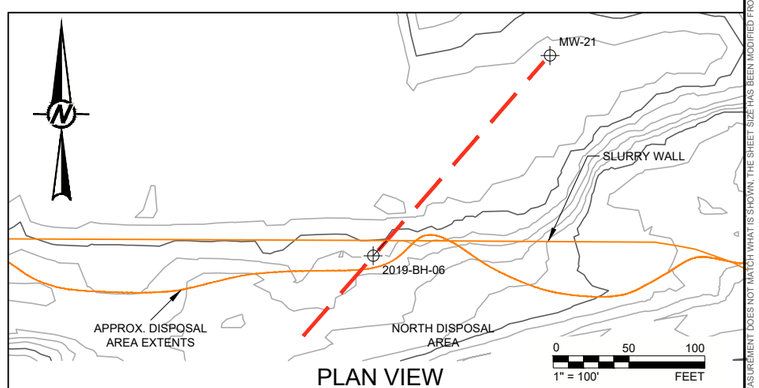
Water Level (FT MSL) - From June 12, 2018

Inferred Current Groundwater Level

SCALE IN FEET



5x Vertical Exaggeration



PLAN VIEW

STATE OF TEXAS
R. BRYAN LUPER
83963
LICENSED PROFESSIONAL ENGINEER
5-31-19

CLIENT
EXIDE TECHNOLOGIES

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-24
DESIGNED	PJJ
PREPARED	PJJ
REVIEWED	EPW
APPROVED	AMF/THR

PROJECT
GROUNDWATER REMEDY DESIGN REPORT

TITLE
CROSS SECTION AA-AA'

PROJECT NO. 130208606 | REV. 0 | FIGURE 6

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

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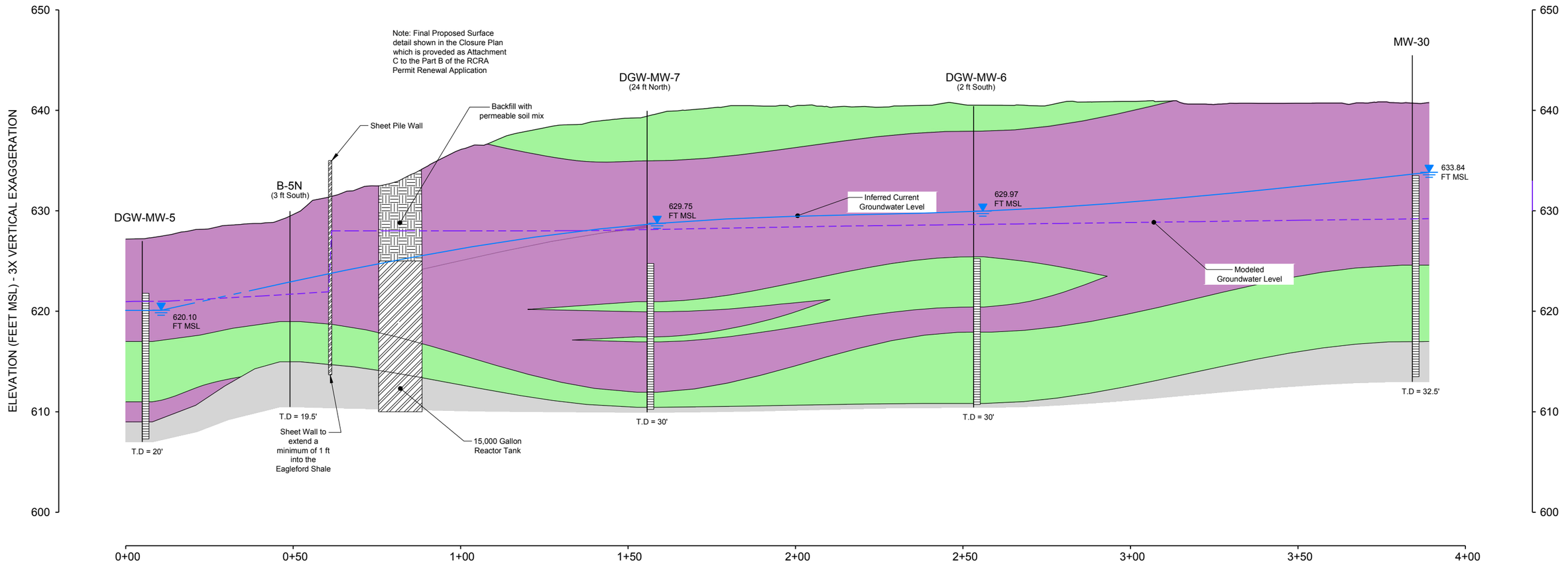
BB
WEST

BB'
EAST



NOTES

1. Ground surface taken from Dallas Aerial Survey in April 2017. Monitoring well ground surface elevations were surveyed by a licensed surveyor.
2. MSL - Above mean sea level.

GENERALIZED LITHOLOGIC ABBREVIATIONS

- (CH) CLAY and (CL) SILTY CLAY
- (CH) Gravelly/Sandy CLAY and (CL) Gravelly/Sandy SILTY CLAY
- EAGLE FORD SHALE

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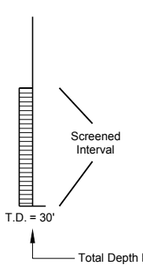
83963
LICENSED PROFESSIONAL ENGINEER

R Bryan Luper
5-31-19

EXPLANATION

Monitoring Well Construction

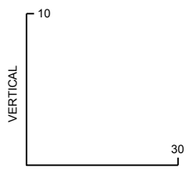


Water Level (FT MSL) - From June 12, 2018

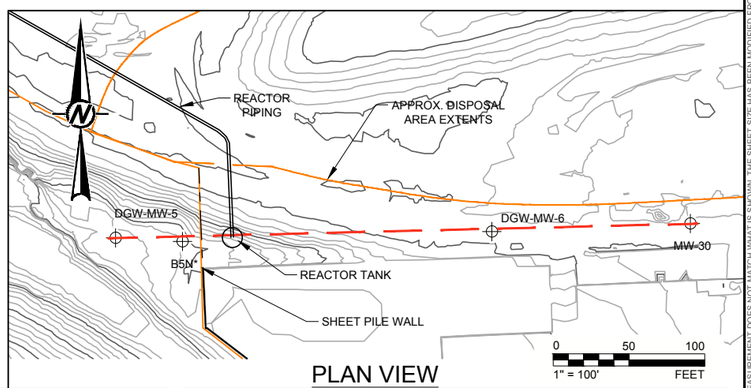
(24 ft North) Location of the borehole relative to the cross-section line

Inferred Current Groundwater Level

SCALE IN FEET



3x Vertical Exaggeration



PLAN VIEW

CLIENT
EXIDE TECHNOLOGIES

PROJECT
GROUNDWATER REMEDY DESIGN REPORT

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-28
DESIGNED	PJJ
PREPARED	PJJ
REVIEWED	EPW
APPROVED	AMF/THR

TITLE
CROSS SECTION BB-BB'

PROJECT NO. 130208606
REV. 0
FIGURE 7

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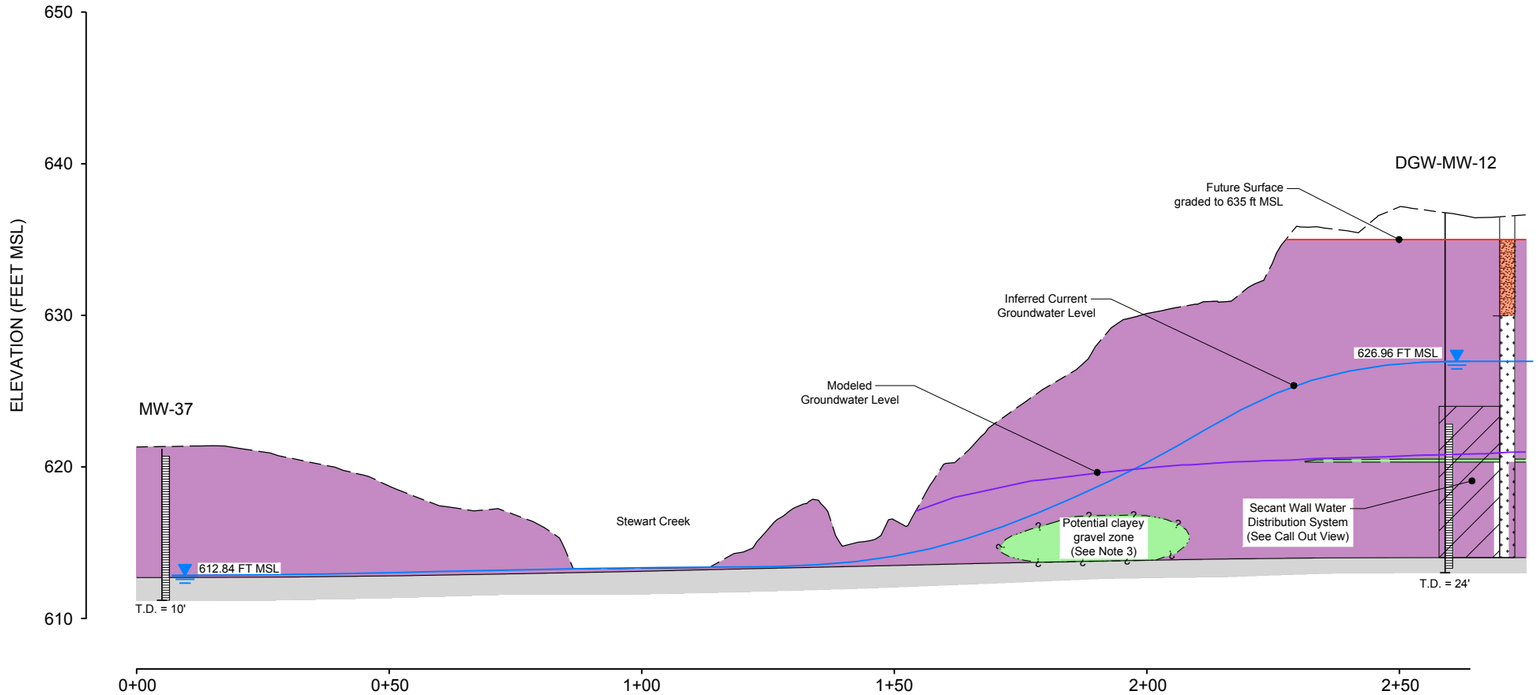
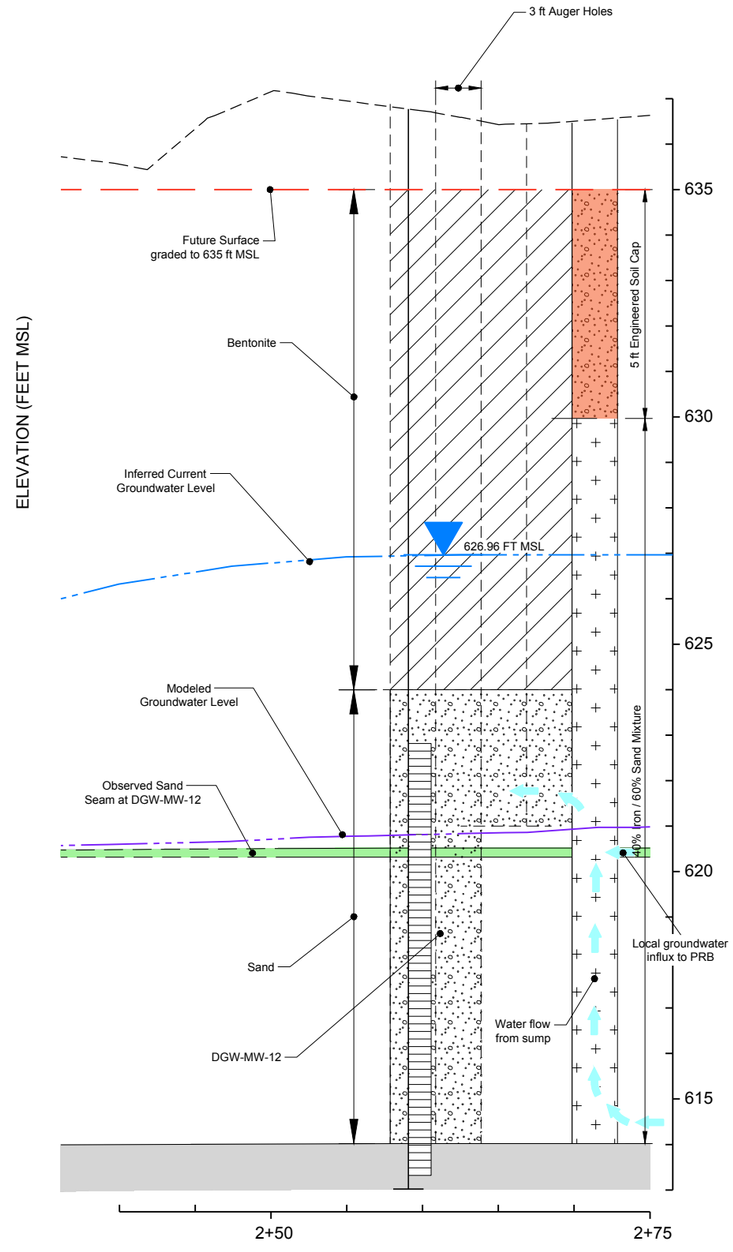
CC
WEST

CC'
EAST



PROFILE



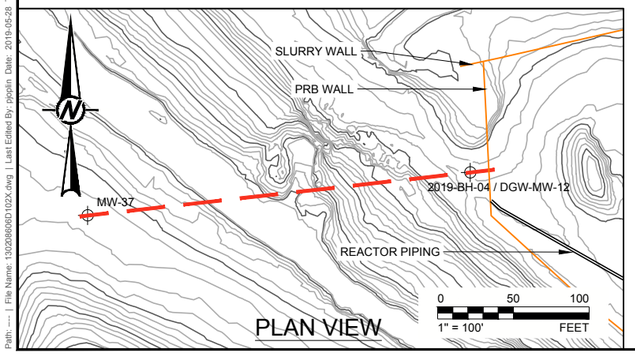
CALL OUT VIEW

NOTES

1. Ground surface taken from Dallas Aerial Survey in April 2017. Monitoring well ground surface elevations were surveyed by a licensed surveyor.
2. MSL - Above mean sea level.

GENERALIZED LITHOLOGIC ABBREVIATIONS

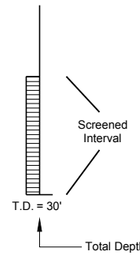
- (CH) CLAY and (CL) SILTY CLAY
- (CH) Gravelly/Sandy CLAY and (CL) Gravelly/Sandy SILTY CLAY
- EAGLE FORD SHALE



PLAN VIEW

EXPLANATION

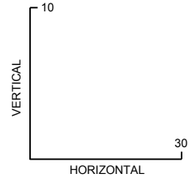
Monitoring Well Construction



Water Level (FT MSL) - From January 26, 2019

(24 ft North) Location of the borehole relative to the cross-section line

SCALE IN FEET



3x Vertical Exaggeration

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5-31-19

CLIENT
EXIDE TECHNOLOGIES

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-28
DESIGNED	PJJ
PREPARED	PJJ
REVIEWED	EPW
APPROVED	AMF/THR

PROJECT
GROUNDWATER REMEDY DESIGN REPORT

TITLE
CROSS SECTION CC-CC'

PROJECT NO.	REV.	FIGURE
130208606	0	8

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

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2480000

2480000

LEGEND

Finite Difference Grid

STATE OF TEXAS
R. BRYAN LUPER
83963
LICENSED
PROFESSIONAL ENGINEER

R Bryan Luper
5-31-19

0 350 700

1 " = 350 feet Feet

NOTE(S)

1. LINE NOTES
2. LINE NOTES
3. LINE NOTES

REFERENCE(S)

1. COORDINATE SYSTEM: NAD 1983 STATEPLANE TEXAS NORTH CENTRAL FIPS 4202 FEET
2. IMAGERY SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

CLIENT

EXIDE FRISCO RECYCLING FACILITY
7471 5TH STREET,
FRISCO, TEXAS

PROJECT

GROUNDWATER REMEDY DESIGN REPORT

TITLE

MODEL FINITE DIFFERENCE GRID LAYOUT

CONSULTANT

GOLDER

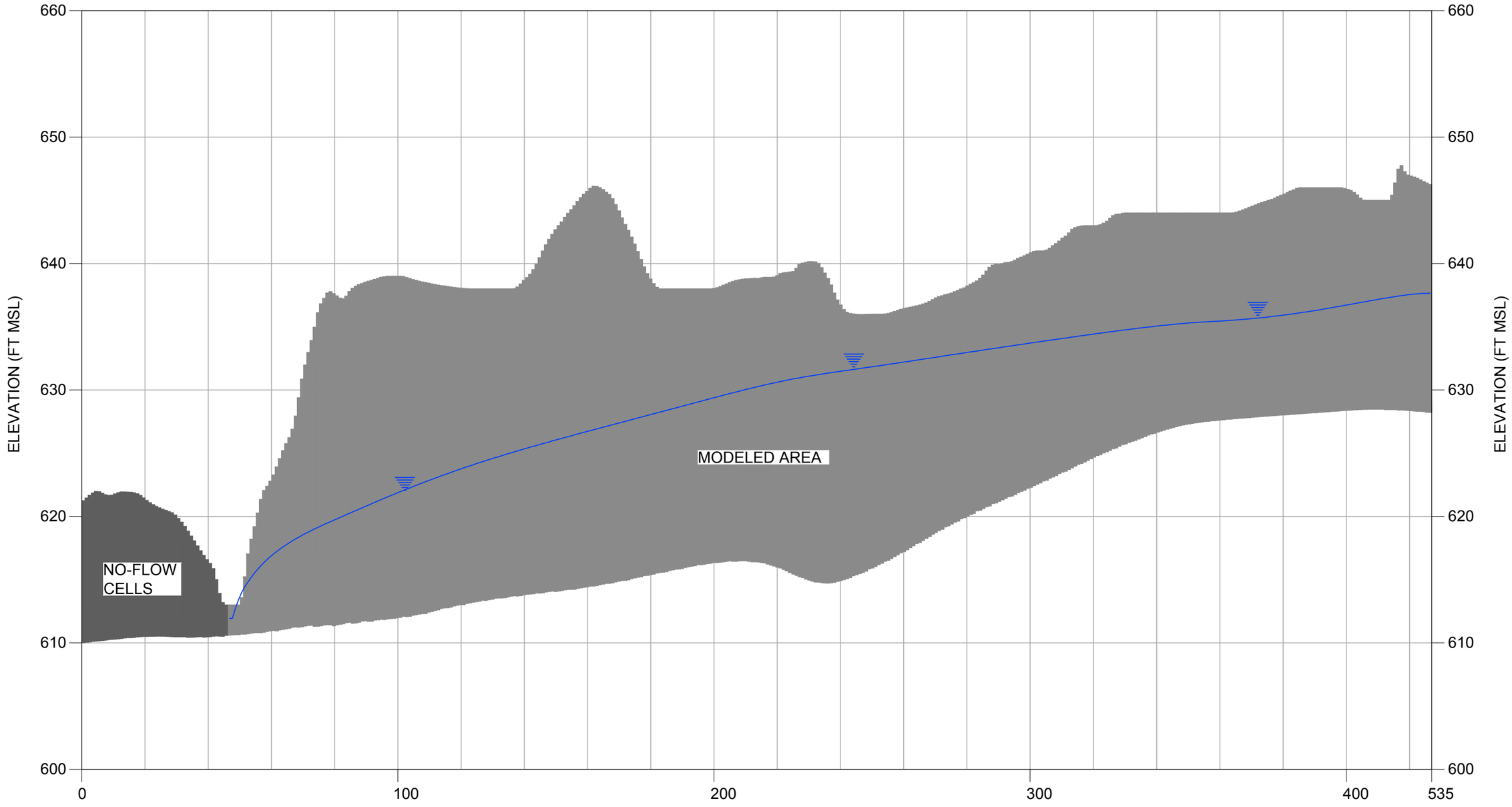
YYYY-MM-DD	5/21/2019
DESIGNED	LDA
PREPARED	JN
REVIEWED	THR
APPROVED	RBL

PROJECT NO.	CONTROL	REV.	FIGURE
130-2086-06	-	-	9

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI A

1 in

0



LEGEND

- MODELED AREA
- NO-FLOW CELLS
- GROUNDWATER ELEVATION

STATE OF TEXAS
R. BRYAN LUPER
83963
LICENSED
PROFESSIONAL ENGINEER

R Bryan Luper
5-31-19

VERTICAL 20X EXAGGERATED SCALE: 0 4 8 — 1" = 8' FEET

HORIZONTAL SCALE: 0 80 160 — 1" = 160' FEET

CLIENT
EXIDE TECHNOLOGIES
EXIDE FRISCO RECYCLING CENTER
FRISCO, TEXAS

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-17
DESIGNED	LDA
PREPARED	RWC
REVIEWED	THR
APPROVED	RBL

PROJECT
GROUNDWATER REMEDY DESIGN REPORT

TITLE
MODEL CROSS-SECTION ALONG ROW 117

PROJECT NO.	CONTROL	REV.	FIGURE
1302086	0014	0	10

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

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LEGEND

Finite Difference Grid

Boundary Conditions

Constant Head

No flow

STATE OF TEXAS
R. BRYAN LUPER
83963
LICENSED
PROFESSIONAL ENGINEER
5-31-19

0 350 700

1 " = 350 feet Feet

NOTE(S)

1. LINE NOTES
2. LINE NOTES
3. LINE NOTES

REFERENCE(S)

1. COORDINATE SYSTEM: NAD 1983 STATEPLANE TEXAS NORTH CENTRAL FIPS 4202 FEET
2. IMAGERY SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

CLIENT

EXIDE FRISCO RECYCLING FACILITY
7471 5TH STREET,
FRISCO, TEXAS

PROJECT

GROUNDWATER REMEDY DESIGN REPORT

TITLE

MODEL FINITE DIFFERENCE GRID LAYOUT AND BOUNDARY CONDITIONS

CONSULTANT

GOLDER

YYYY-MM-DD	5/21/2019
DESIGNED	LDA
PREPARED	JN
REVIEWED	THR
APPROVED	RBL

PROJECT NO.	CONTROL	REV.	FIGURE
130-2086-06	-	-	11

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI A

1 in

0

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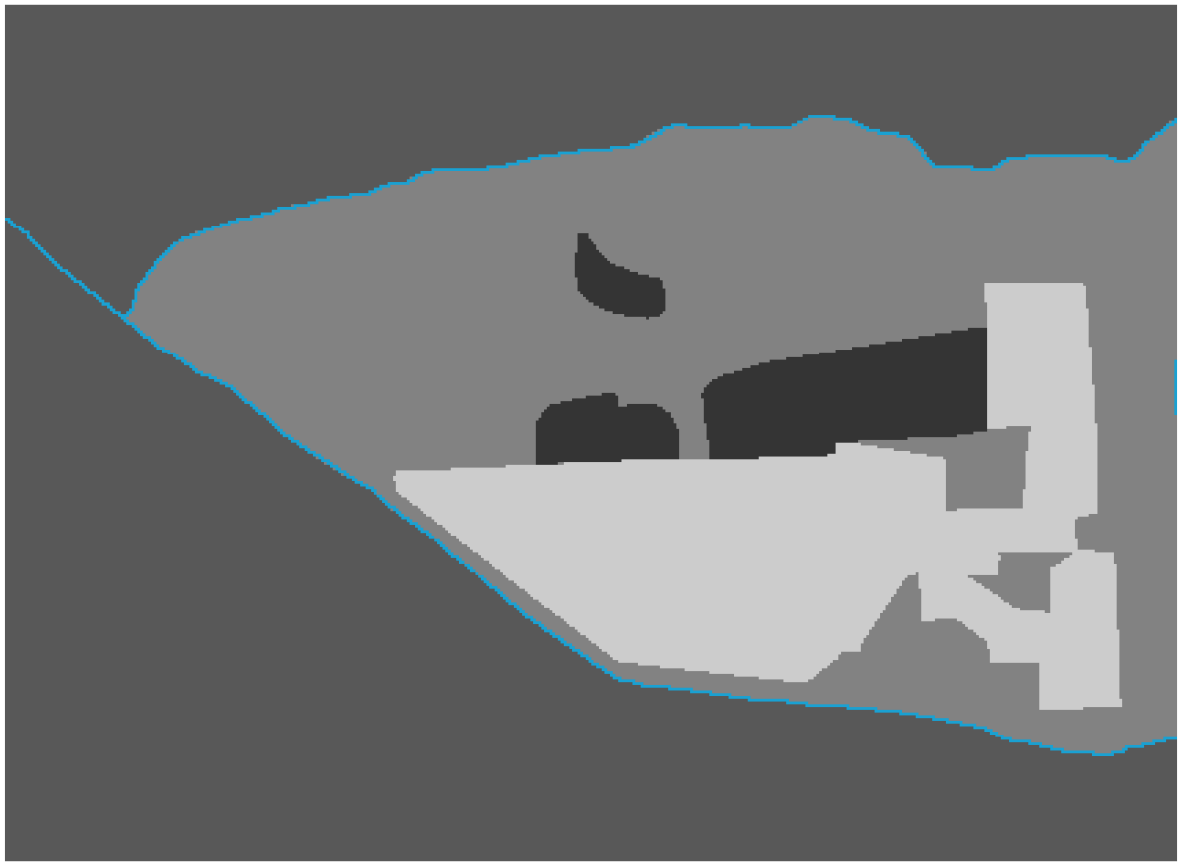

2480000

LEGEND

Boundary Conditions

- Constant Head
- No flow

Precipitation Recharge (feet/day)

- 0.00011
- 0.00022
- 0.0011

STATE OF TEXAS
R. BRYAN LUPER
83963
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PROFESSIONAL ENGINEER

5-31-19

0 350 700

1 " = 350 feet Feet

NOTE(S)

1. LINE NOTES
2. LINE NOTES
3. LINE NOTES

REFERENCE(S)

1. COORDINATE SYSTEM: NAD 1983 STATEPLANE TEXAS NORTH CENTRAL FIPS 4202 FEET
2. IMAGERY

CLIENT

EXIDE FRISCO RECYCLING FACILITY
7471 5TH STREET,
FRISCO, TEXAS

PROJECT

GROUNDWATER REMEDY DESIGN REPORT

TITLE

PRECIPITATION RECHARGE

CONSULTANT

GOLDER

YYYY-MM-DD	5/21/2019
DESIGNED	LDA
PREPARED	JN
REVIEWED	THR
APPROVED	RBL

PROJECT NO.	CONTROL	REV.	FIGURE
130-2086-06	-	-	12

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI A

1 in

0

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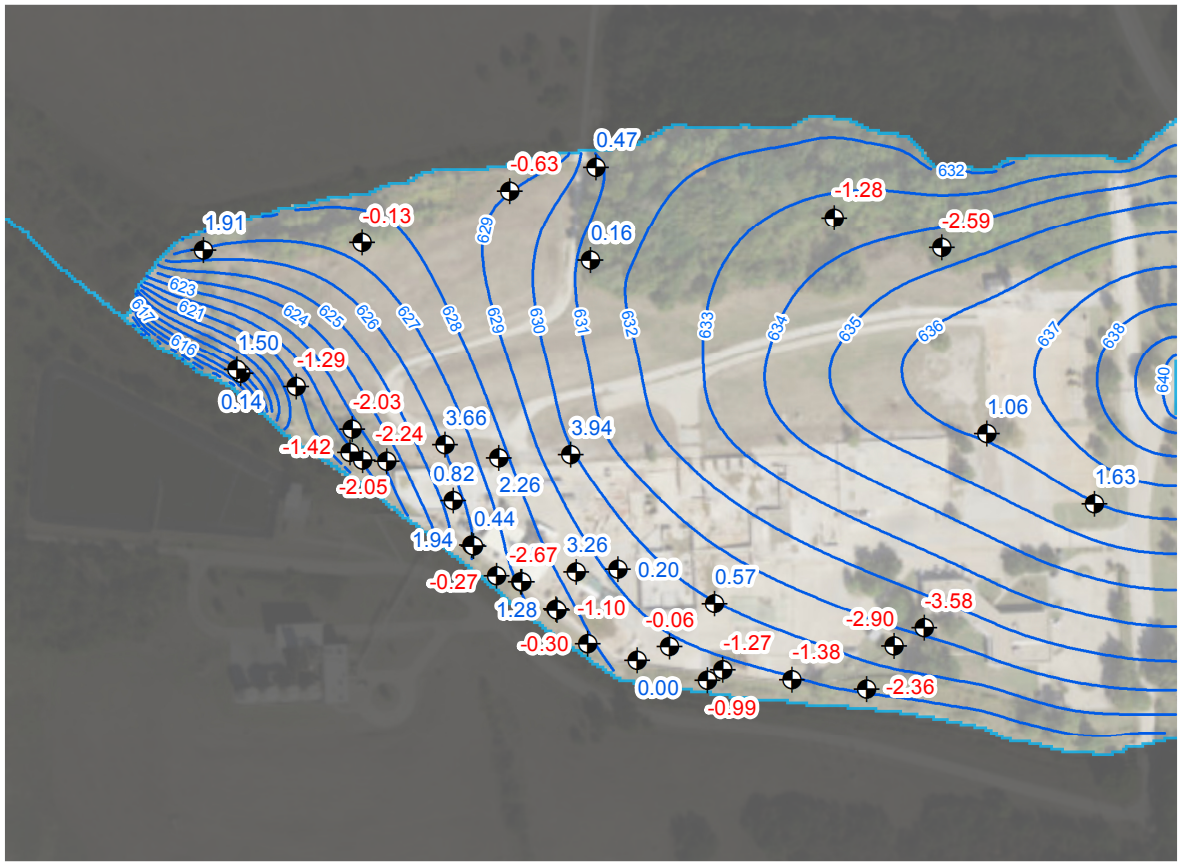

LEGEND

- Target Residuals
- Groundwater Elevation Contour

Boundary Conditions

- Constant Head
- No Flow

STATE OF TEXAS
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83963
LICENSED
PROFESSIONAL ENGINEER

R Bryan Luper
5-31-19

0 350 700
1 " = 350 feet
Feet

NOTE(S)

1. LINE NOTES
2. LINE NOTES
3. LINE NOTES

REFERENCE(S)

1. COORDINATE SYSTEM: NAD 1983 STATEPLANE TEXAS NORTH CENTRAL FIPS 4202 FEET
2. IMAGERY SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

CLIENT
EXIDE FRISCO RECYCLING FACILITY
7471 5TH STREET,
FRISCO, TEXAS

PROJECT
GROUNDWATER REMEDY DESIGN REPORT

TITLE
MODFLOW MODEL OUTPUT – JUNE 12, 2018 GROUNDWATER ELEVATION CONTOURS AND TARGET RESIDUALS

CONSULTANT
GOLDER

YYYY-MM-DD	5/21/2019
DESIGNED	LDA
PREPARED	JN
REVIEWED	THR
APPROVED	RBL

PROJECT NO.	CONTROL	REV.	FIGURE
130-2086-06	-	-	13

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI A
1 in
0

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LEGEND

Wall

Boundary Conditions

Constant Head

No Flow

Hydraulic Conductivity (feet/day)

0.78

10

Precipitation Recharge (feet/day)

0

0.00011

0.00022

0.0011

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5-31-19

0 350 700

1 " = 350 feet Feet

NOTE(S)

1. LINE NOTES
2. LINE NOTES
3. LINE NOTES

REFERENCE(S)

1. COORDINATE SYSTEM: NAD 1983 STATEPLANE TEXAS NORTH CENTRAL FIPS 4202 FEET
2. IMAGERY

CLIENT

EXIDE FRISCO RECYCLING FACILITY
7471 5TH STREET,
FRISCO, TEXAS

PROJECT

GROUNDWATER REMEDY DESIGN REPORT

TITLE

FUNNEL-AND-GATE SIMULATION BOUNDARY CONDITIONS

CONSULTANT

GOLDER

YYYY-MM-DD	5/21/2019
DESIGNED	LDA
PREPARED	JN
REVIEWED	THR
APPROVED	RBL

PROJECT NO.	CONTROL	REV.	FIGURE
130-2086-06	-	-	14

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI A

1 in

0

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LEGEND

- Wall
- Groundwater Elevation Contour

Boundary Conditions

- Constant Head
- No flow

Precipitation Recharge (feet/day)

- 0
- 0.00011
- 0.00022
- 0.0011

STATE OF TEXAS
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LICENSED
PROFESSIONAL ENGINEER

5-31-19

0 350 700

1 " = 350 feet Feet

NOTE(S)

1. LINE NOTES
2. LINE NOTES
3. LINE NOTES

REFERENCE(S)

1. COORDINATE SYSTEM: NAD 1983 STATEPLANE TEXAS NORTH CENTRAL FIPS 4202 FEET
2. IMAGERY SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

CLIENT

EXIDE FRISCO RECYCLING FACILITY
7471 5TH STREET,
FRISCO, TEXAS

PROJECT

GROUNDWATER REMEDY DESIGN REPORT

TITLE

MODFLOW MODEL OUTPUT FUNNEL-AND-GATE SIMULATION

CONSULTANT

GOLDER

YYYY-MM-DD	5/21/2019
DESIGNED	LDA
PREPARED	JN
REVIEWED	THR
APPROVED	RBL

PROJECT NO.	CONTROL	REV.	FIGURE
130-2086-06	-	-	15

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI A

1 in

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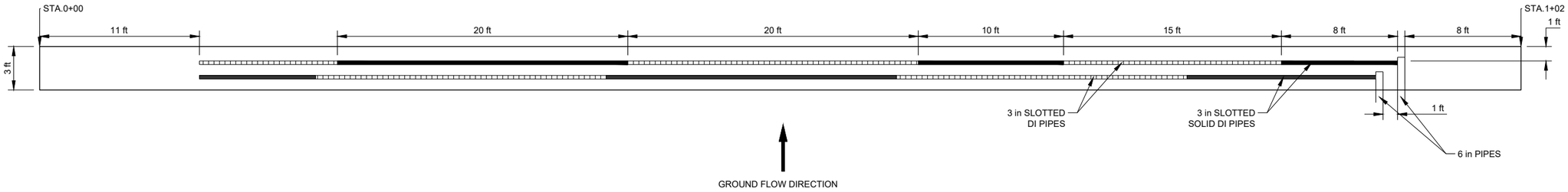

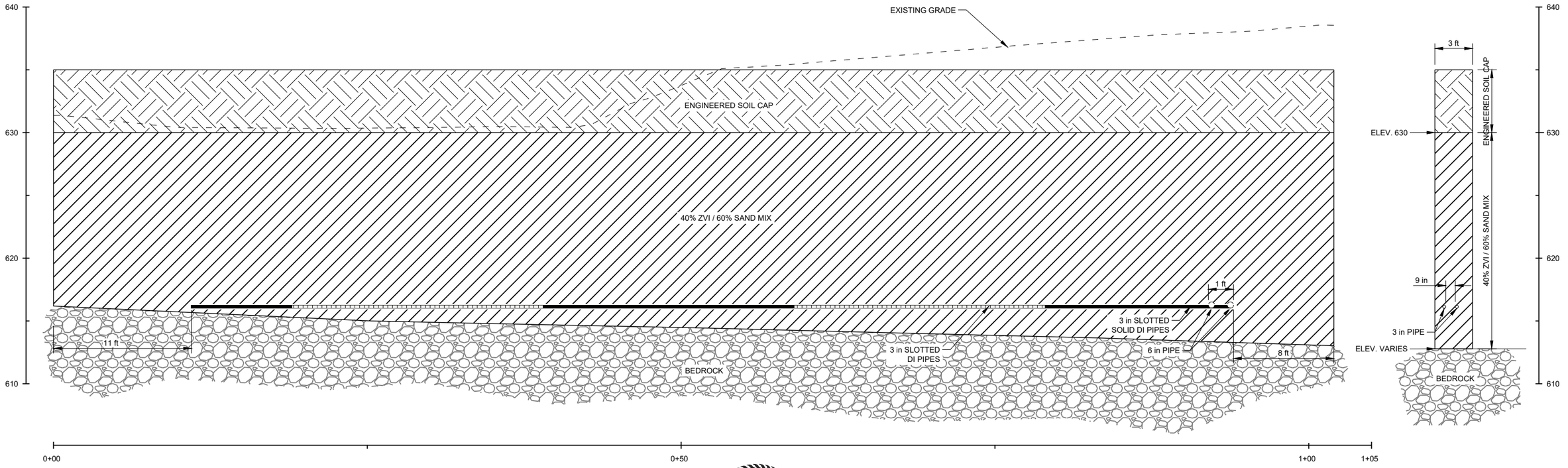

SCALE 1" = 8' 1/16 PERMEABLE REACTIVE BARRIER WALL

STATE OF TEXAS
R. BRYAN LUPER
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5-31-19

ISSUED FOR PERMITTING PURPOSES ONLY

0 4 8
1" = 8' FEET

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
A	2019-05-28	ISSUED FOR PERMITTING PURPOSES ONLY	THR	RS	THR	RBL

SEAL

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TEXAS REGISTRATION F-2578

CLIENT
EXIDE TECHNOLOGIES
EXIDE FRISCO RECYCLING CENTER
FRISCO, TEXAS

CONSULTANT
GOLDER
HOUSTON OFFICE - NORTH
14950 HEATHROW FOREST PKWY, STE 280
HOUSTON, TEXAS 77032
USA
[+1] (281) 821 6868
www.golder.com

PROJECT
RCRA PERMIT RENEWAL APPLICATION
GROUNDWATER REMEDY DESIGN REPORT
FRISCO, COLLIN COUNTY, TEXAS

TITLE
PERMEABLE REACTIVE BARRIER LAYOUT

PROJECT NO.	SCALE	REV.	FIGURE
130208606	AS SHOWN	A	16

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

1 in
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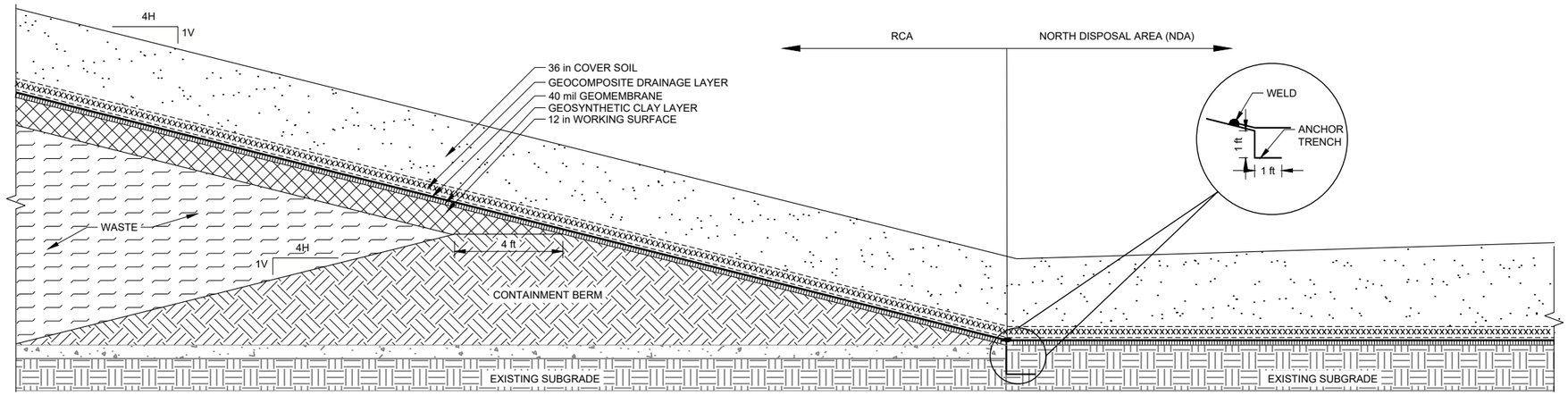
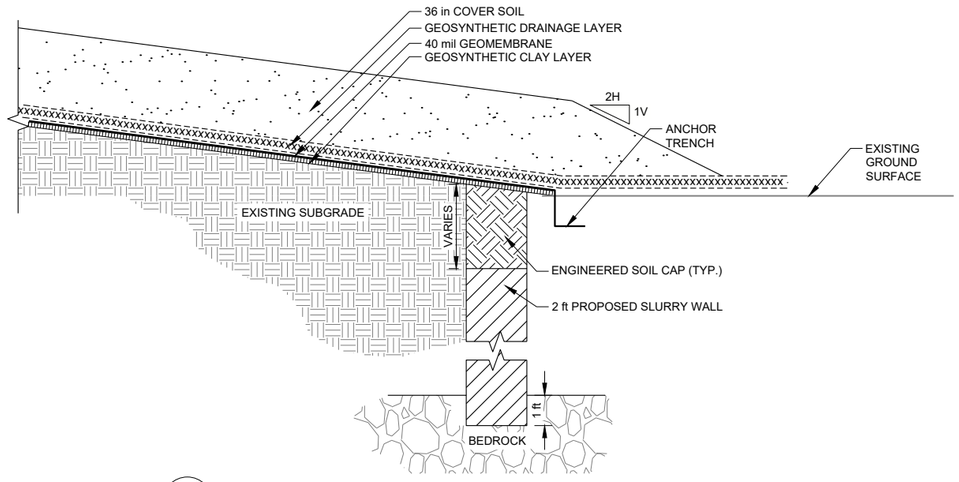
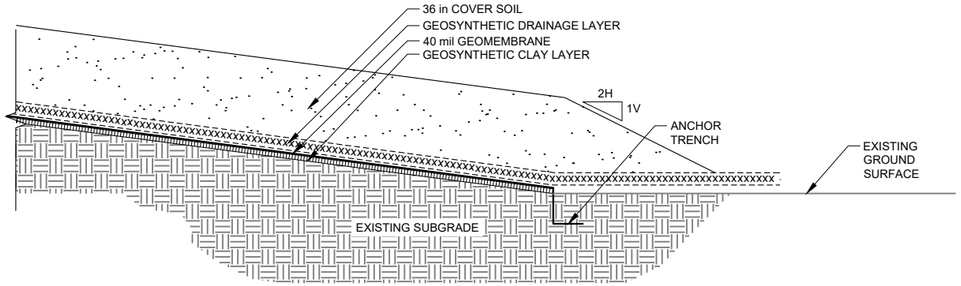


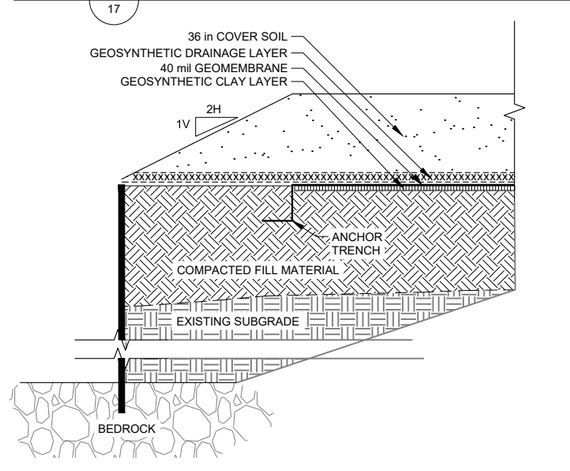
SCALE 1" = 5' 2/17 RCA AND NDA FINAL COVER TRANSITION DETAIL



SCALE 1" = 5' 3/17 NDA & SLAG LANDFILL COVER DETAIL



SCALE 1" = 5' 4/17 NDA LANDFILL COVER DETAIL



SCALE 1" = 5' 5/17 SOUTH SHEET PILE WALL DETAIL

STATE OF TEXAS
R. BRYAN LUPER
83963
LICENSED PROFESSIONAL ENGINEER

5-31-19

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0 2.5 5
1" = 5' FEET

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
A	2019-05-17	NOT FOR CONSTRUCTION	THR	RS	THR	RBL

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TEXAS REGISTRATION F-2578

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EXIDE TECHNOLOGIES
EXIDE FRISCO RECYCLING CENTER
FRISCO, TEXAS

CONSULTANT

GOLDER
HOUSTON OFFICE - NORTH
14950 HEATHROW FOREST PKWY, STE 280
HOUSTON, TEXAS 77032
USA
[+1] (281) 821 6868
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PROJECT
RCRA PERMIT RENEWAL APPLICATION
GROUNDWATER REMEDY DESIGN REPORT
FRISCO, COLLIN COUNTY, TEXAS

TITLE
FORMER OPERATING PLANT
FINAL COVER SYSTEM DETAILS

PROJECT NO.	SCALE	REV.	FIGURE
130208606	AS SHOWN	A	17

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

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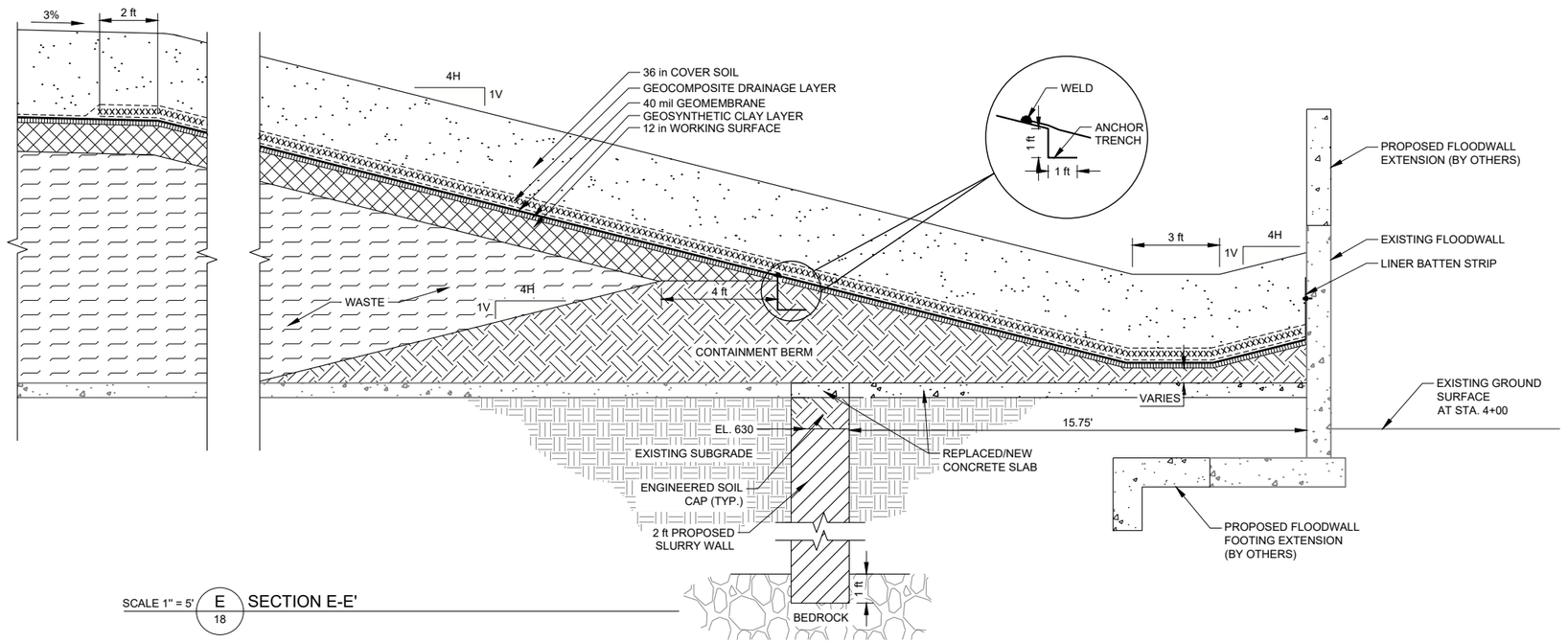
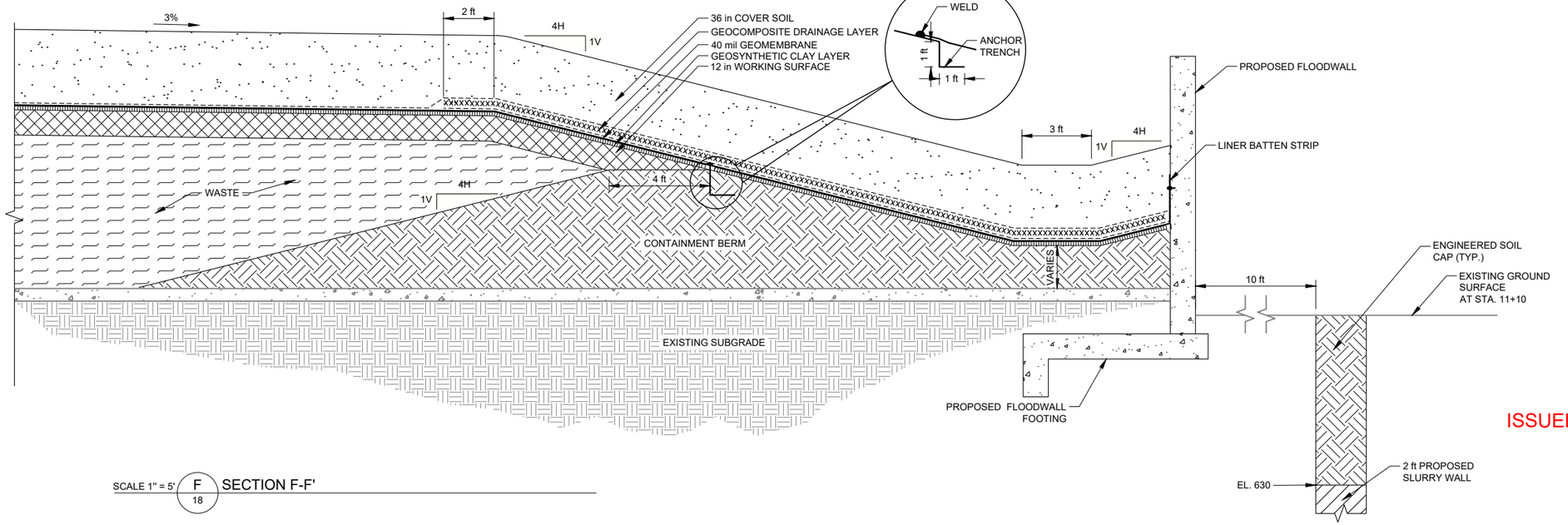


SCALE 1" = 5' E 18 SECTION E-E'



SCALE 1" = 5' F 18 SECTION F-F'

STATE OF TEXAS
R. BRYAN LUPER
83963
LICENSED PROFESSIONAL ENGINEER
RBryanLuper
5-31-19

ISSUED FOR PERMITTING PURPOSES ONLY

0 2.5 5
1" = 5' FEET

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
A	2019-05-17	NOT FOR CONSTRUCTION	THR	RS	THR	RBL

SEAL

GOLDER ASSOCIATES, INC
TEXAS REGISTRATION F-2578

CLIENT
EXIDE TECHNOLOGIES
EXIDE FRISCO RECYCLING CENTER
FRISCO, TEXAS

CONSULTANT
GOLDER
HOUSTON OFFICE - NORTH
14950 HEATHROW FOREST PKWY, STE 280
HOUSTON, TEXAS 77032
USA
[+1] (281) 821 6868
www.golder.com

PROJECT
RCRA PERMIT RENEWAL APPLICATION
GROUNDWATER REMEDY DESIGN REPORT
FRISCO, COLLIN COUNTY, TEXAS

TITLE
FORMER OPERATING PLANT FINAL COVER SYSTEM AND FLOODWALL DETAILS

PROJECT NO.	SCALE	REV.	FIGURE
130208606	AS SHOWN	A	18

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

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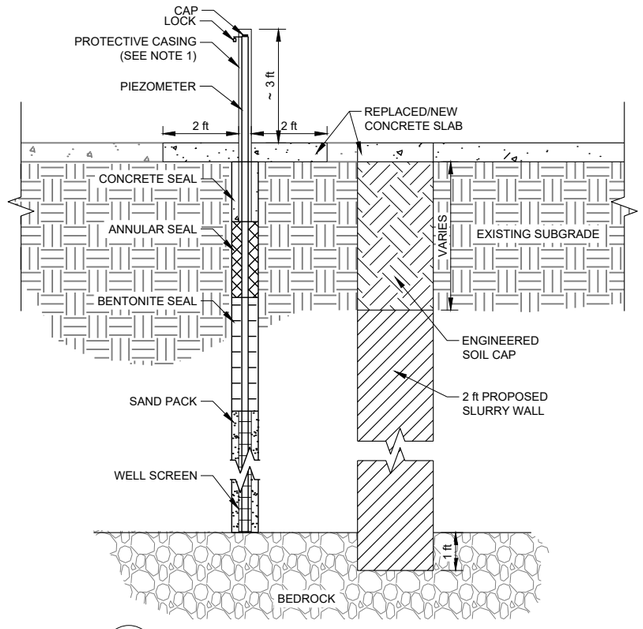
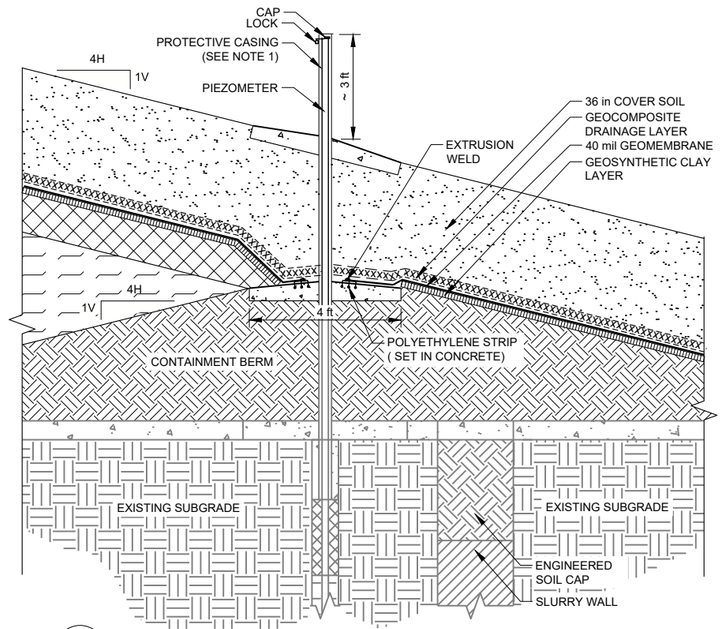
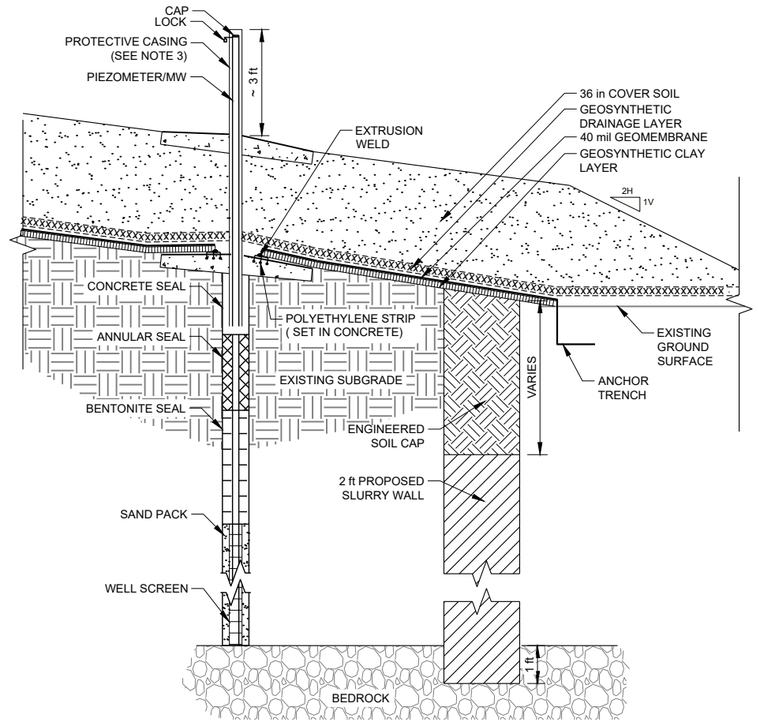


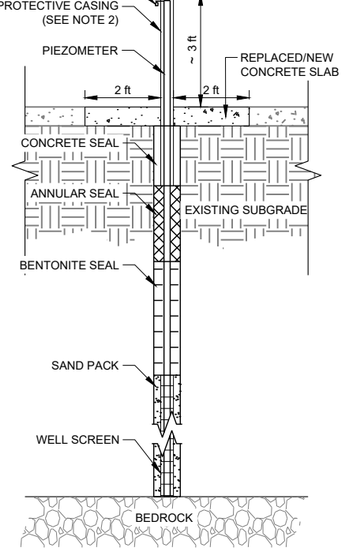
SCALE 1" = 4' 6A 19 ABOVE GROUND PIEZOMETER - PZ-1 AND PZ-2



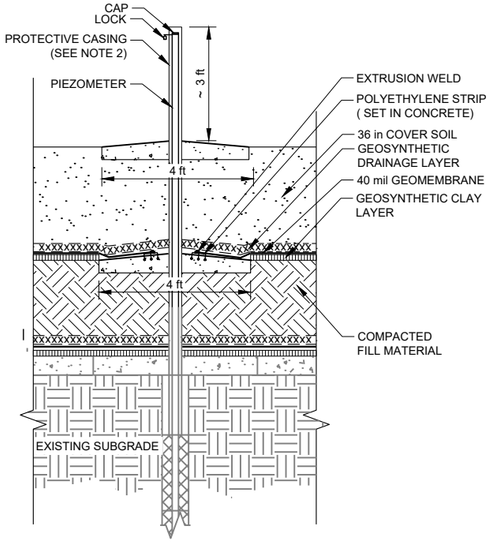
SCALE 1" = 4' 6B 19 ABOVE GROUND PIEZOMETER WITHIN ENGINEERED CAP - PZ-1 AND PZ-2



SCALE 1" = 4' 8 19 NDA/SLAG LANDFILL PIEZOMETERS AND MONITORING WELLS



SCALE 1" = 4' 7A 19 ABOVE GROUND PIEZOMETER - PZ-3



SCALE 1" = 4' 7B 19 ABOVE GROUND PIEZOMETER WITHIN ENGINEERED CAP - PZ-3

NOTE(S)

1. ABOVE GROUND PIEZOMETERS PZ-1 AND PZ-2 IN RCA WILL BE INSTALLED FOLLOWING SOUTH SLURRY WALL CONSTRUCTION. THE PIEZOMETER AND PROTECTIVE CASING WILL BE EXTENDED (i) DURING PLACEMENT OF THE CONTAINMENT BERM AND (ii) DURING CONSTRUCTION OF THE FINAL COVER.
2. ABOVE GROUND PIEZOMETER PZ-3 WILL BE INSTALLED FOLLOWING CONSTRUCTION SHEETPILE WALL. THE PIEZOMETER AND PROTECTIVE CASING WILL BE EXTENDED DURING CONSTRUCTION OF THE FINAL COVER.
3. ABOVE GROUND PIEZOMETER/MONITORING WELLS IN NORTH DISPOSAL AREA (NDA) AND SLAG LANDFILL WILL BE INSTALLED FOLLOWING SLURRY WALL CONSTRUCTION.THE PIEZOMETER/WELL AND PROTECTIVE CASING WILL BE EXTENDED DURING CONSTRUCTION OF THE FINAL COVER.

STATE OF TEXAS
R. BRYAN LUPER
83963
LICENSED
PROFESSIONAL ENGINEER
5-31-19

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0 2 4
1" = 4' FEET

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
A	2019-05-17	NOT FOR CONSTRUCTION	THR	RS	THR	RBL

SEAL

GOLDER ASSOCIATES, INC
TEXAS REGISTRATION F-2578

CLIENT
EXIDE TECHNOLOGIES
EXIDE FRISCO RECYCLING CENTER
FRISCO, TEXAS

CONSULTANT

GOLDER
HOUSTON OFFICE - NORTH
14950 HEATHROW FOREST PKWY, STE 280
HOUSTON, TEXAS 77032
USA
[+1] (281) 821 6868
www.golder.com

PROJECT
RCRA PERMIT RENEWAL APPLICATION
GROUNDWATER REMEDY DESIGN REPORT
FRISCO, COLLIN COUNTY, TEXAS

TITLE
PIEZOMETER DETAILS

PROJECT NO.	SCALE	REV.	FIGURE
130208606	AS SHOWN	A	19

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B
1 in
0

ATTACHMENT A

CALCULATIONS FOR ZVI DEMAND

GOLDER

Subject: Calculations for ZVI Demand
Project Number: 130208606
Project Name: Exide
Prepared by: B. Forthaus **Checked by:** T. Rees
Date: 5/15/2019 **Reviewed by:**

OBJECTIVE

Determine the zero-valent iron (ZVI) demand over a 30-year period based on the average arsenic concentration in groundwater.

ASSUMPTIONS

Concentration	Units	Average	Minimum	Maximum
Concentration of Arsenic (C_{As})	ug/L	20	non-detect	158
Arsenic Removal Capacity (ARC)	mg-As/g-iron	4.0	0.47	7.5
(mass of As removed per mass of ZVI used)	kg/kg	0.0040	0.00047	0.0075

Parameter	Units	Value	
Flow Rate (Q)	L/yr	397,900	(0.2 gallons per minute)

ZVI makes up 40% (by mass) of PRB
Sand makes up 60% (by mass) of PRB

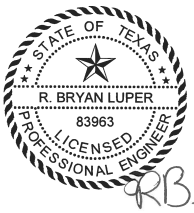
CALCULATIONS

	Units	Value	Equation or Conversion
Mass Flow Rate (M)	ug/yr	7,958,000	$M = Q \times C_{As}$
	kg/yr	7.96	1 kg = $1E^{+6}$ ug
Mass of arsenic to be removed over 30 years (M_{30})	kg-As	239	$M_{30} = M \times 30$
Total mass of ZVI demand ($M_{ZVI,t}$)	kg-ZVI	59,685	$M_{ZVI,t} = M_{30} / ARC$
	tons-ZVI	66	1 ton = 907 kg
Design mass - sand (M_{SAND})	tons	99	$M_{SAND} = (M_{ZVI} / 0.40) \times 0.60$

UNITS DEFINED

ug/L - micrograms per liter
mg/g - milligrams per gram
kg/kg - kilograms per kilogram
L/yr - liters per year
ug/yr - micrograms per year
kg/yr - kilograms per year

Reference: ASCE, 2007, Zero-Valent Iron Reactive Materials for Hazardous Inorganics Removal. Range of removal capacities provided 0.47 - 7.5 mg-As/g-iron.



R Bryan Luper
5-31-19

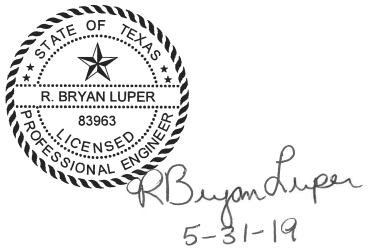
GOLDER

Subject: Calculations for ZVI Demand
Project Number: 130208606
Project Name: Exide
Prepared by: T. Rees **Checked by:** B. Forthaus
Date: 5/22/2019 **Reviewed by:**

OBJECTIVE

Vendor provided zero-valent iron (ZVI) demand over a 30-year period based on the average arsenic concentration in groundwater.

From: Hepure Iron Products



PRB Dimensions:			
	Length	102	feet
	Width	3	feet
	Depth (saturated)	6	feet

Flow Velocity	0.0055	feet per hour
Porosity	0.33	decimal
Years	30	
Safety Factor	1	

Compound	Molecular Weight	Demand	Concentration	Static Demand	Flow Demand	Total Demand		
	g/mol	mol/mol	mg/L	kg	kg	lb	tons	
Oxygen (O)	16.00	2	5	0.30218	145.59160	321.69579	0.16085	
Nitrate (NO_3^-)	62.00	2.5	0.07	0.00136	0.65751	1.45282	0.00073	
Sulfate (SO_4^{2-})	96.06	4	1400	28.18610	13580.06187	30006.18676	15.00309	
Chloride (Cl)	35.45	2	190	5.18271	2497.02943	5517.37777	2.75869	
Calcium (Ca)	40.08	2	320	7.72043	3719.70557	8218.97434	4.10949	
Magnesium (Mg)	24.31	2	46	1.83013	881.75617	1948.30778	0.97415	
Antimony (Sb)	121.76	1	0.003	0.00001	0.00574	0.01268	0.00001	
Arsenic (As)	74.92	3	0.02	0.00039	0.18656	0.41221	0.00021	
Chromium (Cr)	52.00	3	0	0.00000	0.00000	0.00000	0.00000	
Selenium (Se)	78.97	2	0	0.00000	0.00000	0.00000	0.00000	
Cadmium (Cd)	112.40	1	0.002	0.00001	0.00414	0.00916	0.00000	
Lead (Pb)	207.20	1	0.019	0.00004	0.02136	0.04720	0.00002	
Tetrachloroethylene (PCE)	165.83	4	0	0.00000	0.00000	0.00000	0.00000	
Trichloroethylene (TCE)	131.40	3	0	0.00000	0.00000	0.00000	0.00000	
Dichloroethylene (DCE)	96.95	2	0	0.00000	0.00000	0.00000	0.00000	
Vinyl chloride (VC)	62.50	1	0	0.00000	0.00000	0.00000	0.00000	
				43.2	20825.0	46014.5	23.0	Total Demand

GOLDER	**Subject:** Calculations for ZVI Demand **Project Number:** 130208606 **Project Name:** Exide **Prepared by:** B. Forthaus **Checked by:** T. Rees **Date:** 5/15/2019 **Reviewed by:**

OBJECTIVES

Determine how much of the zero-valent iron (ZVI) demand is met over a 30-year period using a permeable reactive barrier (PRB) wall.

ASSUMPTIONS

	Units	Length	Width	Height (saturated)
PRB wall dimensions	m	31.09	0.91	1.83

Parameter	Units	Value
Volume of voids	%	33
Volume of solids	%	67
Density of ZVI (ρ_{ZVI})	g/cm^3	7.86
Density of sand (ρ_{SAND})	g/cm^3	2.35
Mass ratio (R_m), ZVI to sand	unitless	0.667
Total mass of ZVI demand ($M_{ZVI,t}$)	tons	66

ZVI makes up 40% (by mass) of PRB

CALCULATIONS

	Units	Value	Equation
Volume total (V_t)	m^3	51.77	Length x Width x Height
Volume voids (V_V) (33%)	m^3	17.1	V_t x 33%
Volume solids (V_S) (67%)	m^3	34.7	V_t x 67%
Volumetric Ratio (R_V), ZVI to sand	unitless	0.20	R_m / (ρ_{ZVI} / ρ_{SAND}) (mass ratio / density ratio)
Volume ZVI (V_{ZVI})	m^3	5.8	V_S x (R_V / 1 + R_V)
Volume sand (V_{SAND})	m^3	28.9	V_S x (1 / 1 + R_V)
	tons	74.9	
PRB Mass ZVI ($M_{ZVI,PRB}$)	kg	45,314	V_{ZVI} x ρ_{ZVI}
	tons	50.0	1 ton = 907 kg
ZVI demand met (30-year)	%	76	$M_{ZVI,PRB}$ / $M_{ZVI,t}$

UNITS DEFINED

m - meters

g/cm^3 - grams per cubic centimeter

m^3 - cubic meters

kg - kilograms

GOLDER	**Subject:**	Calculations for ZVI Demand	
	Project Number:	130208606	
	Project Name:	Exide	
	Prepared by:	B. Forthaus	**Checked by:** T. Rees
	Date:	5/15/2019	**Reviewed by:**

OBJECTIVE

Determine how much of the zero-valent iron (ZVI) demand is met over a 30-year period with a reactive sump.

ASSUMPTIONS

	Units	Diameter (D)	Depth (H)
Reactive sump dimensions	m	4.33	4.67

Parameter	Units	Value
Volume of voids	%	33
Volume of solids	%	67
Density of ZVI (ρ_{ZVI})	g/cm^3	7.86
Density of sand (ρ_{SAND})	g/cm^3	2.35
Mass ratio (R_m), ZVI to sand	unitless	0.667
Total mass of ZVI demand ($M_{ZVI,t}$)	tons	66

ZVI makes up 40% (by mass) of PRB

CALCULATIONS

	Units	Value	Equation
Volume total (V_t)	m^3	68.7	$(\pi D^2)/4 \times H$
Volume voids (V_V) (33%)	m^3	22.7	$V_t \times 33\%$
Volume solids (V_S) (67%)	m^3	46.1	$V_t \times 67\%$
Volumetric Ratio (R_V), ZVI to sand	unitless	0.20	$R_m / (\rho_{ZVI} / \rho_{SAND})$ (mass ratio / density ratio)
Volume ZVI (V_{ZVI})	m^3	7.7	$V_S \times (R_V / 1 + R_V)$
Volume sand (V_{SAND})	m^3	38.4	$V_S \times (1 / 1 + R_V)$
	tons	99.4	
PRB Mass ZVI ($M_{ZVI,SUMP}$)	kg	60,156	$V_{ZVI} \times \rho_{ZVI}$
	tons	66.3	1 ton = 907 kg
ZVI demand met (30-year)	%	101	$M_{ZVI,SUMP} / M_{ZVI,t}$

UNITS DEFINED

m - meters

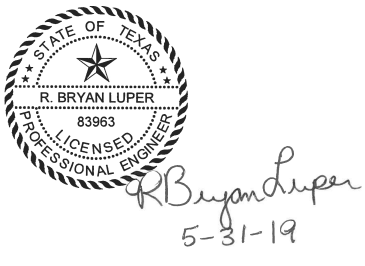
g/cm^3 - grams per cubic centimeter

m^3 - cubic meters

kg - kilograms

SUMMARY

	Units	Value
Total mass of ZVI demand ($M_{ZVI,t}$)	tons	66
Total mass of ZVI in PRB ($M_{ZVI,PRB}$)	tons	50
Total mass of ZVI in sump ($M_{ZVI,SUMP}$)	tons	66
30-year demand met from PRB	%	76
30-year demand met from reactor sump	%	101
Total demand met (30-year)	%	177



ATTACHMENT B

CALCULATIONS FOR HEAD LOSS

GOLDER	**Subject:** Calculations for Head Loss through Trench **Project Number:** 130208606 **Project Name:** Exide **Prepared by:** B. Forthaus **Checked by:** T. Rees **Date:** 4/3/2019 **Reviewed by:**

OBJECTIVE

Determine the head loss through a trench delivering groundwater from the reactive sump to the PRB wall.

ASSUMPTIONS

Parameter	Units	Value
Saturated height of trench (H) [(1)]	feet	6
Width of trench (W)	feet	2
Length of trench (L)	feet	400
Flow Rate (Q)	gpm	0.2
Hydraulic conductivity (k)	cm/s	0.10

(1) The saturated height of the trench is assumed to be six (6) feet
based on a bottom elevation of 615 feet above mean sea level (amsl) and a top elevation of 621 feet amsl.

CALCULATIONS

	Units	Value	Equation
Cross-sectional area of flow through trench (A)	ft^2	12	A = W x H
Head Loss (Δh)	feet	5	Δh = L x [Q / (k x A)]

UNITS DEFINED

gpm - gallons per minute
cm/s - centimeters per second
ft^2 - square feet

CONVERSION FACTORS

86,400	seconds per day
1,440	minutes per day
7.48	gallons per cubic foot
30.48	centimeters per foot

SUMMARY

The head loss through the trench from the reactive sump to the PRB wall is approximately 23 feet based on the parameters listed above.

STATE OF TEXAS
R. BRYAN LUPER
83963
LICENSED
PROFESSIONAL ENGINEER

RBryan Luper
5-31-19

GOLDER

Subject: Calculations for Head Loss through Trench
Project Number: 130208606
Project Name: Exide
Prepared by: B. Forthaus **Checked by:** T. Rees
Date: 5/20/2019 **Reviewed by:**

OBJECTIVE

Determine the head loss through a pipe delivering groundwater from the reactive sump to the PRB wall.

ASSUMPTIONS

			Pipe Diameter	
Parameter (equivlant length of component)	Units	Value	3"	6"
straight pipe	feet	650	650	650
45 - elbows (4ft for 3", 8ft for 6")	each	4	16	32
90 - elbows (8ft for 3", 18ft for 6"	each	4	32	72
strainer (for screens (5ft)	each	6	30	30
total equivlent length of pipe	feet		728	784

(gallons per minute)	0.2
available head (624 - 621 amsl)	3
friction factor	0.04

GOVERNING EQUATION: $H=4flv^2/2gd$

where H=head loss, f= friction factor, l= total equivalent length piping, v=velocity, g=gravity constant, d=diameter

CALCULATIONS

	Units	3"	6"	Equation
max velocity	ft/sec	0.64	0.88	v=((H*2*g*d)/(4*f*l))^0.5
average velocity	ft/sec	0.009	0.002	v=Q/A
average velocity	ft/day	784	196	
H (for average velocity)	ft	0.001	0.00002	H=(4*f*l*v^2)/2*g*d

UNITS DEFINED

gpm - gallons per minute
cm/s - centimeters per second
ft^2 - square feet

CONVERSION FACTORS

86,400	seconds per day
1,440	minutes per day
7.48	gallons per cubic foot
30.48	centimeters per foot

SUMMARY

The head loss through the pipe from the reactive sump to the PRB wall is less than 0.1 ft, with a residence time of 1-3 days

ATTACHMENT C

CALCULATIONS FOR FLOW THROUGH SECANT WALL DIFFUSER

GOLDER	**Subject:** Calculations for Flow through Secant Wall Diffuser **Project Number:** 130208606 **Project Name:** Exide **Prepared by:** B. Forthaus **Checked by:** T. Rees **Date:** 4/23/2019 **Reviewed by:**

OBJECTIVE

Determine the gradient of the secant wall diffuser based on the flow rate and hydraulic conductivity through the wall.

ASSUMPTIONS

Parameter	Units	Value
Saturated height through secant wall diffuser (H)	inches	2
Effective width through secant wall diffuser (W)	feet	3
Flow rate (Q) based on MODFLOW model	gpm	0.14
Hydraulic conductivity (k)	cm/s	0.05

CALCULATIONS

	Units	Value	Equation
Cross-sectional area of flow through secant wall diffuser (A)	ft^2	0.5	A = W x H
Gradient (i)	ft/ft	0.4	i = Q / (k x A)

UNITS DEFINED

gpm - gallons per minute
cm/s - centimeters per second
ft^2 - square feet
ft/ft - foot per foot

CONVERSION FACTORS

12	inches per foot
86,400	seconds per day
1,440	minutes per day
7.48	gallons per cubic foot
30.48	centimeters per foot

SUMMARY

The gradient of the secant wall diffuser is approximately 0.5 feet based on the parameters listed above.

ATTACHMENT D

MODFLOW SENSITIVITY ANALYSIS

Attachment D: MODFLOW Sensitivity Analysis

BASE Model Run (1x multiplier on all parameters)*

	1		**133.1**		**1.49**		**1.85**

Parameter: Kz Zone: 1

Run	Multiplier	Sum of Squares	Residual Mean	Residual Std.
1	0.5	133.1	1.49	1.85
2	0.6	133.1	1.49	1.85
3	0.7	133.1	1.49	1.85
4	0.8	133.1	1.49	1.85
5	0.9	133.1	1.49	1.85
6	1	133.1	1.49	1.85
7	1.1	133.1	1.49	1.85
8	1.2	133.1	1.49	1.85
9	1.3	**133.1**	1.49	1.85
10	1.4	133.1	1.49	1.85
11	1.5	133.1	1.49	1.85

Parameter: Kx Zone: 1

Run	Multiplier	Sum of Squares	Residual Mean	Residual Std.
1	0.25	605.9	3.16	2.58
2	0.3	436.2	2.68	2.32
3	0.5	198.6	1.83	1.92
4	0.8	138.4	1.51	1.84
5	0.9	134.7	1.50	1.84
6	1	133.7	1.49	1.85
7	1.1	134.2	1.50	1.85
8	1.2	135.7	1.52	1.86
9	1.5	142.3	1.55	1.90
10	2	154.0	1.60	1.94
11	3	171.7	1.65	2.00
12	5	192.6	1.71	2.07

Parameter: Recharge Zone: 1

Run	Multiplier	Sum of Squares	Residual Mean	Residual Std.
1	0.5	135.3	1.51	1.86
2	0.6	134.4	1.51	1.85
3	0.7	133.8	1.50	1.85
4	0.8	133.4	1.50	1.85
5	0.9	133.2	1.50	1.85
6	1	133.1	1.49	1.85
7	1.1	133.3	1.49	1.85
8	1.2	133.7	1.49	1.85
9	1.3	134.2	1.50	1.85
10	1.4	135.0	1.50	1.85
11	1.5	135.9	1.50	1.85

Parameter: Recharge Zone: 2

Run	Multiplier	Sum of Squares	Residual Mean	Residual Std.
1	0.5	133.7	1.51	1.85
2	0.6	133.6	1.50	1.85
3	0.7	133.4	1.50	1.85
4	0.8	133.3	1.50	1.85
5	0.9	133.2	1.50	1.85
6	1	133.1	1.49	1.85
7	1.1	133.1	1.49	1.85
8	1.2	133.1	1.49	1.84
9	1.3	133.1	1.49	1.84
10	1.4	133.2	1.49	1.84
11	1.5	133.3	1.49	1.84

Parameter: Recharge Zone: 3

Run	Multiplier	Sum of Squares	Residual Mean	Residual Std.
1	0.5	142.7	1.56	1.90
2	0.6	140.0	1.54	1.89
3	0.7	137.7	1.53	1.88
4	0.8	135.8	1.52	1.87
5	0.9	134.3	1.51	1.86
6	1	133.1	1.49	1.85
7	1.1	132.3	1.49	1.84
8	1.2	131.8	1.48	1.83
9	1.3	131.7	1.48	1.83
10	1.4	131.9	1.48	1.82
11	1.5	132.4	1.49	1.82

Parameter: Constant Head Zone: 22

Run	Addend	Sum of Squares	Residual Mean	Residual Std.
1	-3	136.0	1.52	1.87
2	-2	134.6	1.51	1.86
3	-1	133.7	1.50	1.85
4	-0.4	133.3	1.50	1.85
5	-0.3	133.2	1.50	1.85
6	-0.2	133.2	1.50	1.85
7	-0.1	133.2	1.50	1.85
8	0	133.1	1.49	1.85
9	0.1	133.1	1.49	1.85
10	0.2	133.1	1.49	1.85
11	0.3	133.1	1.49	1.85
12	0.4	133.1	1.49	1.85
13	1	133.2	1.49	1.84

golder.com

TEXAS RISK REDUCTION PROGRAM

RESTRICTIVE COVENANT

STATE OF TEXAS §
§ KNOW ALL PERSONS BY THESE PRESENTS:
COUNTY OF COLLIN §

This Restrictive Covenant is filed to provide information concerning certain environmental conditions and use limitations pursuant to the Texas Commission on Environmental Quality ("TCEQ") Texas Risk Reduction Program Rule ("TRRP") found at 30 Texas Administrative Code ("TAC") Chapter 350, and affects the real property ("Property") described as follows:

> The property located in Collin County, Texas more particularly described on Exhibit A attached hereto and incorporated herein by reference.

Portions of the soils and/or groundwater of the Property contain certain identified chemicals of concern causing those portions of the Property to be considered an Affected Property as that term is defined in the TRRP. The portion considered to be Affected Property is described as follows:

> The property located in Collin County, Texas more particularly described in Exhibit B attached hereto and incorporated herein by reference.

This Restrictive Covenant is required for the following reasons:

1. The Affected Property currently meets TRRP standards for commercial/industrial use. Based on the reports, the chemicals of concern pose no significant present or future risk to humans or the environment based on commercial/industrial land use. No further remediation of the Affected Property is required by the TCEQ as long as the Affected Property is not to be used for residential purposes. If any person desires in the future to use the Affected Property for residential purposes, the TCEQ must be notified at least 60 days in advance of such use and additional response actions may be necessary before the property may be used for residential purposes. Persons contemplating a change in land use for the Affected Property are encouraged to review the definitions for commercial/industrial and residential land use contained in TRRP as the definition of residential land use is broad.

2. The Affected Property is subject to the TRRP requirements for properties containing concentrations of chemicals of concern in soil and is subject to the requirements of 30 TAC § 350.33(e)(2) to prevent exposure to soils that contain a chemical of concern in excess of the protective concentration level. The attached Exhibit C describes and provides the location of the physical control and extent of the soil that exceeds the TCEQ-approved protective concentration levels for certain chemicals of concern. Exhibit C also provides the reason the physical control must remain in place, and describes the required maintenance and monitoring required for the physical control. This program must be implemented unless and until TCEQ approves any modification.

DRAFT

3. The Affected Property is subject to the TRRP requirements for properties containing concentrations of chemicals of concern in groundwater that underlie units containing contaminated media or waste. The Affected Property includes a corrective action management unit referred to as the Remediation Consolidation Area ("RCA") that meets alternate design requirements to the liner requirements set forth in 40 CFR § 264.522(e)(3)(ii). Pursuant to 40 CFR § 264.522(e)(3)(ii)(B), the alternate requirements are designed to prevent migration from the unit that would exceed long term remedial goals. The RCA is subject to the requirement in 40 CFR § 264.522(e)(6) to control, minimize, or eliminate, to the extent necessary to protect human health and the environment, escape of hazardous constituents or leachate, to the ground, to surface waters, or to the atmosphere, which includes preventing exposure to underlying groundwater that contains a chemical of concern in excess of the TCEQ-approved protective concentration level. The attached Exhibit D provides the location of the RCA and the extent of the groundwater underlying and contiguous to the RCA that exceeds the TCEQ-approved protective concentration levels for certain chemicals of concern. The attached Exhibit D also describes the required maintenance and monitoring required for the RCA. This program must be implemented unless and until TCEQ approves any modification.

4. The Affected Property is subject to the TRRP requirements for properties with areas overlying TCEQ-approved plume management zones. A plume management zone is defined as an area of groundwater containing concentrations of chemicals of concern exceeding the TCEQ-approved protective concentration levels, plus any additional area allowed by the TCEQ in accordance with 30 TAC §350.33(f)(4). Plume management zones were established so that the chemicals of concern in the groundwater are managed such that human exposure is prevented and other groundwater resources are protected. The attached Exhibit D provides the location and extent of the plume management zones and describes the maintenance and monitoring required. This maintenance and monitoring must be implemented unless and until TCEQ approves some modification of those requirements.

As of the date of this Restrictive Covenant, the record owner of fee title to the Property is Exide Technologies having a permanent address of 13000 Deerfield Parkway, Suite 200, Milton, GA 30004-6118 ("Owner").

Owner conducted the Response Actions at the Property and in consideration of approval of the Response Action Completion Report, and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Owner has agreed to place the following restrictions on the Property in favor of the TCEQ and the State of Texas, to-wit:

1. The Property shall not be used for any purposes other than commercial/industrial uses, as defined in 30 TAC Chapter 350, Section 350.4(a)(13).

2. The removal or modification of the physical controls on the Affected Property is prohibited without prior approval from TCEQ and the physical controls must be maintained and monitored as described in Exhibit C. Removal or modification of this restrictive covenant is prohibited without prior approval of TCEQ.

3. The removal or modification of the RCA on the Affected Property is prohibited without prior approval from TCEQ and the RCA must be maintained and monitored as described in Exhibit D.

Use of and exposure to the groundwater underlying and contiguous to the RCA unit for any purpose is prohibited until such time when all the chemicals of concern no longer exceed their respective protective concentration levels. Removal or modification of this restrictive covenant is prohibited without prior approval of TCEQ.

4. Exposure to the groundwater underlying the Affected Property for any purpose is prohibited until such time when all the chemicals of concern no longer exceed their respective protective concentration levels. The maintenance and monitoring described in Exhibit D is required. Any modification of this restrictive covenant is prohibited without prior approval of TCEQ.

5. These restrictions shall be a covenant running with the land.

For additional information, contact:

TCEQ
Central Records
12100 Park 35 Circle
Building E
Austin, TX 78753

Mail: TCEQ - MC 199
PO Box 13087
Austin, TX 78711-3087

TCEQ Program and Identifier No.: Corrective Action SWR No. 30516.

DRAFT

This Restrictive Covenant may be rendered of no further force or effect only by a release executed by the TCEQ or its successor agencies and filed in the same Real Property Records as those in which this Restrictive Covenant is filed.

EXECUTED this _____ day of _____, _____ .

OWNER AND RESPONDER:
EXIDE TECHNOLOGIES

By:_____

Name:_____

Title:_____

Accepted as Third Party Beneficiary this _____ day of _____, _____.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

By:_____

Name:_____

Title:_____

DRAFT

STATE OF TEXAS §
§
COUNTY OF _____ §

BEFORE ME, on this the _____ day of _____ , ____, personally appeared _____, of Exide Technologies, a Delaware corporation, known to me to be the person whose name is subscribed to the foregoing instrument, and they acknowledged to me that they executed the same for the purposes and consideration herein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the ____ day of _____, _____.

_____
Notary Public in and for the State of Texas,
County of _____

My Commission Expires:

STATE OF TEXAS §
§
COUNTY OF _____ §

BEFORE ME, on this the _____ day of _____, ____, personally appeared _____, of the Texas Commission on Environmental Quality, known to me to be the person whose name is subscribed to the foregoing instrument, and they acknowledged to me that they executed the same for the purposes and consideration herein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the ____ day of _____, _____.

_____
Notary Public in and for the State of Texas,
County of _____

My Commission Expires:

DRAFT

Exhibit A

Legal Description of the Property

BLOCK A, LOT 5 of STEWART CREEK BUSINESS PARK ADDITION, BLOCK A, LOT(S) 1-7 & BLOCK B, LOT 1, an Addition to the City of Frisco, Collin County, Texas, according to the plat thereof recorded in Cabinet 2019, Page 121 of the Plat Records of Collin County, Texas, TOGETHER WITH Certificate of Correction filed 03/04/2019, recorded in cc# 20190304000222660, Real Property Records, Collin County, Texas.

Exhibit B

Legal Description of the Affected Property

[Exhibit B needs to include a metes and bounds description of the Affected Property and a plat map clearly demarcating the portions of the Property that contain the Affected Property. The map must contain a north arrow, a correlating map scale, and a legend identifying any used symbols or abbreviations. The metes and bounds description and plat map must be accompanied by a certification a registered professional land surveyor so registered by the Texas Board of Professional Surveying attesting to the accuracy of the descriptions.]

Also list each chemical of concern by environmental medium that exceeds the critical Protective Concentration Level

Media	**COCs exceeds the critical Protective Concentration Level**
Surface Soil (0-15 feet below ground surface)	Lead Cadmium Arsenic Antimony Selenium Benzene Methylene Chloride Bis(2-chloroethyl) ether
Subsurface Soil (>15 ft)	Lead Cadmium Arsenic Antimony Selenium
Groundwater	Lead Cadmium Arsenic Antimony Selenium

The Affected Property will be described in one or more tracts to include the following:

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- The North CAMU and the associated plume management zone
- The RCA and the associated plume management zone (portion of the groundwater affected property upgradient from the PRB)
- Slag Landfill
- South Disposal Area and
- North Disposal Area

DRAFT

Exhibit C

Description and Location of Affected Soils and Physical Controls

DRAFT

Exhibit C-2 Remediation Consolidation Area, Slag Landfill and North Disposal Area

As part of overall Site remedial activities, a Corrective Action Management Unit (CAMU) referred to as the Remediation Consolidation Area (RCA), will be designed, engineered, constructed, and operated within the Former Operating Plant (FOP) area of the former Frisco Recycling Center (FRC). The proposed RCA is in an area of existing soil and groundwater contamination and will be used as a consolidation area for soil and sediment excavated from other areas of the FRC and Stewart Creek. Surface and subsurface soils within the area of the RCA are above the critical PCLs lead, antimony, arsenic, cadmium, and/or selenium as well as isolated exceedances of methylene chloride, bis(2-chloroethyl)ether, and benzene. The RCA allows Exide to consolidate impacted media in an existing impacted area, thus minimizing media disturbance and the footprint of remaining impacted media.

The Slag Landfill is a closed Class 2 landfill used for the disposal of nonhazardous, Class 2, slag-containing material. It is located northwest of the former production area and is bound by the North Tributary to the north, the North Disposal Area (NDA) to the southeast, and the railroad spur to the southwest. The Slag Landfill was closed in 1996 via an engineered cover. The NDA is a closed pre-RCRA landfill. The NDA is located immediately north of the former production area. It has been capped and closed by placement and compaction of a clay soil cover over the surface. Existing surface soils on the caps of the Slag Landfill and NDA contain lead, antimony, arsenic, cadmium, and/or selenium above the critical PCLs. Using the Area of Concern Policy, some soils removed from other areas of the Site may be consolidated on top of the Slag Landfill or NDA prior to the placement of physical controls on the Slag Landfill or NDA in order to assist with grading.

Physical control(s) to prevent exposure to affected soils and remediation wastes in the RCA, NDA and Slag Landfill include an engineered cap and a funnel and gate permeable reactive barrier. A metes and bounds description of the location of the RCA, North Disposal Area and Slag Landfill can be found on Page xx of Exhibit C-2 - Figure 2a. A survey map of the location of the RCA, North Disposal Area and Slag Landfill can be found on Page xx of Exhibit C-2 - Figure 2b. An aerial map identifying the extent of the physical control are shown on Exhibit C-2 Figure 2.

Engineered Cap

The multi-layered engineered cap on the RCA, Slag Landfill and NDA response action will include the following major components: An engineered cap consisting of a geosynthetic clay liner (GCL), geomembrane, geotextile/geocomposite, and 36-in clean fill layer (including a 6-inch vegetative cover soil layer). In order to prevent erosion or ponding, the cap will be graded to support drainage away from the cap toward Stewart Creek or the North Tributary. This system will eliminate or minimize the potential for contact of the underlying consolidated remediation waste with surface water or wind and will eliminate or minimize potential infiltration of storm water. A more detailed discussion of the engineered cap is described in the Closure Plan for the FOP, which is included as Attachment C to the Part B Permit Renewal Application.

Funnel and Gate PRB

The funnel and gate PRB is comprised of the following:

- North and south wall segments, keyed into bedrock, and composed of a low-permeable material (bentonite-enhanced concrete barrier wall (slurry wall) and sheet piles) having a hydraulic conductivity

no greater than $1x10^{-07}$ cm/sec. The north and south slurry wall segments "funnel" the groundwater into a permeable reactive barrier (PRB) for treatment, and

- A central (western) PRB segment (the "gate" through which groundwater exits the funnel) that is composed of a permeable reactive material (zero-valent iron) mixed with sand and having a net hydraulic conductivity no less than $1x10^{-02}$ cm/sec and no greater than $1x10^{-01}$ cm/sec, and a
- A below grade 15,000-gallon perforated stainless-steel tank that acts as a "sump reactor" near the northwest corner of the FOP. The tank is backfilled with a similar zero-valent iron mix as the PRB and treats groundwater in that area prior to transmission to the PRB.

In addition to directing groundwater to move through the PRB gate, the low conductivity sections prevent the transmission of groundwater directly to Stewart Creek without first passing through the PRB. The design funnel and gate system is comprised of approximately 3,100 linear feet of slurry-wall, 160 linear feet sheet pile funnel section, and 100 feet of PRB and a 15,000-gallon tank. The funnel and gate remedy will effectively remove groundwater contaminants to below their respective PCLs. A more detailed discussion of the funnel and gate PRB is described in the Response Action Plan for the FOP, which is included as Attachment M to the Part B Permit Renewal Application.

Flood Wall

A vertical extension of this existing barrier wall and a new lateral extension of this wall along the eastern boundary of the RCA will be constructed to protect the facility from 100-year flooding of Stewart Creek. Plans and specifications for the flood wall are included in the Conditional Letter of Map Revision included in Appendix A to the RCA Engineering Report which is included as Attachment F to the Part B Permit Renewal Application.

Inspections, Monitoring and Maintenance

Inspections, monitoring and maintenance of the general conditions and physical controls at the Site will be performed by Exide during and following closure. These are briefly described below and a more detailed discussion is included in the Closure Plan for the FOP, which is included as Attachment C to the Part B Permit Renewal Application. Groundwater monitoring is discussed in Exhibits D and E below. In the event that removal or disturbance of the engineering controls is planned, the TCEQ will be notified according to the requirements of this Restrictive Covenant.

Engineered Cap

The final covers of the North CAMU, the RCA, the Slag Landfill, the North Disposal Area, and the South Disposal Area will be inspected regularly following closure to look for evidence of erosion, subsidence, ponded water, animal burrows, cracks along the cover, and loss of soil. Maintenance will include mowing, repairs of any eroded areas, restoration and repair of drainage channels and other repairs as needed.

Funnel and Gate PRB

The Funnel and Gate PRB and Sump Reactor will be inspected regularly, however maintenance is anticipated to be minimal and generally limited to back-washing the media. Rejuvenation of the PRB may be performed periodically based on the results of ongoing groundwater monitoring. Rejuvenation is discussed in more detail in the Response Action Plan for the FOP, which is included as Attachment M to the Part B Permit Renewal Application.

Flood Wall

The flood wall will be inspected at the same time as periodic inspection of the FOP engineered cap. The condition of waterstops and joint filters will be assessed to ensure they are in good condition, and the flood wall will be inspected for signs of seepage through the wall, cracks, and other signs of damage. The area along the flood wall will be inspected for any signs of seepage, settlement, sand boils, saturated soil areas, or other damage. The area along the flood wall will also be inspected for high vegetation (trees or high brush), any accumulations of trash or debris, any bank erosion/caving that would endanger wall stability.

Groundwater Monitoring

A Groundwater Monitoring Plan will be implemented for the FOP describing the monitoring system and the procedures for monitoring well sampling, sample management, analytical methods, quality assurance/quality control, sample custody control, and data reduction (see Exhibit D for additional discussion).

DRAFT

Exhibit C-3 South Disposal Area

The South Disposal Area (SDA) is a closed pre-RCRA landfill. The SDA is located on the south side of the property, south of Stewart Creek. It has been capped and closed by placement and compaction of a clay soil cover over the surface of the respective disposal areas. The SDA was capped and closed in 1974. The cap is composed of native soils up to five feet thick. Existing surface soils on the caps of the SDA contain lead, antimony, arsenic, cadmium, and/or selenium above the critical PCLs.

Engineered Cap

Physical control(s) to prevent exposure to affected soils and wastes in the SDA include an engineered cap. The engineered cap will consist of a geomembrane, geotextile/geocomposite, 18-in clean fill layer, and 6-inch vegetative cover soil layer. The cap will be graded to support drainage away from the cap.
A metes and bounds description of the location of the SDA can be found on Page xx of Exhibit C-3 - Figure 2a. A survey map of the location of the SDA can be found on Page xx of Exhibit C-3 - Figure 2b. An aerial map identifying the extent of the physical control are shown on Exhibit C-3 Figure 2.

Inspections, Monitoring and Maintenance

The final cover of the SDA will be inspected regularly following closure to look for evidence of erosion, subsidence, ponded water, animal burrows, cracks along the cover, and loss of soil. Maintenance will include mowing, repairs of any eroded areas and other repairs as needed. A Groundwater Monitoring Plan will be implemented for the SDA describing the monitoring system and the procedures for monitoring well sampling, sample management, analytical methods, quality assurance/quality control, sample custody control, and data reduction (see Exhibit D for additional discussion).

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Exhibit C-4 North CAMU

The North CAMU is an active Corrective Action Management Unit located on the northern portion of the site. The North CAMU currently consists of fifteen cells, nine of which (Cells 1 through 9) have been closed and capped. The closed cells of the North CAMU consist of treated slag monofills. The active cells (Cells 10 through 12) of the North CAMU contain treated slag, and they, along with the new cells that are part of a partially constructed expansion (cells 13 through 15) also contain Class 2 wastes generated during the ongoing demolition and remediation activities. Additional Class 2 remediation waste from the former operating plant area will be disposed in cells 13-15.

Engineered Cap

The multi-layered engineered cap on the North CAMU will include the following major components: An engineered cap consisting of a geosynthetic clay liner (GCL), geomembrane, geotextile/geocomposite, and 36-in clean fill layer (including a 6-inch vegetative cover soil layer). In order to prevent erosion or ponding, the cap will be graded to support drainage away from the cap. A leachate collection system is present at the North CAMU.

A metes and bounds description of the location of the North CAMU can be found on Page xx of Exhibit C-4 - Figure 3a. A survey map of the location of the North CAMU can be found on Page xx of Exhibit C-4 - Figure 2b. An aerial map identifying the extent of the physical control are shown on Exhibit C-4 Figure 2.

Inspections, Monitoring and Maintenance

The final cover of the North CAMU will be inspected regularly following closure to look for evidence of erosion, subsidence, ponded water, animal burrows, cracks along the cover, and loss of soil. Maintenance will include mowing, repairs of any eroded areas, restoration and repair of drainage channels and other repairs as needed. The leachate collection and conveyance system at the North CAMU will be inspected regularly. Several leachate collection system components will require ongoing maintenance during the post-closure care period. The pumps will be removed and cleaned annually and will be replaced as needed during the post-closure care period. Sediment will be cleaned from the collection pipes and the enclosed sump by a high-pressure jet cleaning contractor as needed. A Groundwater Monitoring Plan has been implemented for the FOP describing the monitoring system and the procedures for monitoring well sampling, sample management, analytical methods, quality assurance/quality control, sample custody control, and data reduction This groundwater monitoring plan is described in Attachment K to the Part B Permit Renewal Application.

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Exhibit D

Location and Extent of Plume Management Zones and Required Maintenance and Monitoring

D-1 North CAMU Plume Management Zone

A Plume Management Zone (PMZ) will be established around the PCLE zones south and east of the North CAMU to prevent human exposure to affected groundwater and to protect other groundwater resources. The PMZ and groundwater monitoring program will allow Exide to monitor the effectiveness of the physical control and confirm the long term protectiveness of the remedy. Based on the relatively small extent of the potential arsenic and selenium exceedances and the fact that the PCLE zones do not appear to be migrating or expanding, natural attenuation will be used under Remedy Standard B as a physical control remedy. This will be done to ensure that arsenic and selenium concentrations at the downgradient Alternate Points of Exposure (APOEs) at the limits of the PMZ are contained in accordance with §350.37(l) for Class 2 groundwater. If arsenic or selenium is detected in exceedance of the site specific Attenuation Action Level (AAL) or PCL in future sampling events, additional evaluation and/or response actions will be proposed and discussed with TCEQ.

The affected groundwater plumes at the North CAMU are located to the east and south of the North CAMU. The affected groundwater bearing unit (GWBU) at the FOP is a shallow zone encountered between approximately 10 to 24 feet below ground surface and that is underlain by the Eagle Ford Shale. In the absence of human consumption, the existing concentrations of chemicals of concern in groundwater are protective of human health and the environment. The shallow GWBU is not used in the vicinity of the Affected Property and this Restrictive Covenant will prevent potential future usage. Groundwater samples collected downgradient from the PMZ have demonstrated that arsenic and selenium have not migrated to the North Tributary to Stewart Creek.

The North CAMU PMZ described in the Response Action Plan for the FOP, which is included as Attachment M to the Part B Permit Renewal Application. The North CAMU PMZ groundwater monitoring network consists of the following wells.

- Alternate Point of Exposure Wells: LMW-5, LMW-8 and LMW-9;
- Attenuation Monitoring Point Wells: LMW-17, LMW-22 and MW-47;
- APOE Well/POC wells: MW-41 and MW-42.

Figure D-1 provides the location of these wells and the extent of the North CAMU PMZ. The groundwater sampling will be performed at the same time and using the same procedures as outlined in the North CAMU Detection Monitoring Plan, which is included as Attachment K to the Part B Permit Renewal Application. The monitoring wells will be sampled on a quarterly basis for two years and a semi-annual basis thereafter for 30 years. Each groundwater sample will be analyzed for total and dissolved arsenic and selenium. The implementation of the monitoring responsibilities will be undertaken by Exide as appropriate.

Maintenance and Monitoring

A visual inspection of the groundwater monitoring wells will be performed during each routine groundwater sampling event as described in the North CAMU Detection Monitoring Plan, which is included as Attachment K to the Part B Permit Renewal Application. Any wells identified as needing

replacement, repair or maintenance will be noted on field sampling forms, and repairs will be implemented. Bolts, gaskets, well caps, and manway covers will be replaced as needed. The implementation of the maintenance responsibilities will be undertaken by Exide as appropriate.

D-2 FOP Plume Management Zone

A PMZ will be established around the FOP to prevent human exposure to affected groundwater and to protect other groundwater resources. The PMZ and groundwater monitoring program will allow Exide to monitor the effectiveness of the funnel and gate physical control and confirm the long-term protectiveness of the remedy. The PMZ will include the area of the Funnel & Gate Permeable Reactive Barrier (PRB) Wall. In-Situ Chemical Reduction (ISCR) using Zero-Valent Iron (ZVI) is a proven technology for removing arsenic, antimony, cadmium, and lead the relevant COCs. The application of ISCR using a PRB is a proven and accepted remedy. This PMZ will ensure that lead, cadmium, arsenic and antimony concentrations at the downgradient Alternate Points of Exposure (APOEs) at the limits of the PMZ are contained in accordance with §350.37(l) for Class 2 groundwater. If lead, cadmium, arsenic or antimony are detected in exceedance of the PCL in future sampling events, additional evaluation and/or response actions will be proposed and discussed with TCEQ.

Key operating parameters for the funnel and gate PRB are groundwater monitoring data. COC concentrations and water level elevations will be monitored both upgradient and downgradient of the funnel and gate PRB. The funnel and gate PRB will be determined to be functioning properly as long as COC concentrations downgradient are below the applicable PCLs. Increased water levels upgradient from the PRB or increased COC concentrations (above applicable PCLs) downgradient of the PRB will indicate additional evaluation or actions are required. If downgradient COC concentrations are detected above applicable PCLs, and confirmed through resampling (as indicated in the FOP groundwater monitoring plan)., additional groundwater monitoring may be conducted or additional response actions may be evaluated, proposed, or implemented, if conditions warrant.

The existing affected groundwater plumes at the FOP are located within the area of the funnel and gate PRB. COCs for the FOP based on the exceedance of one or more of the PCLs include arsenic, antimony, cadmium, and lead. In addition, selenium is considered a constituent of concern although it was not detected in groundwater above applicable PCLs as selenium may be present in soil remediation waste that is placed in the RCA. The affected GWBU at the FOP is a shallow zone encountered between approximately 0.7 to 30 feet below ground surface and that is underlain by the Eagle Ford Shale. As described in Exhibit C, the funnel and gate PRB will prevent the transmission of groundwater towards Stewart Creek (the funnels) prior to passing through the PRB, and force groundwater to move through the PRB (the gate) which is designed to treat the COCs within the wall thickness prior to transmission downgradient and subsequently to Stewart Creek.

The FOP PMZ is described in the Response Action Plan for the FOP, which is included as Attachment M to the Part B Permit Renewal Application. The FOP PMZ groundwater monitoring network consists of the following wells.

- Alternate Point of Exposure Wells: XX
- Attenuation Monitoring Point Wells: XX

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- APOE Well/POC wells: XX.

Figure D-2 provides the location of these wells and the extent of the FOP PMZ. The groundwater sampling will be performed using the procedures as outlined in the FOP Groundwater Monitoring Plan, which is included as Attachment L to the Part B Permit Renewal Application. The monitoring wells will be sampled on a quarterly basis for two years and a semi-annual basis thereafter for 30 years. Each groundwater sample will be analyzed for total and dissolved lead, arsenic, cadmium, antimony and selenium. The implementation of the monitoring responsibilities will be undertaken by Exide as appropriate.

Maintenance and Monitoring

A visual inspection of the groundwater monitoring wells will be performed during each routine groundwater sampling event as described in the FOP Detection Monitoring Plan, which is included as Attachment L to the Part B Permit Renewal Application. Any wells identified as needing replacement, repair or maintenance will be noted on field sampling forms, and repairs will be implemented. Bolts, gaskets, well caps, and manway covers will be replaced as needed. The implementation of the maintenance responsibilities will be undertaken by Exide as appropriate.

DRAFT

TEXAS RISK REDUCTION PROGRAM

RESTRICTIVE COVENANT

STATE OF TEXAS	§	
	§	KNOW ALL PERSONS BY THESE PRESENTS:
COUNTY OF COLLIN	§	

This Restrictive Covenant is filed to provide information concerning certain environmental conditions and use limitations pursuant to the Texas Commission on Environmental Quality ("TCEQ") Texas Risk Reduction Program Rule ("TRRP") found at 30 Texas Administrative Code ("TAC") Chapter 350, and affects the real property ("Property") described as follows:

> The property located in Collin County, Texas more particularly described on Exhibit A attached hereto and incorporated herein by reference.

Portions of the soils of the Property contain certain identified chemicals of concern causing those portions of the Property to be considered an Affected Property as that term is defined in the TRRP. The portion considered to be Affected Property is described as follows:

> The property located in Collin County, Texas more particularly described in Exhibit B attached hereto and incorporated herein by reference.

This Restrictive Covenant is required for the following reasons:

1. The Affected Property currently meets TRRP standards for commercial/industrial use. Based on the reports, the chemicals of concern pose no significant present or future risk to humans or the environment based on commercial/industrial land use. No further remediation of the Affected Property is required by the TCEQ as long as the Affected Property is not to be used for residential purposes. If any person desires in the future to use the Affected Property for residential purposes, the TCEQ must be notified at least 60 days in advance of such use and additional response actions may be necessary before the property may be used for residential purposes. Persons contemplating a change in land use for the Affected Property are encouraged to review the definitions for commercial/industrial and residential land use contained in TRRP as the definition of residential land use is broad.

2. The Affected Property is subject to the TRRP requirements for properties containing concentrations of chemicals of concern in soil and is subject to the requirements of 30 TAC § 350.33(e)(2) to prevent exposure to soils that contain a chemical of concern in excess of the protective concentration level. The attached Exhibit C describes and provides the location of the physical control and extent of the soil that exceeds the TCEQ-approved protective concentration levels for certain chemicals of concern. Exhibit C also provides the reason the physical control must remain in place, and describes the required maintenance and monitoring required for the physical control. This program must be implemented unless and until TCEQ approves any modification.

DRAFT

The Property was dedicated by Exide Technologies ("Exide") as a public way easement in that conveyance plat for STEWART CREEK BUSINESS PARK ADDITION, an Addition to the City of Frisco, Collin County, Texas, according to the plat thereof recorded in Cabinet 2019, Page 121 of the Plat Records of Collin County, Texas, TOGETHER WITH Certificate of Correction filed 03/04/2019, recorded in cc# 20190304000222660, Real Property Records, Collin County, Texas in fee simple for use as a street. This restrictive covenant is being executed by Exide and the City of Frisco, Texas (the "City").

Exide conducted the Response Actions at the Property and in consideration of approval of the Response Action Completion Report, and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the City and Exide have agreed to place the following restrictions on the Property in favor of the TCEQ and the State of Texas, to-wit:

1. The Property shall not be used for any purposes other than commercial/industrial uses, as defined in 30 TAC Chapter 350, Section 350.4(a)(13).

2. An engineered barrier has been placed on the portions of the affected Property that are not developed with Parkwood Boulevard. Parkwood Boulevard serves as an engineered barrier for portions of the affected Property. The engineered barrier areas and areas of Parkwood Boulevard that are serving as an engineered barrier are shown in Figure XX. The engineered barrier areas will be inspected semi-annually. Soil disturbance of the affected property will be done in accordance with Parkwood Boulevard Soil Management Plan, which is attached as Exhibit D. The removal or modification of the physical controls on the Affected Property is prohibited without prior approval from TCEQ and the physical controls must be maintained and monitored as described in Exhibit C. Removal or modification of this restrictive covenant is prohibited without prior approval of TCEQ.

3. These restrictions shall be a covenant running with the land.

For additional information, contact:

TCEQ
Central Records
12100 Park 35 Circle
Building E
Austin, TX 78753

Mail: TCEQ - MC 199
PO Box 13087
Austin, TX 78711-3087

TCEQ Program and Identifier No.: Corrective Action SWR No. 30516.

DRAFT

This Restrictive Covenant may be rendered of no further force or effect only by a release executed by the TCEQ or its successor agencies and filed in the same Real Property Records as those in which this Restrictive Covenant is filed.

EXECUTED this _____ day of _____, _____ .

EXIDE TECHNOLOGIES

By:_____

Name:_____

Title:_____

CITY OF FRISCO, TEXAS

By:_____

Name:_____

Title:_____

Accepted as Third Party Beneficiary this _____ day of _____, _____.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

By:_____

Name:_____

Title:_____

DRAFT

STATE OF TEXAS §
§
COUNTY OF _____ §

BEFORE ME, on this the _____ day of _____ , ____, personally appeared _____, of Exide Technologies, a Delaware corporation, known to me to be the person whose name is subscribed to the foregoing instrument, and they acknowledged to me that they executed the same for the purposes and consideration herein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the ____ day of _____, _____.

_____
Notary Public in and for the State of Texas,
County of _____

My Commission Expires:

STATE OF TEXAS §
§
COUNTY OF _____ §

BEFORE ME, on this the _____ day of _____ , ____, personally appeared _____ , of the City of Frisco, Texas, known to me to be the person whose name is subscribed to the foregoing instrument, and they acknowledged to me that they executed the same for the purposes and consideration herein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the ____ day of _____, _____.

_____
Notary Public in and for the State of Texas,
County of _____

My Commission Expires:

DRAFT

STATE OF TEXAS §
§
COUNTY OF _____ §

BEFORE ME, on this the _____ day of _____, ____, personally appeared _____, of the Texas Commission on Environmental Quality, known to me to be the person whose name is subscribed to the foregoing instrument, and they acknowledged to me that they executed the same for the purposes and consideration herein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the ____ day of _____, _____.

_____
Notary Public in and for the State of Texas,
County of _____

My Commission Expires:

DRAFT

Exhibit A

Legal Description of the Property

Being a portion of BLOCK A, LOTS 7 of STEWART CREEK BUSINESS PARK ADDITION, BLOCK A, LOT(S) 1-7 & BLOCK B, LOT 1, an Addition to the City of Frisco, Collin County, Texas, according to the plat thereof recorded in Cabinet 2019, Page 121 of the Plat Records of Collin County, Texas, TOGETHER WITH Certificate of Correction filed 03/04/2019, recorded in cc# 20190304000222660, Real Property Records, Collin County, Texas, more particularly described as follows:

[insert portion of Parkwood Blvd. subject to this IC]

Exhibit B

Legal Description of the Affected Property

Exhibit B needs to include a metes and bounds description of the Affected Property and a plat map clearly demarcating the portions of the Property that contain the Affected Property.

The map must contain a north arrow, a correlating map scale, and a legend identifying any used symbols or abbreviations.

The metes and bounds description and plat map must be accompanied by a certification a registered professional land surveyor so registered by the Texas Board of Professional Surveying attesting to the accuracy of the descriptions.

Also list each chemical of concern by environmental medium that exceeds the critical Protective Concentration Level

Media	**COCs exceeds the critical Protective Concentration Level**
Surface Soil (0-15 feet below ground surface)	Lead

The Affected Property will be described in one or more tracts to include the following:

- Portions of the Parkwood Parcel with a physical control or soil management plan

DRAFT

Exhibit C

Description and Location of Affected Soils and Physical Controls

Exhibit C-1 Parkwood Parcel

The Parkwood Parcel is a parcel of land that is publicly dedicated right of way adjacent to the Frisco Recycling Center (FRC) and also located between portions of the former Exide Undeveloped Buffer Property (UBP). Parkwood Boulevard runs through the Parkwood Parcel. Lead exceeded critical Protective Concentration Limit (PCLs) in surface and subsurface soil samples. Physical control(s) to prevent exposure to affected soils in the Parkwood Parcel include an engineered barrier (cap) and the use of the existing Parkwood Boulevard roadway as an engineered barrier.

A metes and bounds description of the location of the affected soils exceeding the critical PCLs can be found on Page xx of Exhibit C-1 - Figure 1a. A survey map of the location of the affected soils exceeding the critical PCLs can be found on Page xx of Exhibit C-1 - Figure 1b. An aerial map identifying the extent of this physical control is shown on Exhibit C - 1 Figure 2.

Engineered Cap

The area of the Parkwood Parcel with lead impacts above the critical PCL will receive an engineered cap consisting of a geomembrane, geotextile/geocomposite, 18-in clean fill layer, and 6-inch vegetative cover soil layer. The proposed cap area extends from the edge of Parkwood Boulevard (west boundary or east boundary of the cap area) to the edge of the Property Boundary and then extends vertically to the depth of impacts. A soil management plan will be implemented for the affected portions of the Parkwood Parcel such that any work performed within the affected portions of the Parkwood Parcel would be subject to specific requirements that will be attached to a Right-of-Way permit issued by the City of Frisco. The soil management plan will outline required Personal Protection Equipment (PPE), soil waste handling procedures, and instructions regarding repair of the geomembrane if work on the Parkwood Parcel requires disturbance of the cap.

Maintenance and Monitoring

The proposed post-response action care activities include inspections, maintenance and monitoring for the engineered cap on the Parkwood Parcel. Inspections of the final cover of capped areas will be performed to look for evidence of erosion, subsidence, ponded water, animal burrows, cracks along the cover, and loss of soil. These inspection, maintenance, and repair responsibilities will be undertaken by Exide. However, in the event that removal or disturbance of the Parkwood cap is planned, the TCEQ will be notified according to the requirements of this Restrictive Covenant.

DRAFT

Exhibit D

Parkwood Boulevard Soil Management Plan

DRAFT

Brad Weaver
Director, Remediation
Exide Technologies
7471 Old 5th Street
P.O. Box 250
Frisco, TX 75034

Dear Mr. Weaver,

The City of Frisco has been informed of the potential use of an Institutional Control (Restrictive Covenant) as part of the response action planned for the Parkwood Parcel adjacent to the Exide Technologies (Exide) Former Operating Plant (FOP) located in Frisco, Collin County, Texas. It is our understanding that an Institutional Control may be applied to the area identified as the Parkwood Parcel to restrict land use to commercial/industrial purposes and to limit exposure to soil and disturbance of the engineered barrier that will be placed on this parcel. The Parkwood Parcel is part of the public way, including portions of Parkwood Boulevard, dedicated by Exide by the conveyance plat for the Stewart Creek Business Park Addition. The Parkwood Parcel includes areas that are owned or under the control of the City of Frisco.

The City of Frisco has reviewed the proposed Institutional Control language and agrees to the Institutional Control in principle.

Name:

Title:

SAMPLE

APPENDIX 6.1

RESPONSE ACTION SAMPLING AND ANALYSIS PLAN

GOLDER

APPENDIX 6.1

RESPONSE ACTION SAMPLING AND ANALYSIS PLAN

Exide Technologies Frisco Recycling Center
Former Operating Plant

GOLDER ASSOCIATES INC.
Geoscience Firm Registration
Certificate Number 50369

Submitted to:

Exide Technologies, Inc.
7471 Old 5th Street
Frisco, TX 75034

Submitted by:

Golder Associates Inc.
13515 Barrett Parkway Drive, Suite 260, Ballwin, Missouri, USA 63021

+1 314 984-8800

130208606

May 2019

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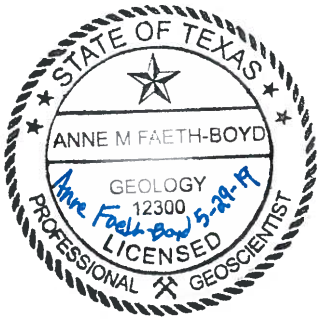


1.0 INTRODUCTION AND BACKGROUND

Exide Technologies Frisco Former Operating Plant (FOP) consists of approximately 94-acres on which industrial operations occurred. The FOP and downstream portions of Stewart Creek as delineated in the Affected Property Assessment Report are collectively, the "Site". This Sampling and Analysis Plan (SAP or Plan) has been prepared to describe sampling and analysis methods and procedures to be used in conjunction with response action activities consisting of removal of affected soils and sediment at the Site. Removal of affected soil and sediment is being conducted based on the results of the affected property assessment performed for the Site as part of Texas Commission on Environmental Quality (TCEQ) Corrective Action Program, SWR Number 30516. The objective of this Plan is to describe the procedures for soil and sediment sampling and analysis to be conducted as part of the response action activities. Low-flow groundwater sampling procedures associated with detection monitoring and corrective action monitoring for the FOP are discussed in the North CAMU Detection Monitoring Plan and the FOP Groundwater Monitoring Program, attached to the Part B Resource Conservation and Recovery Act (RCRA) Permit Renewal Application as Attachments K and L, respectively. Waste sampling and characterization are discussed in the Waste Analysis Plan which is included as Attachment Q to the Part B RCRA Permit Renewal Application. Sediment samples that will be collected from Stewart Creek in areas where excavation is not initially performed to determine the exposure point concentration (EPC) for different segments is discussed in the Stewart Creek Exposure Point Concentration Sampling Work Plan, also included in Appendix 6 of the Response Action Plan.

This SAP addresses the discrete confirmation samples collected from the floor and sidewalls of the remediated soil areas on the FOP or Stewart Creek (where fill material containing slag or battery case fragments has been removed) to confirm that residual concentrations meet remediation goals.

2.0 SAMPLE LOCATIONS, FREQUENCY, EQUIPMENT, AND PROCEDURES

2.1 FOP Soils

Prior to excavation, areas requiring excavation will be located and marked using a differential GPS.

Following excavation, a hand-held X-ray fluorescence analyzer (XRF) meter will be used as a screening tool to evaluate lead (and potentially other metal) concentrations in remaining soil. Any areas potentially containing concentrations of lead exceeding 275 mg/kg (or other applicable Protective Concentration Level [PCL]) will be further tested or excavated. When excavation appears complete, post-excavation confirmation samples will be collected for laboratory analysis to confirm that remaining soils do not contain COCs at concentrations exceeding the PCLs.

Specific sample locations will be determined in the field and will be dictated by the conditions in the excavated area. Sample locations will be chosen in a manner intended to achieve the most representative sample in the sample area. Sample locations will be marked with a stake, pin-flag, or other marking device so that the location can be recorded. Sample information will be recorded in a field log at the time of collection and will include the sample ID, date and time of collection, and any applicable notes regarding the sample (i.e., bedrock, waste/debris present).

Post-excavation confirmation samples will be collected using hand tools such as a trowel or shovel. Post-excavation confirmation samples will be collected from the upper few inches of the floor of each excavation area at a frequency of one sample for each 2,500 square foot area (approximately 50 x 50 feet). In areas where excavation is completed to bedrock/limestone, the floor confirmation samples will be collected by breaking up pieces of the bedrock to be pulverized and analyzed. Confirmation samples will also be collected from the ground surface (0-3 inches) along the perimeter of shallow excavations (0-1 ft) at a frequency of one sample per 100 linear feet of sidewall or on each of the four sides for smaller excavations. Confirmation samples will be collected from the sidewalls of deeper excavation at approximately one-half of the excavation depth.

2.2 Stewart Creek Sediment

The vertical extent of sediment excavations will be determined by the depth of sediment (all sediment in PCLE zones will be removed down to bedrock or down to natural soil). Where the base of the excavation is bedrock, no confirmation samples will be collected. Where the base of the excavation is native soil, a floor sample will be collected using the same procedures identified above for floor samples within soil excavation areas on the FOP. For this application, natural or native soils are defined as competent, undisturbed deposits that clearly show no indication of secondary re-working or the presence of foreign objects such as battery chips or other anthropogenic material. The presence of natural soil will be determined based on visual inspection by Exide's consultant during excavation activities.

The horizontal extent of sediment excavations will be determined on a segment by segment basis (further described below and as discussed in the Response Action Plan) and thus no additional upstream or downstream sediment samples will be collected.

2.3 Stewart Creek Sidewall Soil

Where sidewall soils are removed from the banks of Stewart Creek due to the presence of observed slag or battery case fragments within fill material, when excavation appears complete, post-excavation confirmation

samples will be collected for laboratory analysis to confirm that remaining soils do not contain COCs at concentrations exceeding the PCLs. No sidewall/soil samples will be collected other than in areas where there is suspected fill material. As channel sidewalls are not considered a depositional environment, it is not anticipated that slag or battery case fragments will be present in these areas unless fill material has been placed. Based on visual observations of Stewart Creek by Exide, this is likely limited to areas on the FOP or immediately downstream (upstream from Dallas North Tollway).

Specific sample locations will be determined in the field and will be dictated by the conditions in the excavated area. Sample locations will be chosen in a manner intended to achieve the most representative sample in the sample area. Sample locations will be marked with a stake, pin-flag, or other marking device so that the location can be recorded. Sample information will be recorded in a field log at the time of collection and will include the sample ID, date and time of collection, and any applicable notes regarding the sample (i.e., bedrock, waste/debris present).

Post-excavation confirmation samples will be collected using hand tools such as a trowel or shovel. Post-excavation confirmation samples will be collected from the upper few inches of the center of each excavation area (realizing the excavation may be at an angle or have a vertical cut) at a frequency of one sample for each 2,500 square foot area (approximately 50 x 50 feet). Confirmation samples will be collected from the perimeter of the excavation at approximately one-half of the excavation depth at a frequency of one sample per 100 linear feet of perimeter.

3.0 SAMPLE DESIGNATION

The sample identification system for the project has been designed to uniquely identify each sample location and sample. The numbering system will utilize a pre-planned numbering system based on the area, an identifier for sample type (confirmation classification), and QA/QC identifier if applicable.

Sample identification will use the following format:

AP-X #-# where X represents the affected property number i.e., AP-1 and #-# represents the sample ID. Floor samples will be designated as FCS, sidewall samples will be designated as CS, and base samples (along roads where sidewall samples are not attainable) will be designated as BCS. Sample AP-1 CS-1 would represent the post-excavation floor confirmation sample 1 in the Affected Property 1 grid system.

Additional identifiers may be appended to the sample ID to indicate other sample types (if needed), a field QA/QC sample, a specific sample depth, or a second sample from the same location following additional excavation.

Sample locations will be marked at the time of sampling and the coordinates of the sample locations recorded using a differential GPS.

4.0 SAMPLE HANDLING AND LABORATORY ANALYSIS

Following sample collection, sample jars will be placed in boxes or ice chests and handled under chain-of-custody procedures. Samples will be delivered to the analytical laboratory by sampling personnel, courier, or overnight delivery service. Post-excavation soil samples from the FOP will be analyzed for lead, cadmium, arsenic, selenium, and antimony by EPA Method 6020A. Post-excavation soil samples collected from Stewart Creek will be analyzed for lead, cadmium and arsenic by EPA Method 6020A.

Since the samples will be analyzed for lead, cadmium, arsenic, antimony, and/or selenium only, no preservation is required (i.e., no ice required in the coolers). The holding time for the selected metals is 6 months.

5.0 DECONTAMINATION AND QUALITY ASSURANCE/QUALITY CONTROL

5.1 Decontamination

5.1.1 Soil Confirmation Sampling

Reusable soil sampling equipment will be decontaminated between each use by removing any gross soils, washing the tool with a phosphate-free detergent solution, and then rinsing with tap water followed by rinsing with de-ionized/distilled water. Disposable sampling equipment will not be re-used and will be discarded after use.

5.1.2 Stewart Creek Confirmation Sampling

Reusable sampling equipment will be decontaminated between each use by removing any gross soils/sediment and washing the tool with native water (or potable water/distilled water if washing with native water is not feasible).

5.2 Duplicate Samples or Split Samples

One field duplicate sample will be collected per 20 samples for all types of samples. For duplicate samples or samples to be split with another party, the soil or sediment will be placed in a plastic bag and homogenized prior to placing into laboratory-supplied jars.

5.3 Blank Samples

For soil and sediment confirmation samples, one equipment blank sample will be collected per 20 samples where dedicated or disposable equipment is not used.

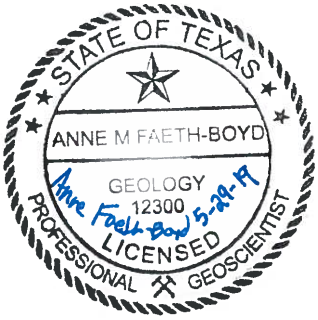
5.4 Data Usability

Analytical data for confirmation samples will be evaluated for usability in accordance with the procedures described in TRRP guidance document, Review and Reporting of COC Concentration Data (RGG-366/TRRP-13) and for adherence to project objectives.

The results of the data usability evaluation will be included in the Response Action Completion Report (RACR) to be submitted upon completion of the response action.

Signature Page

Golder Associates Inc.



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EPW/AMF

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APPENDIX 6.2

STEWART CREEK EXPOSURE POINT CONCENTRATION SAMPLING WORK PLAN

STEWART CREEK EPC SAMPLING WORK PLAN

STEWART CREEK EXPOSURE POINT CONCENTRATION SAMPLING WORK PLAN

Exide Frisco Recycling Facility
7471 Old 5th Street, Frisco, Texas 75034-5047
TCEQ SWR No. 30516
TCEQ Hazardous Waste Permit No. HW-50206
TCEQ Agreed Order Docket No. 2011-1712-IHW-E
EPA ID No. TXD006451090
Customer No. CN600129779
Regulated Entity No. RN100218643

Submitted To: Exide Technologies, Inc.
7471 Old Fifth Street
Frisco, TX 75034

Submitted By: Golder Associates Inc.
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Ballwin, MO 63021

Distribution: TCEQ (electronic and two hard copies)
Exide Technologies (electronic)

May 28, 2019 **130208606**

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1.0 INTRODUCTION AND BACKGROUND

Golder Associates Inc. (Golder) has prepared this Exposure Point Concentration (EPC) Sampling Work Plan (EPCSWP) for areas of Stewart Creek downstream of the Exide Technologies, Inc. (Exide) Former Operating Plant (FOP) located at 7471 Old Fifth Street in Frisco, Texas (Figure 1). The Stewart Creek EPCSWP has been prepared in response to the Texas Commission on Environmental Quality (TCEQ) Technical Notice of Deficiency (NOD) dated December 7, 2017 and next steps for Exide's Frisco Recycling Center (FRC) Permit Renewal Application with a Major Amendment and Compliance Plan (referred to throughout as the "Permit Renewal Application").

Stewart Creek is approximately 8 miles long running from east of the FOP to the west and south of the FOP, ultimately flowing into Lake Lewisville. A portion of Stewart Creek runs through the central portion of the FOP from east to west along the south side of the former production area. Significant sampling of Stewart Creek on the FOP and on downstream areas have been performed and results have indicated exceedances of Critical Protective Concentration Limits (PCLs) for lead, cadmium, and arsenic. In order to address concerns regarding the timing of response action implementation and the dynamic environment of Stewart Creek, a combination of pre-determined excavation and post-remediation sampling has been proposed in the Response Action Plan (RAP) for the FOP included as Attachment M to the Permit Renewal Application. This combination of approaches will address portions of Stewart Creek where the highest frequency of PCL exceedances have been observed (based on 1,402 sediment samples, including 125 duplicates, downstream of the FOP between 2014 and 2017) and the greatest number of observations of the presence of battery case fragments and slag have been made. The approach will also provide for the determination of additional areas of excavation needed, based on future re-sampling data for areas of Stewart Creek not pre-determined for excavation.

The objective of the EPC sampling is to gather sufficient sediment data necessary to evaluate those areas of Stewart Creek that have not been established as pre-determined excavation areas in the Site RAP. The term EPC, synonymous with the TCEQ's "representative concentration", describes the level of exposure—expressed as a concentration—that a receptor may experience over an exposure area during an extended period of time. This EPCSWP includes the rationale and methodology that will be used while performing sampling activities to determine exposure point concentrations within the areas not designated as pre-determined excavation areas, to be referred to as "Exposure Areas" of Stewart Creek (shown on Figure 2-1 through Figure 2-5).

This EPCSWP includes a description of the following:

- Determination of Exposure Areas
- Field Procedures
- Quality Assurance/Quality Control

- Calculation of EPCs
- Schedule and Reporting

Additional detail regarding the statistical methodology that will be used to calculate the EPC within each Exposure Area is included in the “Revised Draft RAP Appendix 7 – Statistical Methodology – Stewart Creek Sediment” dated May 30, 2019 included under separate cover.

2.0 DETERMINATION OF EXPOSURE AREAS

In order to determine exposure areas within Stewart Creek, Golder reviewed topographic maps, aerial photos, property ownership records (tax assessor maps), and used information obtained during numerous reconnaissance activities performed in Stewart Creek between 2014 and 2017 to assess stream geomorphology, property ownership, type of development in adjacent areas, and/or other physical characteristics or considerations of the Segments (five major stream reaches) of Stewart Creek. The Segments are described below:

- Segment 1 - Exide Property
- Segment 2 - From the BNSF Railroad Bridge to Dallas North Tollway Bridges
- Segment 3 - Dallas North Tollway Bridges to Stonebrook Parkway
- Segment 4 - Stonebrook Parkway to the U.S. Army Corp of Engineers Property
- Segment 5 - U.S. Army Corp of Engineers Property

Based on this review, the portions of Stewart Creek requiring EPC sampling were separated into sixteen Exposure Areas. The Exposure Areas are depicted on Figures 2-1 through 2-5. The Exposure Areas within each Segment of Stewart Creek are described below and briefly summarized in Table 1.

2.1 Segment 1 – On-Site Exide FOP

There are no exposure areas designated on-Site at the Exide FOP because it is presumed that sediment in this area will be removed as described in the RAP (see Figure 2-1)

2.2 Segment 2 – Exide FOP to Upstream of Dallas North Tollway

There are no exposure areas designated between the Exide FOP and Dallas North Tollway because it is presumed that sediment in this area will be removed as described in the RAP (see Figure 2-2).

2.3 Segment 3 – Upstream of Dallas North Tollway to Stonebrook Parkway

2.3.1 Exposure Area 1 – Dallas North Tollway Bridge and Pipeline

Exposure Area 1 (EA-1) includes the area under the Dallas North Tollway Bridge and the area immediately downstream where an active gas utility line is located. In this area, significant erosion was observed with limited natural habitat. There were very few exceedances of PCLs observed in sediment samples previously collected in this Exposure Area.

Photos 1 and 2 – View under Dallas North Tollway Bridge and gas utility line downstream of Dallas North Tollway Bridge.

2.3.2 Exposure Area 2 – Grand Park Area A

EA-2 is characterized by a relatively straight portion of Stewart Creek from downstream of the Dallas North Tollway Bridge to the point where the Stewart Creek starts to turn more southward. This Exposure Area is located within the proposed Grand Park area and was observed to have a consistent stream base throughout. There were very few exceedances of PCLs observed in sediment samples previously collected in this Exposure Area and a limited number of slag or battery case fragments were observed during Interim Actions performed in 2014 and 2016.

2.3.3 Exposure Area 3 – Grand Park Area B

EA-3 is also located within the proposed Grand Park area and includes a broad meander of Stewart Creek between EA-2 and the predetermined excavation area downstream to the south. A change in stream hydraulics is observed in this area. There were very few exceedances of PCLs observed in sediment samples previously collected in this Exposure Area and a limited number of slag or battery case fragments were observed during Interim Actions performed in 2014 and 2016.

2.4 Segment 4 – Stonebrook Parkway to Upstream of USACE Property

2.4.1 Exposure Area 4 – Stonebrook to Legacy A

EA-4 is located downstream from the predetermined excavation area on Grand Park and extends approximately halfway of the distance between Stonebrook Parkway and Legacy Drive to upstream of the confluence of a tributary to Stewart Creek. The area contains a deep pool (at the 1st left hand bend, looking downstream), tight brush, minor stream braiding with exposed gravel beds. The open land area to the west of the creek has recently been used as a staging and construction area for others.

2.4.2 Exposure Area 5 – Stonebrook to Legacy B

EA-5 is located downstream of the confluence of the tributary to Stewart Creek and extends to Legacy Drive. EA-5 is primarily defined by the large right-hand (looking downstream) bend with significant exposed cut-bank. This area has been structurally re-enforced by a gabion wall. . Downstream of the existing gabion wall on the south bank of the right-hand bend, erosion is occurring with bank sloughing. As with EA-4, the land area to the west has been recently used as a staging and construction area by others.

Photo 3 – Aerial Photo obtained from Google Earth with view of gabion wall, tight meanders and bank sloughing below football field.

2.4.3 Exposure Area 6 – Legacy to 4th Army A

EA-6 extends from Legacy Drive approximately 0.25 mile downstream and includes a large right-hand (looking downstream) meander with a significant cut bank on the south side. This area is also structurally supported by a gabion wall. Downstream of which bank sloughing can be observed. On the inside of the meander bend is a low-lying grass vegetation on the north side. The stream widens within the bend and contains a small island-like deposition body that supports vegetation. Just downstream of the island feature, the stream has a stretch of exposed bedrock.

Photos 4 and 5 – Aerial Photo obtained from Google Earth with view of gabion wall and bank sloughing, exposed bedrock and significant under-cut bank.

2.4.4 Exposure Area 7 - Legacy to 4th Army B

EA-7 is a 0.15 mile portion of Stewart Creek located farther downstream from EA-6, and is characterized by dense woody vegetation and a tightly meandering stream. Numerous sediment bodies occur on the inside (low velocity area) of the meanders.

2.4.5 Exposure Area 8 - Legacy to 4th Army C

EA-8 is characterized as a gentle broad left-hand meander (looking downstream) followed by a relatively straight stretch. The exposure area contains a similar woody vegetation with a consistently incised channel. It is approximately 0.3 mile long.

2.4.6 Exposure Area 9 - Legacy to 4th Army D

This approximately 0.25 mile long Exposure Area includes a series of 3 meanders with active erosion on the cut-bank side of the larger left-hand (looking downstream) meander and contains a large island-like deposition body that supports vegetation. Just downstream of the island feature, the creek is heavily vegetated and incised.

2.4.7 Exposure Area 10 - Legacy to 4th Army E

EA-10 is a straight section north to south through wooded vegetation to utility lines. This Exposure Area receives storm water from at least three outfalls from recent construction activities to the west. This Exposure Area extends to the point upstream of a confluence with a tributary to Stewart Creek entering on the east side of the creek, near to the south side of a utility corridor.

2.4.8 Exposure Area 11 - Legacy to 4th Army F

EA-11 is a straight east-west section of Stewart Creek from the confluence of a tributary to Stewart Creek approximately 0.35 miles downstream and includes an area with woody vegetation. It is located south of a relatively new residential development, and runs parallel to a utility corridor. Along this relatively homogenous stretch, the creek is incised with good vegetation on the stream banks. At the upstream end of EA-11 is a larger (~150 foot long) cut bank undergoing active erosion on the south side of the creek.

Photo 6 - Aerial Photo obtained from Google Earth with view of cut-bank erosion.

2.4.9 Exposure Area 12 - Legacy to 4th Army G

EA-12 is located south of new residential development, north of a wastewater treatment plant (WWTP) and is characterized by a tight meander and broad meander in dense woody vegetation. It is noted that there were no lead or cadmium PCL exceedances (and very few arsenic PCL exceedances) within this Exposure Area based on sampling performed between 2014 and 2017 (see Figures 1A-4 through 1A-6 presented in the August 2017 RAP).

2.4.10 Exposure Area 13 - Legacy to 4th Army H

This portion of Stewart Creek flows along the WWTP and includes the outfall from the WWTP and, ends at 4th Army Drive. It is noted that there were no lead or cadmium PCL exceedances (and very few arsenic PCL exceedances) within this Exposure Area based on sampling performed between 2014 and 2017 (see Figures 1A-4 through 1A-6 presented in the August 2017 RAP).

2.4.11 Exposure Area 14 – 4th Army to Lebanon

This Exposure Area runs between 4th Army Drive and Lebanon Road. It is noted that there were no lead or cadmium PCL exceedances (and very few arsenic PCL exceedances) within this Exposure Area based on sampling performed between 2014 and 2017 (see Figures 1A-4 through 1A-6 presented in the August 2017 RAP).

2.5 Segment 5 – USACE Property

2.5.1 Exposure Area 15 – USACE Area A

EA-15 is located on property owned by the United States Army Corps of Engineers (USACE). This Exposure Area is located from downstream of Lebanon Road to upstream of the confluence of a tributary to Stewart Creek. In general, this portion of the USACE property is shallower and the stream channel is narrower than the area downstream. It is noted that there were no lead or cadmium PCL exceedances (and very few arsenic PCL exceedances) within this Exposure Area based on sampling performed between 2014 and 2017 (see Figures 1A-4 through 1A-6 presented in the August 2017 RAP).

2.5.2 Exposure Area 16 – USACE Area B

EA-16 is also located on property owned by the USACE. This Exposure Area is located from downstream of the confluence of a tributary to Stewart Creek to Lake Lewisville. In general, this portion Stewart Creek on the USACE property is shallower broader than the upstream area. It is noted that there were no lead or cadmium PCL exceedances (and very few arsenic PCL exceedances) within this Exposure Area based on sampling performed between 2014 and 2017 (see Figures 1A-4 through 1A-6 presented in the August 2017 RAP).

3.0 FIELD PROCEDURES

3.1 Health and Safety

This work will be performed under a Site-Specific Health and Safety Plan (HASP), in accordance with OSHA regulation 29 CFR 1910.120. Each subcontractor will be responsible for their own health and safety program. This work will be conducted using Level D Protection. All Golder and other subcontracted personnel working on this Site who may be potentially exposed to hazardous materials will have successfully completed 40-hour HAZWOPER training.

All personnel working on-Site will need to complete pre-mobilization medical monitoring required by the Occupational Safety and Health Administration (OSHA) lead standard. All personnel working on-Site will need to provide documentation that they are medically cleared to use respirators, and have a fit test completed; unless Golder (or other subcontractors) provides rationale for not wearing respirators during on-Site work. All contaminated clothing and personal protective equipment will be disposed of or cleaned as appropriate before leaving the Site. Contaminated investigation derived waste (IDW) must be disposed of in client-provided containers on-Site, sampled, and profiled for disposal.

3.2 Site Access

Following completion of excavation of pre-determined excavation areas, and prior to mobilization to the field to areas not included in the pre-determined excavation activities, Golder will assemble property owner information, prepare access agreements, and coordinate access to properties within the EPCS areas. If no response is received from the property owner, or access is denied, Golder and Exide will request assistance from TCEQ as needed. In order to efficiently evaluate the areas, it is anticipated that the field portion of the assessment activities will not be started until access for the entire stretch of the creek is obtained.

3.3 Site Walk/Confirmation of Exposure Areas

Once access is obtained, Golder will perform reconnaissance of the Exposure Areas by walking or viewing the Exposure Areas from accessible areas to confirm that the designated breaks between Exposure Areas are still appropriate and to note any significant changes in the characteristics of Stewart Creek.

3.4 Exposure Point Concentration Area Sampling

3.4.1 Sample Location Selection

Once Exposure Areas are confirmed, Golder will begin sampling of each EA where all upstream excavation of pre-determined excavation areas have been completed. At least 20 representative locations will be identified for sediment sampling from each of the EPCS Exposure Areas. Samples will be collected using a stainless steel spoon or shovel, a ponar dredge, a sampling jar, or with a nitrile gloved hand. Description

of the sample will be recorded on field forms and within the field log book for depth of sediment collected, odor, observation of sheen, color, description of sediment (i.e., fine, coarse), and texture. Debris such as sticks and rocks will be removed from the sample. Sediment will be placed immediately into the laboratory-supplied sample jars specific to the desired analyses. Should samples be split among other parties, the sediment will first be placed into plastic bags, homogenized, and then placed into the laboratory-supplied sample jars specific to the desired analyses.

If encountered, the location of slag or battery case fragments will be recorded and the slag or battery case fragments will be removed and transported to the FOP for containerization (if they can be removed by hand). The material will be stored in 55-gallon drums, characterized, and disposed of in a facility authorized to accept the material. Waste characterization procedures will be included in the Waste Analysis Plan (WAP) that will be submitted as an attachment to the RCRA Permit Renewal Application.

3.4.2 Container and Labels

The analytical testing laboratory will provide containers and appropriate container lids. The containers will be filled, and container lids will be tightly closed. The following information will be legibly and indelibly written on the label:

- Project identification
- Sample identification
- Location
- Name or initials of collector
- Date and time of collection
- Analysis requested
- Sample preservative, if applicable

3.4.3 Chain-of-Custody Control

After samples have been collected, chain-of-custody procedures will be followed to establish a written record of sample movement between the sampling site and the testing laboratory.

3.4.4 Sample Shipment

Samples awaiting shipment to the laboratory will be stored in a cooler or similar container. Once a set of samples is ready for shipment, the samples will be packed in a manner that will not cause breakage during shipment (i.e., packing paper or plastic wrap). Completed chain-of-custody forms will be inserted into a plastic sleeve and placed inside the sample shipment container. The cooler will be labeled with the sample collector's name, address, and telephone number; the laboratory's name, address, and telephone number; and the date of shipment. The cooler will be sealed with a chain-of-custody seal and signed and dated by the sampler before shipment.

3.5 Laboratory Analytical Program

Following collection, samples will be shipped to ALS's Houston, Texas laboratory. Samples will be analyzed for total lead, cadmium, and arsenic by EPA method 6020.

3.6 Decontamination

In accordance with TCEQ (2012), sampling equipment will be cleaned with native water between sampling locations.

4.0 QUALITY ASSUARNCE/QUALITY CONTROL

Field procedures, including sediment sampling, collection of quality assurance and quality control (QA/QC) samples, and decontamination will also be conducted in accordance with industry standard practices. All pertinent sampling information and other associated field activities will be recorded in a field logbook or on field forms. Samples will be handled under appropriate chain-of-custody documentation and procedures.

To confirm the accuracy and reproducibility of the laboratory analytical results, the analytical laboratory will implement a program, including laboratory replicate samples, method blanks and control standards. The laboratory QA/QC data generated during the sample analysis will be included in the laboratory analytical reports provided to Golder.

Field QA/QC protocols will include:

- One field duplicate sample will be collected for every 20 field samples collected.

Once the analytical data is received from the laboratory, the laboratory report will be reviewed for any narratives or comments indicating qualified data. Any qualified data will be closely evaluated with the laboratory. Next, the data will be reviewed for results in expected ranges. Anomalous results will be noted for additional review. The laboratory quality control report will also be reviewed to note any qualified data or other indications of anomalous runs. The data will then be deemed validated as appropriate. A Data Usability Summary (DUS) will be prepared in accordance with Texas Risk Reduction Program (TRRP) 13 guidance.

5.0 CALCULATION OF EPCS

Following the receipt and validation of all data, the EPC will be calculated for each Exposure Area in accordance with Appendix 7 of the RAP (dated May 2019, submitted under separate cover). The EPC will then be used to determine which Exposure Areas will require excavation as part of the response action.

6.0 SCHEDULE AND REPORTING

Implementation of the EPCSWP will begin following the completion of response action activities for portions of Stewart Creek identified in the RAP as pre-determined excavation areas (also shown on Figure 2-1 through Figure 2-3). It is anticipated that following response action activities at the FOP, field activities can be initiated within 2-4 weeks, pending access agreements and weather. Field work is anticipated to take approximately one week for reconnaissance, two weeks for sampling, and two weeks for EPC/UCL determinations following receipt of final analytical data packages.

If there are any proposed changes to the Exposure Areas identified in this EPCSWP following the initial reconnaissance (described in Section 3.3), Golder will contact TCEQ within one week of completion of the field reconnaissance to discuss the proposed changes.

Golder will compose and submit an EPCS Summary Report to TCEQ within 6 weeks following the completion of field work and receipt of all final analytical data packages. The EPCS Summary Report will include descriptions of Site activities, tabulated data, appendices containing all “raw” data (e.g. field forms, laboratory analytical data forms), EPC/UCL calculations, and a discussion of Exposure Areas designated for a response action, if any.

7.0 REFERENCES

The following references were used in the preparation of this Stewart Creek EPCS Work Plan.

Environmental Protection Agency (EPA), 2002. Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites, Office of Emergency and Remediation Response, United States Environmental Protection Agency, Washington, D.C. 20460, December 2002.

Exide, 2013a. Affected Property Assessment Report (APAR), Exide Technologies Frisco Recycling Center, Frisco, Texas, July 8, 2013.

Exide, 2013b. Response to TCEQ and EPA Comments on Affected Property Assessment Report (APAR) and Tier 2 Screening Level Ecological Risk Assessment (SLERA) for the Former Operating Plant, Exide Technologies Frisco Recycling Center, Frisco, Texas, October 29, 2013.

Exide, 2017. Exide's Frisco Recycling Center Permit Renewal Application with a Major Amendment and Compliance Plan, 7471 Fifth Street, Frisco, Texas 75034-5047, August 1, 2017.

Golder, 2013. Interim Action Work Plan, Slag and Battery Case Fragment Removal and Disposal, Exide Frisco Recycling Facility, 7471 5th Street, Frisco, Texas 75034-5047, November 7, 2013.

Golder, 2015. Request To Modify Interim Action Work Plan, Exide Frisco Recycling Center – Frisco, Texas, October 5, 2015.

TCEQ, 2012. Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods. RG-415.

TCEQ, 2013a. Comments to the Affected Property Assessment Report (APAR) and the Tier 2 Screening Level Ecological Risk Assessment (SLERA) for the Former Operating Plant, dated July 9, 2013, Request for a Revised APAR, Exide Frisco Facility, 7471 5th St., Frisco, TX 75034-5047, October 8, 2013.

TCEQ, 2013b. Conditional Approval of Interim Action Work Plan, Slag and Battery Case Fragment Removal and Disposal, Exide Frisco Recycling Facility, 7471 5th Street, Frisco, Texas 75034-5047, December 17, 2015.

TCEQ, 2014. Email RE: Changes to Interim Action Work Plan. From Gary Beyer of TCEQ to Exide Technologies, Baker Botts, and Golder Associates, May 5, 2014.

TCEQ, 2015. Approval – Request to Modify Interim Action Work Plan, dated October 5, 2015, Exide Frisco Recycling Facility, 7471 5th Street, Frisco, Texas 75034-5047, December 16, 2015.

W&M, 2013a. Interim Action Work Plan, Slag and Battery Case Fragment Removal and Disposal, Exide Frisco Recycling Facility, 7471 5th Street, Frisco, Texas 75034-5047, April 29, 2013.

8.0 CLOSING

Golder appreciates the opportunity to assist Exide with this project. Please contact the undersigned if you have any questions or would like any additional information about this work plan.

GOLDER ASSOCIATES INC.

Emily White

Emily P. White
Project Geological Engineer

Anne Faeth-Boyd

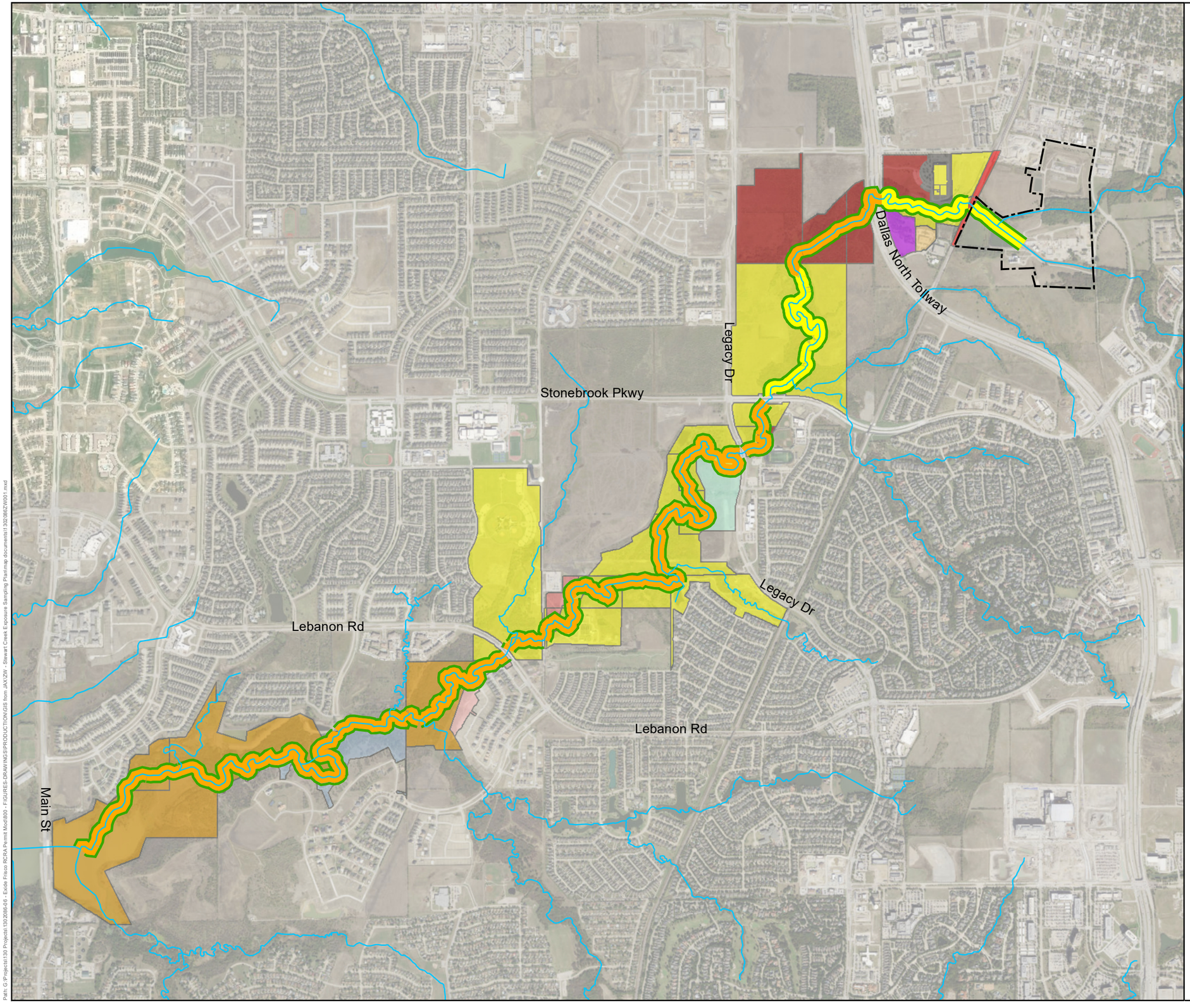
Anne M. Faeth-Boyd, P.G.
Associate and Senior Engineer

Todd H. Rees

Todd H. Rees, Ph.D., P.E. (New Jersey)
Program Leader

EPW/AMF/THR

FIGURES



LEGEND

- Creek Centerline
- Predetermined Excavation
- Exposure Point Concentration Sampling
- Former Operating Plant Property Boundary
- Artistry Senior Residences at Edgestone
- Bellevue Partners Ltd & Stewart Creek International Investors LP
- Burlington Northern Santa Fe RR Co Property Tax Department
- City of Frisco
- Frisco Community Development Corp (City of Frisco)
- GGH Kingswood Lots LLC
- Meritage Homes of Texas
- Oncor Electric Delivery Company
- Owner Unknown
- Pirwig Properties LLC
- USACE

STATE OF TEXAS
ANNE M FAETH-BOYD
GEOLOGY
12300
Anne Faeth-Boyd 5-28-19
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PROFESSIONAL GEOSCIENTIST

REFERENCE

1. SITE FEATURES - GOLDER, 2014 AND 2016
2. TAX PARCEL DATA - COLLIN COUNTY, DENTON COUNTY, CITY OF FRISCO, 2019.
3. AERIAL IMAGERY - SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS,

0.35 0.175 0 0.35 Miles

CLIENT
EXIDE TECHNOLOGIES

PROJECT
STEWART CREEK EXPOSURE POINT CONCENTRATION SAMPLING PLAN

TITLE
SEDIMENT EXCAVATION AND EXPOSURE POINT CONCENTRATION SAMPLING OVERVIEW MAP

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-08
PREPARED	SJS
DESIGN	SJS
REVIEW	EPW/THR
APPROVED	AMF

PROJECT No.	CONTROL	Rev.	FIGURE
13-0208606	1302086ZW001.mxd	0	1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI B

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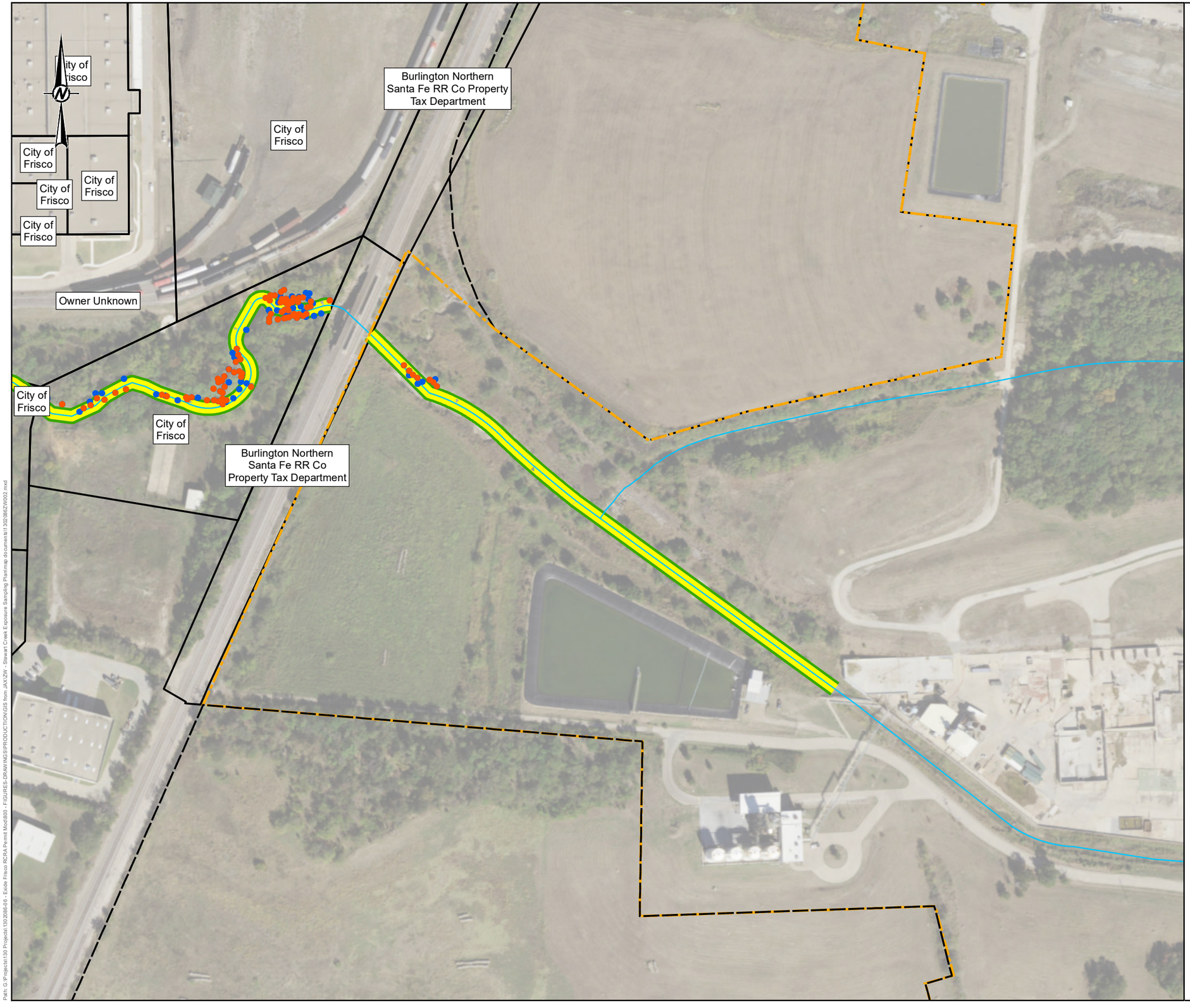

LEGEND

- No Exceedance
- Exceedance of PCL for Lead, Cadmium or Arsenic
- Creek Centerline
- Predetermined Excavation Area
- Former Operating Plant Property Boundary
- Former Undeveloped Buffer Property
- Property Boundary

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NOTES
1. CREEK WIDTH FOR PURPOSES OF PLANNING SEDIMENT EXCAVATION IS ASSUMED TO BE 34 FEET IN THIS SEGMENT BASED ON OBSERVATIONS MADE BY GOLDER AND THE CITY OF FRISCO.

REFERENCE
1. SITE FEATURES - GOLDER, 2014
2. TAX PARCEL DATA - COLLIN COUNTY, DENTON COUNTY, CITY OF FRISCO, 2019.
3. AERIAL IMAGERY - SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

200 100 0 200
Feet

CLIENT
EXIDE TECHNOLOGIES

PROJECT
STEWART CREEK EXPOSURE POINT CONCENTRATION SAMPLING PLAN

TITLE
SEDIMENT EXCAVATION AND EXPOSURE POINT CONCENTRATION SAMPLING MAP

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-28
PREPARED	SJS
DESIGN	SJS
REVIEW	EPW/THR
APPROVED	AMF

PROJECT No.	CONTROL	Rev.	FIGURE
13-0208606	1302086ZW002.mxd	0	**2-1**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI B

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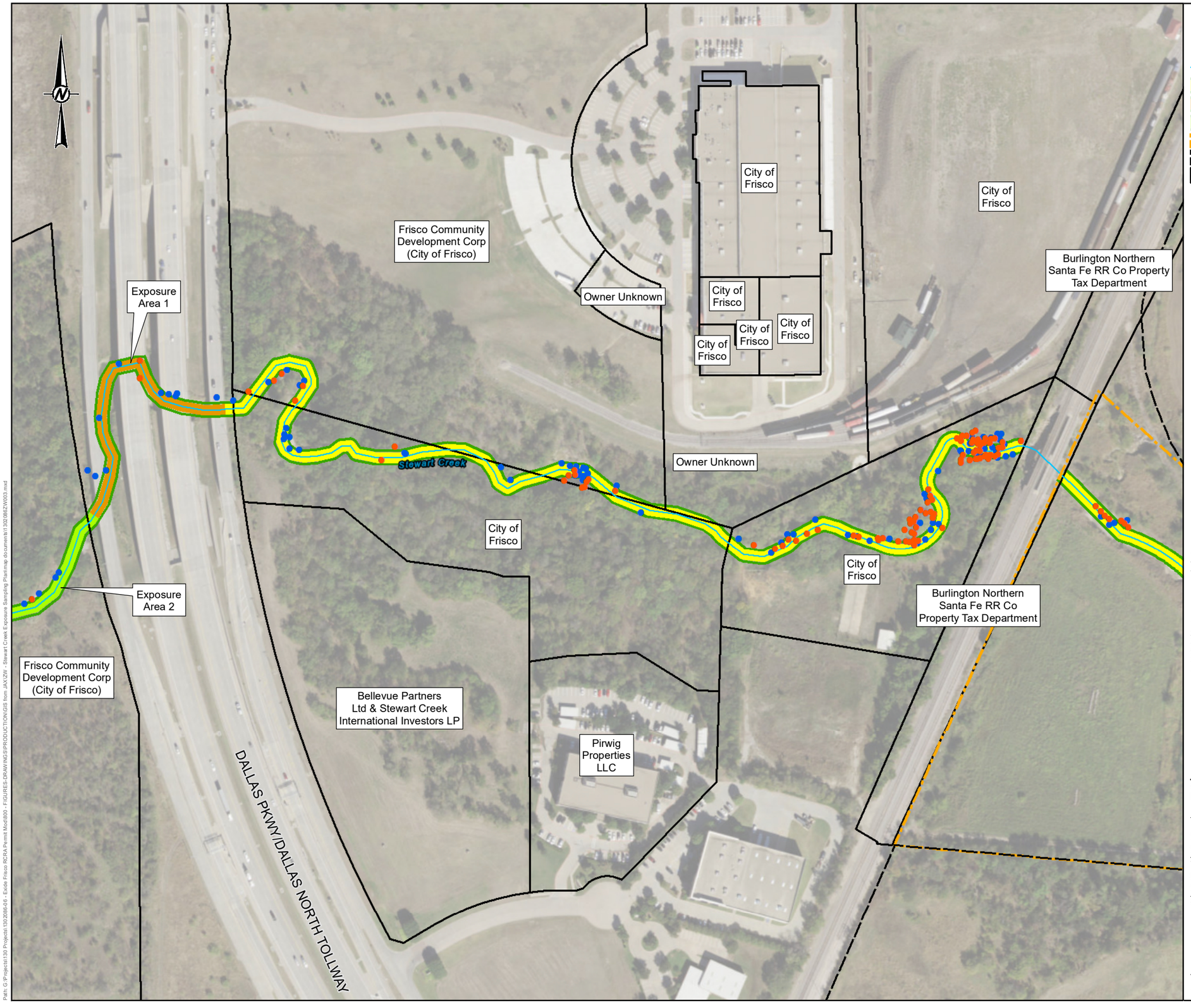

LEGEND

- No Exceedance
- Exceedance of PCL for Lead, Cadmium or Arsenic
- Creek Centerline
- Predetermined Excavation Area
- Exposure Point Concentration Sampling Segment 1
- Exposure Point Concentration Sampling Segment 2
- Former Operating Plant Property Boundary
- Former Undeveloped Buffer Property
- Property Boundary

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NOTES
1. CREEK WIDTH FOR PURPOSES OF PLANNING SEDIMENT EXCAVATION IS ASSUMED TO BE 31 FEET IN THIS SEGMENT BASED ON OBSERVATIONS MADE BY GOLDER AND THE CITY OF FRISCO.

REFERENCE
1. SITE FEATURES - GOLDER, 2014
2. TAX PARCEL DATA - COLLIN COUNTY, DENTON COUNTY, CITY OF FRISCO, 2019.
3. AERIAL IMAGERY - ESRI, HERE, DELORME, MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

200 100 0 200
Feet

CLIENT
EXIDE TECHNOLOGIES

PROJECT
STEWART CREEK EXPOSURE POINT CONCENTRATION SAMPLING PLAN

TITLE
SEDIMENT EXCAVATION AND EXPOSURE POINT CONCENTRATION SAMPLING MAP - SITE TO TOLLWAY

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-28
PREPARED	SJS
DESIGN	JWT
REVIEW	EPW/THR
APPROVED	AMF

PROJECT No. 13-0208606 | CONTROL 1302086ZW003.mxd | Rev. 0 | FIGURE **2-2**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI B

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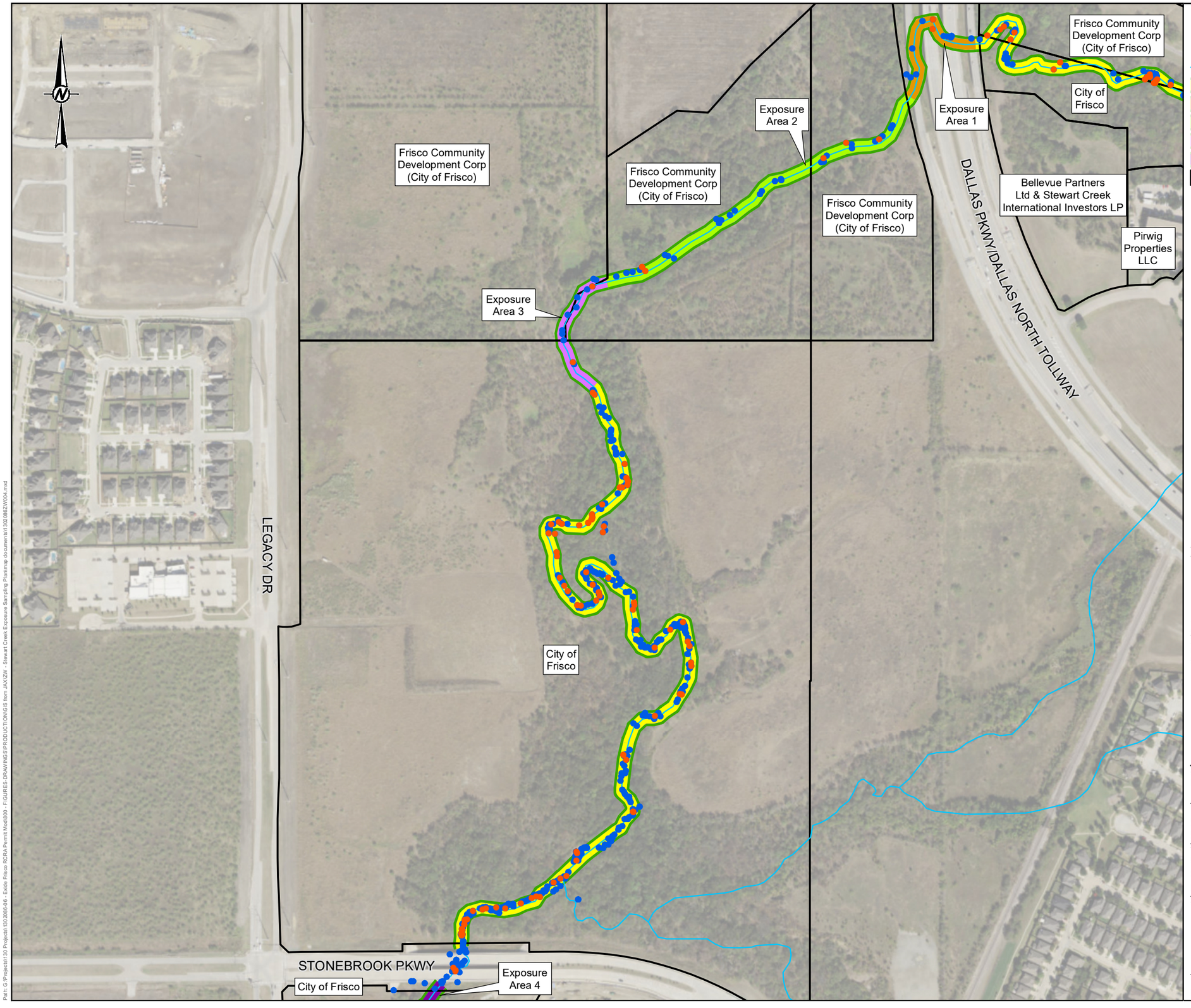

LEGEND

- No Exceedance
- Exceedance of PCL for Lead, Cadmium or Arsenic
- Creek Centerline
- Predetermined Excavation Area
- Exposure Point Concentration Sampling Exposure Area 1
- Exposure Point Concentration Sampling Exposure Area 2
- Exposure Point Concentration Sampling Exposure Area 3
- Exposure Point Concentration Sampling Exposure Area 4
- Property Boundary

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NOTES

1. CREEK WIDTH FOR PURPOSES OF PLANNING SEDIMENT EXCAVATION IS ASSUMED TO BE 26 FEET IN THIS SEGMENT BASED ON OBSERVATIONS MADE BY GOLDER AND THE CITY OF FRISCO.

REFERENCE

1. SITE FEATURES - GOLDER, 2014
2. TAX PARCEL DATA - COLLIN COUNTY, DENTON COUNTY, CITY OF FRISCO, 2019.
3. AERIAL IMAGERY - SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

400 200 0 400
Feet

CLIENT
EXIDE TECHNOLOGIES

PROJECT
STEWART CREEK EXPOSURE POINT CONCENTRATION SAMPLING PLAN

TITLE
SEDIMENT EXCAVATION AND EXPOSURE POINT CONCENTRATION SAMPLING MAP - DALLAS NORTH TOLLWAY BRIDGES TO STONEBROOK PARKWAY

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-28
PREPARED	SJS
DESIGN	SJS
REVIEW	EPW/THR
APPROVED	AMF

PROJECT No.	CONTROL	Rev.	FIGURE
13-0208606	1302086ZW004.mxd	0	**2-3**

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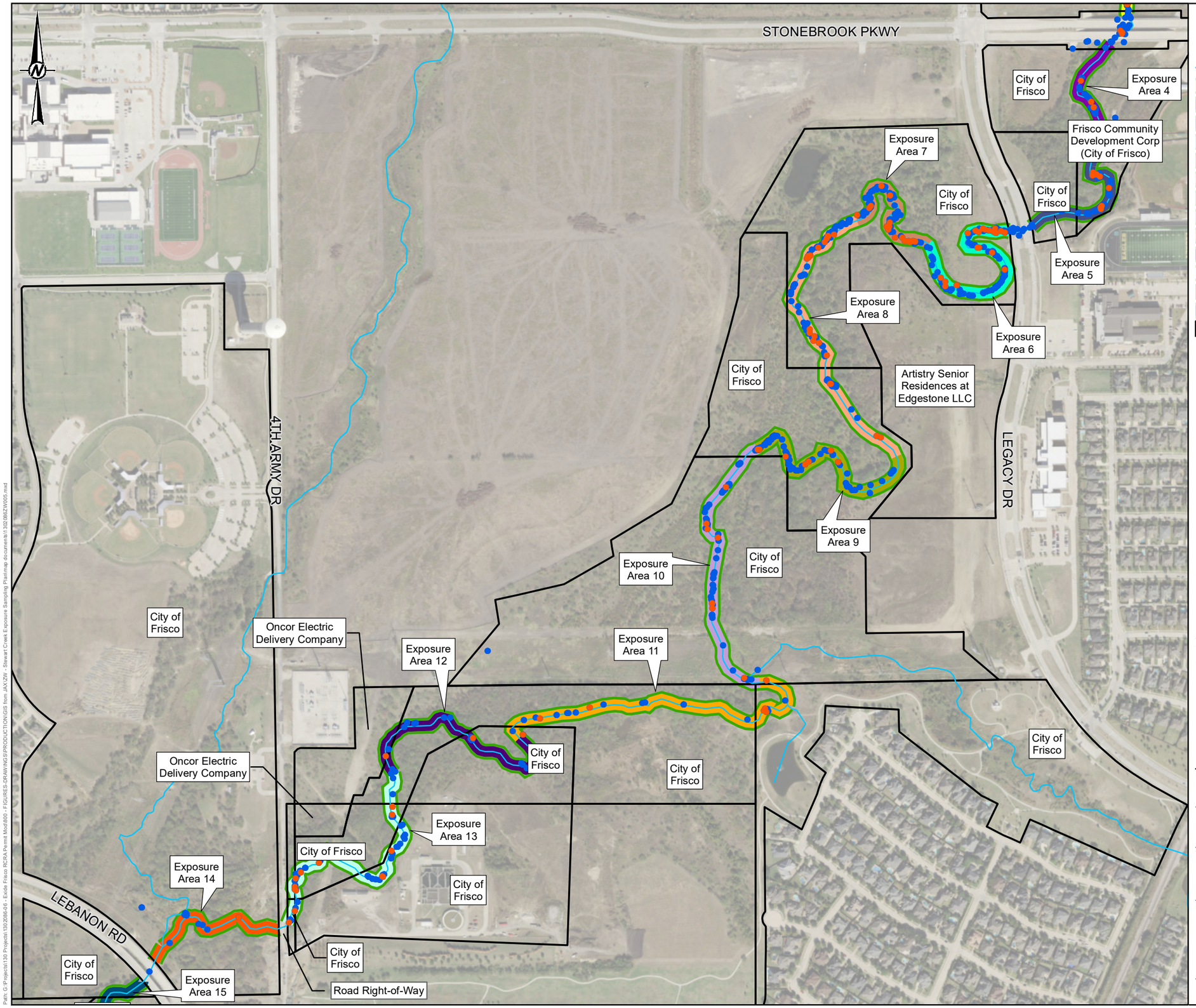

LEGEND

- No Exceedance
- Exceedance of PCL for Lead, Cadmium or Arsenic
- Creek Centerline
- Predetermined Excavation Area
- Exposure Point Concentration Sampling Exposure Area 4
- Exposure Point Concentration Sampling Exposure Area 5
- Exposure Point Concentration Sampling Exposure Area 6
- Exposure Point Concentration Sampling Exposure Area 7
- Exposure Point Concentration Sampling Exposure Area 8
- Exposure Point Concentration Sampling Exposure Area 9
- Exposure Point Concentration Sampling Exposure Area 10
- Exposure Point Concentration Sampling Exposure Area 11
- Exposure Point Concentration Sampling Exposure Area 12
- Exposure Point Concentration Sampling Exposure Area 13
- Exposure Point Concentration Sampling Exposure Area 14
- Exposure Point Concentration Sampling Exposure Area 15
- Property Boundary

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NOTES

1. CREEK WIDTH FOR PURPOSES OF PLANNING SEDIMENT EXCAVATION IS ASSUMED TO BE 20 FEET IN THIS SEGMENT BASED ON OBSERVATIONS MADE BY GOLDER AND THE CITY OF FRISCO.

REFERENCE

1. SITE FEATURES - GOLDER, 2014
2. TAX PARCEL DATA - COLLIN COUNTY, DENTON COUNTY, CITY OF FRISCO, 2019.
3. AERIAL IMAGERY - SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

500 250 0 500
Feet

CLIENT
EXIDE TECHNOLOGIES

PROJECT
STEWART CREEK EXPOSURE POINT CONCENTRATION SAMPLING PLAN

TITLE
SEDIMENT EXCAVATION AND EXPOSURE POINT CONCENTRATION SAMPLING MAP - STONEBROOK TO LEBANON/USACE PROPERTY

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-28
PREPARED	SJS
DESIGN	SJS
REVIEW	EPW/THR
APPROVED	AMF

PROJECT No. 13-0208606 | CONTROL 1302086ZW005.mxd | Rev. 0 | FIGURE **2-4**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI B
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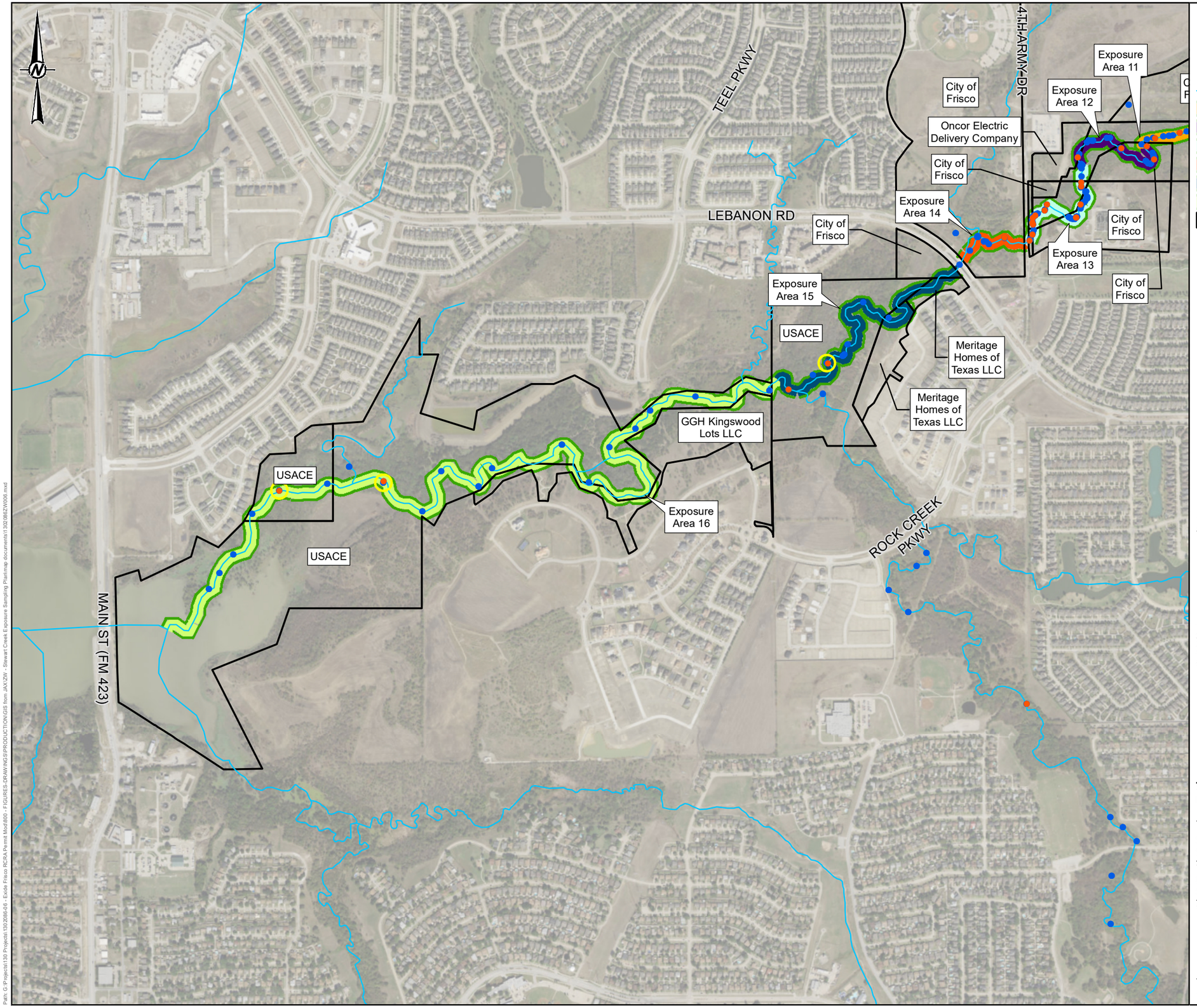

LEGEND

- Resampled Location (See Note 1)
- No Exceedance
- Exceedance of PCL for Lead, Cadmium or Arsenic
- Creek Centerline
- Exposure Point Concentration Sampling Exposure Area 11
- Exposure Point Concentration Sampling Exposure Area 12
- Exposure Point Concentration Sampling Exposure Area 13
- Exposure Point Concentration Sampling Exposure Area 14
- Exposure Point Concentration Sampling Exposure Area 15
- Exposure Point Concentration Sampling Exposure Area 16
- Property Boundary

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NOTES

1. 2014 SAMPLES 2014-SED-051, 2014-SED-053, AND 2016-IASED-003 WERE RESAMPLED AS 2017-SED-010, 2017-SED-011, AND 2017-SED-012, RESPECTIVELY. THE 2014 RESULTS EXCEEDED THE PCL. THE 2017 CONFIRMATION SAMPLES RESULTS WERE BELOW THE PCL.

REFERENCE

1. SITE FEATURES - GOLDER, 2014
2. TAX PARCEL DATA - COLLIN COUNTY, DENTON COUNTY, CITY OF FRISCO, 2019.
3. AERIAL IMAGERY - SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

1,000 500 0 1,000 Feet

CLIENT
EXIDE TECHNOLOGIES

PROJECT
STEWART CREEK EXPOSURE POINT CONCENTRATION SAMPLING PLAN

TITLE
SEDIMENT EXCAVATION AND EXPOSURE POINT CONCENTRATION SAMPLINE MAP - USACE PROPERTY

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-08
PREPARED	SJS
DESIGN	SJS
REVIEW	EPW/THR
APPROVED	AMF

PROJECT No. 13-0208606 | CONTROL 1302086ZW006.mxd | Rev. 0 | FIGURE **2-5**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI B

1 in
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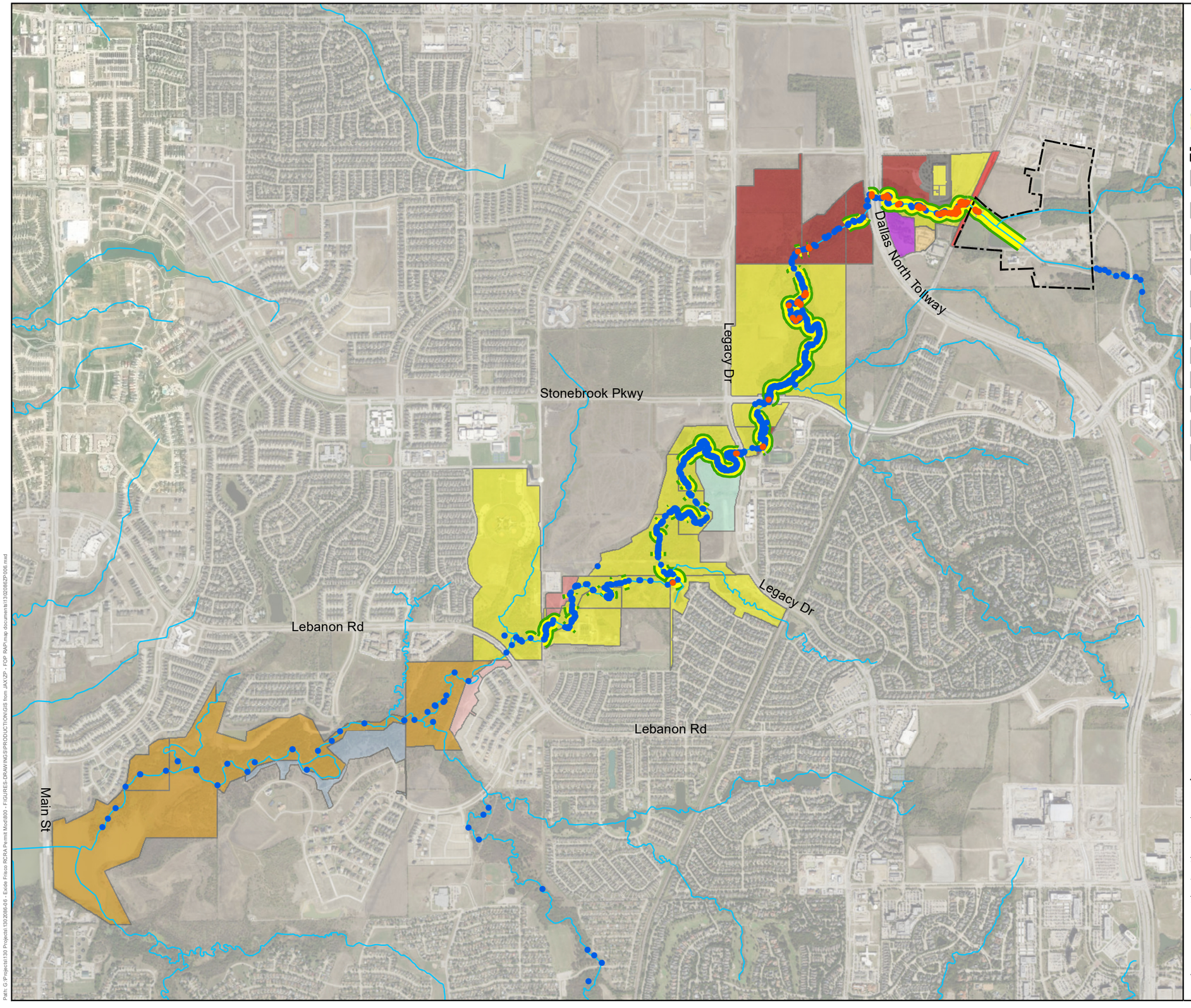
APPENDIX A

FIGURES 1A-4 THROUGH 1A-6 AS PRESENTED IN THE MAY 2019 RESPONSE ACTION PLAN



LEGEND

- Sediment Sample (No Exceedance)
- Sediment Sample (Exceedance)
- Creek Centerline
- Affected Property No.8 - Stewart Creek Sediments
- Former Operating Plant Property Boundary
- Artistry Senior Residences at Edgestone
- Bellevue Partners Ltd & Stewart Creek International Investors LP
- Burlington Northern Santa Fe RR Co
- City of Frisco
- Frisco Community Development Corp (City of Frisco)
- GGH Kingswood Lots LLC
- Meritage Homes of Texas LLC
- Oncor Electric Delivery Company
- Owner Unknown
- Pirwig Properties LLC
- USACE

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5-28-19

NOTES

1. SEDIMENT SAMPLE LOCATIONS INCLUDE THOSE COLLECTED BY GOLDER (2014 THROUGH 2017).
2. PROPERTY INFORMATION UPDATED FROM COLLIN AND DENTON COUNTY APPRAISAL DISTRICT WEBSITES, MAY 2019.

REFERENCE

1. SITE FEATURES - GOLDER, 2014 AND 2016
2. AERIAL IMAGERY - SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

0.35 0.175 0 0.35 Miles

CLIENT
EXIDE TECHNOLOGIES

PROJECT
EXIDE TECHNOLOGIES FORMER OPERATING PLANT RESPONSE ACTION PLAN

TITLE
AFFECTED PROPERTY AND PCLE ZONE MAP - LEAD EXCEEDANCES IN SEDIMENT

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-28
PREPARED	EFT
DESIGN	AM
REVIEW	EPW
APPROVED	AMF

PROJECT No.	CONTROL	Rev.	FIGURE
13-0208606	1302086ZP006.mxd	0	**1A-4**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI B

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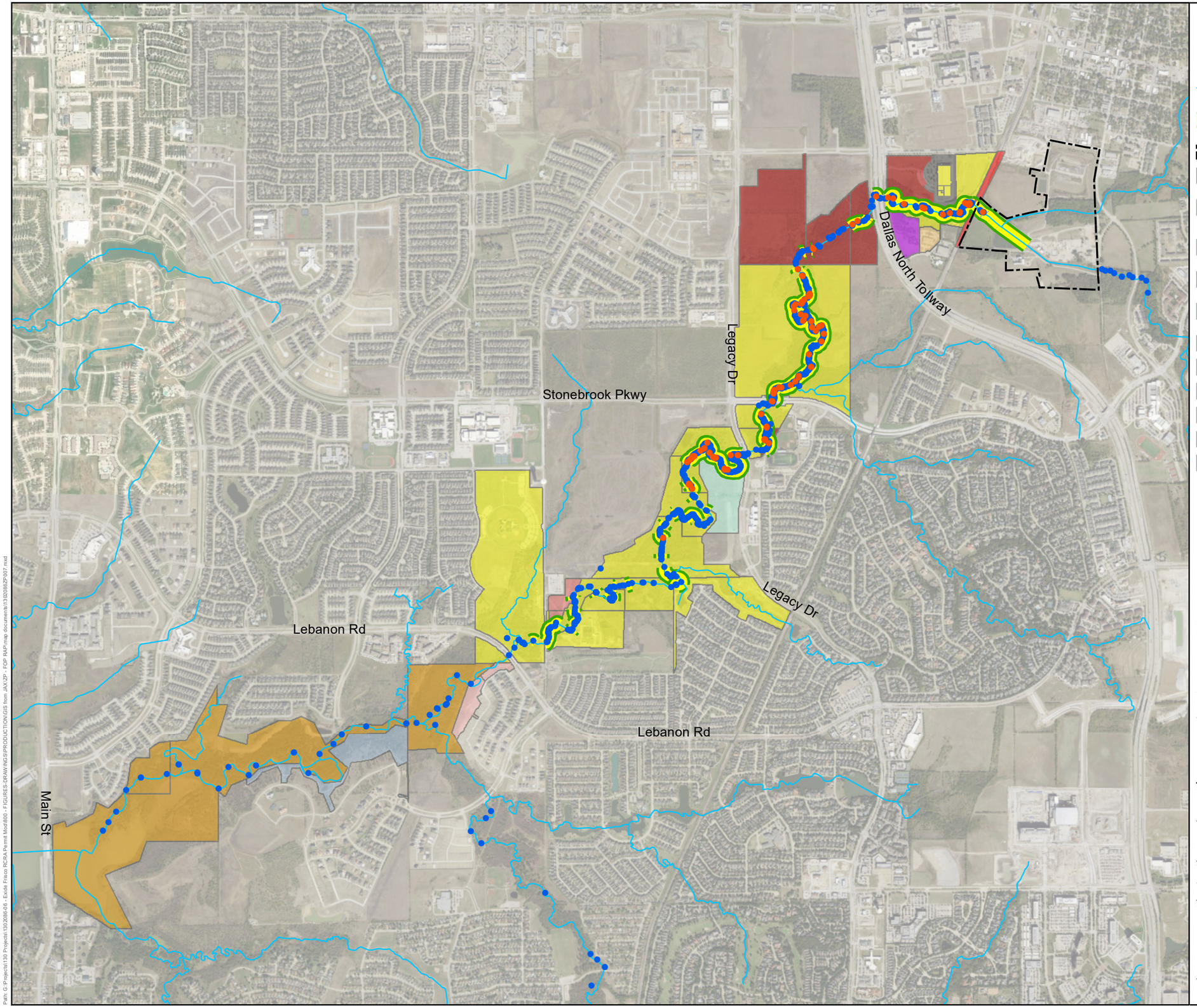

LEGEND

- Sediment Sample (No Exceedance)
- Sediment Sample (Exceedance)
- Creek Centerline
- Affected Property No.8 - Stewart Creek Sediments
- Former Operating Plant Property Boundary
- Artistry Senior Residences at Edgestone LLC
- Bellevue Partners Ltd & Stewart Creek International Investors LP
- Burlington Northern Santa Fe RR Co Property Tax Department
- City of Frisco
- Frisco Community Development Corp (City of Frisco)
- GGH Kingswood Lots LLC
- Meritage Homes of Texas LLC
- Oncor Electric Delivery Company
- Owner Unknown
- Pirwig Properties LLC
- USACE

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NOTES

1. SEDIMENT SAMPLE LOCATIONS INCLUDE THOSE COLLECTED BY GOLDER (2014 THROUGH 2017).
2. PROPERTY INFORMATION UPDATED FROM COLLIN AND DENTON COUNTY APPRAISAL DISTRICT WEBSITES, MAY 2019.

REFERENCE

1. SITE FEATURES - GOLDER, 2014 AND 2016
2. AERIAL IMAGERY - SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

0.35 0.175 0 0.35
Miles

CLIENT
EXIDE TECHNOLOGIES

PROJECT
EXIDE TECHNOLOGIES FORMER OPERATING PLANT
RESPONSE ACTION PLAN

TITLE
AFFECTED PROPERTY AND PCLE ZONE MAP - CADMIUM EXCEEDANCES IN SEDIMENT

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-28
PREPARED	EFT
DESIGN	AM
REVIEW	EPW
APPROVED	AMF

PROJECT No.	CONTROL	Rev.	FIGURE
13-0208606	1302086ZP007.mxd	0	**1A-5**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI B

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Stonebrook Pkwy

Legacy Dr

Dallas North Tollway

Legacy Dr

Lebanon Rd

Lebanon Rd

Main St

LEGEND

- Sediment Sample (No Exceedance)
- Sediment Sample (Exceedance)
- Creek Centerline
- Affected Property No.8 - Stewart Creek Sediments
- Former Operating Plant Property Boundary
- Artistry Senior Residences at Edgestone LLC
- Bellevue Partners Ltd & Stewart Creek International Investors LP
- Burlington Northern Santa Fe RR Co Property Tax Department
- City of Frisco
- Frisco Community Development Corp (City of Frisco)
- GGH Kingswood Lots LLC
- Meritage Homes of Texas LLC
- Oncor Electric Delivery Company
- Owner Unknown
- Pirwig Properties LLC
- USACE

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12300
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5-28-19

NOTES

1. SEDIMENT SAMPLE LOCATIONS INCLUDE THOSE COLLECTED BY GOLDER (2014 THROUGH 2017).
2. PROPERTY INFORMATION UPDATED FROM COLLIN AND DENTON COUNTY APPRAISAL DISTRICT WEBSITES, MAY 2019.

REFERENCE

1. SITE FEATURES - GOLDER, 2014 AND 2016
2. AERIAL IMAGERY - SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

0.35 0.175 0 0.35 Miles

CLIENT
EXIDE TECHNOLOGIES

PROJECT
EXIDE TECHNOLOGIES FORMER OPERATING PLANT RESPONSE ACTION PLAN

TITLE
AFFECTED PROPERTY AND PCLE ZONE MAP - ARSENIC EXCEEDANCES IN SEDIMENT

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-28
PREPARED	EFT
DESIGN	AM
REVIEW	EPW
APPROVED	AMF

PROJECT No.	CONTROL	Rev.	FIGURE
13-0208606	1302086ZP008.mxd	0	**1A-6**

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At Golder Associates we strive to be the most respected global group of companies specializing in ground engineering and environmental services. Employee owned since our formation in 1960, we have created a unique culture with pride in ownership, resulting in long-term organizational stability. Golder professionals take the time to build an understanding of client needs and of the specific environments in which they operate. We continue to expand our technical capabilities and have experienced steady growth with employees now operating from offices located throughout Africa, Asia, Australasia, Europe, North America and South America.

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Golder Associates

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APPENDIX 6.3

PARKWOOD BOULEVARD SOIL MANAGEMENT PLAN

Parkwood Boulevard Soil Management Plan

Exide Frisco Recycling Facility
7471 Old 5th Street, Frisco, Texas 75034-5047
TCEQ SWR No. 30516
TCEQ Hazardous Waste Permit No. HW-50206
TCEQ Agreed Order Docket No. 2011-1712-IHW-E
EPA ID No. TXD006451090
Customer No. CN600129779
Regulated Entity No. RN100218643

Submitted to:

Mr. Brad Weaver
Director, Remediation
Exide Technologies
P.O. Box 250
7471 Old 5th Street
Frisco, TX 75034

Submitted by:

Golder Associates Inc.
13515 Barrett Parkway Drive, Suite 260, Ballwin, Missouri, USA 630211

+1 314 984-8800

130208606

May 2019

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FIGURES

Figure 1 Site Location Map
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Figure 3 Parkwood Boulevard Cap Overview Map
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1.0 INTRODUCTION AND PURPOSE

Golder Associates Inc. (Golder) has prepared this Soil Management Plan (SMP) on behalf of Exide Technologies, Inc. (Exide) for the parcel of land dedicated to the City of Frisco by Exide as public right-of-way, which is developed with a portion of Parkwood Boulevard (Parkwood Parcel or "Site"). The Parkwood Parcel is adjacent to the Exide Former Operating Plant (FOP) located at 7471 Old 5th Street in Frisco, Texas (Figure 1) and also located between portions of the former Exide Undeveloped Buffer Property (UBP), now owned by the Frisco Economic Development Corporation and the Frisco Community Development Corporation. The Parkwood Parcel is located to the east of the FOP. Parkwood Boulevard---i.e., the paved road---runs through the Parkwood Parcel. This SMP provides a summary of existing data and previous soil management activities at the Site and a description of the procedures to be put in place in order to minimize potential risks associated with exposure to known or suspected soil contamination during any future excavation, trenching, or construction activities. This SMP is an Appendix to the FOP Response Action Plan (FOP RAP).

The overall intent of the SMP is to (1) mitigate the potential risks associated with exposure to contaminants in the soil, (2) provide information on soil management procedures during soil disturbance activities to ensure appropriate soil handling and disposal procedures are used at the Site.

This SMP and the procedures herein apply to qualifying projects such as future excavation, trenching, drilling, or construction activities performed within the Parkwood Parcel engineered cap areas. Qualifying projects may also include concrete coring, routine landscaping operations which require soil removal (mowing and trimming are excluded), and repairs to Parkwood Boulevard within the Parkwood Parcel, depending on the location and scope of the project.

This plan is not applicable for new contaminant releases, leaks, or spill response activities that may impact the subsurface. The City of Frisco should be contacted immediately regarding any new releases. Contact information for City of Frisco (referred to throughout this SMP) is as follows:

City of Frisco

Mack Borchardt

(972) 292-5127

mborchardt@friscotexas.gov

Exide should also be contacted for any questions related to this SMP or other related issues (permitting, applicable regulations, etc.) using the contact information below:

Exide Technologies

Brad Weaver

(972) 335-2121

Brad.weaver@exide.com

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2.0 SITE BACKGROUND

2.1 Response Actions Completed to Date

In 2017 and 2018, a response action was performed by Exide on the former Exide UBP under the Texas Commission on Environmental Quality (TCEQ) Voluntary Cleanup Program (VCP) which included the removal of fill material on or adjacent to the Parkwood Parcel. During the Exide UBP response action activities, portions of the Parkwood Parcel adjacent to the UBP were excavated and backfilled with clean fill material, consistent with the UBP RAP. Due to safety and structural considerations, materials extending to depths greater than two feet below ground surface and adjacent to Parkwood Boulevard and material present beneath Parkwood Boulevard were left in-place. The VCP Co-Applicants and the TCEQ agreed that affected material located adjacent to and outside of the UBP and within the Parkwood Parcel would be addressed within the FOP RAP.

2.2 Summary of Parkwood Parcel Investigation

While some samples were collected along the boundary of the Parkwood Parcel and the UBP during remediation of the UBP in 2017 and 2018, Golder conducted an investigation of Parkwood Boulevard in July 2018 to evaluate concentrations of lead and cadmium in the material beneath and adjacent to Parkwood Boulevard (i.e. beneath and adjacent to road base). The sample locations are shown on Figure 2 and included soil sampling from 19 boreholes located within the boundary of the Parkwood Parcel. The results of the Parkwood Parcel Investigation are included in Appendix 3.5 of the FOP RAP. Three samples collected as part of the Parkwood Boulevard Parcel Investigation contained lead above the critical protective concentration level (PCL) (274.5 mg/kg), see Figure 3.

2.3 Affected Soil Summary

Results of the historical response action at the surrounding former Exide UBP and investigation of Parkwood Parcel have indicated the presence of lead above the critical PCL in the soil at several locations on the Parkwood Parcel. The locations of lead impacts in soil exceeding the critical PCL are shown on Figure 3 (including samples collected during UBP response actions and samples collected during the Parkwood Parcel Investigation).

2.4 Response Actions

The response actions to address affected soil on the Parkwood Parcel will include the following major components (described in the FOP RAP):

- The area of the Parkwood Parcel with lead impacts above the critical PCL will receive an engineered cap consisting of a geomembrane, geotextile/geocomposite, 18-in clean fill layer, and 6-inch vegetative cover soil layer, in areas where Parkwood Boulevard is not present (see Figures 3 and 4).
- A soil management plan (this SMP) will be proposed and implemented for the Parkwood Parcel such that any work performed within the Parkwood Parcel capped areas (and paved areas immediately adjacent) would be subject to specific requirements that will be attached to a Right-of-Way permit issued by the City of Frisco.
- The Parkwood Parcel will be deed restricted for commercial/industrial use only with additional restrictions regarding disturbing capped areas as described in Worksheet 2.4 and Appendix 4 of the FOP RAP.

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- The Parkwood Parcel cap areas (and paved areas immediately adjacent, see Figure 5) will be inspected semi-annually concurrently with the performance of groundwater monitoring activities for the FOP as described in Worksheet 3.2 of the FOP RAP.

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3.0 SOIL MANAGEMENT PLAN IMPLEMENTATION

This SMP was developed to provide guidance for work at the Site that would involve disturbing soils containing lead above the critical PCL such as excavation, trenching, or construction activities, including routine landscaping operations (which involve digging) and repairs to Parkwood Boulevard, depending on the location and scope of the project on the Site. This SMP should be used in the planning stages of future projects to minimize risks to human health and the environment when work that would involve disturbing impacted soils is performed at the Site.

All field activities should be conducted in accordance with applicable state regulations, federal regulations, and permits/regulatory approvals necessary to facilitate work under the SMP. Soil management procedures applicable to on-Site excavation, trenching, and/or construction activities are described below.

In the following sections, the term “excavation” refers to all soil disturbance activities including, but not limited to: excavation, trenching, concrete coring, and construction/landscaping activities that require ground disturbance work.

3.1 Soil Excavation Planning

3.1.1 Pre-Excavation Data Review and Planning

Prior to initiating excavation activities, a pre-excavation planning data review should be performed for any work to be completed within the Parkwood Parcel cap or inspection areas (see Figures 3 and 5). The proposed work area and depth should be evaluated for data related to suspected soil contamination and cap areas. Current and historical soil data should be reviewed; this includes results from the response action at the Exide UBP, Parkwood Boulevard Parcel Investigation, and data from any additional subsurface investigations performed at the Site following the finalization of this SMP.

Following the data review, the results of this evaluation should be used to develop the health and safety procedures (Section 3.1.2) and soil disposal protocol (Section 3.1.3) for the project. Potential issues with dust, noise, or storm water runoff should also be identified prior to starting excavation, trenching, or construction activities, and management strategies should be developed. Plans to repair the cap should also be developed as described in Section 3.3.3 for preapproval by Exide and the City of Frisco.

3.1.2 Health and Safety

Personnel performing work on the Parkwood Parcel should develop and adhere to a project-specific Health and Safety Plan (HASP) for all proposed excavation, trenching, construction, or other soil disturbance activities. The HASP should include a description of appropriate personal protective equipment (PPE) and any other health and safety requirements relevant to the project. Subcontractors must be notified of potential human health and environmental hazards prior to any field work initiation; however, subcontractors will be responsible for developing and adhering to their own HASPs.

In the course of the work at the Site, if the City of Frisco or its subcontractors encounter materials reasonably believed to be hazardous that were not previously anticipated and/or which could present a risk to human health and/or the environment, work in the area affected must be suspended and immediately reported to City of Frisco. The work in the affected area shall not be resumed except by written agreement of City of Frisco and the contractor.

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3.1.3 Soil Waste Management Plan

Based on the results of the data review, a project-specific soil waste management plan should be developed for preapproval by Exide and the City of Frisco. Each plan must include the following elements:

- A description, including anticipated volumes, of all types of waste expected to be generated on-Site.
- A description of where and how all of the waste will be stored before it is removed from the Site.
- A description of waste characterization activities that will be performed.
- Designated disposal destination(s) for all waste.

Management and disposal of excavated soils should be performed based on the Soil Management Flow Chart (Figure 6).

3.2 Soil Excavation Field Procedures

After pre-excavation planning activities are complete, excavation activities may proceed. The following sections discuss soil handling, sampling, and loading.

3.2.1 Excavation, Stockpiling, and Dust Control

Excavated soil should be stockpiled at a convenient nearby location(s), on polyethylene sheeting, preferably over concrete or asphalt pavement or in a roll-off container, until it has been determined whether it can be reused on-Site as backfill material (if the soil has been excavated from areas previously backfilled with clean soil) or must be transported off-Site for treatment or disposal.

The following provides general and generic guidance on excavation, segregation, and related dust control procedures.

- Workers in and around the excavation area should wear appropriate personal protective equipment (PPE) to avoid unnecessary direct contact with potentially contaminated soils as described in the HASP for the project.
- To the extent practical, foreign objects such as demolition debris should likewise be segregated from soil to simplify its subsequent management.
- At a minimum, impacted soil or suspected impacted soil should be stockpiled on heavy duty polyethylene sheeting (6 mil minimum thickness) and covered with the same to minimize potential contaminant dispersion via wind or precipitation. Adjoining sheets of polyethylene should be overlapped by at least 3 feet. Ideally, the stockpiles can be located in paved areas to prolong the life of the polyethylene ground cover, make stockpile removal easier, and to prevent clean soil in unpaved areas from being impacted.
- Stockpile covers should be weighted down with sandbags or similar to prevent the cover from being blown off.
- Covered stockpiles should be surrounded by bermed clean soil, or similar to minimize the potential for eroded sediment being transported beyond the stockpile limits.
- If needed, as it is being removed, mist or lightly spray soil with water to minimize dust generation and odors in ambient air. Newly-cut and exposed soil surfaces should also be misted or lightly sprayed with water to

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minimize dust. The amount of water applied should be limited to the least amount needed in order to control dust generation while avoiding infiltration and/or leaching of potential contaminants.

3.2.2 Truck Loading for Off-Site Treatment or Disposal

Impacted soil or soil that will not be reused as backfill should be transported off-Site for treatment or disposal in accordance with applicable regulations. Prior to the removal of excavated soil, the City of Frisco and Exide must be provided the opportunity to review and approve the proposed off-Site treatment or disposal facility.

When loading trucks with impacted material for off-Site treatment or disposal, the following general procedures should be followed:

- Mist or lightly water impacted soil when placing it in trucks or bins (as above, the amount of water should be minimized as much as possible). The soil cannot be watered to the point where there are any free liquids present.
- Minimize “drop heights” when loading trucks or bins.
- Impacted soil in trucks must be covered with tarpaulins or other effective covers prior to leaving the Site.
- Prior to leaving the Site, trucks and bins should be thoroughly inspected, particularly truck wheels and undercarriages, to ensure there is no loose dirt that may fall off onto public streets. The truck wheels and undercarriages should be cleaned, if necessary, to remove any loose dirt that may be present.
- Public streets near the Site that are used by trucks transporting impacted soil off-Site should be inspected daily for debris and/or dust accumulations and swept as necessary.

Proper documentation related to material transported off-Site should be maintained, including hazardous and non-hazardous waste manifests, bills of lading, scale tickets, disposal facility receipts, and certificates of disposal, where applicable.

3.3 Soil Sampling

3.3.1 Stockpile or Roll-off Sampling

For soil stockpile sampling, excavated soils will be staged on plastic sheeting (minimum 6 mil in thickness) in approximately 50 cubic yard stockpiles (an area of approximately 13 feet by 13 feet or equivalent area with a height that does not exceed eight feet) adjacent to the excavation area. Samples of the excavated material will be collected from the stockpiles for the purpose of waste characterization/classification.

Mixing of the soils during excavation occurs as the excavator bucket scrapes the ground surface to pull soil into a small pile within the excavation. Mixing further occurs as the soil is loaded from the excavation footprint into a truck to be transported to the stockpile location or is picked up from the excavation area and placed directly into the stockpile (for stockpiles located adjacent to excavation areas). The soil is mixed again when the stockpiles are graded to meet the required height restrictions (no higher than 8 feet). By selecting five separate random, representative areas for sampling from the small (50 cubic yard) stockpile of soils that have been mixed, the

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composite of the five samples is expected to exhibit the properties of the whole of the stockpile as is required under the definition of a representative sample per 40 CFR 260.1[1].

As described above, as a result of the excavation, transfer and stockpiling process, excavated material will be thoroughly mixed prior to placement in stockpiles. A 5-part composite sample will be collected from the stockpiled material at a frequency of approximately one sample for every 50 cubic yards of material (each stockpile). The five sub-samples of soil to form the composite will be collected from the upper 12 inches of each stockpile at five separate, random, representative areas and combined in a large plastic bag.

The sub-samples will be collected using a gloved hand and/or decontaminated/disposable soil sampling equipment (i.e., trowels). The material will then be homogenized and a sub-sample will be placed in laboratory-supplied sample jars, labeled with the sample identification, date, and time of collection.

Following sample collection, sample jars will be placed on ice in ice chests and handled under chain-of-custody procedures. Samples will be delivered to the analytical laboratory by sampling personnel, courier, or overnight delivery service. Samples will be analyzed for the Resource Conservation and Recovery Act (RCRA) metals in TCLP extract using EPA Method 1311 TCLP and 6010B/6020A/7470 (metals concentrations). Since the samples will be analyzed for TCLP mercury, ice is required in the coolers submitted for waste characterization. The holding time for the selected metals is 28 days. Material to be disposed of at an off-Site facility may be analyzed for additional constituents to meet the characterization requirements of the specific disposal facility.

3.3.2 Backfill Sampling

Any backfill materials that will be brought to the Site should be sampled prior to the start of excavation activities. Backfill materials should be sampled by the contractor in accordance with standard practices and analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), total petroleum hydrocarbons (TPH) – gasoline range organics (GRO), TPH – diesel range organics (DRO), TPH – oil range organics (ORO), RCRA metals, polychlorinated biphenyls (PCBs), pesticides, and herbicides. Backfill sampling results should be approved by the City of Frisco prior to being brought on-Site.

3.3.3 Repairs

Disturbance of the engineered cap on the Parkwood Parcel or the portions of the Parkwood Boulevard roadway that comprise the engineered barrier for affected soils at the Site should be repaired to existing conditions. The repair work should be performed by qualified contractors under the oversight of a professional engineer. A report documenting the repairs should be submitted to Exide and the City of Frisco to review and maintain with files for the Site. Repairs should also meet criteria established by the City of Frisco for Parkwood Boulevard and adjacent right-of-way. Specifications for the engineered cap are included in Figure 4.

3.4 Excavation Project Completion Reporting

Following the completion of any excavation project, the following project close-out documentation should be prepared:

[1] Representative Sample per 40 CFR Part 260.1 is defined as follows: *Representative sample* means a sample of a universe or whole (e.g., waste pile, lagoon, ground water) which can be expected to exhibit the average properties of the universe or whole.

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- If impacted soil was identified (contaminant concentrations were above critical PCLs) and removed from the Site, prepare a brief narrative of activities performed, a figure depicting the excavation limits, sampling locations, photos (if available), and copies of the analytical reports. Exide and the City of Frisco will use this information to update its understanding of the Site.
- If soil was transported off-Site, provide Exide and the City of Frisco with disposal-related documentation, including waste characterization data, waste profiles, hazardous and non-hazardous waste manifests, bills of lading, scale tickets, disposal facility receipts, and certificates of disposal, where applicable.
- Documentation of the repairs made to the engineered cap and Parkwood Boulevard where it serves as an engineered barrier must be provided to Exide and the City of Frisco.

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4.0 CLOSING

Golder appreciates the opportunity to work on this project. Should you require any additional information about this plan, please feel free to contact the undersigned.

Sincerely,

Golder Associates Inc.

-DRAFT-

Brett E. Forthaus
Project Environmental Engineer

-DRAFT-

Anne M. Faeth-Boyd, P.G.
Associate and Senior Engineer

BEF/AMF

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Figures

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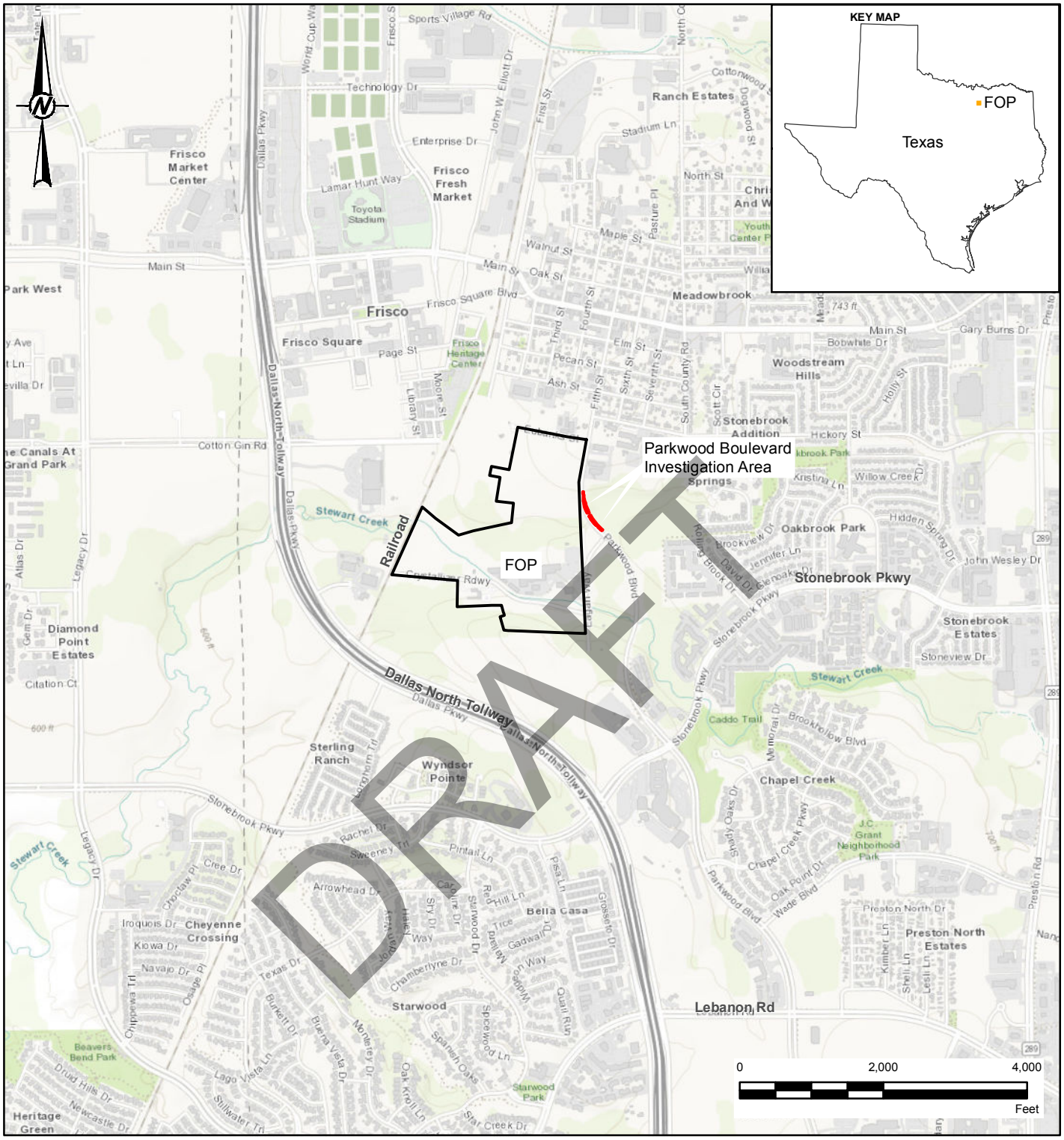

LEGEND

- Investigation Area
- Former Operating Plant Property Boundary

REFERENCE(S)

1. SITE BOUNDARY - GOLDER, 2016 AND 2017
2. FORMER OPERATING PLANT - FOP RCRA BOUNDARY, 2016
3. BACKGROUND IMAGERY - SOURCES: ESRI, HERE, GARMIN, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), SWISSTOPO, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY

CLIENT
EXIDE TECHNOLOGIES

PROJECT
PARKWOOD BOULEVARD SOIL MANAGEMENT PLAN

TITLE
SITE LOCATION MAP

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-22
DESIGNED	JWT
PREPARED	JWT
REVIEWED	EPW/THR
APPROVED	AMF/FMB

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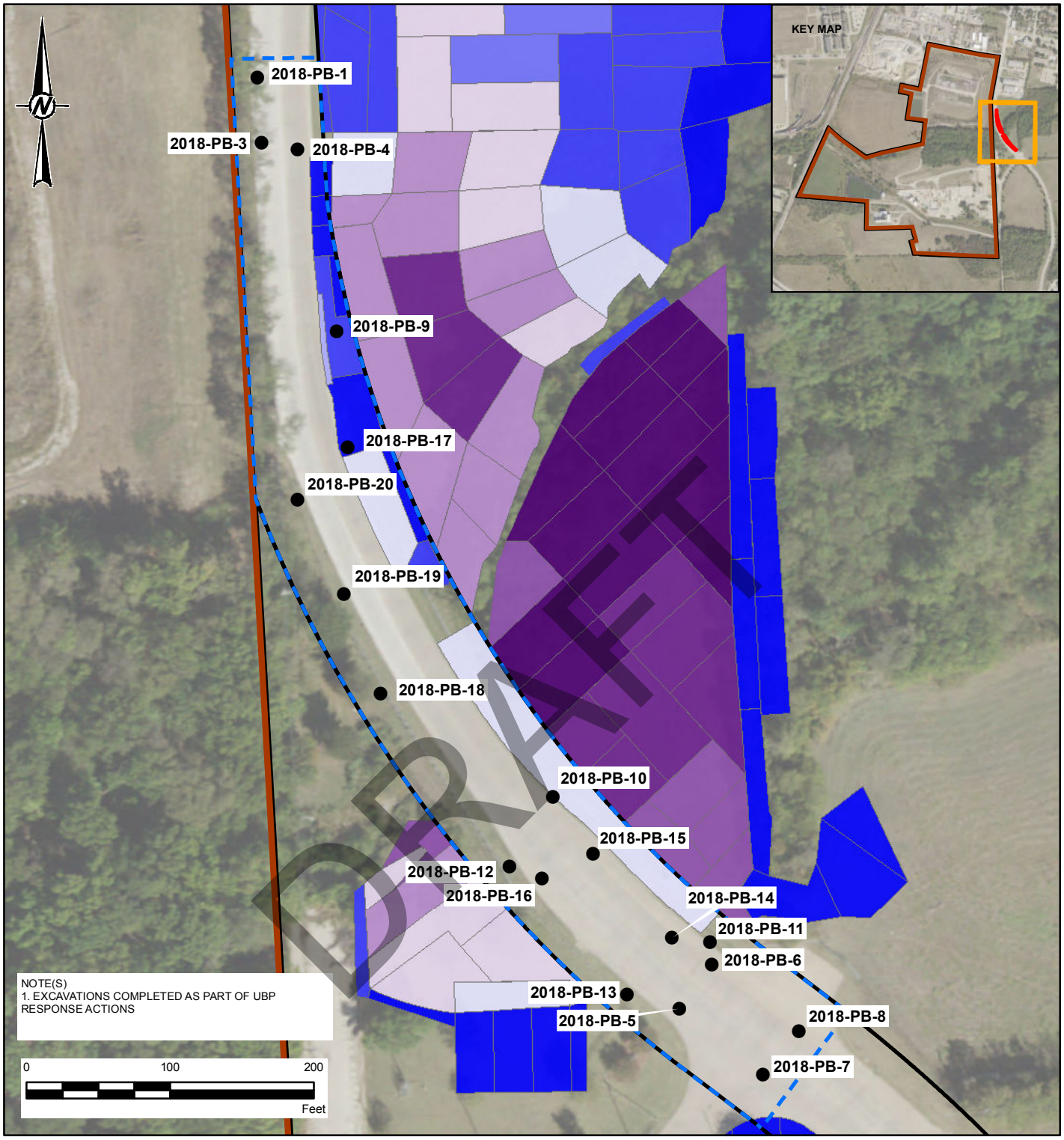

- Sample Location
- Parkwood Parcel Investigation Area Former
- Operating Plant Property Boundary
- Former Undeveloped Buffer Property (UBP)
- Excavation Depth (0-0.5ft)
- Excavation Depth (0-1ft)
- Excavation Depth (0-1.5ft)
- Excavation Depth (0-1.7ft)
- Excavation Depth (1ft intervals to 2ft)
- Excavation Depth (1ft intervals to 3ft)
- Excavation Depth (1ft intervals to 4.5ft)
- Excavation Depth (1ft intervals to 5ft)
- Excavation Depth (1ft intervals to 6ft)
- Excavation Depth (1ft intervals to 7ft)

REFERENCE(S)

1. INVESTIGATION AREA AND LOCATIONS - GOLDER 2018
2. BACKGROUND IMAGERY - SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

CLIENT
EXIDE TECHNOLOGIES

PROJECT
PARKWOOD BOULEVARD SOIL MANAGEMENT PLAN

TITLE
BOREHOLE LOCATION MAP

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-22
DESIGNED	JWT
PREPARED	JWT
REVIEWED	EPW/THR
APPROVED	AMF

PROJECT NO.	CONTROL	REV.	FIGURE
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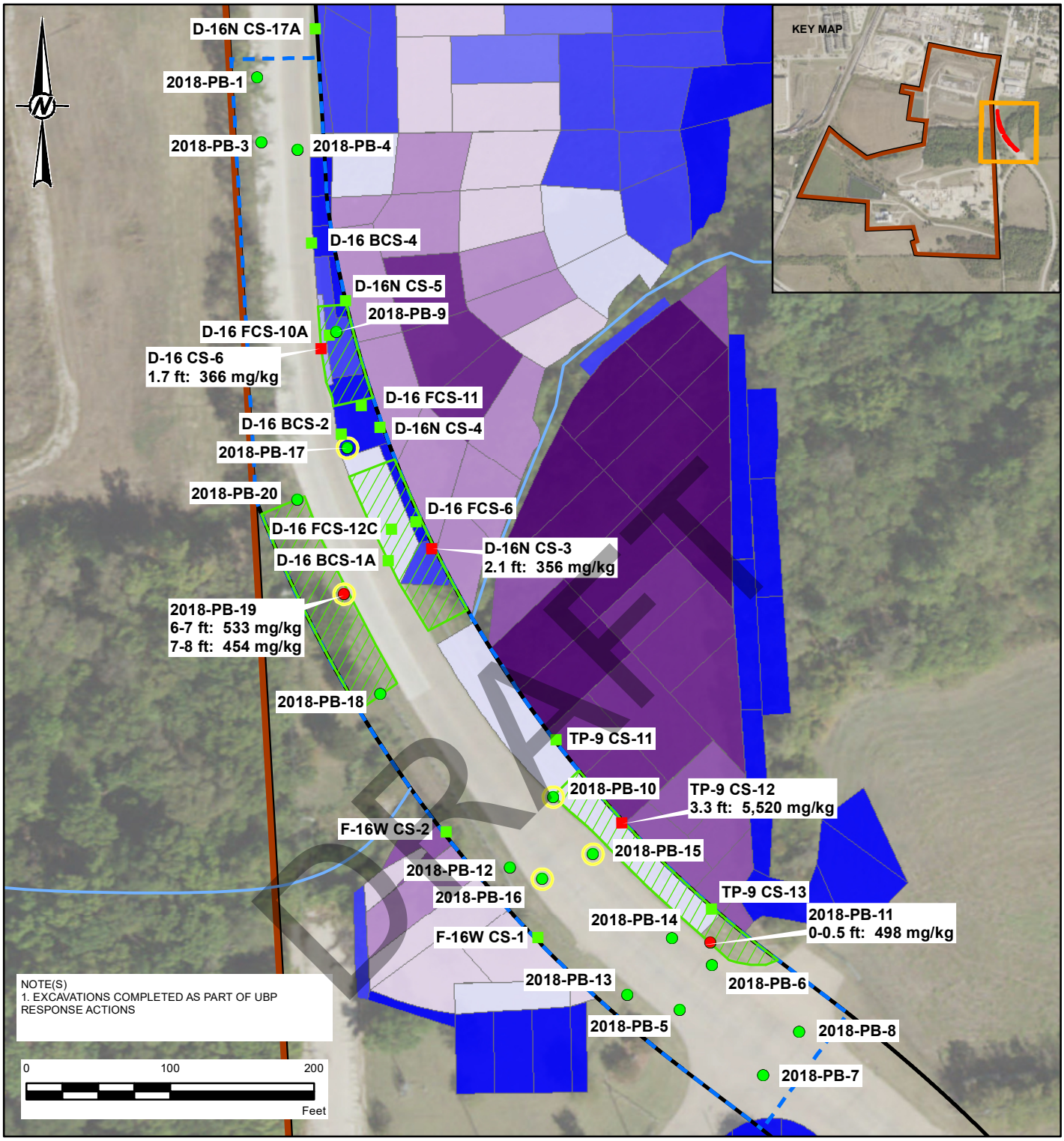

- UBP sample lead concentration greater than 274.5 mg/kg
- UBP sample lead concentration less than 274.5 mg/kg
- Lead concentration greater than 274.5 mg/kg
- Parkwood sample lead concentration less than 274.5 mg/kg
- Parkwood Boulevard Cap
- Parkwood Parcel Investigation area
- Former Operating Plant
- Former Undeveloped Buffer Property (UBP)
- Debris noted in boring log
- Excavation Depth (0-0.5ft)
- Excavation Depth (0-1ft)
- Excavation Depth (0-1.5ft)
- Excavation Depth (0-1.7ft)
- Excavation Depth (1ft intervals to 2ft)
- Excavation Depth (1ft intervals to 3ft)
- Excavation Depth (1ft intervals to 4.5ft)
- Excavation Depth (1ft intervals to 5ft)
- Excavation Depth (1ft intervals to 6ft)
- Excavation Depth (1ft intervals to 7ft)

REFERENCE(S)

1. INVESTIGATION AREA AND LOCATIONS - GOLDER 2018
2. BACKGROUND IMAGERY - SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

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EXIDE TECHNOLOGIES

PROJECT
PARKWOOD BOULEVARD SOIL MANAGEMENT PLAN

TITLE
PARKWOOD BOULEVARD CAP OVERVIEW MAP

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-28
DESIGNED	JWT
PREPARED	JWT
REVIEWED	EPW/THR
APPROVED	AMF

PROJECT NO.	CONTROL	REV.	FIGURE
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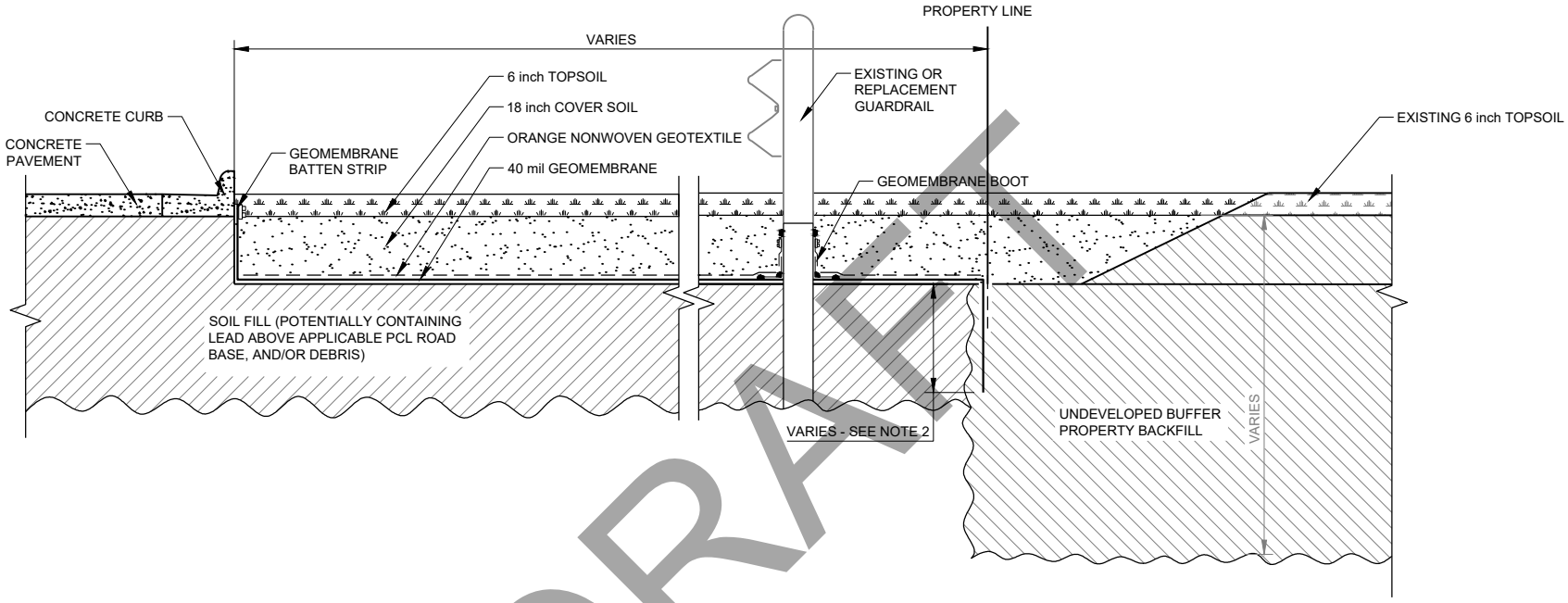

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NOTE(S)

1. DESIGN MAY BE MODIFIED TO INCORPORATE APPROPRIATE TRAFFIC CONTROL SAFETY MEASURES AS DETERMINED BY THE ROAD MAINTENANCE AUTHORITY.
2. GEOMEMBRANE TO EXTEND 1 ft BELOW DEPTH OF CONTAMINATION. SEE APPENDIX 3.3 OF RAP.

0 2 4
1" = 4' FEET

CLIENT
EXIDE TECHNOLOGIES
EXIDE FRISCO RECYCLING CENTER
FRISCO, TEXAS

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-22
DESIGNED	JBF
PREPARED	RS
REVIEWED	JBF
APPROVED	JBF

PROJECT
RCRA PERMIT RENEWAL APPLICATION
PARKWOOD BOULEVARD SOIL MANAGEMENT PLAN
FRISCO, COLLIN COUNTY TEXAS

TITLE
PARKWOOD BOULEVARD CAP DETAIL

PROJECT NO.	SCALE	REV.	FIGURE
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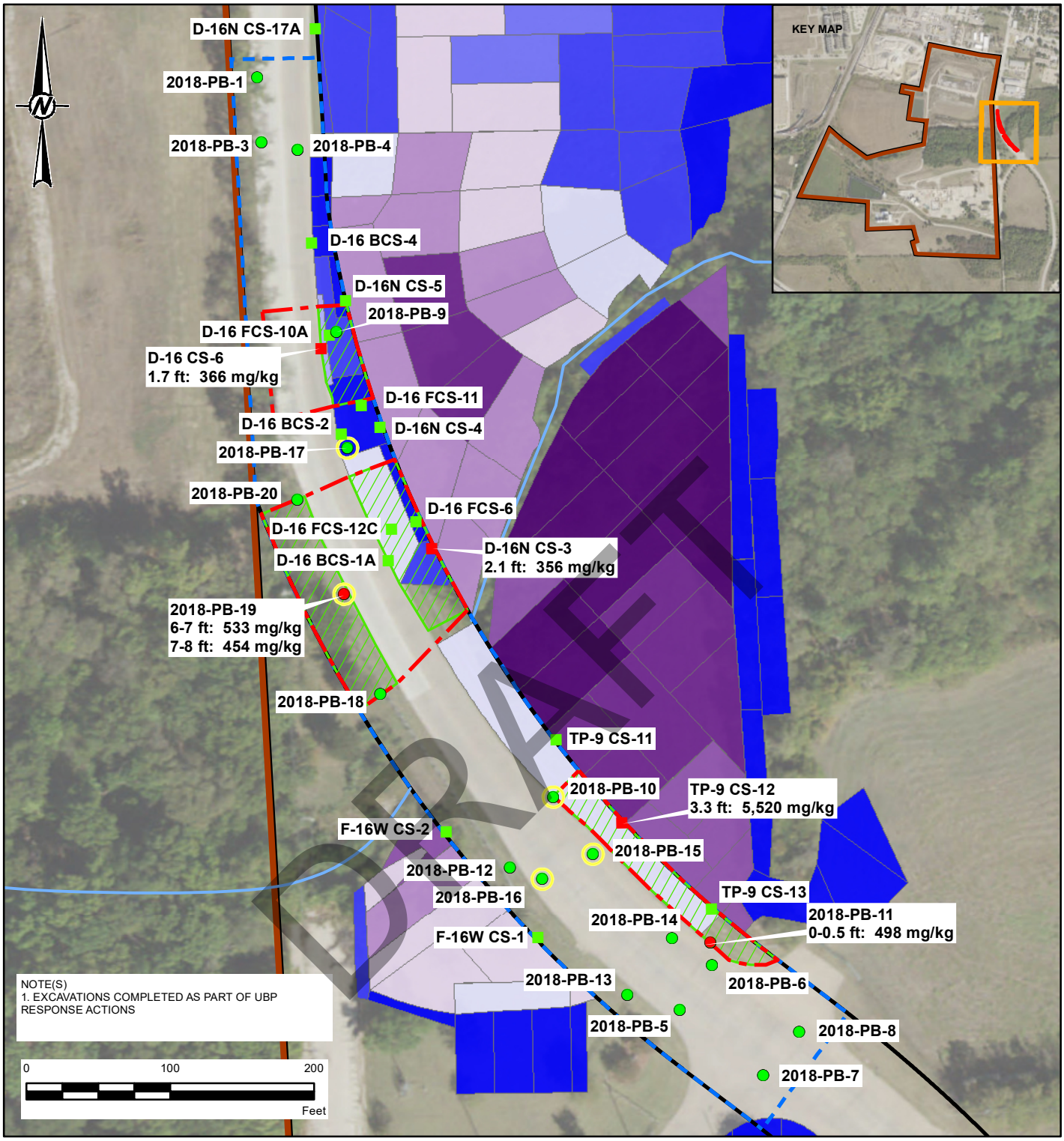

- UBP sample lead concentration greater than 274.5 mg/kg
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- Excavation Depth (1ft intervals to 2ft)
- Excavation Depth (1ft intervals to 3ft)
- Excavation Depth (1ft intervals to 4.5ft)
- Excavation Depth (1ft intervals to 5ft)
- Excavation Depth (1ft intervals to 6ft)
- Excavation Depth (1ft intervals to 7ft)

REFERENCE(S)

1. INVESTIGATION AREA AND LOCATIONS - GOLDER 2018
2. BACKGROUND IMAGERY - SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

CLIENT
EXIDE TECHNOLOGIES

PROJECT
PARKWOOD BOULEVARD SOIL MANAGEMENT PLAN

TITLE
PARKWOOD BOULEVARD PERIODIC INSPECTION AREAS

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-29
DESIGNED	JWT
PREPARED	JWT
REVIEWED	EPW/THR
APPROVED	AMF

PROJECT NO.	CONTROL	REV.	FIGURE
130208606	1302086ZZE004	0	5

1 in
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A
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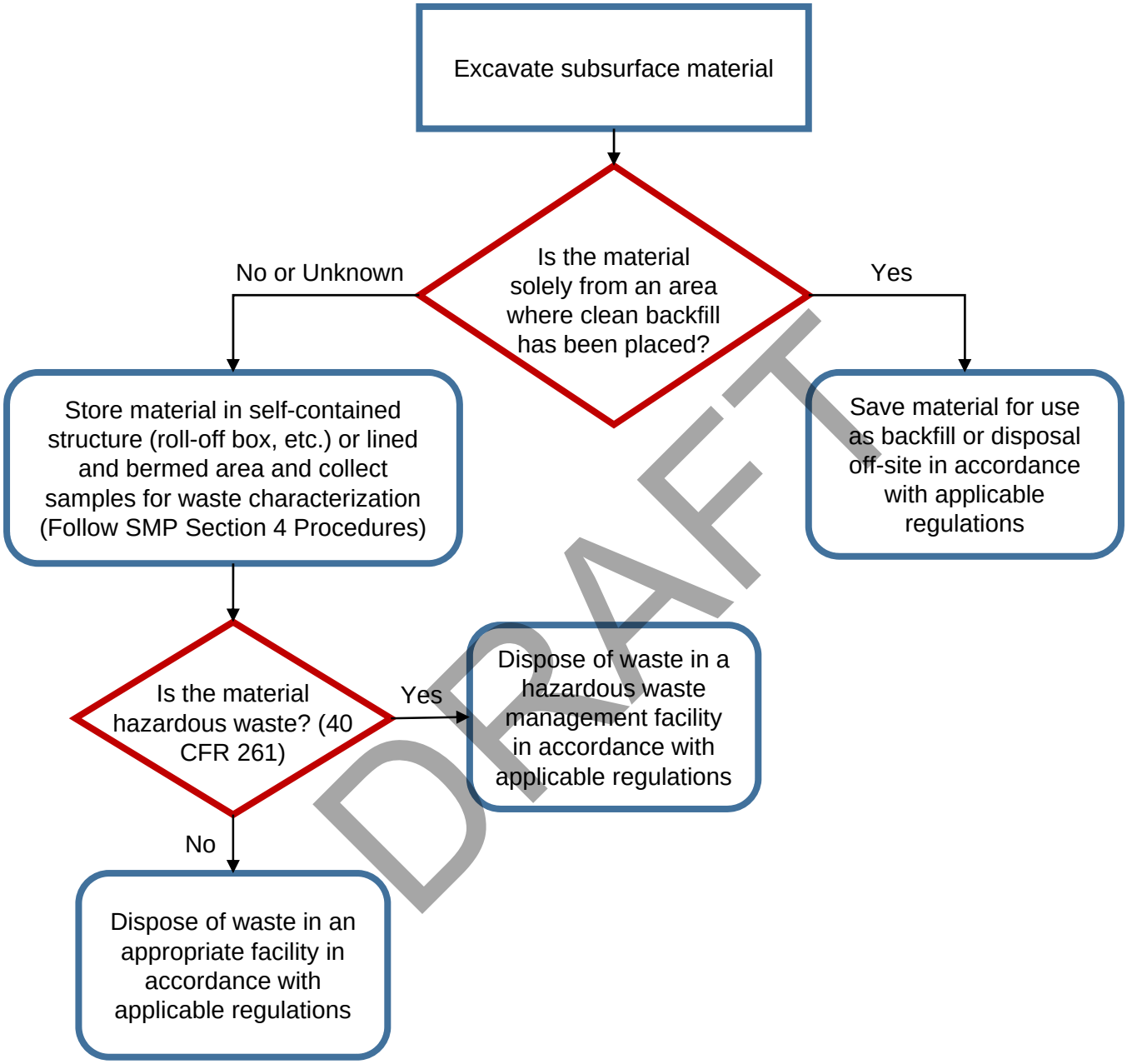
PATH: G:\Projects\130 Projects\1302086-06 - Exide Frisco RCRA Permit Mod\600 - FIGURES-DRAWINGS\PRODUCTION\GIS from JAX\ZE - Parkwood Blvd RAP Appendix\map documents\1302086ZZE004.mxd LAST SAVED ON: 2019-05-29 AT 8:19:45 AM

Figure 6

Soil Management Flow Chart
Parkwood Parcel
Frisco, TX



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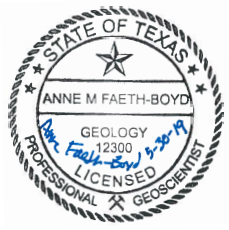

GOLDER ASSOCIATES INC.
Geoscience Firm Registration
Certificate Number 50369

TECHNICAL MEMORANDUM

Date: May 30, 2019 **Project No.:** 130208606

RE: RAP APPENDIX 7 – STATISTICAL METHODOLOGY – STEWART CREEK SEDIMENT

This technical memorandum has been prepared to document the statistical methodology that will be used to calculate an exposure point concentration (EPC) within each Exposure Area of Stewart Creek. The proposed Exposure Areas are described in the Draft Stewart Creek Exposure Point Concentration Sampling Work Plan dated August 8, 2018.

STATISTICAL METHODOLOGY

The term Exposure Point Concentration (EPC), synonymous with the TCEQ's "representative concentration", generally represents the average level of exposure—expressed as a concentration—that a receptor may experience over an exposure area during an extended period of time. Therefore, the EPC should reflect a conservative estimate of the true average value (TCEQ, 2013).

For this project, there will be at least 20 samples collected for each Exposure Area. Exide will then calculate a 95% upper confidence limit (UCL) of the arithmetic mean for each exposure area for the sediment data set and use that for the EPC. The 95% UCL accounts for uncertainty in COC concentrations throughout the exposure area via its conservative nature. This method will be used as TCEQ has selected the 95% UCL as the preferred EPC for receptors since the goal is to protect receptors at a population scale, and not individually. The 95% UCL will be calculated using the most recent version of EPA's ProUCL software. If more than one UCL is recommended by ProUCL, the highest UCL recommended by ProUCL will be used as the exposure point concentration. All ProUCL output will be submitted to the Texas Commission on Environmental Quality (TCEQ) with the results of the EPC sampling.

If the EPC for a particular exposure area is at, or lower than, the applicable PCL for individual COCs, then no receptors are at risk and the delineated area will be eliminated from further evaluation and no excavation will be performed. However, if the EPC is higher than the applicable PCL, two options for remediation will be evaluated:

- The sediment data from the exposure area will be evaluated for outliers to identify potential hot spots that can be strategically remediated (removal of only a part of the exposure area containing the hot spot).
- The entire exposure area will be designated for excavation.

For segments that may have a relatively few high concentrations, a process known as "hilltopping" will be used to identify areas associated with sample stations that most contribute to the exceedance of the PCL

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value. In hilltopping, measurements defined as mild or extreme outliers will be ranked from highest to lowest. The sample location associated with the highest measurement defined as a mild or extreme outlier will be excavated (and removed from the data set) so that a new EPC can be calculated. This process will repeat, removing the sample location associated with the next highest measurement defined as a mild or extreme outlier, until the EPC is at or lower than the PCL.

Where a sample is excavated and removed from the data set, it will be replaced with the following:

- Analytical data obtained from the gravel backfill that will be used to restore the area, or
- If no backfill is required in an area, the PCL will be used.

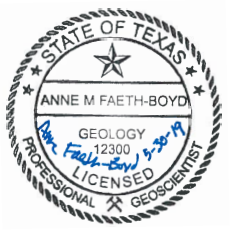
Mild and extreme outliers will be defined in terms of the range of the middle half of the data called the interquartile range (IQR). The IQR is the difference between the 75th and the 25th percentiles of an exposure area's sediment data. A mild outlier is any measurement that exceeds the 75th percentile by more than 1.5 times the IQR, but no more than 3 times the IQR. An extreme outlier is any measurement that exceeds the 75th percentile by more than 3 times the IQR (EPA, 2000; EPA, 2009).

Professional judgement should also consider implementability/practicability characteristics of remediation within the Exposure Area (e.g. the effort in accessing a portion of the Exposure Area may justify simply remediating the entire Exposure Area even though the outliers are few).

In either option, remediation will be performed to a level such that the remaining Exposure Area EPC value is less than the PCL.

REFERENCES

Texas Commission on Environmental Quality, 2013. Determining Representative Concentrations of Chemicals of Concern for Ecological Receptors, RG-366/TRRP-15eco. November.

EPA, 2000. Guidance for Data Quality Assessment Practical Methods for Data Analysis EPA QA/G-9 QA00 UPDATE. July.

EPA, 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities - Unified Guidance. March.