REPORT

CCR ASSESSMENT OF CORRECTIVE MEASURES REVISION 1

Oak Grove Steam Electric Station - FGD Ponds
Robertson County, Texas

Submitted to:

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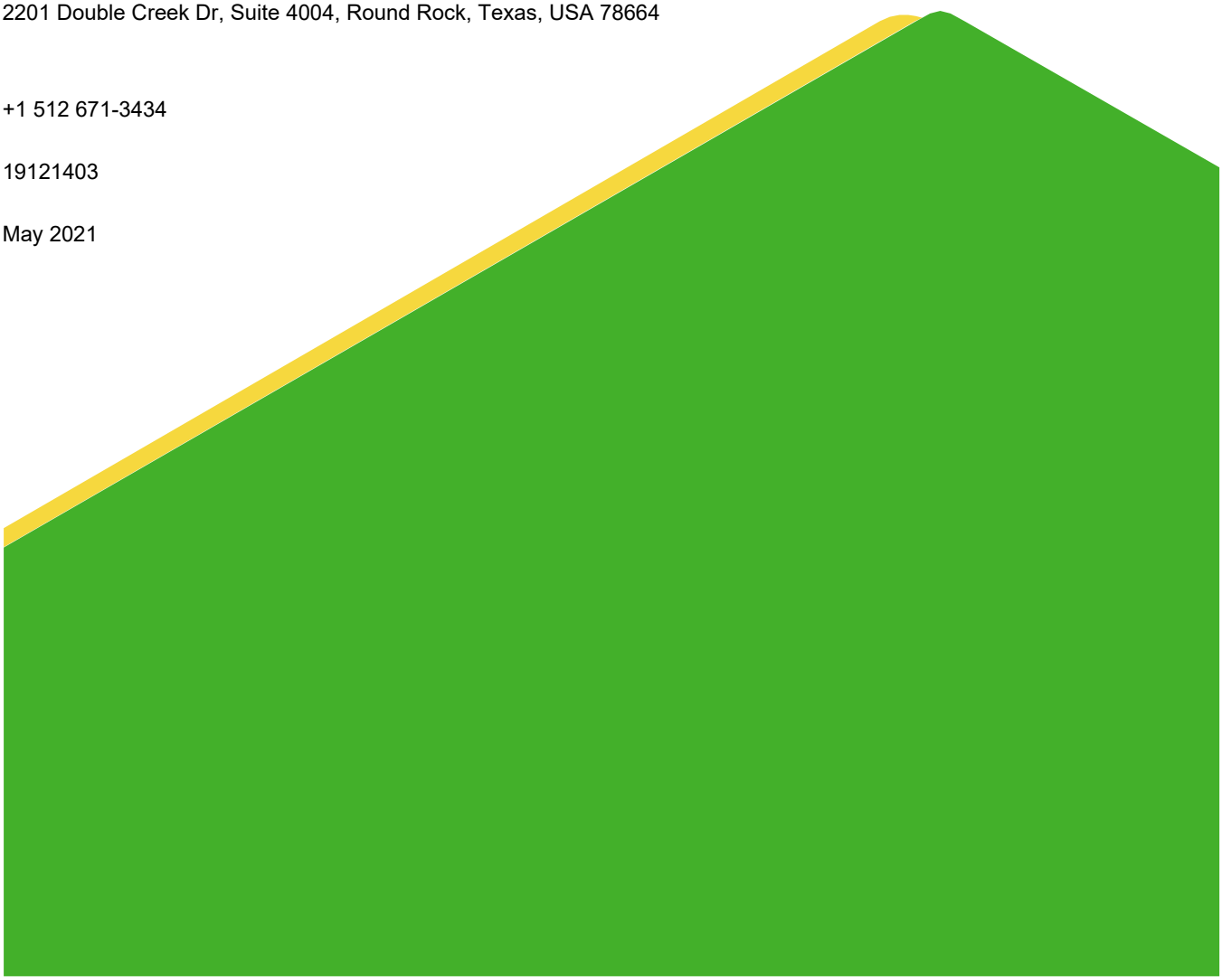


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DOCUMENT REVISION RECORD

Issue No.	Date	Details of Revisions
Revision 0	September 2019	Original Document
Revision 1	May 2021	Revised to reflect an Alternate Source Demonstration for statistically significant levels of lithium for the FGD Ponds

1.0 INTRODUCTION

On behalf of Oak Grove Management Company LLC (Luminant), Golder Associates Inc. (Golder) has prepared this revision to the assessment of corrective measures (ACM) report for FGD-A Pond, FGD-B Pond, and FGD-C Pond (collectively referred to as the "FGD Ponds") located at the Oak Grove Steam Electric Station (OGSES) in Robertson County, Texas (hereafter, the "Site"). The original ACM Report for the Site was prepared in September 2019 in accordance with §257.96 of the Coal Combustion Residual (CCR) Rule due to the presence of cobalt and lithium concentrations in the uppermost Site aquifer at statistically significant levels (SSLs) above the groundwater protection standards (GWPS) established for these constituents. The original ACM Report was placed in the OGSES operating record on September 5, 2019 in accordance with §257.105(h)(10).

In October 2020, an Alternate Source Demonstration (ASD) was completed for the lithium SSL (Appendix A), as allowed by §257.95(g)(3)(ii). As a result of the ASD for lithium, cobalt is the only remaining Appendix IV constituent that the ACM must address. This revised ACM Report was completed in accordance with §257.96 and §257.97 to assess potential corrective measures to address the cobalt SSL.

This report also incorporates the results of a site investigation conducted at the FGD Ponds in May and June 2019. The objectives of the site investigation were:

- delineate the nature and extent of the selected Appendix IV constituents to their respective GWPS;
- update the statistical evaluations of the Appendix IV constituents to include data collected during 2019 to confirm that SSL exceedances continue to occur at the Site;
- collect data to evaluate potential future alternate source demonstrations (ASDs) for the Appendix IV constituents; and
- assess the potential for monitored natural attenuation (MNA) to be successful at the Site for the Appendix IV constituents.

The OGSES is located approximately 10 miles north of the city of Franklin in Robertson County, Texas (Figure 1). Construction of the OGSES began in the mid-1980s; however, plant construction was suspended in the mid-1980s prior to completion. OGSES construction resumed in 2007 and the plant was commissioned in 2010. The OGSES is expected to remain in operation for the foreseeable future, depending on future power demands.

The FGD Ponds are located approximately 2,500 feet northwest of the OGSES power generation units (Figure 2). FGD-A Pond construction began in the mid-1980s, but pond construction stopped when construction of the OGSES as suspended (Golder 2016a). FGD-A construction resumed in 2007 and was completed in 2008. The FGD-A Pond covers an area of approximately 9.5 acres and stores CCR and other wastes generated from the OGSES prior to recycling or disposal in OGSES Ash Landfill 1. FGD-A is lined with a 3-foot thick compacted clay liner (Golder 2016b). FGD-A was formerly considered a lined CCR surface impoundment in accordance with §257.71(a)(1)(i) of the CCR Rule; however, the pond is now considered an unlined impoundment based on the August 2018 DC Circuit Court Ruling. The reline of this impoundment is expected to be complete in 2021.

Construction began on the FGD-B Pond in the mid-1980s during the initial OGSES construction phase for use as a storm water retention pond. Pond construction was halted in the 1980s when construction of the OGSES was suspended. The former retention pond was reconstructed in 2012 as FGD-B Pond for use in management of CCR and other wastes (Golder 2016a). FGD-B covers an area of approximately 12 acres in size and receives CCR and other wastes generated from the OGSES similar to the FGD-A Pond. FGD-B is constructed with a

composite liner consisting of a minimum 2-foot thick compacted clay liner, overlain be a 60-mil HDPE geomembrane liner, overlain by a 1-foot thick layer of protective soil. (Golder 2016b). The composite liner system in FGD-B complies with the requirements of §257.71(a)(1)(ii) of the CCR Rule and the pond is considered a lined surface impoundment under the CCR Rule.

FGD-C Pond construction commenced in 2015 and was completed in 2016 (Golder 2016a). FGD-C Pond is approximately 25 acres in size and receives CCR and other wastes generated from the OGSES, similar to the FGD-A and FGD-B Ponds. FGD-C is constructed with a composite liner consisting of a minimum 2-foot thick compacted clay liner, overlain by a 60-mil HDPE geomembrane liner, overlain by a 2-foot thick soil/ash protective layer (Golder 2016b). The composite liner system in FGD-C complies with the requirements of §257.71(a)(1)(ii) of the CCR Rule and the pond is considered a lined surface impoundment under the CCR Rule.

2.0 REGIONAL AND SITE SETTING

2.1 Regional Geology

The Site is located in the outcrop area of the Eocene-aged Wilcox Group (Barnes 1970), which is divided into three formations in the region: the Calvert Bluff, Simsboro, and Hooper Formations (in order from youngest to oldest). The FGD Ponds are completed in the Calvert Bluff Formation, which consists mostly of unconsolidated to moderately consolidated clay and silt, with various amounts of interbedded sand and lignite. The depositional environment of the Calvert Bluff Formation is associated with fluvial-deltaic processes such as inter-channel crevasse splays, overbank deposits, and localized channel fills. The Simsboro Formation, which underlies the Calvert Bluff Formation, consists mostly of sand (locally indurated) with some clay, mudstone, and mudstone conglomerates. The Hooper Formation, which underlies the Simsboro Formation, consists mostly of mudstone with various amounts of sandstone and minor amounts of lignite.

2.2 Regional Hydrogeology

Groundwater wells completed in the channel sands of the Calvert Bluff Formation are typically used for domestic and stock watering purposes. Groundwater within the upper 100 feet below ground surface (bgs) in the region typically flows under unconfined to semi-confined conditions. The direction and rate of groundwater movement in the Calvert Bluff Formation are affected by a number of physical features, including topography, surface drainage, and geology. The natural groundwater potentiometric surface in these shallow flow systems is generally a subdued replica of topography. In general, groundwater flow occurs from high potentiometric areas (recharge zones) toward valleys (discharge zones). Groundwater divides generally coincide with surface drainage divides.

2.3 Site Hydrogeology and CCR Monitoring Well Network

The CCR groundwater monitoring well network at the FGD Ponds was established in 2015 using pre-existing Site monitoring wells (FGD-1, FGD-2, FGD-3, FGD-4, FGD-5, FGD-6, FGD-8, FGD-11, and FGD-12), which are each screened in the uppermost groundwater-bearing unit (GWBU) of the Calvert Bluff Formation (Figure 2). Pre-existing monitoring well FGD-14 and newly installed monitoring wells FGD-15 and FGD-16 were also monitored in 2019 as part of the nature and extent evaluation. Boring logs for the CCR monitoring wells and nature and extent wells are provided in Appendix A. Based on soil borings completed at the Site, the geology near the unit generally consists of an upper zone of relatively thick, interbedded sand and clay strata, which is underlain by a lower zone of interbedded silty to clayey sand and well sorted sand. The uppermost GWBU occurs under unconfined conditions within the shallow sand units at the Site. Geologic cross sections of the FGD Ponds are presented on Figures 3, 4, and 5.

Groundwater elevations are generally highest near the western side of the OGSES Ash Landfill I, which is located southeast of the FGD Ponds at the Site. A groundwater potentiometric map constructed using groundwater elevation data collected in September 2020 from the CCR monitoring networks for the FGD Ponds and Ash Landfill I is presented on Figure 6. Since CCR monitoring began in 2015, the inferred groundwater flow direction at the Site has been to the east-northeast. The groundwater gradient in the area of the FGD Ponds is relatively flat. Based on the inferred groundwater flow direction and the timing of pond construction, the location of each CCR monitoring well relative to the FGD Ponds is as follows:

Upgradient/Background Wells	Downgradient Wells
FGD-8 FGD-11	FGD-1 FGD-2 FGD-3 FGD-4 FGD-5 FGD-6 FGD-12

Rising- and falling-head aquifer tests (i.e., slug tests) were conducted in 2015 at monitoring wells FGD-5, FGD-11, and FGD-12 to evaluate lateral groundwater flow velocities of the uppermost GWBU. The test methods and results were documented in the CCR Groundwater System Certification Report for the Site (PBW 2017a). Based on the test results, the uppermost GWBU has an estimated horizontal hydraulic conductivity value of 4.2E-04 cm/sec and an estimated lateral groundwater flow velocity of about 2 feet per year.

Golder performed a survey of water supply wells located in the vicinity of the FGD Ponds in May 2019 as part of a Texas Commission on Environmental Quality (TCEQ) Texas Risk Reduction Program (TRRP) assessment of the Site. A Drinking Water Survey Report (Golder, 2019) documenting the water well survey activities and findings was approved by the TCEQ in a letter dated August 12, 2019. No imminent threats to water wells or potentially affected drinking water wells were identified.

3.0 NATURE AND EXTENT EVALUATION

3.1 Groundwater Monitoring Summary

Background monitoring of groundwater in the vicinity of the FGD Ponds began in November 2015 and was completed in December 2016. Samples collected during this period were analyzed for Appendix III and Appendix IV constituents to establish background concentrations pursuant to §257.94(b).

A detection monitoring program in accordance with §257.94 was initiated in September 2017. The evaluation of those data was completed in 2018 using procedures described in the Statistical Analysis Plan (PBW 2017b) to identify statistically significant increases (SSIs) of Appendix III parameters above background concentrations. Based on the identification of SSIs for one or more Appendix III parameters, an assessment monitoring program was established pursuant to §257.94(e)(1).

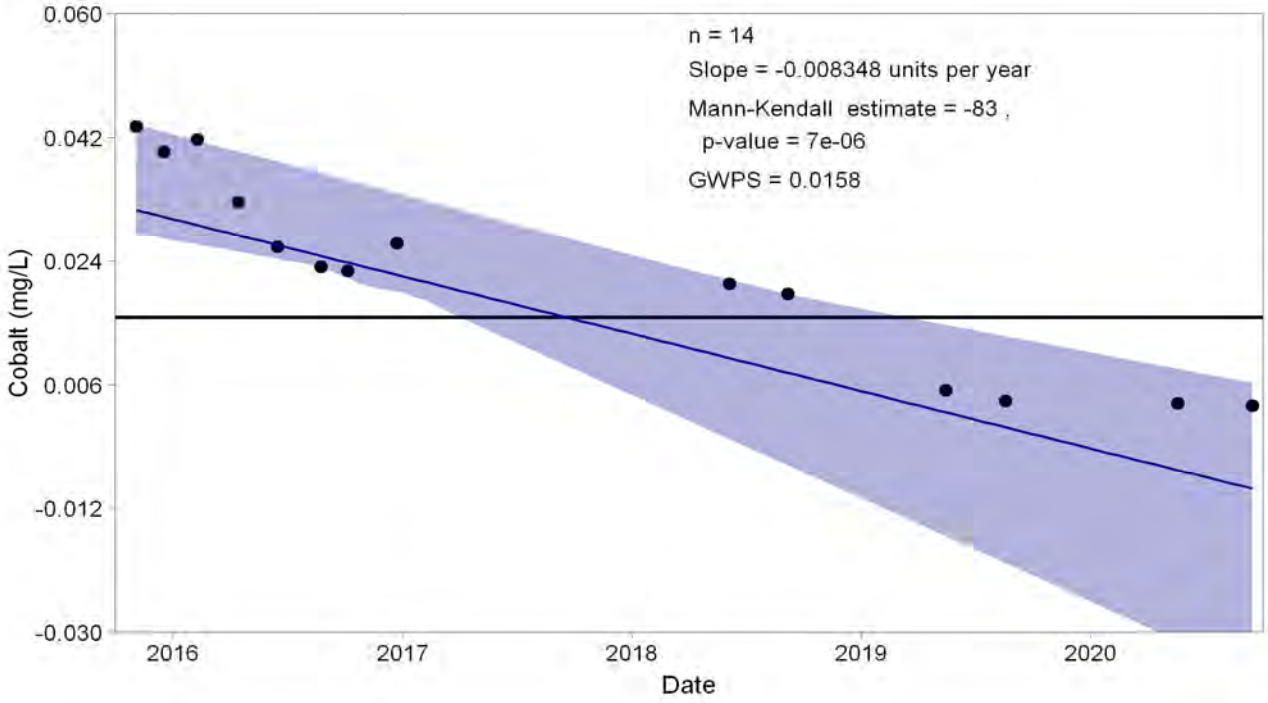
The initial assessment monitoring event was conducted in June 2018 and a subsequent semi-annual assessment monitoring event was conducted in September 2018 in accordance with §257.95(a) and §257.95(d). Using the Appendix IV data collected during the assessment monitoring period through September 2018, SSLs above GWPSs were initially identified in January 2019 for cobalt and lithium in downgradient monitoring wells FGD-3 for cobalt and FGD-5 for lithium (Figure 7); therefore, an ACM was completed in September 2019 in accordance with §257.96. As described previously, an ASD was completed in October 2020 to address the lithium SSL (Appendix A) and, as a result, cobalt is the only remaining Appendix IV constituent to be addressed by the ACM.

3.2 Assessment Monitoring SSL Evaluation

Additional assessment monitoring events were performed in 2019 and 2020 subsequent to the SSLs identified in January 2019. Groundwater sampling analytical results for all Appendix IV parameters from 2015 through 2020 are presented in Table 1. An updated statistical analysis of cobalt concentrations in downgradient CCR monitoring wells was performed including the 2019 and 2020 data to evaluate if cobalt concentrations remained at SSLs relative to the GWPS. The updated statistical analysis included a Sens Slope Analysis and a Confidence Interval Analysis in accordance with the Statistical Analysis Plan for CCR Groundwater Monitoring (PBW 2017b) and the USEPA Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities-Unified Guidance (USEPA 2009). The GWPS for cobalt was set at 0.0158 mg/L based on background concentrations in well FGD-8.

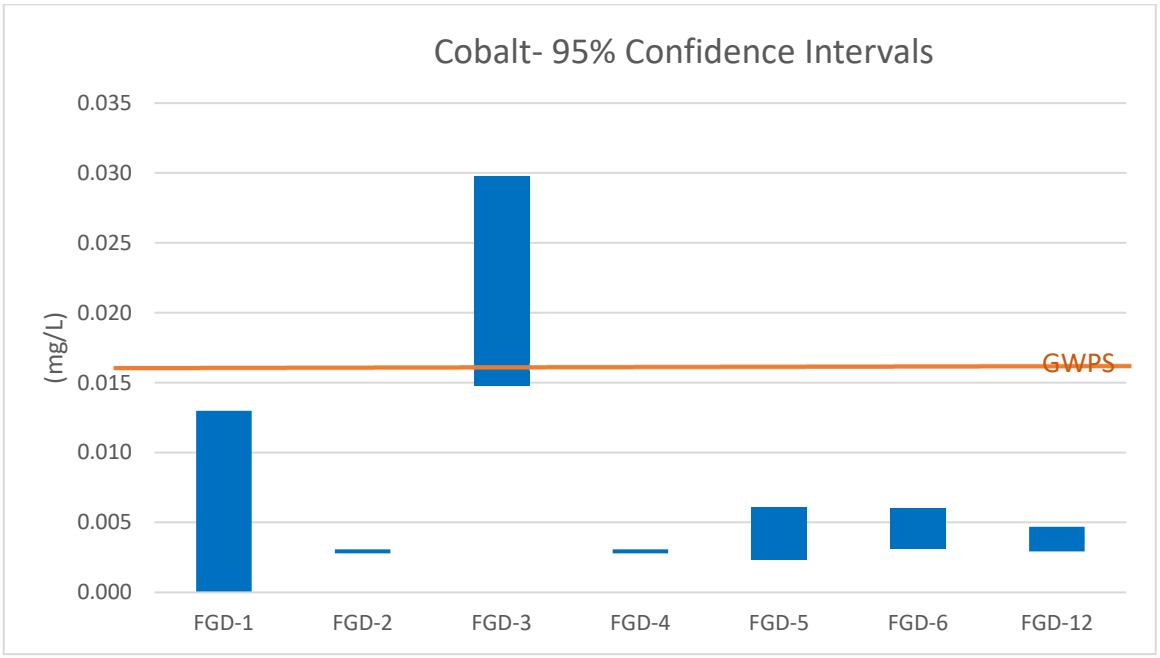
- Sens Slope Analysis: A Sen's slope analysis with 95% confidence intervals was conducted for cobalt in well FGD-3 to evaluate concentration trends since cobalt was historically detected at concentrations higher than the GWPS. A plot of the Sen's slope analysis with 95% confidence intervals is provided below:

Sen's Slope analysis for Cobalt at FGD-3



The Sen's slope analysis indicates that cobalt concentrations in FGD-3 are no longer present at SSLs above the GWPS.

- Confidence Interval Analysis: Confidence intervals for cobalt concentrations in FGD-3 and other monitoring wells were updated to include the 2019 and 2020 data as shown in the plot below:



The updated confidence interval analysis also indicates that cobalt concentrations are no longer present at SSLs above the GWPS in FGD-3 or other wells downgradient of the FGD Ponds.

The updated statistical analyses indicate that cobalt is no longer present at SSLs above the GWPS in FGD-3 or other wells downgradient of the FGD Ponds; however, cobalt concentrations in these wells will continue to be monitored to confirm that the concentrations remain below the GWPS in the future in accordance with the CCR Rule.

3.3 Field Investigation

3.3.1 General

Field investigation activities conducted as part of the ACM included collection of soil samples for a mineralogical assessment and chemical analysis, nature and extent monitoring well installation and development, groundwater-level measurements, and groundwater sampling and analysis. Figure 2 presents the locations of soil borings and monitoring wells installed and sampled as part of the field investigation.

3.3.2 Soil Sample Collection

Soil borings were completed in June 2019 at proposed nature and extent monitoring well locations FGD-15 and FGD-16, and from a location near well FGD-3 (soil boring FGD-2019-1). Soil samples were collected within the target GWBU in each of the soil borings. Soil samples were submitted under chain-of-custody for laboratory analysis of the following parameters:

- Mineralogical composition: The purpose of the mineralogical analysis was to identify and quantify the crystalline mineral phases in each sample. This information is required for geochemical modeling as the release or attenuation of constituents of interest is influenced by the mineral phase(s) present in the aquifer (Hem 1985). The mineralogical testing laboratory (SGS Minerals Services) performed the analysis using quantitative (Rietveld) X-ray diffraction (XRD) (ME-LR-MIN-MET-MN-DO5) and a Bruker AXS D8 Advance Diffractometer.
- Total metals: Analysis of total metals was conducted to quantify the chemical composition of soil materials. The total mass of metals, in combination with the results of sequential extraction testing, can be used to determine the provenance of metals and verify sequential extraction results.
- Sequential extraction (SEP): This test consists of a seven-step metals extraction from solids as per Tessier et al. (1979) to identify the provenance of constituents of interest (i.e. the operationally-defined fraction that contains the metal)[1] and determine their potential environmental mobility. For instance, metals bound in the carbonate fraction, or that are exchangeable, are much more likely to become mobile due to changes in groundwater conditions than metals bound within a sulfide or silicate fraction. The total concentration of a

[1] Sequential extraction of metals from soil samples consisted of seven discrete steps for this investigation:
Step 1 - Exchangeable Fraction: This extraction includes trace elements that are reversibly adsorbed to soil minerals, amorphous solids, and/or organic material by electrostatic forces.

Step 2 - Carbonate Fraction: This extraction targets trace elements that are adsorbed or otherwise bound to carbonate minerals.

Step 3 - Non-Crystalline Materials Fraction: This extraction targets trace elements that are complexed by amorphous minerals (e.g., iron).

Step 4 - Metal Hydroxide Fraction: Trace elements bound to hydroxides of iron, manganese, and/or aluminum.

Step 5 - Organic Fraction: This extraction targets trace elements strongly bound via chemisorption to organic material.

Step 6 - Acid/Sulfide Fraction: The extraction is used to identify trace elements precipitated as sulfide minerals.

Step 7 - Residual Fraction: Trace elements remaining in soil after the previous extractions will be distributed between silicates, phosphates, and refractory oxides.

metal measured from all seven steps can be compared to the concentration determined from the total metal analysis for compositional accountability.

3.3.3 Monitoring Well Installation

Two new nature and extent monitoring wells were completed at FGD-15 and FGD-16 to total depths of 35 feet bgs and 40 feet bgs, respectively. The wells were constructed of 2-inch diameter, schedule 40 PVC casing and 0.010-inch slotted screen. Annular materials consisted of a sand/gravel pack around the screened interval, a bentonite seal above the sand/gravel pack, and grout or bentonite chips to ground surface. Surface completions consisted of a concrete pad, protective steel casing stickup, and guard posts. The monitoring wells were developed by surging the wells several times and purging the wells using an electric submersible pump to remove fine-sized particles and to establish a hydraulic connection between the well and the formation.

An existing monitoring well not previously part of the CCR monitoring program (FGD-14) was used as a third nature and extent well.

3.3.4 Groundwater Sampling

ACM groundwater samples were collected from the CCR monitoring network as part of the Assessment Monitoring Program semi-annually in 2019 and 2020. Additional groundwater samples evaluated in this report include major cation/anion and nutrient samples collected in May 2019 and nature and extent well samples collected in May and June 2019. Laboratory analytical reports are provided in Appendix C and groundwater sampling records, which include field-measured parameters, are provided in Appendix D.

Chemical/geochemical analysis of groundwater samples included field parameters and radionuclides, nutrients, and major cations and anions. The rationale and methods used are as follows:

- Field Parameters: Parameters measured in the field included pH, dissolved oxygen, oxidation reduction potential (ORP), conductivity, and temperature. These parameters were used to evaluate general geochemical conditions in the groundwater and support geochemical modeling.
- Metals and Regulated COIs: Analysis of Appendix III and IV metals to better understand the geochemical composition of groundwater. Metals analysis allows for the delineation of a potential plume, evaluation of mineral saturation indices, and evaluation of background contributions from natural sources or anthropogenic sources.
- Major Cations, Anions, and Nutrients: Geochemical modeling of mineral solubility, metals attenuation and background contributions requires analysis of major cations and anions because they affect and participate in sorption and mineral dissolution or precipitation reactions.

3.4 Evaluation of Groundwater Data

3.4.1 Geochemical Modeling Approach

Geochemical modeling was conducted to evaluate general groundwater quality, determine the potential for precipitation of sorbent media, evaluate the potential for mineral precipitation or adsorption in the aquifer, and determine the speciation of metals of interest. The geochemical computer code developed by the United States Geological Survey (USGS), PHREEQC, was used for these simulations (Parkhurst and Appelo 2013). PHREEQC version 3.4 is a general-purpose geochemical modeling code used to simulate reactions in water and between water and solid mineral phases (e.g., rocks and sediments). Reactions include aqueous equilibria, mineral dissolution and precipitation, ion exchange, surface complexation, solid solutions, gas-water equilibrium, and kinetic biogeochemical reactions. The widely-accepted thermodynamic database Minteq.v4, 2017 edition, was used as a basis for the thermodynamic constants required for modeling.

The Geochemist's Workbench Version 12 (Bethke 2015) was used to generate graphical representations of geochemical modeling outputs in the form of predominance, or Pourbaix diagrams (also known as Eh-pH diagrams) for cobalt and trilinear plots (also known as Piper plots) displaying the relative abundance of major ions. The Minteq.v4 database was used as the basis for the Pourbaix diagrams.

3.4.2 Summary of Groundwater Results

Groundwater quality data from background wells FGD-8 and FGD-11; monitoring wells FGD-1, FGD-2, FGD-3, FGD-4, FGD-5, FGD-6, and FGD-12; and nature and extent monitoring wells FGD-14, FGD-15, and FGD-16 were used for this evaluation. The water quality monitoring data are presented in Appendices C and D and can be summarized as follows:

General Chemistry Parameters

- pH: The pH of groundwater samples collected from monitoring and nature and extent wells ranged from 6.46 to 6.86 across the site in May and June 2019. Historically, pH was lowest in June of 2018, at 5.58 in FGD-1 and the highest pH measured in groundwater was 7.12 in FGD-6 in February 2016. No geographical trend in pH was discernable in groundwater samples.
- ORP (Redox): Field-measured redox values in May and June 2019, corrected to Eh (+200mV), ranged from +144 to +181 mV in the groundwater samples in the CCR monitoring well network. The Eh of groundwater in the nature and extent monitoring wells ranged from +168 mV to +193 mV, indicating that redox conditions were similar to those in the CCR monitoring network wells.
- Total Dissolved Solids (TDS): Groundwater TDS concentrations were variable in May 2019 in the CCR monitoring and nature and extent well network. The lowest TDS concentrations (140 mg/L) occurred in groundwater at CCR monitoring well FGD-12. The highest measured TDS in groundwater (3970 mg/L) was observed in CCR monitoring well FGD-8. The TDS in groundwater of the nature and extent network ranged from 325 mg/L to 2880 mg/L in wells FGD-16 and FGD-15, respectively. Geographically, the highest TDS wells, FGD-8 and FGD-15 are located on opposite sides of the FGD Pond area.
- Major ion chemistry: A Piper plot was generated for groundwater samples to facilitate the identification of water types and source contributions (Figure 8a). Generally speaking, background, downgradient, and nature and extent wells plotted in a region of the trilinear plot separate from the FGD Pond water samples. Upon further investigation of three specific ions (sulfate, magnesium, and sodium) (Figure 8b), the difference between groundwater from CCR monitoring wells and nature and extent wells and FGD Pond water becomes more apparent. Based on the molar ratios of these ions, it is apparent that the groundwater in downgradient and nature and extent wells is similar to that of upgradient, background locations.

Constituents Identified in February 2019 SSL Notification

- Cobalt: Cobalt concentrations in groundwater samples from nature and extent wells or CCR monitoring network wells did not exceed the GWPS for cobalt in 2019 and 2020. The cobalt concentration in groundwater collected from the downgradient nature and extent monitoring well FGD-14 was non-detect (<0.003 mg/L) in May 2019. Cobalt in groundwater across the entire monitoring network was lowest in downgradient wells; the highest concentration was measured at 0.0132 mg/L in FGD-6 in May 2019. The highest cobalt in groundwater measured in May to June 2019 was in FGD-8, an upgradient background well, at 0.0146 mg/L, but still below the GWPS. The cobalt concentration in FGD-3, where previous exceedances of the GWPS occurred, was below the GWPS in the latest samples (Figure 9).

Recent groundwater data at the Site indicate that all Appendix IV parameters are currently below their respective GWPS. Although, as discussed previously in Section 3.2, cobalt has historically been detected at concentrations above the GWPS, it is considered highly likely that the cobalt originated from a natural source, rather than the FGD Ponds based on major ion chemistry.

3.5 Evaluation of Soil

3.5.1 Mineralogical Composition

Quantitative X-ray diffraction (XRD) with Rietveld refinement was used to identify and quantify minerals in three overburden samples collected during the drilling activities - one sample from each of the soil borings completed in June 2019 (FGD-15, FGD-16, and FGD-2019-1). These samples were obtained to better understand the mineralogical composition of the aquifer system and identify any minerals that would potentially influence attenuation of constituents of interest. In contrast, the presence of certain minerals could also indicate a potential for naturally-occurring release of metals into groundwater, for instance due to oxidation of sulfide minerals.

The mineralogical analysis identified the materials in boreholes samples at the FGD Ponds predominately consist of quartz with varying amounts of the silicate minerals K-feldspar, plagioclase, and muscovite. A trace amount of magnesite [$MgCO_3$] was encountered in one sample. Analytical reports for the XRD samples are provided in Appendix C.

3.5.2 Chemical Composition and Sequential Extraction

Chemical analysis and sequential extractions were used to determine the chemical composition of the soil and the distribution of constituents of interest over various operationally-defined fractions comprising the soil. Testing was completed as described in Section 3.3.2 on soil samples obtained from three borehole locations (Figure 2) and the analytical reports for the soil analyses are provided in Appendix C.

Soil sample locations were chosen to gain a better understanding of the underlying geological conditions of the area surrounding the FGD Ponds, mostly adjacent to or downgradient of a CCR monitoring well. In addition, this information allows for a better understanding of naturally-occurring metal contributions to groundwater or the potential for sequestration of constituents from groundwater.

A description of the individual fractions determined by sequential extraction is presented in Section 3.3.2. Metals extracted in steps 1 through 5 are considered environmentally available, whereas metals extracted in steps 6 and 7 are present in refractory fractions and are not expected to be released under conditions typically encountered in aquifers (Tessier et al. 1979). Total metal quantities from the sequential extraction are expressed as “SEP Total” in Appendix C. The sum of the sequential extraction steps is also presented for comparison but does not represent an analytically-determined value.

The results from the chemical analysis and sequential extraction presented in Appendix C are summarized as follows:

General Chemistry Parameters

- Aluminum: Aluminum is not a constituent of interest (COI) at the site but it has been well studied as a sorbing medium in soils (e.g., Karamalidis and Dzombak 2011). Total aluminum in soils ranged from 29,890 mg/kg to 41,270 mg/kg, and the environmentally-available fraction ranged from just 690 mg/kg (FGD-15) to 1,927 mg/kg (FGD-2019-1). Aluminum in the soil at the site is, therefore, largely (~88% to 94%) present in the residual, or silicate-bound fraction. This fraction is likely at least partially represented by hydrous aluminum phyllosilicates minerals or clays intermixed in the silica sand matrix. Clays can represent an important sorptive reservoir for numerous trace metals and metalloids (Uddin 2017).
- Iron: While not a COI, iron and its minerals commonly represent one of most abundant reservoirs for metal/metalloid attenuation in soils (Dzombak and Morel 1990; Smith 1999). Iron was present in all three core samples analyzed, varying from 5,458 mg/kg (FGD-15) to 8,961 mg/kg (FGD-2019-1). In all samples, the sulfide and residual fractions accounted for the largest proportion of total iron (61% to 73%) and, as

such, most of the iron is not environmentally available. However, the remainder of the iron in the samples is largely present in the metal hydroxide phase (+/-1%). This fraction, part of the labile fraction in steps 1 through 5, can generally be considered representative of the amount of iron in soil that may be available as a sorbing medium and can, therefore, be used as a proxy to determine the potential for attenuation of cobalt, along with aluminum.

Constituents Identified in February 2019 SSL Notification

- Cobalt: Total cobalt in soil ranged from 1.8 mg/kg to 69.9 mg/kg while the environmentally-available fraction ranged from 1.0 mg/kg in FGD-15 to 67.6 mg/kg in FGD-2019-1, representing from 58% to 97% of total cobalt. Cobalt in FGD-2019-1 was well above the level that would be considered naturally occurring in typical soils and rock (Hem 1985), with almost all cobalt associated with the metal hydroxide and amorphous metal fractions. Although cobalt was present in the soil of FGD-2019-1 at higher level compared to other soils samples, cobalt concentrations in groundwater from FGD-3 and FGD-14, the closest wells next to and downgradient of FGD-2019-1, respectively, were non-detect, or just above the detection limit of 0.005 mg/L.
- Based on the results from the soil analysis, there is a high likelihood of naturally occurring or alternate sources of the cobalt observed in groundwater at the Site, as represented by the non-environmentally-available fractions.

3.6 Summary of Site Characterization

Based on the above site characterization and nature and extent investigation, the following is concluded with respect to cobalt:

- Cobalt: Recent data indicates that cobalt concentrations in all CCR monitoring wells and nature and extent wells are currently below its GWPS. A Sen's slope analysis for FGD-3, where cobalt has historically exceeded the GWPS, confirms the decreasing trend in cobalt groundwater concentrations. Cobalt present in the non-environmentally available fraction of soils represents a likely alternate source of cobalt in groundwater. The presence of metal hydroxides in soils also supports a strong potential for cobalt attenuation (Smith 1999), which was confirmed by the sequential extraction results. Based on the data collected to date, cobalt concentrations are no longer considered to be present at an SSL above the GWPS; however, cobalt concentrations in groundwater will continue to be monitored to confirm that cobalt levels remain below the GWPS in the future.

4.0 ASSESSMENT OF CORRECTIVE MEASURES

In accordance with §257.96 and §257.97, an ACM was conducted for the FGD Ponds to address concentrations of the following Appendix IV constituent that is conservatively assumed to occur at SSLs above the GWPS based on the February 2019 SSL notification:

- cobalt concentrations in monitoring well FGD-3.

Potential response technologies were identified for Source Control (to reduce the potential for releases of constituents to groundwater) and Groundwater Response Actions (to reduce constituent concentrations below GWPS). The potential response technologies were then screened to identify options that are appropriate for further consideration in developing potential corrective measures alternatives for the Site. The results of the ACM are presented in this section.

4.1 Corrective Measures Objectives and Evaluation Criteria

As described in §257.96(a), the corrective measures must prevent further releases, remediate any releases and restore the affected area to original conditions. Potential corrective measures must meet the requirements specified in §257.97(b):

1) Be protective of human health and the environment;
2) Attain the groundwater protection standard as specified pursuant to § 257.95(h);
3) Control the source(s) of releases to reduce or eliminate, to the maximum extent feasible, further releases of constituents in appendix IV to this part into the environment;
4) Remove from the environment as much of the contaminated material that was released from the CCR unit as is feasible, considering factors such as avoiding inappropriate disturbance of sensitive ecosystems;
5) Comply with standards for management of wastes as specified in § 257.98(d).

In accordance with §257.96(c), the assessment of potential corrective measures alternatives must include an evaluation of the following:

1) The performance, reliability, ease of implementation, and potential impacts of appropriate potential remedies, including safety impacts, cross-media impacts, and control of exposure to any residual contamination
2) The time required to begin and complete the remedy
3) Institutional requirements, such as state or local permit requirements or other environmental or public health requirements that may substantially affect implementation of the remedy(s).

4.2 Potential Source Control Response Technologies

As discussed in Section 3.5, given declining concentrations of cobalt, there is a high likelihood of naturally-occurring or alternate sources of the cobalt observed in groundwater at the Site and the FGD Ponds are not the source of this constituent; however, for the purposes of this ACM, it is assumed that some degree of source control will be considered for the FGD Ponds, since one of the listed objectives in §257.97(b) for the corrective measures is to control the source of releases of Appendix IV constituents to the environment from the CCR Unit.

The OGSES FGD Ponds are an integral part of the CCR management system at the plant. As a result, any needed potential source control technologies would be designed to keep the FGD Ponds in operation.

FGD-B and FGD-C are constructed with composite liner systems that comply with the requirements of §257.71(a)(1)(ii) of the CCR Rule and these ponds are considered lined surface impoundments under the Rule. Since the liner systems in these ponds comply with the CCR Rule, FGD-B and FGD-C provide an appropriate level of source control as currently constructed and no modifications are necessary to these ponds.

FGD-A is constructed with a clay liner and the pond is considered an unlined surface impoundment based on the August 2018 DC Circuit Court Ruling. As a result, FGD-A is being retrofitted with a new composite liner system that complies with the requirements of §257.71(a)(1)(ii) of the CCR Rule to improve the level of source control in the pond. The new liner system will be installed in general accordance with the following procedures:

- Water will be removed from the pond and transferred to FGD-B and FGD-C;
- Solids in the pond will be dewatered, removed and transported to the OGSES Ash Landfill 1;
- A minimum of 2 feet of the existing compacted clay liner will be retained at the base of the pond;
- A 60-mil HDPE geomembrane liner will be installed over the 2 feet of compacted clay liner;
- A protective layer of soil or other material will be placed over the geomembrane liner.

Retrofitting FGD-A with a new composite liner system is assumed to serve as the source control component of the potential corrective measures for the FGD Ponds. It is estimated that the FGD-A liner retrofit will be completed in 2021.

4.3 Potential Groundwater Response Technologies

For the purposes of this ACM, cobalt is conservatively assumed to be present in groundwater at the Site at SSLs above the GWPS based on the February 2019 SSL notification. In this section, potential groundwater response technologies to address these constituents are identified and screened for further consideration in developing potential corrective measures alternatives for FGD Ponds.

4.3.1 Monitored Natural Attenuation

Monitored natural attenuation (MNA) refers to the reliance on natural attenuation processes (within the context of a carefully controlled and monitored site cleanup approach) to achieve site-specific groundwater remediation objectives within a time frame that is reasonable compared to that offered by more active remediation methods (USEPA 2007a). MNA relies on a range of natural processes, including dispersion, dilution, sorption, (co)precipitation, radioactive decay, and abiotic degradation/transformation to achieve remediation objectives (ITRC 2010). Routine groundwater monitoring would be required to verify MNA is occurring at the Site.

Where necessary, MNA processes can be enhanced through the use of low-energy, in-situ techniques to stimulate or increase the attenuation of contaminants or reduce contaminant loading (ITRC 2010). Enhancement options include increasing the attenuation capacity of the aquifer, decreasing the mobility of contaminants, and/or increasing the stability of immobilized contaminants by increasing the ability of aquifer solids to remove contaminants from groundwater and/or manipulating the geochemistry to reduce remobilization of contaminants by desorption or dissolution of precipitates (ITRC 2010).

MNA has been demonstrated effective in reducing cobalt concentrations in groundwater (ITRC 2010; USEPA 2007b). Cobalt is removed through adsorption to iron hydroxides and/or amorphous metals and the level of effectiveness is dependent on iron hydroxide availability as well as pH, alkalinity, and calcium levels (ITRC 2010).

MNA would be effective in remediating groundwater beneath and downgradient of the FGD Ponds. An MNA feasibility evaluation for cobalt is currently being performed in accordance with USEPA and ITRC guidance and preliminary results indicate that MNA is an effective groundwater remedy for the FGD Ponds. The estimated time to implement MNA is estimated to be approximately 1 year including design and construction. The estimated time to achieve GWPS for the target Appendix IV constituents is dependent on site-specific conditions ; however, as stated previously, groundwater cobalt concentrations downgradient of the FGD Ponds did not exceed the GWPS for cobalt in 2019 and 2020.

4.3.2 Groundwater Extraction and Treatment

Groundwater extraction and treatment is one of the most widely implemented groundwater remediation technologies and is used to provide 1) hydraulic containment and 2) treatment (USEPA 1996). A groundwater extraction and treatment system consists of the following major components:

- A series of extraction wells or trenches strategically located to modify/interrupt the natural flow of groundwater;
- Extraction pumps installed in each well/trench to pump groundwater from the subsurface;
- A treatment system to remove constituents of concern from the extracted groundwater; and
- A point of discharge for the treated groundwater (surface water, re-injection to groundwater, etc.).

For the FGD Ponds, a system of extraction wells would be installed along the downgradient edge of the ponds to provide hydraulic control of the Appendix IV constituent groundwater plumes. The extracted groundwater would be treated in an on-site treatment system and treated water would be discharged to Twin Oaks Reservoir or re-injected into the aquifer.

Potential groundwater treatment methods for the target Appendix IV constituents include the following:

- Cobalt - ion exchange, adsorptive media, activated carbon, and chemical treatment with membrane filtration (USEPA 2019a).

Treatment methods for these constituents would need to be bench/pilot tested to evaluate their effectiveness prior to designing a full-scale system. Treatment will generate residual material (sludge, regenerate brine, etc.) containing concentrated levels of the target Appendix IV constituents that must managed.

Groundwater extraction and treatment would be effective in reducing contaminant concentrations in groundwater downgradient of the FGD Ponds through hydraulic containment, but would have little effect on groundwater conditions beneath the ponds. The estimated time to implement groundwater extraction and treatment is estimated to be approximately 3 to 4 years, including testing, design, and construction. The estimated time to achieve GWPS for the target Appendix IV constituents is dependent on site-specific conditions and groundwater modeling is needed to better evaluate remedial timeframes.

4.3.3 Vertical Hydraulic Barrier

A vertical, low permeability hydraulic barrier can be installed to provide a physical barrier to groundwater flow to contain the migration of contaminated groundwater. Vertical hydraulic barriers that have been demonstrated effective at controlling groundwater flow include the following (USEPA 1998):

- Slurry Wall. Slurry walls consist of a narrow, excavated trench that is filled with a soil-bentonite slurry mixture. The slurry shores and supports the trench walls and forms a low-permeability barrier in the trench. Key design considerations include wall depth, key depth, and material compatibility. Slurry trenches can be excavated to depths of 50 feet using standard excavators and over 80 feet using long-reach excavators or a crane mounted drag line/clamshell bucket. Geosynthetic materials can be placed in the trench in conjunction with the slurry wall to improve the hydraulic performance (decrease permeability) and chemical resistance.
- Soil-Mixed Wall. Soil-mixed walls form a hydraulic barrier through in-situ mixing of soil with amendments, such as bentonite and/or cement. Soil-mixed barrier walls can be installed to depths of over 100 feet. The walls are installed by sections or panels that overlap to achieve a continuous barrier.
- Grout Curtain. Grout curtain barriers are constructed by injecting grout into the subsurface in an overlapping injection pattern to form a continuous barrier. Grouted barriers can be installed using permeation grouting, jet grouting, or vibrating beam technologies. Grouted barriers must be designed and constructed to ensure hydrofracturing does not occur and the completed wall is effective at restricting groundwater flow.
- Sheet-pile Wall. Sheet-pile walls consist of steel, vinyl, or other materials driven into the subsurface using a hydraulic percussion hammer or vibratory hammer. Sheet-pile walls are common in civil engineering applications; however, their use in environmental applications has been more limited. One of the major concerns with sheet-walls in environmental applications is leakage through the vertical joints between piles; however, improvements in pile interlock designs have been made to improve joint sealing.

For a vertical hydraulic barrier to be effective, the bottom of the barrier must be “keyed” into a low-permeability confining layer. A detailed engineering analysis and design, likely including a bench/pilot test to identify most appropriate barrier materials, would be required for the construction of a vertical hydraulic barrier.

For the FGD Ponds, the vertical hydraulic barrier would be constructed along the downgradient edge of the ponds to provide hydraulic control of the cobalt groundwater plumes. A vertical hydraulic barrier physically interrupts the natural flow of groundwater; consequently, groundwater elevations upgradient of the barrier will rise, potentially to the point that groundwater could begin to flow around the edges of the barrier. To address this concern, a groundwater extraction and treatment system would be required upgradient of the barrier to control the groundwater levels. The groundwater extraction and treatment system used in conjunction with the vertical hydraulic barrier would be similar to the system described in Section 4.3.2; however, the required capacity of the system would be less since the rate of groundwater extraction would be limited to that required to control upgradient groundwater levels.

Construction of a vertical hydraulic barrier is expected to require significant effort and time. Prior to implementation of the barrier, pre-design field work, including site investigations and bench/pilot-scale barrier material testing would be required, followed by full-scale design and construction. The estimated time to implement a vertical hydraulic barrier with groundwater extraction and treatment is estimated to be approximately 5 to 8 years, including testing, design, and construction. The estimated time to achieve GWPS for the target Appendix IV constituents is dependent on site-specific conditions and groundwater modeling is needed to better

evaluate remedial timeframes however, as stated previously, groundwater cobalt concentrations downgradient of the FGD Ponds did not exceed the GWPS for cobalt in 2019 and 2020.

4.3.4 Permeable Reactive Barrier

A permeable reactive barrier (PRB) is an in-situ, permeable treatment zone that contains reactive media designed to intercept impacted groundwater and either immobilize contaminants or transform the contaminants to a more desirable state (ITRC 2011). A PRB is a passive treatment system that acts as a barrier to groundwater contamination but not groundwater flow. The PRB must intercept the flow of impacted groundwater and must be designed and constructed such that impacted groundwater cannot bypass the reactive media by flowing over, under, or around the PRB. A PRB must include the appropriate reactive media and the residence time within the PRB needs to sufficient to allow for effective treatment. The effectiveness of the reactive media will be reduced over time and the media will likely have to be replaced periodically. Groundwater monitoring is used to evaluate the performance/effectiveness of a PRB system.

There are two primary PRB configurations: continuous and funnel-and-gate. A continuous PRB features permeable reactive media across the entire length of the barrier. A funnel-and -gate PRB uses sections of vertical hydraulic barriers to direct groundwater flow through permeable reactive media sections that allow the groundwater to pass through while treating contaminants. In both configurations, the permeability of the reactive media must be greater than the aquifer to ensure flow is not diverted around the PRB media. For FGD Ponds, PRB system would be constructed along the downgradient edge of the ponds to provide control of the cobalt groundwater plume.

PRB systems are generally considered a proven technology, however, site conditions and the specific contaminants of interest affect the system performance. The potential applicability of a PRB system for the target Appendix IV constituents can be summarized as follows:

- Cobalt - potentially removed using sulfate-reducing media or combination of zero-valent iron (ZVI) and organic material (Ludwig 2002; ITRC 2011).

Removal of the target Appendix IV constituents using a PRB system has not been consistently demonstrated under full-scale conditions and bench/pilot-scale testing would be required to confirm the effectiveness of a PRB system at the Site. A groundwater model would be needed to evaluate the remedial timeframes.

Similar to a vertical hydraulic barrier, construction of a PRB system is expected to require significant effort and time. Prior to implementation of the PRB, pre-design field work, including site investigations, groundwater modeling, and bench-scale soil mix testing would be required, followed by full-scale design and construction. The estimated time to implement a PRB system is estimated to be approximately 5 to 8 years, including testing, design, and construction. The estimated time to achieve GWPS for the target Appendix IV constituents is dependent on site-specific conditions and groundwater modeling is needed to better evaluate remedial timeframes however, as stated previously, groundwater cobalt concentrations downgradient of the FGD Ponds did not exceed the GWPS for cobalt in 2019 and 2020.

4.3.5 In-situ Chemical Treatment

In-situ Chemical Treatment (ICT) involves the injection of a chemical reagent or other material into the groundwater aquifer to adjust the geochemistry to enhance the direct precipitation, co-precipitation, or related adsorption/precipitation of the target contaminants (USEPA 2019c). Direct precipitation occurs when a

constituent exceeds its solubility in water and precipitates out of solution. Co-precipitation refers to the removal of a constituent through adsorption onto the precipitate of another chemical reaction.

Cobalt has the potential to be removed through adsorption and/or coprecipitation under reducing groundwater conditions (Goldemund and Robb 2018).

Injection wells would be installed into the aquifer along the downgradient edge of the FGD Ponds and the chemical reagents would be injected to provide control of the target Appendix IV constituent groundwater plume.

ICT is considered an emerging remediation technology for the target Appendix IV constituents and the effectiveness of the technology on most of the constituents is uncertain. Bench/pilot-scale testing would be required to confirm the effectiveness of an ICT system at the Site. The estimated time to implement an ICT system is estimated to be approximately 5 to 8 years, including testing, design, and construction. The estimated time to achieve GWPS for the target Appendix IV constituents is dependent on site-specific conditions and groundwater modeling is needed to better evaluate remedial timeframes however, as stated previously, groundwater cobalt concentrations downgradient of the FGD Ponds did not exceed the GWPS for cobalt in 2019 and 2020

4.3.6 Phytoremediation

Phytoremediation refers to the use of plants to partially or substantially remediate selected contaminants in contaminated soil, sludge, sediment, ground water, surface water, and wastewater (USEPA 2001). The process utilizes a variety of plant biological processes and plant physical characteristics to aid in remediation; however, the primary plant process potentially applicable to the target Appendix IV constituents at the Site is phytoextraction, which is the uptake and accumulation of contaminants within aboveground portions of a plant. The contaminants are removed from the Site when the plants are harvested and managed off-site.

Phytoextraction occurs in the root zone of plants, which is typically relatively shallow, with the bulk of roots at shallower rather than deeper depths. This would limit the effectiveness of phytoextraction at the Site due to the depth of groundwater. Phytoremediation for cobalt removal from groundwater has not been demonstrated under full-scale conditions (USEPA 2001).

Implementation of a phytoremediation process at the Site would involve planting appropriate vegetation at intervals along the downgradient edge of the FGD Ponds and across the affected groundwater plume area. A comprehensive bench/pilot testing program would be required to select the most appropriate plants for removal of the target Appendix IV constituents from groundwater at the Site. Since the target Appendix IV constituents would likely accumulate in the plants, management of harvested plants in accordance with RCRA could be required. The estimated time to implement an ICT system is estimated to be approximately 15 to 20 years, based on the success and rate of vegetation growth. The estimated time to achieve GWPS for the target Appendix IV constituents is dependent on site-specific conditions and groundwater modeling is needed to better evaluate remedial timeframes however, as stated previously, groundwater cobalt concentrations downgradient of the FGD Ponds did not exceed the GWPS for cobalt in 2019 and 2020.

4.3.7 Screening of Potential Groundwater Response Technologies

Following identification of potential groundwater response technologies, Golder screened the potential options for further consideration in developing potential corrective measures alternatives for the FGD Ponds. The screening results for each potential source technology are summarized in Table 2. Based on the initial screening, the

following potential groundwater response technologies were retained for future evaluation as part of the corrective measures alternatives for the FGD Ponds:

- Monitored Natural Attenuation
- Groundwater Extraction and Treatment
- Vertical Hydraulic Barrier

4.4 Potential Corrective Measures Alternatives

Based on the response technology screening discussed above, Golder assembled the following potential corrective measures alternatives that could be both effective and implementable at the Site:

- Retrofit Liner in FGD-A with Monitored Natural Attenuation
- Retrofit Liner in FGD-A with Groundwater Extraction and Treatment
- Retrofit Liner in FGD-A with Vertical Hydraulic Barrier

A summary of the corrective measure alternatives, including an assessment of each alternative against the evaluation criteria presented in §257.96(c) is provided in Table 3.

4.5 Remedy Selection

The corrective measure alternative proposed as the remedy for the FGD Ponds will be selected as soon as feasible in accordance with §257.97.

It should also be noted that, for the purposes of this ACM, cobalt concentrations were conservatively assumed to be present at SSLs above the GWPS based on the February 2019 SSL notification. However, as discussed in Sections 3.4-3.6, all CCR monitoring wells and nature and extent wells exhibited cobalt concentrations below the GWPS in 2019 and 2020 and naturally occurring sources of cobalt exist in the vicinity of the FGD Ponds. Cobalt concentrations in groundwater will continue to be monitored in accordance with the CCR rule to confirm that the concentrations remain below the GWPS in the future. These monitoring results, along with updated statistical analysis and alternate source demonstrations (if applicable), will be considered as part of the remedy selection process.

5.0 REFERENCES

Barnes, Virgil E., 1970. Geologic Atlas of Texas, Waco Sheet. Texas Bureau of Economic Geology.

Bethke, C., 2015. Geochemist's Workbench: Release 12.0 - Aqueous Solutions, LLC.

Code of Federal Regulations, 2015 April. Chapter 40, Part 257, Subpart D.

Dzombak, D.A. and Morel, F., 1990. Surface complexation modeling: hydrous ferric oxide. John Wiley & Sons.

Goldemund, H and Robb, C, 2018. Current Overview of Groundwater Remediation Options for CCR Units, Proceedings of 2018 World of Coal Ash Conference.

Golder, 2016a. History of Construction – CCR Surface Impoundments, Oak Grove Steam Electric Station. October.

Golder, 2016b. Certification of Lined Construction – CCR Surface Impoundments, Oak Grove Steam Electric Station. October.

Golder, 2019. Drinking Water Survey Report – Revision No. 1, Oak Grove Steam Electric Station – FGD Ponds and Ash Landfill I, Robertson County, Texas. July 25.

Hem, J.D., 1985. Study and interpretation of the chemical characteristics of natural water (Vol. 2254). US Geological Survey.

ITRC. 2010. A Decision Framework for Applying Monitored Natural Attenuation Processes to Metals and Radionuclides in Groundwater. Technical/Regulatory Guidance, December 2010.

ITRC. 2011. Permeable Reactive Barrier: Technology Update. PRB-5. June 2011.

Karamalidis, A. and Dzombak, D., 2011. Surface complexation modeling: gibbsite. John Wiley & Sons.

Ludwig, R, et. al., 2002. A Permeable Reactive Barrier for Treatment of Heavy Metals in Ground Water 40(1):59-66, January 2002

Parkhurst, D. and Appelo, C., 2013. Description of input and examples for PHREEQC version 3: a computer program for speciation, batch-reaction, one-dimensional transport, and inverse geochemical calculations (No. 6-A43). US Geological Survey.

Pastor, Behling & Wheeler, LLC (PBW), 2017a. Coal Combustion Residual Rule Groundwater Monitoring System Certification, Oak Grove Steam Electric Station, FGD Pond Area, Robertson County, Texas. October 16, 2017.

PBW, 2017b. Coal Combustion Residual Rule Statistical Analysis Plan, Big Brown Steam Electric Station, Ash Disposal Area II, Freestone County, Texas. October 11, 2017.

Smith, K., 1999. Metal sorption on mineral surfaces: an overview with examples relating to mineral deposits. The Environmental Geochemistry of Mineral Deposits. Part B: Case Studies and Research Topics, 6, pp.161-182.

Tessier, A., Campbell, P.G. and Bisson, M., 1979. Sequential extraction procedure for the speciation of particulate trace metals. Analytical chemistry, 51(7), pp.844-851.

Uddin, M., 2017. A review on the adsorption of heavy metals by clay minerals, with special focus on the past decade. Chemical Engineering Journal, 308, pp.438-462.

US Army Corps of Engineers (USACE), 2010. Maywood Chemical Company Superfund Site, Groundwater Feasibility Study Report, September

USEPA, 1996. Pump-and-Treat Ground-Water Remediation: A Guide for Decision Makers and Practitioners. EPA/625/R-95/005. July 1996.

USEPA. 1998. Evaluation of Subsurface Engineered Barriers at Waste Sites, EPA-542-R-98-005, July 1998.

USEPA. 2001. Phytoremediation of Contaminated Soil and Ground Water at Hazardous Waste Sites, EPA/540-S-01/500. February 2001.

USEPA, 2007a. Monitored Natural Attenuation of Inorganic Contaminants in Ground Water. Volume 1. Technical Basis for Assessment. EPA/600/R-07/139.

USEPA, 2007b. Monitored Natural Attenuation of Inorganic Contaminants in Ground Water. Volume 2. Assessment for Non-Radionuclides Including Arsenic, Cadmium, Chromium, Copper, Lead, Nickel, Nitrate, Perchlorate, and Selenium. EPA/600/R-07/140.

USEPA, 2009. Unified Guidance Document: Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, EPA 530-R-09-007, March 2009.

USEPA, 2014. Reference Guide to Treatment Technologies for Mining-Influenced Water. March 2014.

USEPA, 2015. 40 CFR Parts 257 and 261; Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule. April 17, 2015.

USEPA, 2015. Use of Monitored Natural Attenuation for Inorganic Contaminants in Groundwater at Superfund Sites. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response Directive 9283.1-36. August 2015.

USEPA, 2019a. Drinking Water Treatability Database – Cobalt . Retrieved from https://oaspub.epa.gov/tdb/pages/general/home.do

USEPA, 2019b. Permeable Reactive Barriers. CLU-IN. Retrieved from https://clu-in.org/techfocus/default.focus/sec/Permeable_Reactive_Barriers%2C_Permeable_Treatment_Zones%2C_and_Application_of_Zero-Valent_Iron/cat/Overview/

USEPA, 2019c. In Situ Chemical Reduction. CLU-IN. Retrieved from https://clu-in.org/techfocus/default.focus/sec/In_Situ_Chemical_Reduction/cat/Overview/

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TABLES

TABLE 1
APPENDIX IV GROUNDWATER ANALYTICAL DATA SUMMARY
FGD PONDS
OAK GROVE STEAM ELECTRIC STATION

Sample Location	Date Sampled	Sb (mg/L)	As (mg/L)	Ba (mg/L)	Be (mg/L)	Cd (mg/L)	Cr (mg/L)	Co (mg/L)	F (mg/L)	Pb (mg/L)	Li (mg/L)	Hg (mg/L)	Mo (mg/L)	Se (mg/L)	Tl (mg/L)	Ra 226 (pCi/L)	Ra 228 (pCi/L)	Ra 226/228 Combined^ (pCi/L)
GWPS*:		0.006	0.0146	2	0.004	0.005	0.1	0.016	4	0.015	0.15	0.002	0.1	0.05	0.002	--	--	11.2
Background Wells																		
FGD-8	11/04/15	<0.0008	<0.002	0.119	<0.0003	<0.0003	0.00542	<0.003	0.173 J	<0.0003	0.149	<0.00008	0.0261	<0.002	<0.0005	0.671	1.38	2.05
	12/17/15	<0.0008	<0.002	0.179	<0.0003	<0.0003	0.00373 J	0.00646	0.361 J	<0.0003	0.116	<0.00008	0.00404 J	<0.002	<0.0005	<0.609	1.32	1.93
	02/09/16	<0.0008	0.0115	0.892	<0.0003	<0.0003	0.00234 J	0.00609	0.331 J	0.000406 J	0.0104	<0.00008	<0.002	0.00231 J	<0.0005	1.77	3.55	5.32
	04/14/16	<0.0008	0.0146	0.965	<0.0003	<0.0003	0.00202 J	0.00876	0.218 J	0.0016	0.016	<0.00008	<0.002	0.00211 J	<0.0005	0.973	8.34	9.31
	06/14/16	<0.0008	0.00639	0.792	<0.0003	<0.0003	<0.002	0.0158	<0.100	0.00137	0.015	<0.00008	<0.002	<0.002	<0.0005	1.93	2.30	4.23
	08/24/16	<0.0008	<0.002	0.102	0.000417 J	<0.0003	0.0107	0.015	0.186 J	0.00381	0.0265	<0.00008	<0.002	<0.002	<0.0005	0.778	<0.491	1.27
	10/05/16	<0.0008	0.00661	0.753	<0.0003	<0.0003	0.00672	0.00899	0.413	0.000908 J	0.0224	<0.00008	<0.002	<0.002	<0.0005	1.35	5.96	7.31
	12/23/16	<0.0008	0.0119	0.894	<0.0003	<0.0003	0.00259 J	0.00745	<0.100	0.00228	0.0185	<0.00008	<0.002	0.00217 J	<0.0005	2.17	3.70	5.87
	06/05/18	<0.0008	0.00839	0.834	<0.0003	<0.0003	<0.002	0.0193	<0.100	0.00039 J	0.0128	<0.00008	<0.002	<0.002	<0.0005	1.5	5.13	6.63
	09/06/18	NA	0.0137	0.635	<0.0003	<0.0003	<0.002	0.0243	0.362 J	<0.0003	0.009 J	NA	<0.002	0.0025 J	<0.0005	0.349	1.4	1.75
	05/16/19	<0.0008	0.0126	0.864	<0.0003	<0.0003	0.003 J	0.0146	<0.100	<0.00194	0.009 J	<0.00008	<0.002	0.0027 J	<0.0005	3.14	5.27	8.41
	08/19/19	<0.0008	0.00645	0.608	<0.0003	<0.0003	<0.002	0.0135	<0.100	0.00134	0.0144	<0.00008	<0.002	0.00252	<0.0005	1.79	6.82	8.61
	05/11/20	<0.000800	0.00663	0.732	<0.0003	<0.000300	<0.00200	0.0084	<0.100	0.000415 J	0.0152	<0.00008	<0.002	0.0021 J	<0.0005	2.07	6.58	8.65
	09/15/20	NA	0.00796	0.777	<0.0003	NA	0.00287 J	0.00379 J	<0.100	0.00107	0.00864 J	NA	<0.002	<0.002	<0.0005	2.5	6.2	8.7
FGD-11	11/04/15	<0.0008	<0.002	0.0527	<0.0003	<0.0003	<0.002	<0.003	<0.1	0.000727 J	0.0144	<0.00008	<0.002	<0.002	<0.0005	0.928	<1.41	2.34
	12/17/15	<0.0008	<0.002	0.0676	0.000303 J	<0.0003	<0.002	<0.003	0.13 J	0.000987 J	0.016	<0.00008	<0.002	<0.002	<0.0005	0.786	<1.63	2.42
	02/09/16	<0.0008	<0.002	0.271	<0.0003	<0.0003	<0.002	<0.003	0.548	<0.0003	0.011	<0.00008	<0.002	<0.002	<0.0005	1.39	2.64	4.03
	04/14/16	<0.0008	<0.002	0.26	<0.0003	<0.0003	0.00222 J	<0.003	0.671	0.0012	0.011	<0.00008	<0.002	<0.002	<0.0005	1.69	2.43	4.12
	06/15/16	<0.0008	<0.002	0.216	<0.0003	<0.0003	<0.002	<0.003	0.331 J	0.000407 J	0.0126	<0.00008	0.00238 J	<0.002	<0.0005	2.34	2.06	4.40
	08/25/16	<0.0008	<0.002	0.439	<0.0003	<0.0003	0.00465 J	<0.003	0.128 J	0.00179	0.011	<0.00008	<0.002	<0.002	<0.0005	4.23	3.58	7.81
	10/04/16	<0.0008	<0.002	0.55	<0.0003	<0.0003	<0.002	<0.003	0.579	0.000618 J	0.0124	<0.00008	<0.002	<0.002	<0.0005	1.73	2.53	4.26
	12/22/16	<0.0008	<0.002	0.734	<0.0003	<0.0003	0.00258 J	<0.003	0.127 J	0.000635 J	0.0124	<0.00008	<0.002	<0.002	<0.0005	3.94	5.09	9.03
	06/05/18	<0.0008	<0.002	0.520	<0.0003	<0.0003	0.0372	0.007	0.836	0.00891 J	0.0102	<0.00008	0.00266 J	<0.002	<0.0005	4.64	4.22	8.86
	09/06/18	NA	<0.002	0.702	<0.0003	<0.0003	0.0039 J	<0.003	1.09	<0.0003	0.0121	NA	<0.002	<0.002	<0.0005	6.24	6.47	12.71
	05/16/19	<0.0008	<0.002	0.347	<0.0003	<0.0003	0.028	<0.003	0.38 J	0.000576 J	0.0145	<0.00008	0.00358 J	<0.002	<0.0005	2.39	2.75	5.14
	08/19/19	<0.0008	<0.002	0.310	<0.0003	<0.0003	0.00391 J	<0.003	0.63	<0.0003	0.0136	<0.00008	0.00238 J	<0.002	<0.0005	1.39	2.55	3.95
	05/11/20	<0.000800	<0.002	0.347	<0.0003	<0.000300	0.0146	<0.003	0.365 J	0.000658 J	0.0132	<0.00008	<0.002	<0.002	<0.0005	2.39	4.00	6.39
	09/10/20	NA	<0.002	0.330	<0.0003	NA	0.0158	<0.003	0.575	0.000706 J	0.0121	NA	<0.002	<0.002	<0.0005	3.35	4.69	8.04
Downgradient Wells																		
FGD-1	11/03/15	<0.0008	<0.002	0.0311	<0.0003	<0.0003	<0.002	<0.003	0.363 J	<0.0003	0.034	<0.00008	<0.002	<0.002	<0.0005	0.718	<1.40	2.12
	12/17/15	<0.0008	<0.002	0.0263	<0.0003	<0.0003	<0.002	<0.003	0.384 J	<0.0003	0.0306	<0.00008	<0.002	<0.002	<0.0005	0.919	<1.43	2.35
	02/09/16	<0.0008	<0.002	0.0315	<0.0003	<0.0003	0.00437 J	0.0033 J	0.383 J	0.000379 J	0.0314	<0.00008	<0.002	<0.002	<0.0005	<0.318	1.42	1.74
	04/14/16	<0.0008	<0.002	0.0296	<0.0003	<0.0003	<0.002	<0.003	0.229 J	<0.0003	0.0338	<0.00008	<0.002	<0.002	<0.0005	<0.439	<1.28	<1.719
	06/15/16	<0.0008	<0.002	0.0276	<0.0003	<0.0003	<0.002	<0.003	0.302 J	<0.0003	0.0321	<0.00008	<0.002	<0.002	<0.0005	<0.258	1.66	1.92
	08/24/16	<0.0008	<0.002	0.0294	<0.0003	<0.0003	<0.002	<0.003	0.225 J	<0.0003	0.033	<0.00008	<0.002	<0.002	<0.0005	0.188	2.24	2.43
	10/05/16	<0.0008	<0.002	0.0319	<0.0003	<0.0003	<0.002	0.00447 J	0.483	<0.0003	0.0331	<0.00008	<0.002	<0.002	<0.0005	0.430	0.507	0.94
	12/22/16	<0.0008	<0.002	0.0418	<0.0003	<0.0003	<0.002	<0.003	0.326 J	<0.0003	0.0385	<0.00008	<0.002	<0.002	<0.0005	<0.273	<0.645	<0.918
	06/05/18	<0.0008	<0.002	0.0422	<0.0003	<0.0003	<0.002	<0.003	0.206 J	<0.0003	0.0426	<0.00008	<0.002	<0.002	<0.0005	0.194	<0.7680	0.962
	09/06/18	NA	<0.002	0.0417	<0.0003	<0.0003	<0.002	0.0033 J	0.228 J	<0.0003	0.0436	NA	<0.002	<0.002	0.0005	0.209	<0.53	0.739
	05/16/19	<0.0008	<0.002	0.0485	<0.0003	<0.0003	<0.002	<0.003	0.362 J	<0.0003	0.0442	<0.00008	<0.002	<0.002	<0.0005	0.33	<0.59	0.923
	08/19/19	<0.0008	<0.002	0.0538	<0.0003	<0.0003	<0.002	<0.003	0.486	<0.0003	0.0441	<0.00008	<0.002	<0.002	<0.0005	0.489	1.09	1.57
	05/11/20	<0.000800	<0.002	0.131	<0.0003	<0.000300	<0.00200	0.0495	0.231 J	<0.0003	0.0548	<0.00008	<0.002	<0.002	<0.0005	1.08	0.808	1.89
	09/15/20	NA	<0.002	0.162	<0.0003	NA	<0.00200	<0.003	0.215 J	0.000342 J	0.0233	NA	<0.002	<0.002	<0.0005	0.664	1.66	2.32

TABLE 1
APPENDIX IV GROUNDWATER ANALYTICAL DATA SUMMARY
FGD PONDS
OAK GROVE STEAM ELECTRIC STATION

Sample Location	Date Sampled	Sb (mg/L)	As (mg/L)	Ba (mg/L)	Be (mg/L)	Cd (mg/L)	Cr (mg/L)	Co (mg/L)	F (mg/L)	Pb (mg/L)	Li (mg/L)	Hg (mg/L)	Mo (mg/L)	Se (mg/L)	Tl (mg/L)	Ra 226 (pCi/L)	Ra 228 (pCi/L)	Ra 226/228 Combined^ (pCi/L)
GWPS*:		0.006	0.0146	2	0.004	0.005	0.1	0.016	4	0.015	0.15	0.002	0.1	0.05	0.002	--	--	11.2
FGD-2	11/03/15	<0.0008	<0.002	0.146	<0.0003	<0.0003	0.00244 J	<0.003	0.224 J	<0.0003	0.0224	<0.00008	<0.002	0.0203	<0.0005	<0.249	1.97	2.22
	12/17/15	<0.0008	<0.002	0.103	<0.0003	<0.0003	0.00386 J	<0.003	0.347 J	0.00145	0.0183	<0.00008	<0.002	0.0127	<0.0005	1.030	<1.24	2.27
	02/09/16	<0.0008	<0.002	0.133	<0.0003	<0.0003	0.00426 J	<0.003	0.315 J	<0.0003	0.0221	<0.00008	<0.002	0.0181	<0.0005	0.669	1.81	2.48
	04/14/16	<0.0008	<0.002	0.129	<0.0003	<0.0003	<0.002	<0.003	0.192 J	<0.0003	0.0196	<0.00008	<0.002	0.0166	<0.0005	0.198	<2.03	2.23
	06/14/16	<0.0008	<0.002	0.091	<0.0003	<0.0003	<0.002	<0.003	0.122 J	<0.0003	0.0243	<0.00008	<0.002	0.0189	<0.0005	0.275	1.66	1.94
	08/24/16	<0.0008	<0.002	0.144	<0.0003	<0.0003	<0.002	<0.003	<0.1	<0.0003	0.019	<0.00008	<0.002	0.0185	<0.0005	2.47	0.769	3.24
	10/05/16	<0.0008	<0.002	0.129	<0.0003	<0.0003	0.00549	<0.003	0.243 J	0.000693 J	0.0199	<0.00008	<0.002	0.0176	<0.0005	0.716	1.70	2.42
	12/22/16	<0.0008	<0.002	0.158	<0.0003	<0.0003	<0.002	<0.003	<0.1	<0.0003	0.0217	<0.00008	<0.002	0.022	<0.0005	0.345	1.79	2.14
	06/05/18	<0.0008	<0.002	0.108	<0.0003	<0.0003	<0.002	<0.003	0.185 J	<0.0003	0.0226	<0.00008	<0.002	0.0185	<0.0005	0.505	1.12	1.63
	09/06/18	NA	<0.002	0.125	<0.0003	<0.0003	<0.002	<0.003	0.32 J	<0.0003	0.0253	NA	<0.002	0.0204	<0.0005	0.641	0.822	1.46
	05/16/19	<0.0008	<0.002	0.0993	<0.0003	<0.0003	0.003 J	<0.003	0.383 J	<0.0003	0.0228	0.00008	<0.002	0.0214	<0.0005	0.648	0.588	1.24
	08/19/19	<0.0008	<0.002	0.181	<0.0003	<0.0003	<0.002	<0.003	0.413	<0.0003	0.0257	<0.00008	<0.002	0.0249	<0.0005	0.456	2.8	3.26
	05/11/20	<0.000800	<0.002	0.108	<0.0003	<0.000300	0.00234 J	<0.003	<0.100	<0.0003	0.028	<0.00008	<0.002	0.0208	<0.0005	0.677	2.08	2.76
	09/10/20	NA	<0.002	0.104	<0.0003	NA	0.00239 J	<0.003	<0.100	<0.0003	0.0250	NA	<0.002	0.0217	<0.0005	0.744	0.29	1.03
FGD-3	11/03/15	<0.0008	0.00226 J	0.0417	<0.0003	0.00492	<0.002	0.0436	0.505	<0.0003	0.176	<0.00008	<0.002	0.0881	0.0017	0.930	3.18	4.11
	12/17/15	<0.0008	0.00215 J	0.0371	0.000475 J	0.00372	<0.002	0.0399	<0.1	<0.0003	0.14	<0.00008	<0.002	0.0798	0.0016	1.70	2.66	4.36
	02/09/16	<0.0008	0.00206 J	0.0407	<0.0003	0.00343	<0.002	0.0417	0.74	0.000438 J	0.13	<0.00008	<0.002	0.0907	0.0015 J	1.04	3.37	4.41
	04/14/16	<0.0008	0.00218 J	0.0371	<0.0003	0.00212	<0.002	0.0326	0.69	<0.0003	0.119	<0.00008	<0.002	0.064	0.00137 J	<0.276	<1.35	<1.626
	06/14/16	<0.0008	0.00205 J	0.0392	<0.0003	0.00156	<0.002	0.0261	0.173 J	<0.0003	0.107	<0.00008	<0.002	0.0447	0.00126 J	0.754	1.56	2.31
	08/24/16	<0.0008	0.00221 J	0.0387	<0.0003	0.00146	<0.002	0.0232	0.463	<0.0003	0.0974	<0.00008	<0.002	0.0272	0.00123 J	0.416	2.60	3.02
	10/05/16	<0.0008	0.00225 J	0.039	<0.0003	0.00152	<0.002	0.0226	0.723	<0.0003	0.113	<0.00008	<0.002	0.0276	0.00114 J	0.455	2.44	2.90
	12/22/16	<0.0008	0.00226 J	0.0437	<0.0003	0.00173	<0.002	0.0266	1.32	<0.0003	0.11	<0.00008	<0.002	0.0245	0.00124 J	<0.352	2.46	2.81
	06/05/18	<0.0008	0.00236 J	0.0391	<0.0003	0.00152	<0.002	0.0207	1.06	<0.0003	0.0975	<0.00008	0.00212 J	0.0192	0.000985 J	0.528	2.19	2.72
	09/05/18	NA	0.00208 J	0.0379	<0.0003	0.00146	<0.002	0.0192	1.03	<0.0003	0.0955	NA	0.0021 J	0.0213	0.000925 J	<0.323	0.704	1.03
	05/16/19	<0.0008	0.0023 J	0.051	<0.0003	<0.0003	<0.002	0.0052	0.776	<0.0003	0.057	<0.00008	0.0031 J	0.0423	0.0006 J	<0.403	<0.638	<1.041
	08/19/19	<0.0008	0.00248 J	0.0365	<0.0003	<0.0003	<0.002	0.00364 J	0.874	<0.0003	0.0546	<0.00008	0.00231 J	0.0245	0.000588 J	0.523	0.858	1.38
	05/06/20	<0.000800	0.00209 J	0.0353	<0.0003	<0.000300	0.0117	0.00332 J	0.8	<0.0003	0.0498	<0.00008	0.00284 J	0.00993	0.000556 J	0.394	0.463	0.857
	09/15/20	NA	0.00225 J	0.0326	<0.0003	NA	<0.00200	<0.003	0.772	<0.0003	0.0416	NA	0.00245 J	0.00646	0.000534 J	0.257	0.484	0.711
FGD-4	11/03/15	<0.0008	<0.002	0.126	<0.0003	<0.0003	<0.002	<0.003	0.294 J	<0.0003	0.0433	<0.00008	<0.002	<0.002	<0.0005	1.01	<1.39	2.40
	12/17/15	<0.0008	<0.002	0.105	<0.0003	<0.0003	<0.002	<0.003	0.295 J	<0.0003	0.0436	0.000229	0.00211 J	0.00214 J	<0.0005	<0.361	<1.73	<2.091
	02/09/16	<0.0008	<0.002	0.113	<0.0003	<0.0003	<0.002	<0.003	0.32 J	<0.0003	0.0419	0.000288	<0.002	<0.002	<0.0005	<0.332	<1.11	<1.442
	04/14/16	<0.0008	<0.002	0.12	<0.0003	<0.0003	0.00208 J	<0.003	0.323 J	0.0271	0.0357	0.000232	<0.002	<0.002	<0.0005	0.560	<1.21	1.77
	06/14/16	<0.0008	<0.002	0.128	<0.0003	0.000561 J	<0.002	<0.003	<0.1	<0.0003	0.0477	<0.00008	<0.002	<0.002	<0.0005	0.437	<0.975	1.41
	08/24/16	<0.0008	<0.002	0.111	<0.0003	<0.0003	<0.002	<0.003	0.148 J	0.000578 J	0.0383	<0.00008	<0.002	<0.002	<0.0005	<0.199	0.625	0.82
	10/05/16	<0.0008	<0.002	0.106	<0.0003	<0.0003	<0.002	<0.003	0.376 J	0.000489 J	0.0353	<0.00008	<0.002	<0.002	<0.0005	0.308	1.30	1.61
	12/22/16	<0.0008	<0.002	0.114	<0.0003	<0.0003	0.0023 J	<0.003	0.251 J	<0.0003	0.0273	<0.00008	<0.002	<0.002	<0.0005	0.227	<0.667	0.89
	06/04/18	<0.0008	<0.002	0.119	<0.0003	<0.0003	<0.002	<0.003	0.297 J	<0.0003	0.0265	<0.00008	<0.002	<0.002	<0.0005	0.261	<0.923	1.184
	09/05/18	NA	<0.002	0.108	<0.0003	<0.0003	<0.002	<0.003	0.353 J	<0.0003	0.0199	NA	<0.002	<0.002	<0.0005	<0.39	0.673	1.063
	05/16/19	<0.0008	<0.002	0.117	<0.0003	<0.0003	<0.002	<0.003	0.327 J	<0.0003	0.0325	<0.00008	<0.002	<0.002	<0.0005	0.627	0.745	1.372
	08/19/19	<0.0008	<0.002	0.1	<0.0003	<0.0003	<0.002	<0.003	0.67	<0.0003	0.019	<0.00008	<0.002	<0.002	<0.0005	0.39	1.58	1.97
	05/11/20	<0.000800	<0.002	0.104	<0.0003	<0.000300	<0.00200	<0.003	0.3 J	<0.0003	0.0166	<0.00008	<0.002	<0.002	<0.0005	0.15	1.2	1.35
	09/15/20	NA	<0.002	0.0899	<0.0003	NA	<0.00200	<0.003	<0.100	<0.0003	0.0140	NA	<0.002	<0.002	<0.0005	0.498	-0.0258	0.498

TABLE 1
APPENDIX IV GROUNDWATER ANALYTICAL DATA SUMMARY
FGD PONDS
OAK GROVE STEAM ELECTRIC STATION

Sample Location	Date Sampled	Sb (mg/L)	As (mg/L)	Ba (mg/L)	Be (mg/L)	Cd (mg/L)	Cr (mg/L)	Co (mg/L)	F (mg/L)	Pb (mg/L)	Li (mg/L)	Hg (mg/L)	Mo (mg/L)	Se (mg/L)	Tl (mg/L)	Ra 226 (pCi/L)	Ra 228 (pCi/L)	Ra 226/228 Combined^ (pCi/L)
GWPS*:		0.006	0.0146	2	0.004	0.005	0.1	0.016	4	0.015	0.15	0.002	0.1	0.05	0.002	--	--	11.2
FGD-5	11/04/15	<0.0008	<0.002	0.13	<0.0003	0.000557 J	0.0121	<0.003	0.227 J	<0.0003	0.17	<0.00008	0.0445	<0.002	<0.0005	0.449	1.52	1.97
	12/17/15	<0.0008	<0.002	0.237	<0.0003	0.000593 J	0.0391	0.0164	0.469	0.000369 J	0.156	<0.00008	0.0203	<0.002	<0.0005	1.23	3.63	4.86
	02/09/16	<0.0008	<0.002	0.261	<0.0003	<0.0003	<0.002	0.00441 J	0.495	<0.0003	0.158	<0.00008	<0.002	<0.002	<0.0005	1.99	1.50	3.49
	04/14/16	<0.0008	<0.002	0.224	<0.0003	0.000392 J	0.00477 J	<0.003	0.491	<0.0003	0.164	<0.00008	0.0183	<0.002	<0.0005	0.951	<1.24	2.19
	06/15/16	<0.0008	<0.002	0.174	<0.0003	<0.0003	0.00599	<0.003	0.284 J	<0.0003	0.162	<0.00008	0.0144	<0.002	<0.0005	0.429	1.25	1.68
	08/24/16	<0.0008	<0.002	0.173	<0.0003	<0.0003	0.0189	<0.003	0.168 J	0.00045 J	0.145	<0.00008	0.00814	<0.002	<0.0005	0.398	<0.643	1.04
	10/05/16	<0.0008	<0.002	0.229	<0.0003	<0.0003	0.00304 J	<0.003	0.38 J	<0.0003	0.153	<0.00008	0.00355 J	<0.002	<0.0005	0.877	1.16	2.04
	12/22/16	<0.0008	<0.002	0.261	<0.0003	<0.0003	<0.002	0.00471 J	0.291 J	<0.0003	0.152	<0.00008	<0.002	<0.002	<0.0005	0.579	<0.76	1.34
	06/05/18	<0.0008	<0.002	0.136	<0.0003	<0.0003	0.00935	<0.003	0.511	<0.0003	0.154	<0.00008	<0.002	<0.002	<0.0005	0.705	<0.765	1.47
	09/06/18	NA	<0.002	0.215	<0.0003	<0.0003	<0.002	<0.003	0.548	<0.0003	0.155	NA	<0.002	<0.002	<0.0005	0.535	1.31	1.845
	05/16/19	<0.0008	<0.002	0.0926	<0.0003	<0.0003	0.024	<0.003	0.579	<0.0003	0.145	<0.00008	0.003 J	<0.002	<0.0005	0.342	<0.506	0.848
	08/19/19	<0.0008	<0.002	0.106	<0.0003	<0.0003	0.0103	<0.003	0.863	<0.0003	0.152	<0.00008	<0.002	<0.002	<0.0005	0.551	0.659	1.21
	05/11/20	<0.000800	<0.002	0.0959	<0.0003	<0.000300	0.0374	<0.003	0.413	<0.0003	0.156	<0.00008	0.00561	<0.002	<0.0005	0.0983	5.18	5.28
	09/10/20	NA	<0.002	0.0929	<0.0003	NA	0.0307	<0.003	0.617	<0.0003	0.150	NA	0.00362 J	<0.002	<0.0005	0.132	-0.0787	0.132
FGD-6	11/03/15	<0.0008	<0.002	0.124	<0.0003	<0.0003	0.00253 J	<0.003	0.334 J	<0.0003	0.0112	<0.00008	<0.002	<0.002	<0.0005	0.470	<1.70	2.17
	12/17/15	<0.0008	<0.002	0.135	<0.0003	<0.0003	<0.002	<0.003	0.333 J	<0.0003	0.00964 J	<0.00008	<0.002	<0.002	<0.0005	1.03	<2.13	3.16
	02/09/16	<0.0008	<0.002	0.132	<0.0003	<0.0003	<0.002	<0.003	0.354 J	<0.0003	0.0105	<0.00008	<0.002	<0.002	<0.0005	0.801	<1.71	2.51
	04/14/16	<0.0008	<0.002	0.122	<0.0003	<0.0003	0.0568	<0.003	0.442	<0.0003	0.011	<0.00008	<0.002	<0.002	<0.0005	0.484	2.08	2.56
	06/14/16	<0.0008	<0.002	0.16	0.000309 J	0.000404 J	<0.002	0.00657	<0.1	0.00132	0.0092 J	<0.00008	<0.002	<0.002	<0.0005	1.31	2.16	3.47
	08/24/16	<0.0008	0.00725	0.127	<0.0003	<0.0003	0.00334 J	0.00399 J	0.147 J	0.000656 J	0.0089 J	<0.00008	0.00244 J	<0.002	<0.0005	0.465	0.896	1.36
	10/05/16	<0.0008	0.00536	0.117	<0.0003	<0.0003	0.00427 J	0.00414 J	0.364 J	<0.0003	0.0099 J	<0.00008	<0.002	<0.002	<0.0005	0.489	1.69	2.18
	12/22/16	<0.0008	0.00458 J	0.129	<0.0003	<0.0003	<0.002	0.00352 J	0.204 J	<0.0003	0.0102	<0.00008	<0.002	<0.002	<0.0005	0.349	0.917	1.27
	06/04/18	<0.0008	0.0021 J	0.0854	<0.0003	<0.0003	<0.002	<0.003	0.361 J	<0.0003	0.0098 J	<0.00008	<0.002	<0.002	<0.0005	<0.277	<0.964	<1.241
	09/05/18	NA	<0.002	0.0824	<0.0003	<0.0003	<0.002	<0.003	0.405	<0.0003	0.0094 J	NA	<0.002	<0.002	<0.0005	<0.336	<0.677	<1.013
	05/16/19	<0.0008	0.0294	0.107	<0.0003	<0.0003	<0.002	0.0132	0.669	<0.0003	0.0068 J	<0.00008	0.0077	<0.002	<0.0005	1.43	1.67	3.1
	08/19/19	<0.0008	0.0146	0.0903	<0.0003	<0.0003	<0.002	0.00493 J	0.741	<0.0003	0.0082 J	<0.00008	0.00332 J	<0.002	<0.0005	0.385	2.55	2.93
	05/11/20	<0.000800	0.00286 J	0.0814	<0.0003	<0.000300	<0.00200	<0.003	0.292 J	<0.0003	0.00877 J	<0.00008	0.00205 J	<0.002	<0.0005	0.513	0.845	1.36
	09/15/20	NA	0.00651	0.0695	<0.0003	NA	<0.00200	0.00615	0.354 J	<0.0003	0.00669 J	NA	<0.002	<0.002	<0.0005	0.485	1.08	1.57
FGD-12	11/04/15	<0.0008	<0.002	0.0884	<0.0003	<0.0003	0.0124	<0.003	<0.1	0.000678 J	0.0234	<0.00008	0.00221 J	<0.002	<0.0005	1.07	<1.55	2.62
	12/17/15	<0.0008	<0.002	0.0781	<0.0003	<0.0003	<0.002	<0.003	0.159 J	0.000775 J	0.022	<0.00008	<0.002	<0.002	<0.0005	1.32	<2.57	3.89
	02/09/16	<0.0008	<0.002	0.0664	<0.0003	<0.0003	<0.002	<0.003	0.157 J	0.000339 J	0.0211	<0.00008	<0.002	<0.002	<0.0005	0.771	<1.53	2.30
	04/14/16	<0.0008	<0.002	0.104	<0.0003	<0.0003	0.00425 J	<0.003	0.109 J	0.00371	0.0255	<0.00008	<0.002	<0.002	<0.0005	0.560	1.46	2.02
	06/15/16	<0.0008	<0.002	0.107	0.00039 J	<0.0003	0.00269 J	0.00323 J	0.101 J	0.00513	0.0192	0.000134 J	<0.002	<0.002	<0.0005	2.01	2.06	4.07
	08/25/16	<0.0008	0.00451 J	0.262	0.000629 J	<0.0003	0.0135	0.00412 J	<0.1	0.00842	0.0204	<0.00008	<0.002	<0.002	<0.0005	1.59	1.84	3.43
	10/04/16	<0.0008	0.00402 J	0.122	0.00062 J	<0.0003	0.0133	0.00395 J	0.129 J	0.0084	0.0259	<0.00008	<0.002	0.00292 J	<0.0005	1.41	<0.76	2.17
	12/23/16	<0.0008	0.00938	0.557	<0.0003	<0.0003	0.00435 J	0.00609	0.112 J	0.00216	0.0755	<0.00008	<0.002	0.00786	<0.0005	1.89	3.54	5.43
	06/05/18	<0.0008	<0.002	0.0777	0.00031	<0.0003	0.00578	<0.003	0.137 J	0.0029	0.0213	<0.00008	<0.002	<0.002	<0.0005	1.68	<0.526	2.206
	09/06/18	NA	<0.002	0.0517	<0.0003	<0.0003	0.0024 J	<0.003	<0.10	0.0005 J	0.0188	NA	<0.002	<0.002	<0.0005	<0.304	<0.5450	<0.849
	05/16/19	0.0008	<0.002	0.0474	<0.0003	<0.0003	0.0030 J	<0.003	<0.10	0.0003 J	0.0221	<0.00008	<0.002	<0.002	<0.0005	0.385	1.43	1.82
	08/19/19	<0.0008	<0.002	0.0631	<0.0003	<0.0003	0.00218 J	<0.003	0.145 J	0.00139	0.0251	<0.00008	<0.002	<0.002	<0.0005	1.12	3.52	4.64
	05/11/20	<0.000800	0.0116	0.23	0.00166	<0.000300	0.037	0.00883	<0.100	0.0249	0.0371	<0.00008	<0.002	0.00678	0.000651	5.96	10.7	16.6
	09/10/20	NA	0.00252 J	0.0922	0.000375 J	NA	0.00723	<0.003	<0.100	0.00402	0.0235	NA	<0.002	0.00254 J	<0.0005	2.59	6.72	9.31
FGD-14	05/17/19	NA	NA	NA	NA	NA	NA	<0.003	NA	NA	0.00564	NA	NA	<0.002	NA	NA	NA	NA
	08/19/19	<0.0008	<0.002	0.426	<0.0003	<0.0003	<0.002	<0.003	0.318 J	<0.0003	0.0054 J	<0.00008	<0.002	<0.002	<0.0005	1.35	2.22	3.57
FGD-15	06/06/19	NA	NA	NA	NA	NA	NA	NA	0.622	NA	0.0768	NA	NA	NA	NA	NA	NA	NA
	08/19/19	<0.0008	<0.002	0.0236	<0.0003	0.000838 J	<0.002	<0.003	0.483	0.000934 J	0.0823	<0.00008	<0.002	0.0221	<0.0005	0.604	1.55	2.15
FGD-16	06/06/19	NA	NA	NA	NA	NA	NA	NA	0.164 J	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
1. Abbreviations: mg/l - milligrams per liter; pCi/L - picocuries per liter.
2. ^ - Sum of Ra 226 and Ra 228 concentrations. Non-detect isotope results were assigned a value equal to the minimum detectable concentration.
3. J - Concentration is below method quantitation limit; result is an estimate.
4. NA - not analyzed.

Table 2

Screening of Potential Groundwater Response Technologies
Oak Grove Steam Electric Station
FGD Ponds

Groundwater Response Technology	Description	Protective of Human Health and Environment	Attain Groundwater Protection Standard	Control Source of Release	Remove Contaminated Material From Environment	RCRA Compliance	Screening Comments	Retained for Further Evaluation
Monitored Natural Attenuation	Natural processes (dispersion, dilution, sorption, coprecipitation, degradation/transformation, etc.) remove CCR constituents from groundwater in-situ. Groundwater monitoring to verify MNA effectiveness.	Migration of CCR constituents in groundwater controlled and CCR concentrations in groundwater reduced.	CCR constituents removed through adsorption, precipitation or coprecipitation. CCR constituents removed from groundwater and retained in aquifer soil matrix to achieve GWPS below and downgradient of CCR Unit.	CCR constituents removed from groundwater below and downgradient of CCR Unit.	CCR constituents removed from groundwater and retained in aquifer soil matrix.	Purge water from groundwater monitoring requires management in accordance with applicable RCRA requirements.	Site is good MNA candidate for CCR constituents based on field MNA evaluation. Long-term groundwater monitoring required. Easy to implement. Groundwater modelling required to assess remediation timeframe.	Yes
Groundwater Extraction and Treatment	System of extraction wells along downgradient edge of ponds to provide hydraulic control of CCR constituent groundwater plumes. Extracted groundwater treated in an on-site treatment system and discharged to Twin Oaks Reservoir or re-injected into aquifer. Groundwater monitoring to verify system effectiveness.	Migration of CCR constituents in groundwater controlled.	GWPS attained downgradient of CCR Unit, but limited effect on concentrations beneath unit.	CCR groundwater constituents contained at edge of ponds.	CCR constituents removed from extracted groundwater by treatment system. Treatment residuals (sludge, regenerate brine, etc.) require management.	Treatment residuals (sludge, regenerate brine, etc.) require management in accordance with applicable RCRA requirements.	Regulatory authorization for treated water discharge required. Bench/pilot testing of treatment system required. Groundwater modelling required to assess remediation timeframe.	Yes
Vertical Hydraulic Barrier	Vertical, low permeability hydraulic barrier along downgradient edge of ponds to provide hydraulic control of CCR constituent groundwater plumes. Groundwater extraction and treatment required upgradient of barrier to control groundwater elevations. Groundwater monitoring to verify system effectiveness.	Migration of CCR constituents in groundwater controlled.	GWPS attained downgradient of CCR Unit, but limited effect on concentrations beneath unit.	CCR groundwater constituents contained at edge of ponds.	CCR constituents removed from extracted groundwater by treatment system. Treatment residuals (sludge, regenerate brine, etc.) require management.	Excavated soil generated from barrier installation requires testing and management as necessary. Treatment residuals (sludge, regenerate brine, etc.) require management in accordance with applicable RCRA requirements.	Bench/pilot test of barrier materials likely required. Regulatory authorization for treated water discharge required. Bench/pilot testing of treatment system required. Groundwater modelling required to assess remediation timeframe.	Yes

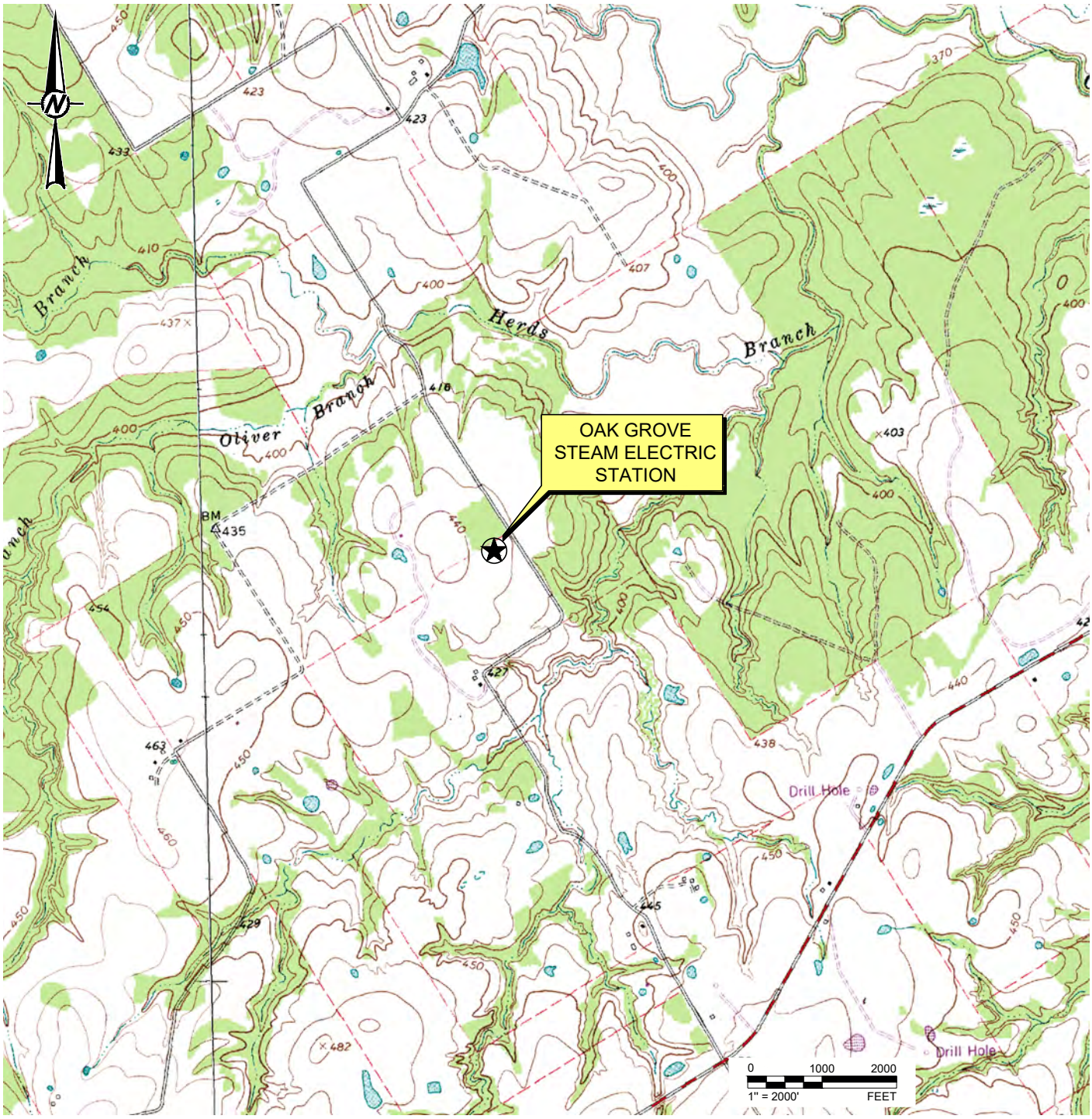
Groundwater Response Technology	Description	Protective of Human Health and Environment	Attain Groundwater Protection Standard	Control Source of Release	Remove Contaminated Material From Environment	RCRA Compliance	Screening Comments	Retained for Further Evaluation
Permeable Reactive Barrier	In-situ, passive, permeable treatment zone containing reactive media designed to intercept impacted groundwater and adjust geochemistry to immobilize CCR contaminants. CCR constituents removed from groundwater through adsorption and/or coprecipitation under reducing groundwater conditions. PRB acts as a barrier to groundwater contamination but not groundwater flow. Groundwater monitoring to verify system effectiveness.	Migration of CCR constituents in groundwater controlled.	GWPS attained downgradient of CCR Unit, but limited effect on concentrations beneath unit.	CCR groundwater constituents removed from groundwater downgradient of CCR Unit.	CCR constituents removed from groundwater and retained on reactive media or aquifer soil matrix.	Excavated soil generated from PRB installation requires testing and management as necessary.	CCR constituent removal using PRB possible but full-scale performance uncertain. Reactive media effectiveness reduced over time and media likely replaced periodically. Bench/pilot testing of PRB media/system required. Groundwater modelling required to assess remediation timeframe.	No
In-Situ Chemical Treatment	Injection of chemical/material into aquifer to adjust geochemistry and enhance precipitation, co-precipitation, or indirect adsorption of CCR constituents. CCR constituents potentially removed through adsorption, precipitation and/or coprecipitation. Groundwater monitoring to verify system effectiveness.	Migration of CCR constituents in groundwater controlled.	GWPS attained downgradient of CCR Unit, but limited effect on concentrations beneath unit.	CCR groundwater constituents removed from groundwater downgradient of CCR Unit.	CCR constituents removed from groundwater and retained on aquifer soil matrix.	No significant RCRA compliance issues anticipated.	ICT considered emerging remediation technology for CCr constituents - not demonstrated under full-scale conditions. Bench/pilot-scale testing of ICT system required. Groundwater modelling required to assess remediation timeframe.	No
Phytoremediation	Use of plants to remove CCR constituents through uptake and accumulation within above ground portions of the plant. Primary plant process for CCR constituent removal is phytoextraction (uptake/accumulation of contaminants within aboveground portions of a plant). Groundwater monitoring to verify system effectiveness.	Migration of CCR constituents in groundwater controlled.	GWPS attained downgradient of CCR Unit, but limited effect on concentrations beneath unit.	CCR groundwater constituents removed from groundwater downgradient of CCR Unit.	CCR constituents removed from groundwater and accumulates in plants.	Management of harvested plants in accordance with RCRA may be required if accumulated CCR constituent concentrations are high.	Phytoextraction occurs in shallow root zone of plants, which limits the effectiveness for the groundwater depths at the Site. Phytoremediation for CCR constituent removal from groundwater has not been demonstrated under full-scale conditions Bench/pilot-scale testing of phytoremediation system required. Groundwater modelling required to assess remediation timeframe.	No

Table 3

Evaluation of Corrective Measures Alternatives
Oak Grove Steam Electric Station
FGD Ponds

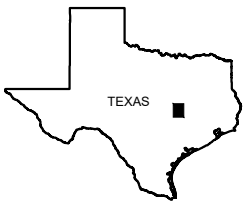
Corrective Measures Alternative	Description	Performance	Reliability	Ease of Implementation	Potential Impacts	Time Requirements	Institutional Requirements
Retrofit Liner in FGD-A with Monitored Natural Attenuation	New Liner in FGD-A. MNA to remove CCR constituents from groundwater and control migration. Groundwater monitoring to verify MNA effectiveness.	New FGD-A Liner and existing FGD-B and FGD-C liners isolate CCR material in pond and mitigate on-going source of CCR constituents to groundwater. Site is good MNA candidate for CCR constituents based on MNA field evaluation.	Liner construction is a common and effective source control technology. On-going attenuation of CCR constituents in groundwater demonstrated during MNA field evaluation. Groundwater monitoring used to verify long-term MNA effectiveness.	Readily implementable with common construction techniques.	Source controlled through pond liner systems. CCR constituents removed from groundwater beneath and downgradient of ponds.	Retrofit Implementation: 1-2 years. MNA Implementation: 2-3 years. Groundwater modelling required to assess remediation timeframe.	Minimal regulatory requirements.
Retrofit Liner in FGD-A with Groundwater Extraction and Treatment	New Liner in FGD-A. System of extraction wells along downgradient edge of ponds to provide hydraulic control of CCR constituents groundwater plumes. Extracted groundwater treated in an on-site treatment system and discharged to Twin Oaks Reservoir or re-injected into aquifer. Groundwater monitoring to verify system effectiveness.	New FGD-A Liner and existing FGD-B and FGD-C liners isolate CCR material in pond and mitigate on-going source of CCR constituents to groundwater. Migration of CCR constituents in groundwater controlled at pond boundaries by extraction wells.	Liner construction is a common and effective source control technology. Groundwater extraction and treatment is a common and effective hydraulic control technology. Treatment system operational reliability is key component of overall reliability.	Readily implementable with common construction techniques. Bench/pilot testing of treatment system required. Regulatory authorization for treated water discharge could be difficult to obtain.	Source controlled through pond liner systems. Control of CCR constituent migration downgradient of ponds by extraction wells. Extraction system does not address groundwater beneath ponds.	Retrofit Implementation: 1-2 years. GW Ext/Treatment Implementation: 3-4 years. Groundwater modelling required to assess remediation timeframe.	Regulatory authorization for treated water discharge required. Treatment system residuals (sludge, regenerate brine, etc.) require management.
Retrofit Liner in FGD-A with Vertical Hydraulic Barrier and Groundwater Extraction and Treatment	New Liner in FGD-A. Vertical, low permeability hydraulic barrier along downgradient edge of ponds to provide hydraulic control of CCR constituent groundwater plumes. Groundwater extraction and treatment required upgradient of barrier to control groundwater elevations. Groundwater monitoring to verify system effectiveness.	New FGD-A Liner and existing FGD-B and FGD-C liners isolate CCR material in pond and mitigate on-going source of CCR constituents to groundwater. Migration of CCR constituents in groundwater controlled at pond boundaries by vertical barrier. Groundwater elevations upgradient of barrier controlled by groundwater extraction.	Liner construction is a common and effective source control technology. Vertical hydraulic barrier must be keyed into lower impermeable layer. Groundwater extraction and treatment is a common and effective hydraulic control technology. Treatment system operational reliability is key component of overall reliability.	Readily implementable with common construction techniques. Bench/pilot testing of treatment system required. Regulatory authorization for treated water discharge could be difficult to obtain.	Source controlled through pond liner systems. Control of CCR constituent migration downgradient of pond by vertical barrier. Vertical barrier does not address groundwater beneath pond.	Retrofit Implementation: 1-2 years. Barrier and GW Ext/Treat Implementation: 5-8 years. Groundwater modelling required to assess remediation timeframe.	Regulatory authorization for treated water discharge required. Treatment system residuals (sludge, regenerate brine, etc.) require management.

FIGURES



REFERENCE(S)

BASE MAP TAKEN FROM WWW.TNRIS.GOV, BALD PRAIRIE, TX 7.5 MIN. USGS QUADRANGLE DATED 1965.



QUADRANGLE LOCATION

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PROJECT
OAK GROVE STEAM ELECTRIC STATION
ROBERTSON COUNTY, TEXAS

TITLE
SITE LOCATION MAP

CONSULTANT
GOLDER

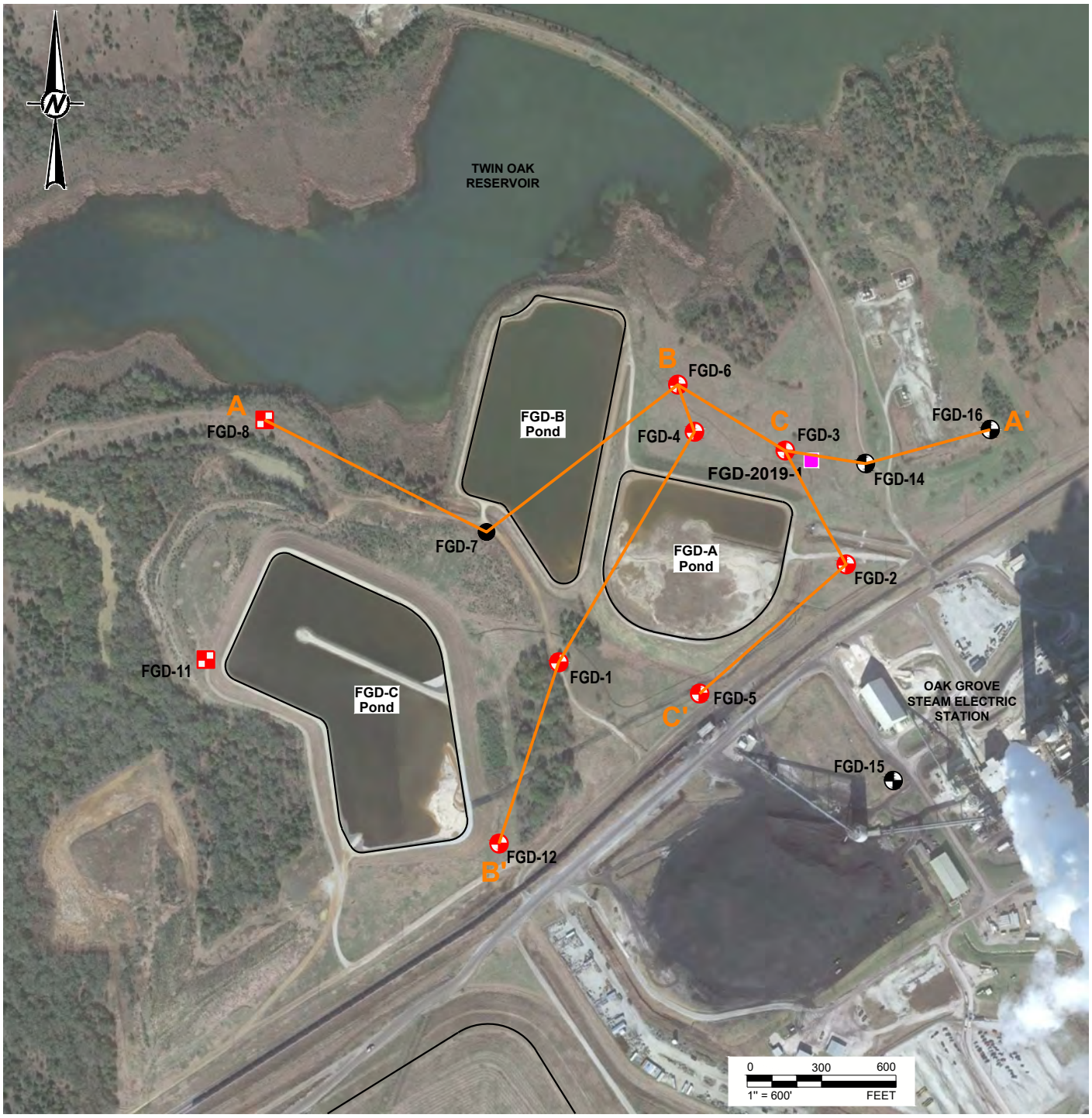
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PREPARED	AJD
REVIEWED	WFV
APPROVED	WFV

PROJECT NO.	REV.	FIGURE
19121403	0	1

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Path: \\texarkanadata\Projects - Round Rock\19121403 - Luminant\Oak Grove\ | File Name: FIG 1 - Site Location Map.dwg



LEGEND

- DOWNGRADIENT CCR MONITORING WELL
- BACKGROUND CCR MONITORING WELL
- CCR DELINEATION WELL
- NON-CCR MONITORING WELL
- MNA SOIL BORING
- A — A' CROSS SECTION LOCATION

NOTE(S)

1. NATURE AND EXTENT EXTENT DELINEATION IS NOT NECESSARY BASED ON THE UPDATED STATISTICAL EVALUATION.

REFERENCE(S)

BASE MAP TAKEN FROM GOOGLE EARTH, IMAGERY DATED 12/9/18.

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ROBERTSON COUNTY, TEXAS

TITLE
DETAILED SITE PLAN - FGD POND AREA

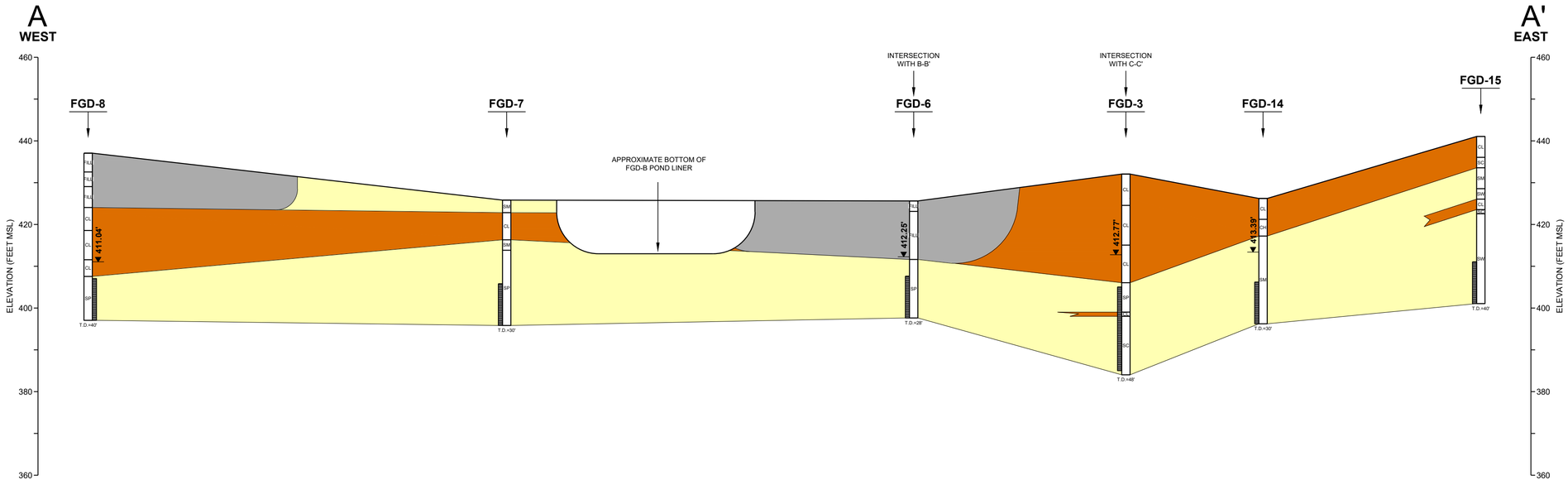
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GOLDER

YYYY-MM-DD	2019-08-28
DESIGNED	AJD
PREPARED	AJD
REVIEWED	WFV
APPROVED	WFV

PROJECT NO. 19121403 | REV. 0 | FIGURE 2

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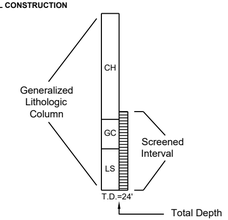
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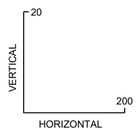
- SAND
- CLAY
- FILL

MONITORING WELL CONSTRUCTION



Water Level (Ft MSL)
Measured May 16-17, 2019

SCALE IN FEET



10x Vertical Exaggeration

CLIENT
LUMINANT

PROJECT
OAK GROVE STEAM ELECTRIC STATION
ROBERTSON COUNTY, TEXAS

TITLE
FGD POND AREA
GEOLOGIC CROSS SECTIONS A-A'

CONSULTANT
GOLDER

YYYY-MM-DD	2019-08-28
DESIGNED	AJD
PREPARED	AJD
REVIEWED	WFV
APPROVED	WFV

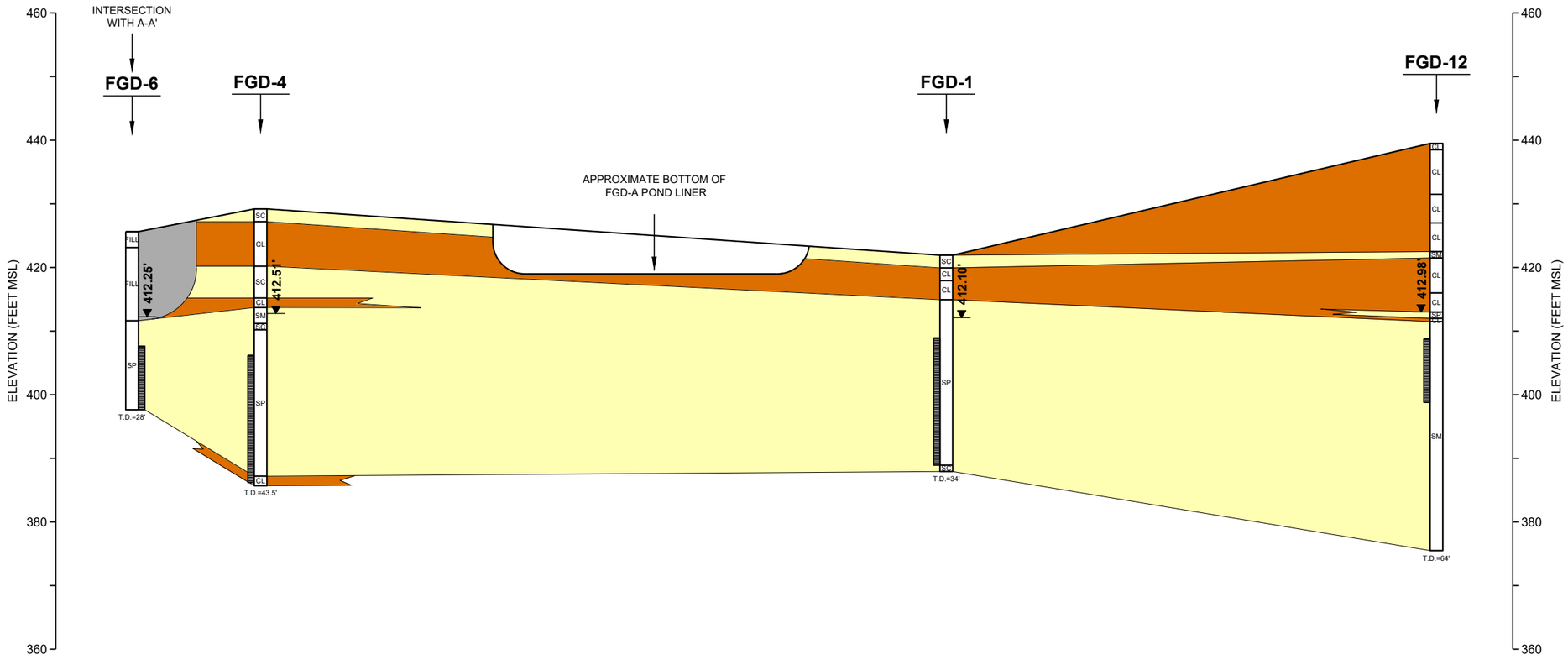
PROJECT NO. 19121403 | REV. 0 | FIGURE 3

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B
NORTH

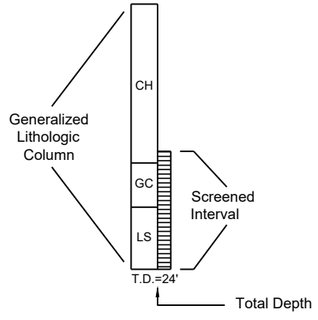
B'
SOUTH



LEGEND

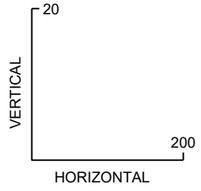
- SAND
- CLAY
- FILL

MONITORING WELL CONSTRUCTION



Water Level (Ft MSL)
Measured May 16-17, 2019

SCALE IN FEET



10x Vertical Exaggeration

CLIENT
LUMINANT

PROJECT
OAK GROVE STEAM ELECTRIC STATION
ROBERTSON COUNTY, TEXAS

TITLE
FGD POND AREA
GEOLOGIC CROSS SECTIONS B-B'

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GOLDER

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DESIGNED	AJD
PREPARED	AJD
REVIEWED	WFV
APPROVED	WFV

PROJECT NO. 19121403 | REV. 0 | FIGURE 4

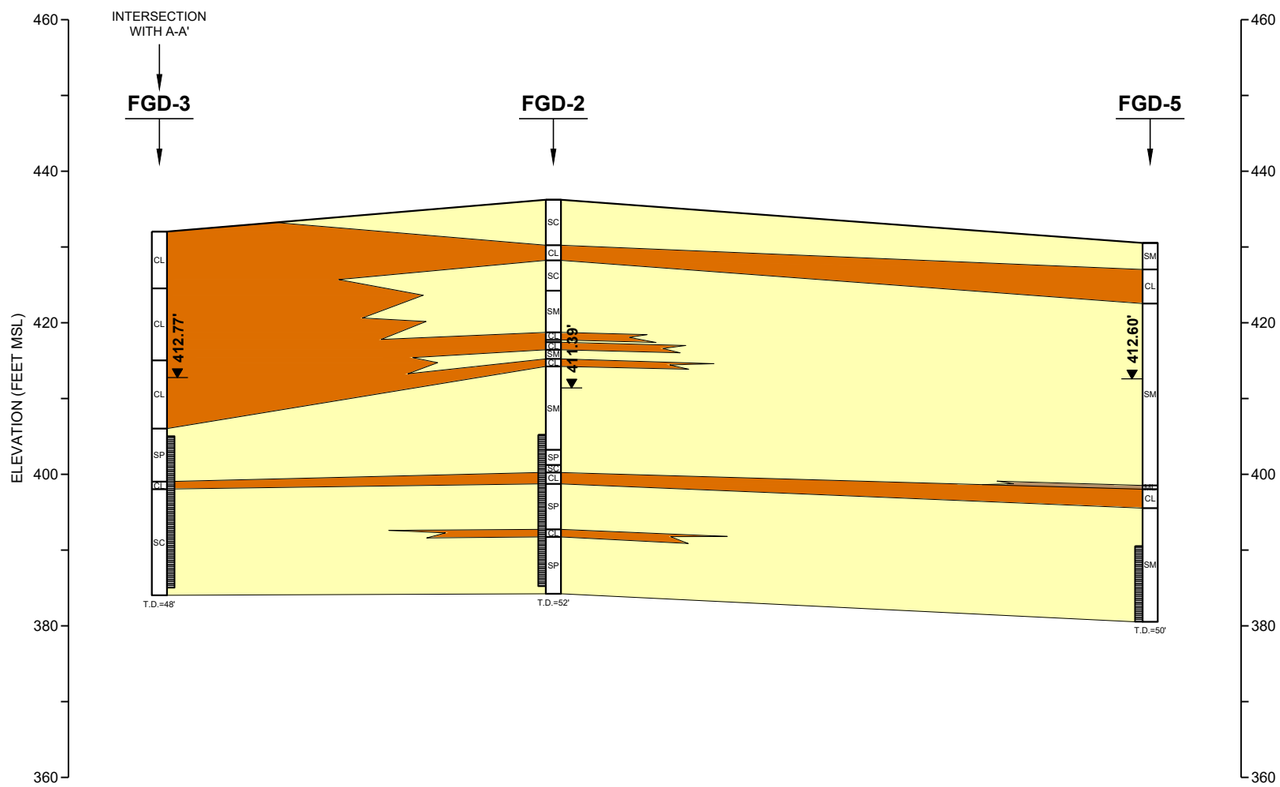
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C
NORTH

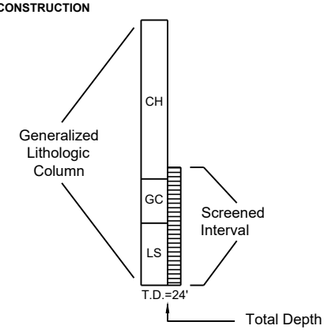
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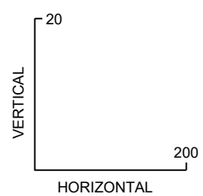
- SAND
- CLAY
- FILL

MONITORING WELL CONSTRUCTION



Water Level (Ft MSL)
Measured May 16-17, 2019

SCALE IN FEET



10x Vertical Exaggeration

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PROJECT
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ROBERTSON COUNTY, TEXAS

TITLE
FGD POND AREA
GEOLOGIC CROSS SECTIONS C-C'

CONSULTANT
GOLDER

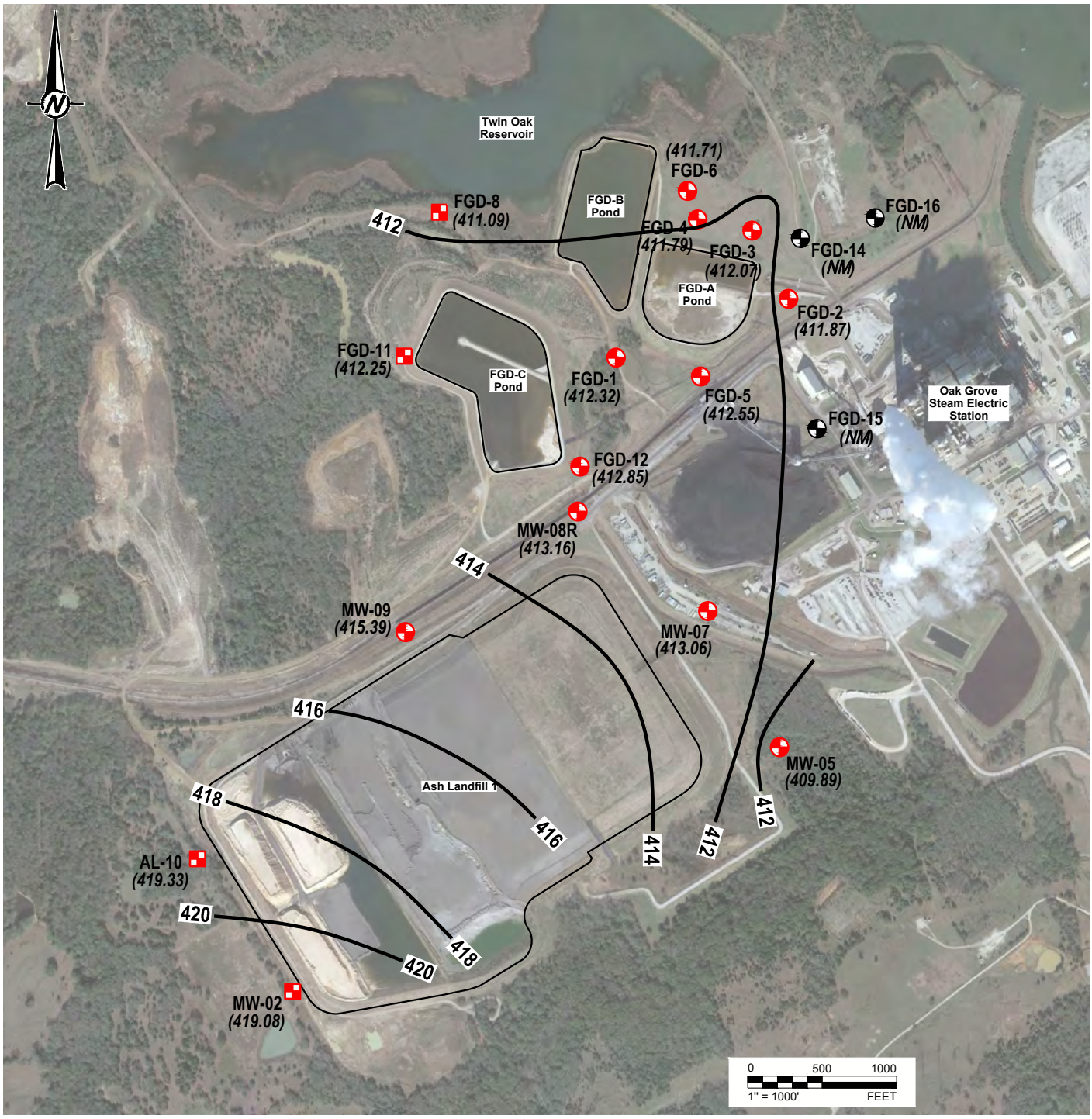
YYYY-MM-DD	2019-08-28
DESIGNED	AJD
PREPARED	AJD
REVIEWED	WFV
APPROVED	WFV

PROJECT NO. 19121403 | REV. 0 | FIGURE 5

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

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0

Path: \\texarkana\data\Projects - Round Rock\19121403 - Luminant\Oak Grove\ | File Name: FIG 4-6 - Cross Sections (FGD Ponds).dwg | Last Edited By: adiamond Date: 2019-08-29 Time:8:38:26 AM | Printed By: adiamond Date: 2019-09-05 Time:2:19:10 PM



LEGEND

- CCR MONITORING WELL
- BACKGROUND CCR MONITORING WELL
- CCR DELINEATION WELL
- *(410.06)* GROUNDWATER POTENTIOMETRIC SURFACE (FT MSL)
- 400 GROUNDWATER POTENTIOMETRIC SURFACE CONTOUR (C.I. = 2 FT)

NOTE(S)

1. NATURE AND EXTENT DELINEATION IS NOT NECESSARY BASED ON THE UPDATED STATISTICAL EVALUATION. .
2. CCR MONITORING WELLS MW-02, MW-05, MW-07, MW-08R, MW-09, AND AL-10 ARE ASSOCIATED WITH ASH LANDFILL 1 CCR UNIT, WHICH IS NOT SUBJECT TO THE ACM.
3. NM - not measured

REFERENCE(S)

BASE MAP TAKEN FROM GOOGLE EARTH, IMAGERY DATED 12/9/18.

CLIENT
LUMINANT

PROJECT
OAK GROVE STEAM ELECTRIC STATION
ROBERTSON COUNTY, TEXAS

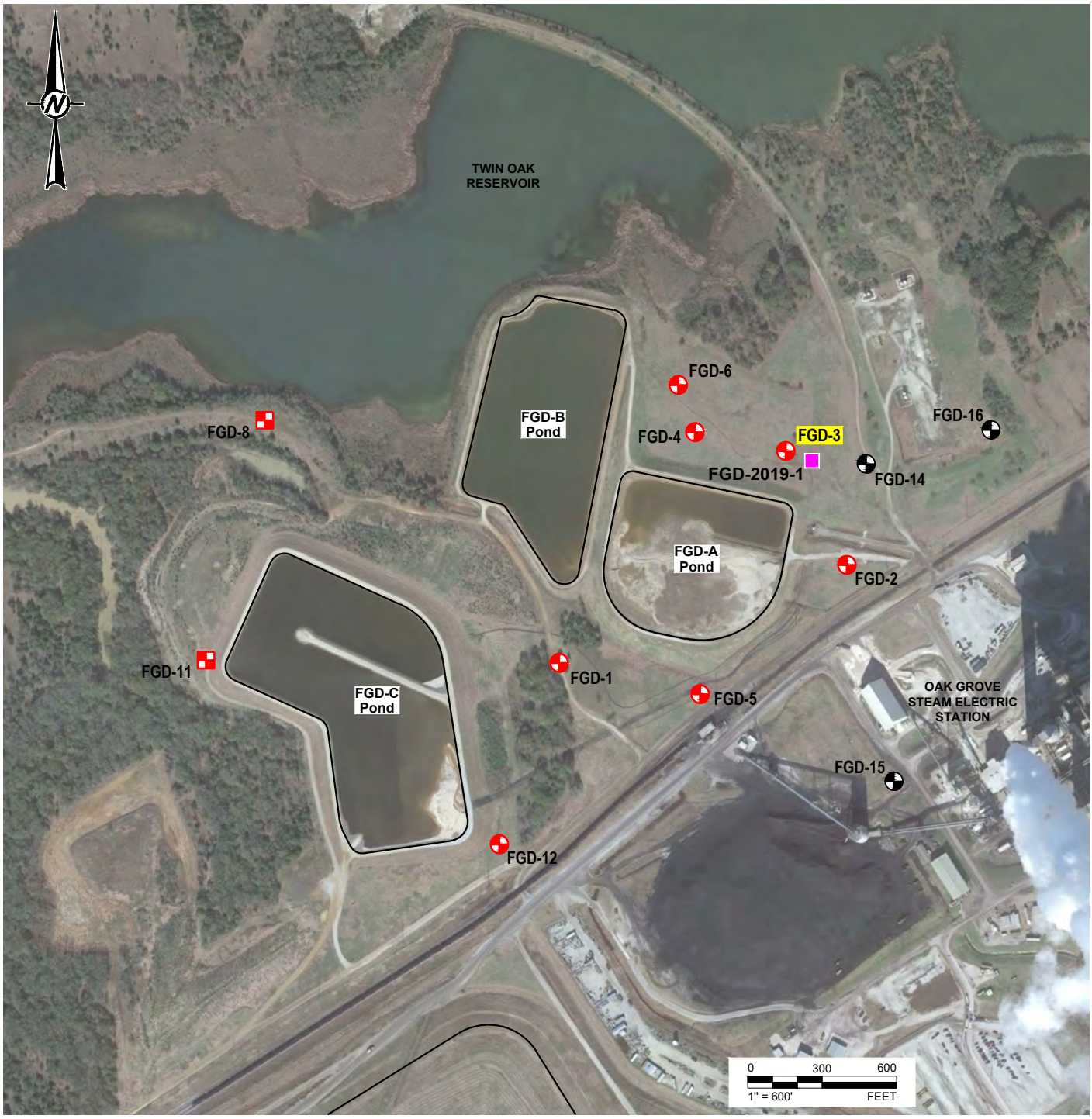
TITLE
ASH LANDFILL AND FGD PONDS POTENTIOMETRIC SURFACE MAP SEPTEMBER 9, 2020

CONSULTANT
GOLDER

YYYY-MM-DD	2020-12-22
DESIGNED	AJD
PREPARED	AJD
REVIEWED	JJ
APPROVED	WFV

PROJECT NO.	CONTROL	REV.	FIGURE
19122262		0	6

Last Edited By: adiamond Date: 2020-12-22 Time:10:25:48 AM | Printed By: adiamond Date: 2020-12-22 Time:10:26:19 AM
Path: \\texarkanadata\Projects - Round Rock_2019\19122262 - Luminant\F - Oak Grove\2020 CCR GWMR\ | File Name: FIG 3 - POT Surface Map (September 2020).dwg
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A
0 1 in



LEGEND

- DOWNGRADIENT CCR MONITORING WELL
- BACKGROUND CCR MONITORING WELL
- CCR DELINEATION WELL
- MNA SOIL BORING
- SSLs FOR ONE OR MORE APPENDIX IV CONSTITUENTS IN DOWNGRADIENT WELLS BASED ON INITIAL STATISTICAL EVALUATION

NOTE(S)

1. NO SSLs WERE DETECTED BASED ON UPDATED STATISTICAL EVALUATION.

REFERENCE(S)

BASE MAP TAKEN FROM GOOGLE EARTH, IMAGERY DATED 12/9/18.

CLIENT
LUMINANT

PROJECT
OAK GROVE STEAM ELECTRIC STATION
ROBERTSON COUNTY, TEXAS

TITLE
FGD POND AREA
EXTENT OF APPENDIX IV CONSTITUENTS
DETECTED AT SSLs ABOVE GWPSs

CONSULTANT
GOLDER

YYYY-MM-DD	2021-01-22
DESIGNED	AJD
PREPARED	AJD
REVIEWED	WFV
APPROVED	WFV

PROJECT NO.	REV.	FIGURE
19121403	0	7

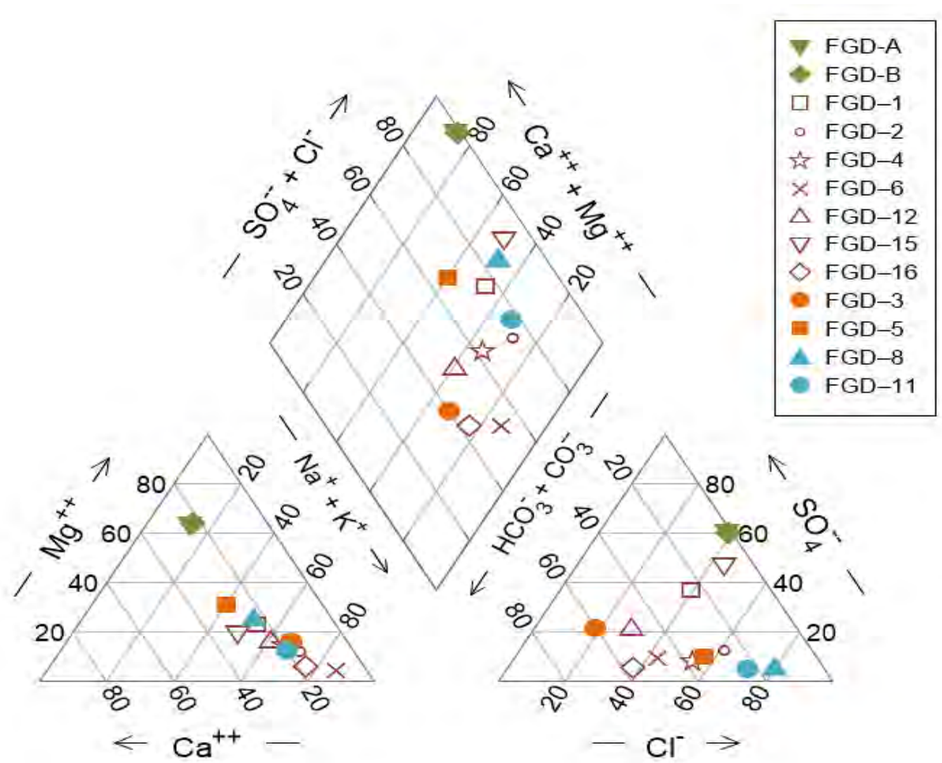
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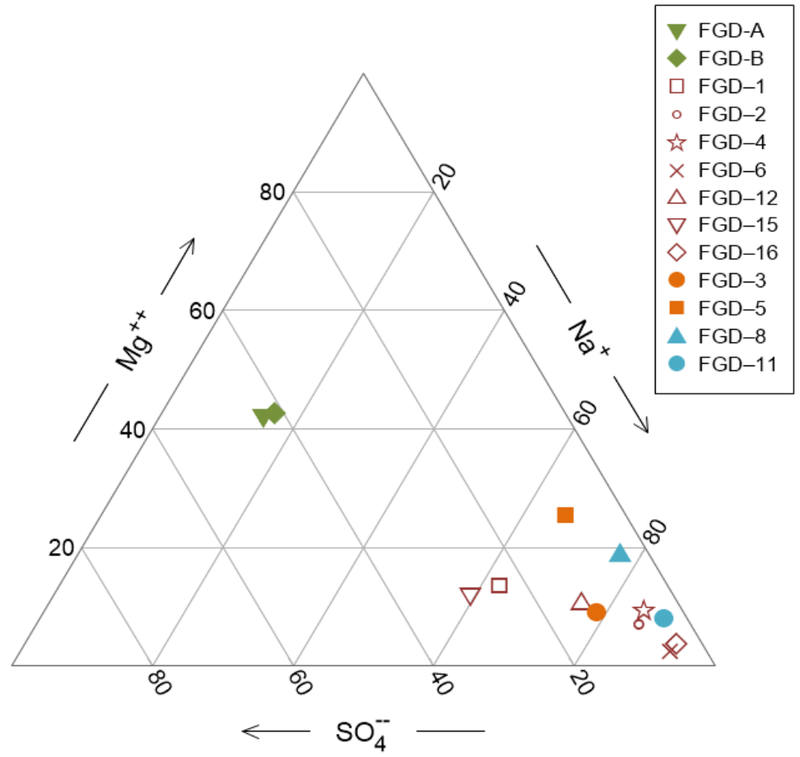
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(a)



% meq/kg

(b)



% mol/l

CLIENT
LUMINANT
OAK GROVE
FGD PONDS

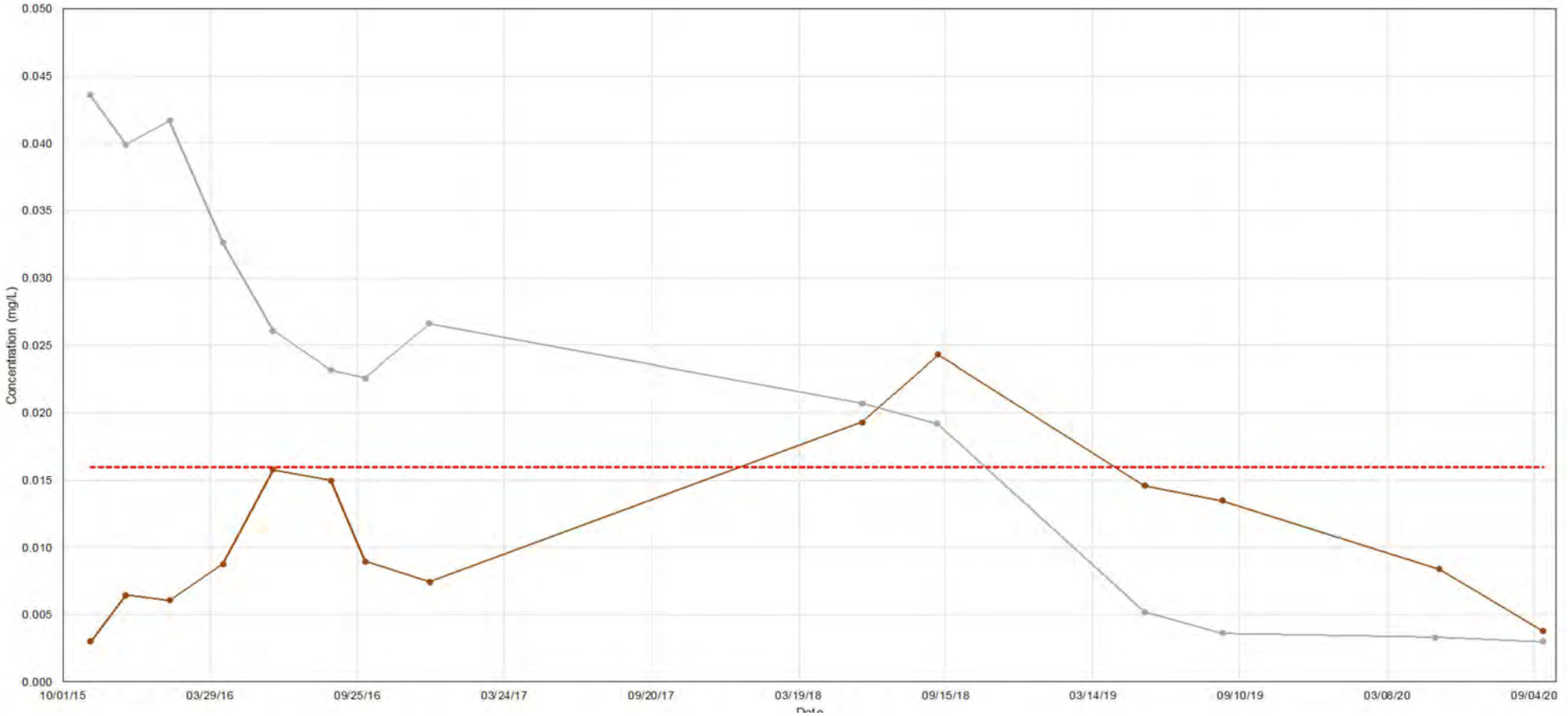
CONSULTANT
GOLDER

PROJECT
ASSESSMENT OF CORRECTIVE MEASURES
GEOCHEMICAL ASSESSMENT

TITLE
GENEREAL GROUNDWATER RELATIVE ION ABUNDANCE (A) AND SELECT ION RATIOS (B) IN GROUNDWATER

PROJECT NO.	PHASE	REV.	FIGURE
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Path: \\texarkana\data\Projects - Round Rock_2019\19121403 - Luminant\Oak Grove\ | File Name: FIG 9 - Historical Trends of Cobalt in MW.dwg





CLIENT
LUMINANT

CONSULTANT
GOLDER

YYYY-MM-DD	2021-01-22
DESIGNED	PJN
PREPARED	AJD
REVIEWED	PJB
APPROVED	PJB

PROJECT
OAK GROVE STEAM ELECTRIC STATION
ROBERTSON COUNTY, TEXAS

TITLE
HISTORICAL TRENDS OF COBALT IN MONITORING WELLS

PROJECT NO.	REV.	FIGURE
19121403	0	9

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

ALTERNATE SOURCE DEMONSTRATION REPORT

Alternate Source Demonstration

Oak Grove Steam Electric Station

FGD Ponds - Robertson County, Texas

Submitted to:

Oak Grove Management Company LLC

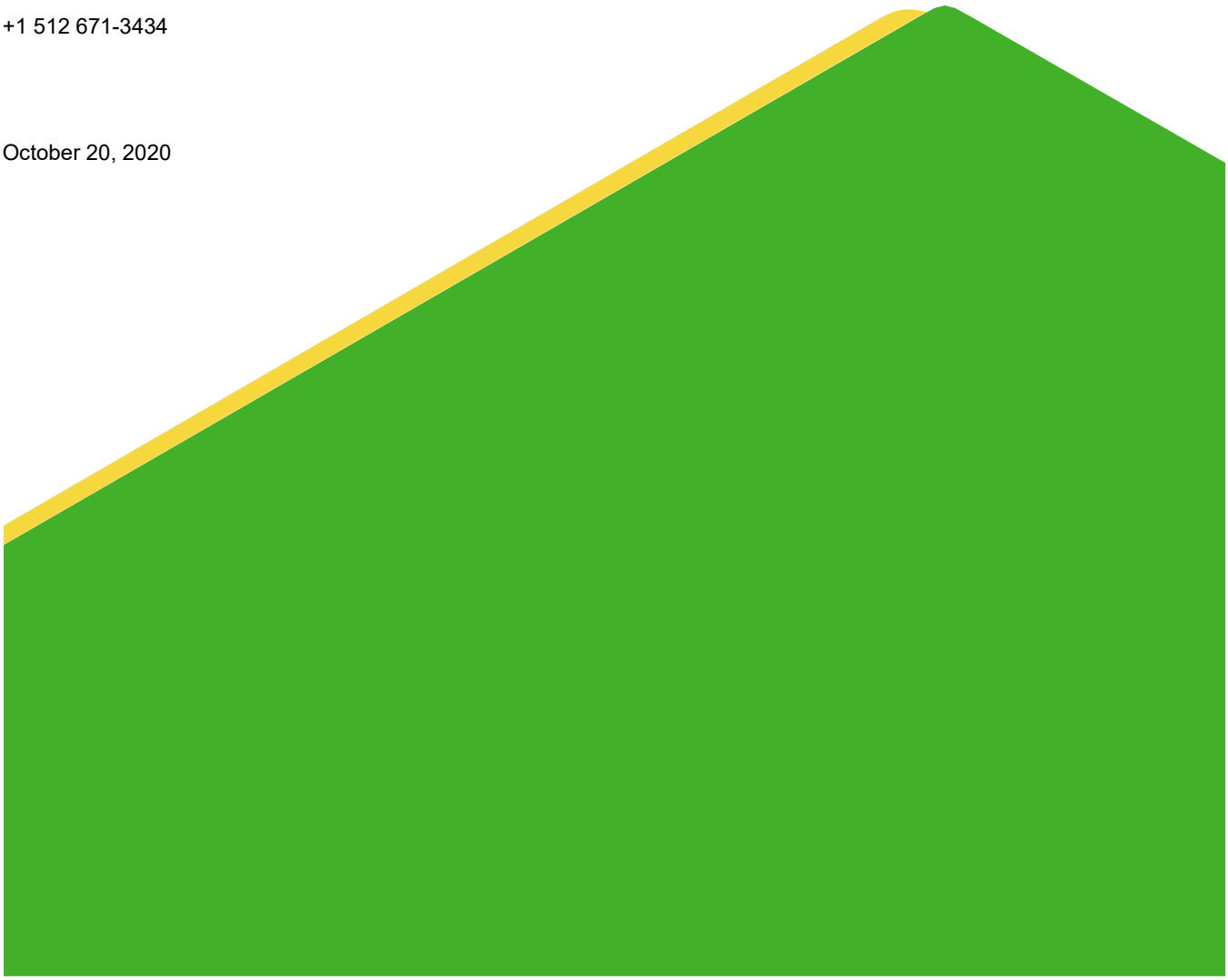
Submitted by:

Golder Associates Inc.

2201 Double Creek Dr, Suite 4004, Round Rock, Texas, USA 78664

+1 512 671-3434

October 20, 2020



Executive Summary

In accordance with the United States Environmental Protection Agency (US EPA) Coal Combustion Residual (CCR) Rule (40 C.F.R. Part 257 Subpart D; 80 Fed. Reg. 21302 (April 17, 2015) (CCR Rule or The Rule), this Alternate Source Demonstration (ASD) was prepared to document that a source other than the FGD Ponds at the Oak Grove Steam Electric Station (the Site) caused a Statistically Significant Level (SSL) of lithium identified in monitoring well FGD-5 during the first semi-annual assessment monitoring event in 2020.

The following lines of evidence support the conclusion that the SSL of lithium in groundwater samples collected from FGD-5 of the FGD Ponds (FDG Pond A, FDG Pond B and FDG Pond C) monitoring well network is not caused by a release of CCR porewater/leachate, but instead results from an alternate source:

- The range of lithium concentrations in samples collected from FGD-5 (0.145 to 0.170 mg/L) is similar to that of samples in upgradient wells FGD-8 and FGD-11 (max 0.149 mg/L since 2015). The groundwater at FGD-5 is of the sodium-chloride type, which is the same type as the upgradient wells (FGD-8 and FGD-11), whereas samples from the FGD ponds indicate water of a magnesium-chloride dominant water type, indicating different water types for the groundwater system and FGD ponds.
- Concentrations of CCR tracers boron, chloride and sulfate, and ratios of boron to lithium differ significantly between FGD pond water and groundwater in the vicinity of FGD-5. Therefore, lithium in groundwater at FGD-5 cannot have originated from CCR porewater as selective dilution of lithium cannot occur.
- FGD-5 is downgradient from FGD Pond C and cross-gradient (and at times upgradient) from FGD Pond A and B. FGD Pond C has only been in operation since 2016. However, lithium concentrations in groundwater at FGD-5 have remained consistent since 2015 (0.145 to 0.170 mg/L). Therefore, lithium concentrations were already elevated in groundwater at FGD-5 prior to ash additions to FGD Pond C, which is the only FGD pond upgradient of FGD-5. Since FGD-5 is not directly downgradient from FGD Ponds A or B, it would not receive porewater from these ponds unless diluted with natural groundwater flowing to FGD-5 from upgradient areas. In groundwater samples collected from FGD-5, concentrations of CCR tracers (boron, sulfate and chloride) that are elevated in FGD Pond A and B water are similar to concentrations in background wells FGD-8 and FGD-11. Furthermore, lithium SSLs have not been observed in CCR monitoring wells directly downgradient of FGD Pond A or B (e.g., FGD-2, FGD-3, FGD-4 and FGD-6), or CCR monitoring wells FGD-1 and FGD-12, which are downgradient and more proximal to FGD Pond C than FGD-5. Thus, it is highly unlikely that lithium measured in FGD-5 groundwater originates from a release from any of the FGD ponds.
- Lithium is naturally occurring in soils at the Site. Sequential extraction of lithium from soil samples indicate total lithium concentrations ranging from 9 to 20 mg/kg, with the majority (76 to 97%) of lithium present in the non-environmentally available acid/sulfide and residual/refractory fractions.

In accordance with §257.95(g)(3), this ASD demonstrates that a source other than the FGD Ponds caused the SSL of lithium identified at monitoring well FGD-5.

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APPENDICES

Appendix A: Sequential Extraction Results

Certification

This document and all attachments were prepared by Golder Associates Inc. under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I hereby certify that the alternative source demonstration at the referenced facility meets the requirements of 40 C.F.R. § 257.94(e)(2) of the CCR Rule.

Golder Associates Inc.

Patrick J. Behling, P.E.
Principal Engineer

Roberta Russell, P.G.
Senior Geologist





1.0 INTRODUCTION

In accordance with the United States Environmental Protection Agency (US EPA) Coal Combustion Residual (CCR) Rule (40 C.F.R. Part 257 Subpart D; 80 Fed. Reg. 21302 (April 17, 2015) (CCR Rule or The Rule), this Alternate Source Demonstration (ASD) was prepared to document that a source other than the FGD Ponds at the Oak Grove Steam Electric Station (the Site) caused a Statistically Significant Level (SSL) of lithium identified in monitoring well FGD-5 during the first semi-annual assessment monitoring event in 2020. This document satisfies the requirements of § 257.95(g)(3)(ii) which allows the owner or operator to demonstrate that a source other than the CCR Unit has caused an SSL and that the SSL was the result of an alternate source or resulted from errors in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

As documented by this report, the SSL for lithium at the FGD Pond monitoring well FGD-5 is attributed to naturally occurring sources in subsurface aquifer materials and is not caused by the CCR unit.

2.0 SITE DESCRIPTION AND BACKGROUND

Oak Grove Management Company LLC owns OGSES located approximately 10 miles north of Franklin, Robertson County, Texas (Exhibit 1). The OGSES consists of two 800-megawatt power generation units which burn lignite and coal. CCR, including fly ash, bottom ash, and gypsum are generated as part of OGSES unit operations. Currently, CCRs generated at the OGSES are managed by Luminant in part within the FGD Pond Area (PBW, 2017a).

The FGD-A Pond, FGD-B Pond, and FGD-C Pond (collectively referred to as the “FGD Ponds”) are located approximately 2,500 feet northwest of the power generation units at the Site (Exhibit 1). FGD-A Pond and FGD-B Pond were placed in service during approximately 2007. Use of FGD-C Pond began in 2016 (PBW, 2017a).

2.1 FGD Pond Area Monitoring Network

The monitoring well network for the FGD Pond Area consists of 9 monitoring wells (FGD-1, FGD-2, FGD-3, FGD-4, FGD-5, FGD-6, FGD-8, FGD-11 and FGD-12) screened within the uppermost groundwater-bearing unit. Two wells, FGD-8 and FGD-11, are considered background monitoring wells. Monitoring well locations are shown on Exhibit 1.

2.2 Geologic and Hydrogeologic Setting

The FGD Ponds are located in the outcrop area of the Eocene-aged Wilcox Group (Barnes, 1970). Previous boring investigations indicate the geology in the FGD Pond Area primarily consists of an upper zone of relatively thick, interbedded sand and clay strata and a lower zone of interbedded silty to clayey sand and well sorted sand. The uppermost groundwater-bearing unit at the Site occurs in the lower zone of interbedded silty to clayey sand (PBW, 2017a).

3.0 STATISTICAL ANALYSIS METHODS

The following sections summarize the assessment monitoring at the FGD Pond Area, present the statistical analysis method for evaluation of assessment monitoring constituents (i.e., Appendix IV parameters) as they pertain to this ASD, discuss the test methods used for soil samples, and describe the geochemical evaluation.

During assessment monitoring, concentrations of Appendix IV constituents are compared to an applicable Groundwater Protection Standard (GWPS). As specified in 40 C.F.R. § 257.95(h), the GWPS is the higher of the

Maximum Contaminant Level (MCL) or the background concentration. For lithium, the GWPS is the background concentration of 0.15 mg/L, which is calculated as the upper prediction limit (UPL) of data collected from upgradient wells during the background period, prior to the start of the detection and assessment monitoring period.

Statistical analysis of the data was performed in accordance with the Statistical Analysis Plan for CCR Groundwater Monitoring (PBW, 2017b) and the USEPA Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities-Unified Guidance (USEPA, 2009). The statistical analysis included an evaluation of confidence intervals for each of the Appendix IV parameter data sets for each well to evaluate whether constituent concentrations were present at concentrations above GWPSs.

Figure 1 shows the lithium concentrations in FGD-5 since 2015 compared to the GWPS. The calculated lower and upper confidence limits for lithium based on sample data collected from FGD-5 are 0.152 mg/L and 0.156 mg/L, respectively. An SSL was indicated at FGD-5 because the lower confidence limit based on the lithium data set from FGD-5 exceeded the GWPS of 0.152 mg/L. As indicated on Figure 1, lithium concentrations exceeded the GWPS in FGD-5 during two sampling events conducted in 2015, prior to the completion of FGD Pond C (in 2016), which is the only FGD pond that is directly upgradient of FGD-5. Furthermore, the highest sample concentration (0.170 mg/L) in FGD-5 occurred in November 2015, prior to the completion of FGD-C.

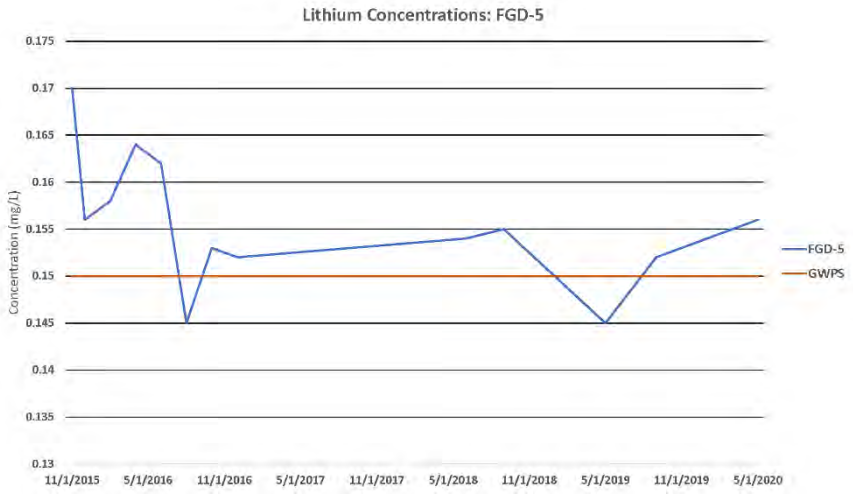


Figure 1: Lithium concentrations in groundwater samples collected from FGD-5.

3.1 Assessment Monitoring

Pursuant to 40 C.F.R. § 257.95(a), FGD Pond Area monitoring wells are sampled for all Appendix IV parameters. The 2015 through 2020 Appendix IV groundwater sample data were compared to the GWPS using confidence intervals.

3.2 Statistically Significant Levels

As stated in the Appendix IV SSL notification dated February 6, 2019, SSLs for cobalt and lithium were identified at the FGD Ponds during 2018 assessment monitoring completed in accordance with 40 C.F.R. § 257.95. No SSLs were identified for cobalt in subsequent semi-annual assessment monitoring completed during 2019 and 2020. No SSLs were identified for lithium in subsequent semi-annual assessment monitoring events in 2019;

however, an SSL notification for lithium was posted on August 21, 2020 based on the first 2020 semi-annual assessment monitoring event results.

3.3 Test Methods for Soil

3.3.1 Sequential Extraction

Chemical analysis of soils for total metals and sequential extraction analysis was conducted on three soil samples collected from FGD Pond Area within the groundwater-bearing unit (Appendix A). The sequential extraction procedure (SEP) consists of a seven-step metals extraction from solids to determine their potential environmental stability. The seven-step SEP is defined by specific extraction steps as illustrated and described (based on a modified Tessier et al. 1979 method) in Figure 2.

SEQUENTIAL EXTRACTION PROCEDURE				
ENVIRONMENTALLY AVAILABLE (Increasing Availability)	Step 1	Increasing Extraction Strength	Exchangeable Fraction:	This extraction includes trace elements that are electrostatically adsorbed to overburden minerals
	Step 2		Carbonate Fraction:	This extraction targets trace elements that are adsorbed or otherwise bound to carbonate minerals
	Step 3		Non-Crystalline Materials Fraction:	This extraction targets trace elements that are complexed by amorphous minerals
	Step 4		Metal Hydroxide Fraction:	This extraction targets trace elements bound to hydroxides of iron, manganese, and/or aluminum
	Step 5		Organic Fraction:	This extraction targets trace elements strongly bound via chemisorption to organic material
NON-ENVIRONMENTALLY AVAILABLE	Step 6		Acid/Sulfide Fraction:	The extraction is used to identify trace elements precipitated as sulfide minerals
	Step 7		Residual Fraction:	Trace elements remaining in the overburden after the previous extractions will be distributed between silicates, phosphates, and refractory oxide

Figure 2: Overview of sequential extraction procedure.

Steps 1 through 7 represent an increasing amount of target metals that can be removed into solution from the solid phase. For instance, metals bound in the carbonate fraction are much more likely to become mobile due to changes in groundwater chemistry than metals bound in a sulfide or residual fraction. The total concentration of a metal measured from all seven steps can be compared to the concentration determined from the total metal analysis for compositional accountability. Metals extracted in Steps 1 through 5 are considered environmentally available, whereas metals extracted in Steps 6 and 7 are present in non-environmentally available fractions and are not expected to be released under conditions typically encountered in aquifers, except in the case of acidification or other excursions from typical groundwater conditions (Tessier et al., 1979).

4.0 ALTERNATE SOURCE DEMONSTRATION

The May 2020 SSL of lithium in groundwater at the monitoring well FGD-5 is not caused by a release of CCR porewater/leachate but instead results from an alternate source. The following lines of evidence support this conclusion:

- **The range of lithium concentrations in samples collected from FGD-5 is similar to that of samples in background wells. Additionally, the FGD pond water is a magnesium-chloride type water whereas water at FGD-5 is of the sodium-chloride type, which is the same type as background wells.**

Lithium concentrations in groundwater samples from FGD-5 range from 0.145 to 0.170 mg/L, which is similar to the upper range of concentrations in background well FGD-8 (max of 0.149 mg/L). In addition, as shown on the Piper diagram presented on Figure 3, the groundwater at FGD-5 is a sodium-chloride type, which is the same water type of the groundwater encountered within the background wells FGD-8 and FGD-11. The FGD pond water samples from FGD Pond A and FGD Pond B are the magnesium-chloride type. Because the lithium concentrations and water chemistry in groundwater samples collected from FGD-5 are similar to those encountered in background wells, it is more likely that groundwater at FGD-5 is representative of background conditions, including the presence of naturally-occurring lithium in groundwater. Groundwater and pond water ASD data are summarized in Table 1.

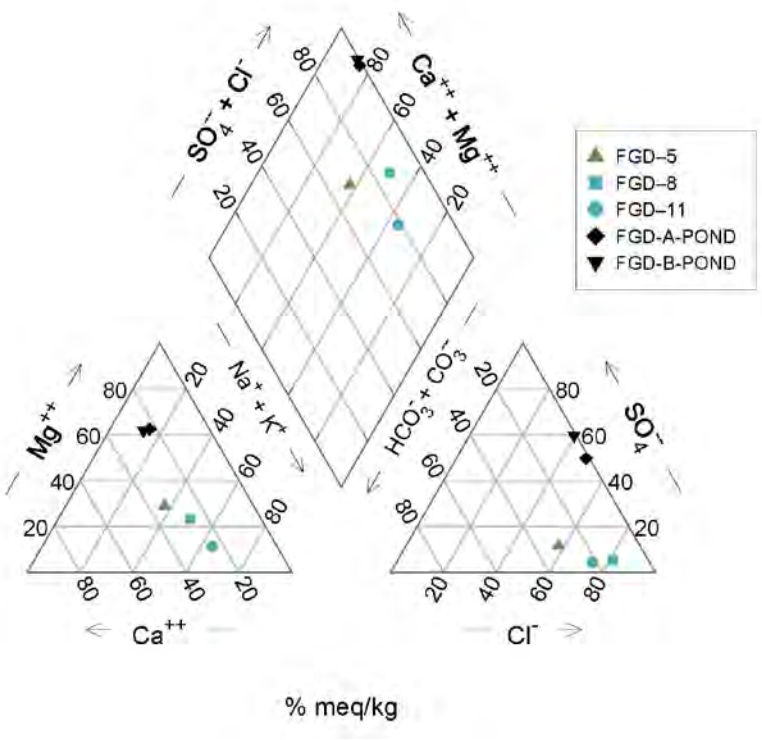


Figure 3: Piper diagram showing water chemistry of FGD-5, FGD-8, FGD-11 and FGD-A Pond and FGD-B Pond samples.

- **Concentrations of CCR tracers boron, chloride and sulfate, and ratios of boron to lithium differ significantly between FGD pond water and groundwater in the vicinity of FGD-5.**

Boron has been historically elevated in FGD pond samples (>72 mg/L). However, boron in groundwater samples collected from FGD-5 has never exceeded 0.2 mg/L since 2015 (when sampling started). Boron at well FGD-5 has also remained well below the maximum measured in background wells FGD-8 and FGD-11 (0.635 mg/L). Similarly, sulfate (max 83.8 mg/L) and chloride (max 307 mg/L) concentrations in FGD-5 are low compared to FGD pond samples (max of 4,680 mg/L and 3,440 mg/L, respectively). These differences are shown graphically in the ternary diagram presented in Figure 3. It should be noted that lithium concentrations in FGD pond water samples are generally similar to FGD-5. However, if lithium in groundwater at FGD-5 originated from the FGD ponds, sulfate, chloride and boron would also be expected to be comparatively higher. Additionally, the ratio of lithium to boron in FGD pond samples was approximately 1:500, while the ratio in groundwater from FGD-5 was approximately 1:1. Therefore, lithium at FGD-5 did not originate from CCR porewater as selective dilution of lithium cannot occur, assuming conservative transport.

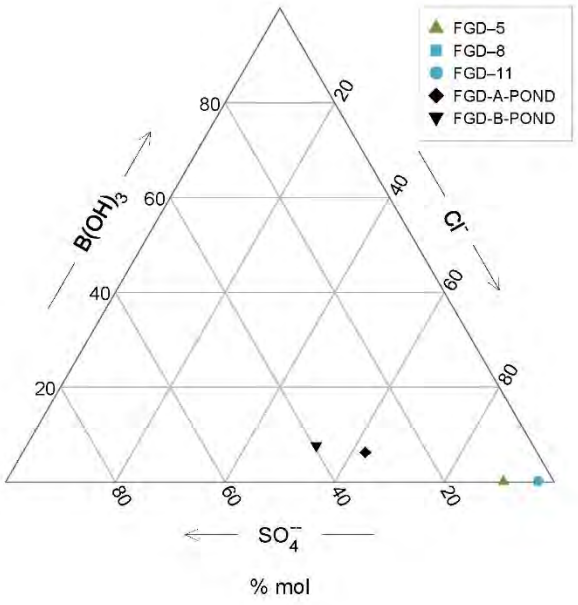


Figure 4: Ternary diagram showing relative molar concentrations of boron, chloride and sulfate for FGD ponds, FGD-5, and background wells FGD-8 and FGD-11.

- **FGD-5 is down-gradient from FGD Pond C, which has only been in operation since 2016. However, lithium in groundwater at FGD-5 has remained consistent since sampling began in 2015.**

Monitoring well FGD-5 is cross-gradient (and at times upgradient) to FGD Ponds A and B and directly down-gradient from FGD Pond C (Exhibit 2). FGD-5 has been sampled since 2015 and, as shown on Figure 1, lithium concentrations have remained consistently between 0.145 and 0.170 mg/L. If the lithium occurrence were due to a plume originating from FGD Pond C, its concentrations would be expected to increase. FGD Pond C was not in operation until 2016; thus, lithium concentrations were already within ranges normal for FGD-5 before CCR was placed in FGD Pond C. Since FGD-5 is cross-gradient to FGD Ponds A and B, any porewater reaching FGD-5 from FGD Ponds A or B would be significantly diluted with natural groundwater flowing to FGD-5 from upgradient areas. Furthermore, lithium SSLs have not been observed in CCR monitoring wells directly downgradient of FGD Pond A or B (e.g., FGD-2, FGD-3, FGD-4 and FGD-6), or CCR monitoring wells FGD-1 and FGD-12, which are downgradient and more proximal to FGD Pond C than FGD-5. As discussed previously, concentrations of boron,

chloride and sulfate, which are mobile constituents and elevated in FGD Pond water, are similar to concentrations in background wells FGD-8 and FGD-11. Thus, it is very unlikely that lithium measured in FGD-5 groundwater originates from FGD Ponds A or B.

- **Lithium is naturally occurring at the Site based on sequential extraction of lithium from soil.**

Total lithium concentrations in the three soil samples range from 9 to 20 mg/kg, which is within the range of naturally-occurring lithium in the Earth's crust and soils (18 to 65 mg/kg and 5 to 130 mg/kg, respectively; Smith and Huyck (1999)). Most of the lithium (between 76 and 97% of the total) is sequestered in the acid sulfide and refractory component of the soil material (SEP Steps 6 and 7). The environmentally-available fraction of lithium (which could contribute to concentrations observed at FGD-5) is less than 24% of the total, the largest of which is represented by the metal hydroxide phase.

5.0 ALTERNATE SOURCE DEMONSTRATION SUMMARY

The evaluation presented in this document demonstrates the statistically significant level of lithium identified in groundwater is due to the presence of naturally-occurring lithium and not caused by releases from the CCR unit. The following lines of evidence demonstrate the natural occurrence of lithium in groundwater at FGD-5:

- FGD-5 lithium concentrations are similar in range to concentrations in background wells. Additionally, the water type at FGD-5 is the same as background wells and different from FGD pond water.
- Concentrations of near-conservative CCR tracers boron, chloride and sulfate, and ratios of boron to lithium differ significantly between FGD pond water and groundwater in the vicinity of FGD-5.
- FGD-5 is located downgradient from FGD Pond C. However, lithium concentrations in FGD-5 have remained consistent since before FGD Pond C was put in operation.
- Lithium is naturally occurring at the Site based on sequential extraction of lithium from soil samples collected in the uppermost groundwater-bearing unit.

Based on these findings, the FGD Ponds are not the source for the SSL of lithium in FGD-5 samples. Instead, the SSL can be attributed to the presence of naturally-occurring lithium in subsurface aquifer materials

6.0 CONCLUSION

In accordance with 40 C.F.R. § 257.95(g)(3), this ASD addresses the SSL of lithium at FGD-5. Review of geochemical data indicates that the exceedance of lithium identified at FGD-5 is not the result of a release from the associated ash ponds at OGSES FGD Pond Area but can be attributed to the presence of naturally-occurring lithium in subsurface aquifer materials

7.0 REFERENCES

Barnes, Virgil.E, 1970. Geologic Atlas of Texas, Waco Sheet. Texas Bureau of Economic Geology.

Pastor, Behling and Wheeler, LLC (PBW), 2017a. Coal Combustion Residual Rule Groundwater Monitoring System Certification, Oak Grove Steam Electric Station FGD Pond Area, Robertson County, Texas. October 16.

PBW, 2017b. Coal Combustion Residual Rule Statistical Analysis Plan, Oak Grove Steam Electric Station FGD Pond Area, Robertson County, Texas.

Smith, K. and Huyck, H., 1999. An overview of the abundance, relative mobility, bioavailability, and human toxicity of metals. In: Plumlee and Logsdon (eds.): The Environmental Geochemistry of Mineral Deposits, Reviews in Economic Geology Vol. 6A, pp.29-70.

Tessier, A., Campbell, P.G. and Bisson, M., 1979. Sequential extraction procedure for the speciation of particulate trace metals. Analytical chemistry, 51(7), pp.844-851.

United States Environmental Protection Agency (USEPA), 2009. Unified Guidance Document: Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, EPA 530-R-09-007. March.

USEPA. Federal Register. Volume 80. No. 74. Friday April 17, Part II. Environmental Protection Agency. 40 CFR Parts 257 and 261. Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule/ [EPA-HQ-RCRA-2009-0640; FRL-9919-44-OSWER] (2015).

Table

Table 1
Analytical Results
Groundwater and Pond Samples
Oak Grove Steam Electric Station FGD Pond Area

Sample Location	Sample Date	Calcium mg/L	Magnesium mg/L	Potassium mg/L	Sodium mg/L	Alkalinity mg/L	Chloride mg/L	Sulfate mg/L	Fluoride mg/L	Boron mg/L	Lithium mg/L	Cobalt mg/L	Iron mg/L
FGD-1	5/16/2019	19.5	11.2	2.11	49.4	52.8	62.4	78.7	0.362 J	0.0803	0.0442	0.003	0.186
FGD-2	5/16/2019	38.9	16.7	2.57	198	157	260	70.7	0.383 J	0.105	0.0228	0.003	0.0799
FGD-3	5/16/2019	60.1	33.6	2.5	277	533	117	182	0.776	0.117	0.057	0.0052	0.126
FGD-4	5/16/2019	41.7	18.6	1.62	160	201	205	41.7	0.327 J	0.0733	0.0325	0.003	0.103
FGD-5	5/16/2019	77.7	50	3.46	123	237	287	67.2	0.579	0.108	0.145	0.003	0.03
FGD-6	5/16/2019	20.3	6.61	0.706	225	262	170	51.3	0.669	0.116	0.0068 J	0.0132	4.86
FGD-8	5/16/2019	314	204	19.2	792	516	2040	173	0.1	0.0687	0.0086 J	0.0146	263
FGD-11	5/16/2019	85	30.6	4.13	328	256	566	50.9	0.38 J	0.108	0.0145	0.003	1.28
FGD-12	5/16/2019	6.79	2.97	1.55	20.1	36.6	15.6	15	<0.100	0.0723	0.0221	0.003	0.425
FGD-A-POND	6/6/2019	487	809	82.1	270	58.6	1510	3260	17.2	72.1	0.167	0.003	0.03
FGD-B-POND	6/6/2019	458	796	86.9	287	68	1470	3040	17.5	73.3	0.172	0.003	0.03
FGD-1	5/11/2020	37.8	17.1	2.56	82	67.6	146	79.5	0.231 J	0.121	0.0548	0.0495	1.09
FGD-2	5/11/2020	217	74.2	5.73	507	114	1150	286	<0.100	0.605	0.028	0.003	0.0636
FGD-3	5/11/2020	42.3	23.5	2.14	230	434	70.2	129	0.8	0.152	0.0498	0.00332	0.0395
FGD-4	5/11/2020	40.6	14.7	1.53	204	247	198	52.9	0.3 J	0.145	0.0166	0.003	0.12
FGD-5	5/11/2020	100	52	3.64	125	232	307	83.8	0.413	0.165	0.156	0.003	0.0483
FGD-6	5/11/2020	27.4	7.17	0.743	235	275	189	70.7	0.292 J	0.109	0.0088 J	0.003	0.582
FGD-8	5/11/2020	381	198	19.9	801	518	2240	188	0.1	0.129	0.0152	0.0084	220
FGD-11	5/11/2020	103	28.5	4.42	306	230	560	43.3	0.365 J	0.166	0.0132	0.003	0.225
FGD-12	5/11/2020	15.6	8.03	5.31	22.1	34.6	19.3	19.9	<0.100	0.149	0.0371	0.00883	32.5
FGD-A-POND	5/11/2020	895	1490	195	563	134	3440	4680	20.6	104	0.422	0.00625	0.15
FGD-B-POND	5/11/2020	696	1020	106	351	68.8	1940	3930	15.6	84.4	0.182	0.003	0.17

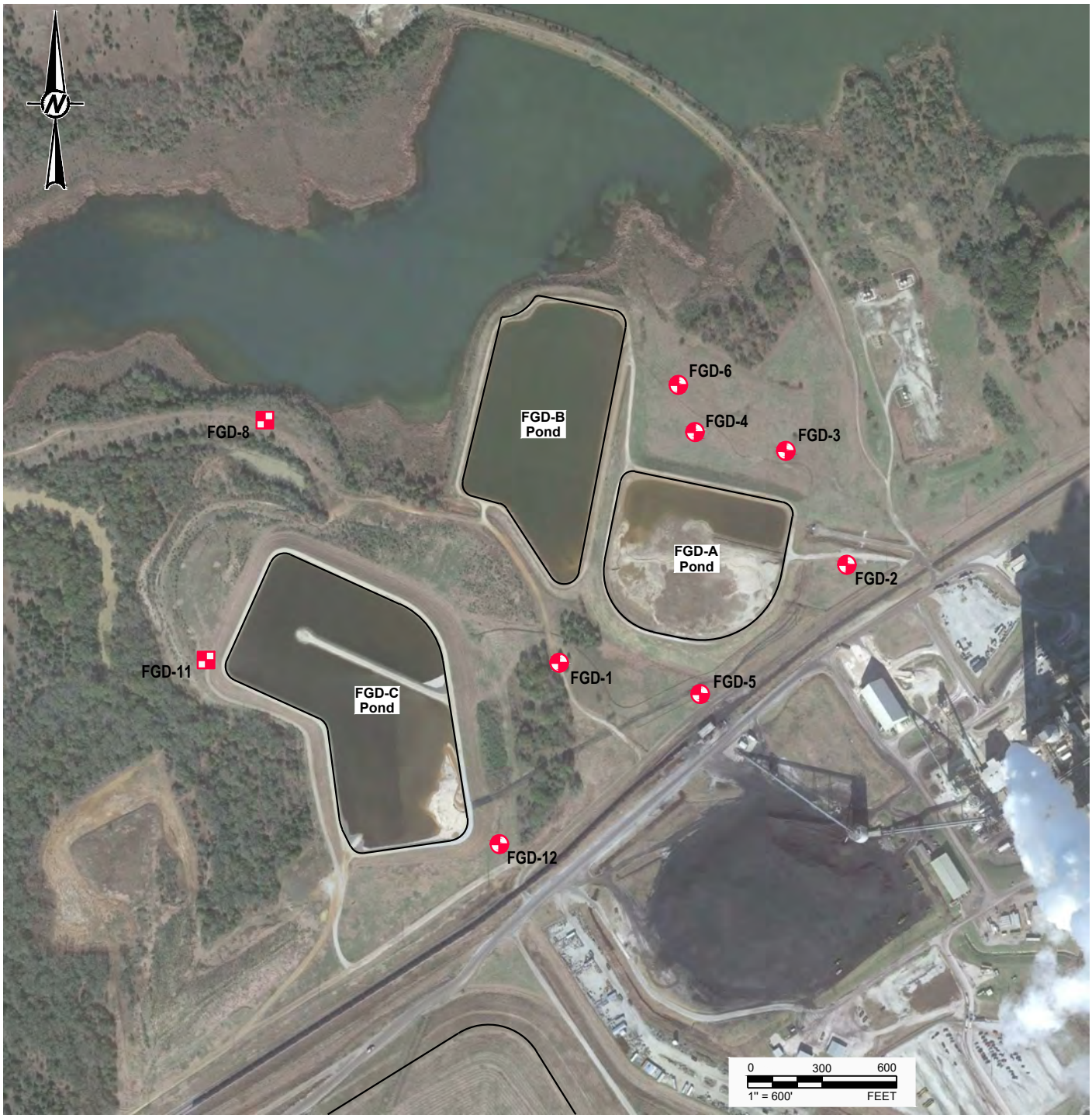
Notes:
mg/L - milligrams per liter
SU - standard units
J -estimated value

Table 1
Analytical Results
Groundwater and Pond Samples
Oak Grove Steam Electric Station FGD Pond Area

Sample Location	Sample Date	Iron (Fe3+) mg/L	Iron (Fe2+) mg/L	Selenium mg/L	Nitrate-N mg/L	Phosphorus mg/L	pH SU	Eh mV	TDS mg/L
FGD-1	5/16/2019	0.186	0.05	0.002	0.1	0.473	6.63	-32	320
FGD-2	5/16/2019	0.0799	0.05	0.0214	1.54	0.237	6.86	-91	729
FGD-3	5/16/2019	0.126	0.05	0.0423	1.41	0.096	6.73	-56	1100
FGD-4	5/16/2019	0.103	0.05	0.002	0.1	0.251	6.57	-41	651
FGD-5	5/16/2019	0.05	0.05	0.002	0.859	0.176	6.46	-31	801
FGD-6	5/16/2019	4.86	0.05	0.002	0.1	0.714	6.85	-28	710
FGD-8	5/16/2019	61	202	0.00274	0.107	0.219	6.67	-42	3970
FGD-11	5/16/2019	1.28	0.05	0.002	0.1	0.2	6.83	-48	1350
FGD-12	5/16/2019	0.425	0.05	0.002	1.42	0.168	6.52	-19	140
FGD-A-POND	6/6/2019	0.05	0.05	1.3	1.87	0.03	6.52	--	7410
FGD-B-POND	6/6/2019	0.00427	0.05	1.2	3.24	0.03	6.57	--	7240
FGD-1	5/11/2020	0.732	0.358	0.002	0.1	0.37	6.95	-55	448
FGD-2	5/11/2020	0.0636	0.05	0.0208	2.52	0.052	6.61	-27	2300
FGD-3	5/11/2020	0.05	0.05	0.00993	0.535	0.053	6.62	16	777
FGD-4	5/11/2020	0.12	0.05	0.002	0.1	0.139	6.62	-46	702
FGD-5	5/11/2020	0.05	0.05	0.002	0.563	0.03	6.82	-15	836
FGD-6	5/11/2020	0.582	0.05	0.002	0.129	0.076	6.75	-17	746
FGD-8	5/11/2020	68	152	0.0021	1.64	0.03	6.69	-14	4090
FGD-11	5/11/2020	0.225	0.05	0.002	0.1	0.064	6.74	-45	1300
FGD-12	5/11/2020	32.5	0.05	0.00678	1.22	0.056	6.59	-33	198
FGD-A-POND	5/11/2020	0.15	0.05	4.71	6.27	0.03	6.59	--	13200
FGD-B-POND	5/11/2020	0.17	0.05	0.681	2.23	0.03	6.64	--	8890

Notes:
mg/L - milligrams per liter
SU - standard units
J -estimated value

Exhibits



LEGEND

- DOWNGRADIENT CCR MONITORING WELL
- BACKGROUND CCR MONITORING WELL

REFERENCE(S)

BASE MAP TAKEN FROM GOOGLE EARTH, IMAGERY DATED 12/9/18.

CLIENT
LUMINANT

PROJECT
OAK GROVE STEAM ELECTRIC STATION
ROBERTSON COUNTY, TEXAS

TITLE
SITE LOCATION MAP

CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-23
DESIGNED	AJD
PREPARED	AJD
REVIEWED	WFV
APPROVED	WFV

PROJECT NO. 19122262 | REV. 0 | EXHIBIT 1

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

0 1 in

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Path: \\texarkanadata\Projects - Round Rock_2019\19122262 - Luminant\F - Oak Grove\ | File Name: FIG 1 - Detaile Site Plan (FGD Pond Area).dwg



LEGEND

- CCR MONITORING WELL
- BACKGROUND CCR MONITORING WELL
- CCR DELINEATION WELL
- *(410.06)* GROUNDWATER POTENTIOMETRIC SURFACE (FT MSL)
- 400 GROUNDWATER POTENTIOMETRIC SURFACE CONTOUR (C.I. = 1 FT)

NOTE(S)

1. NATURE AND EXTENT DELINEATION IS NOT NECESSARY BASED ON THE UPDATED STATISTICAL EVALUATION.

REFERENCE(S)

BASE MAP TAKEN FROM GOOGLE EARTH, IMAGERY DATED 12/9/18.

CLIENT
LUMINANT

PROJECT
OAK GROVE STEAM ELECTRIC STATION
ROBERTSON COUNTY, TEXAS

TITLE
FGD PONDS
POTENTIOMETRIC SURFACE MAP
MAY 2020

CONSULTANT
GOLDER

YYYY-MM-DD	2020-09-30
DESIGNED	AJD
PREPARED	AJD
REVIEWED	WFV
APPROVED	WFV

PROJECT NO. 19134019 | REV. 0 | EXHIBIT 2

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

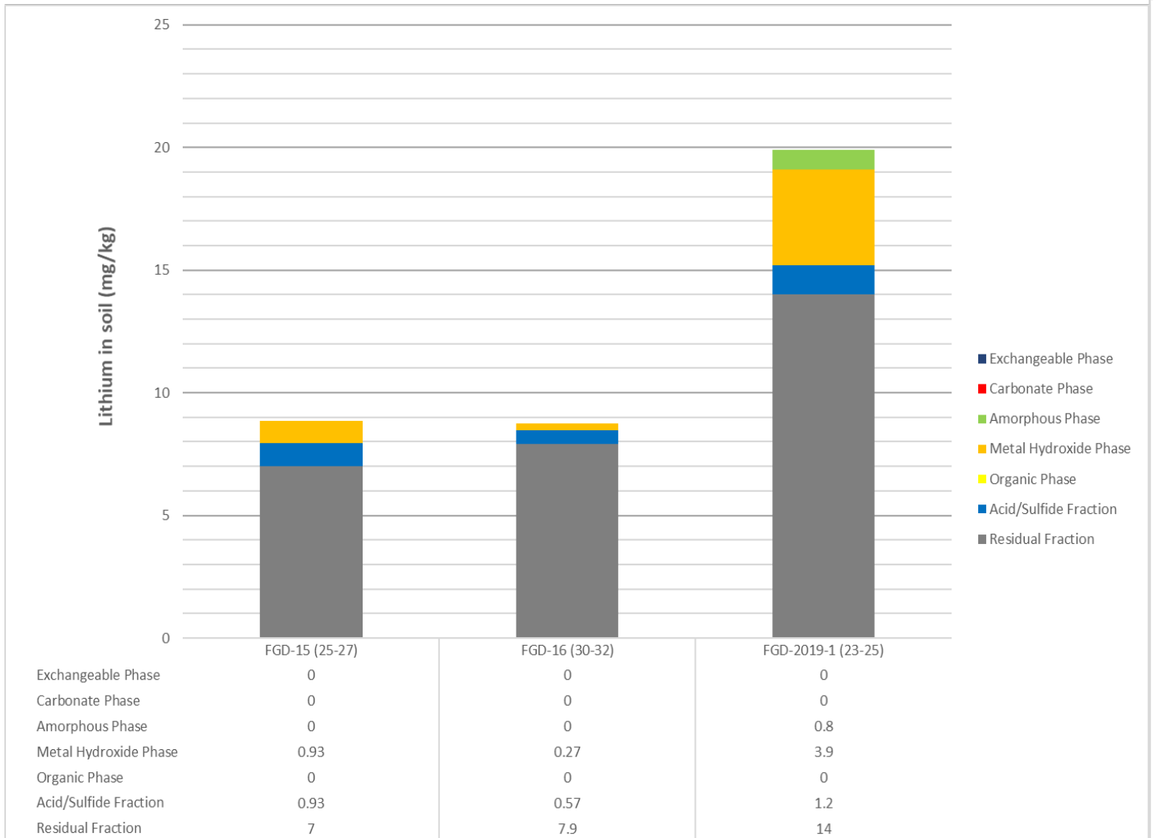
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APPENDIX A

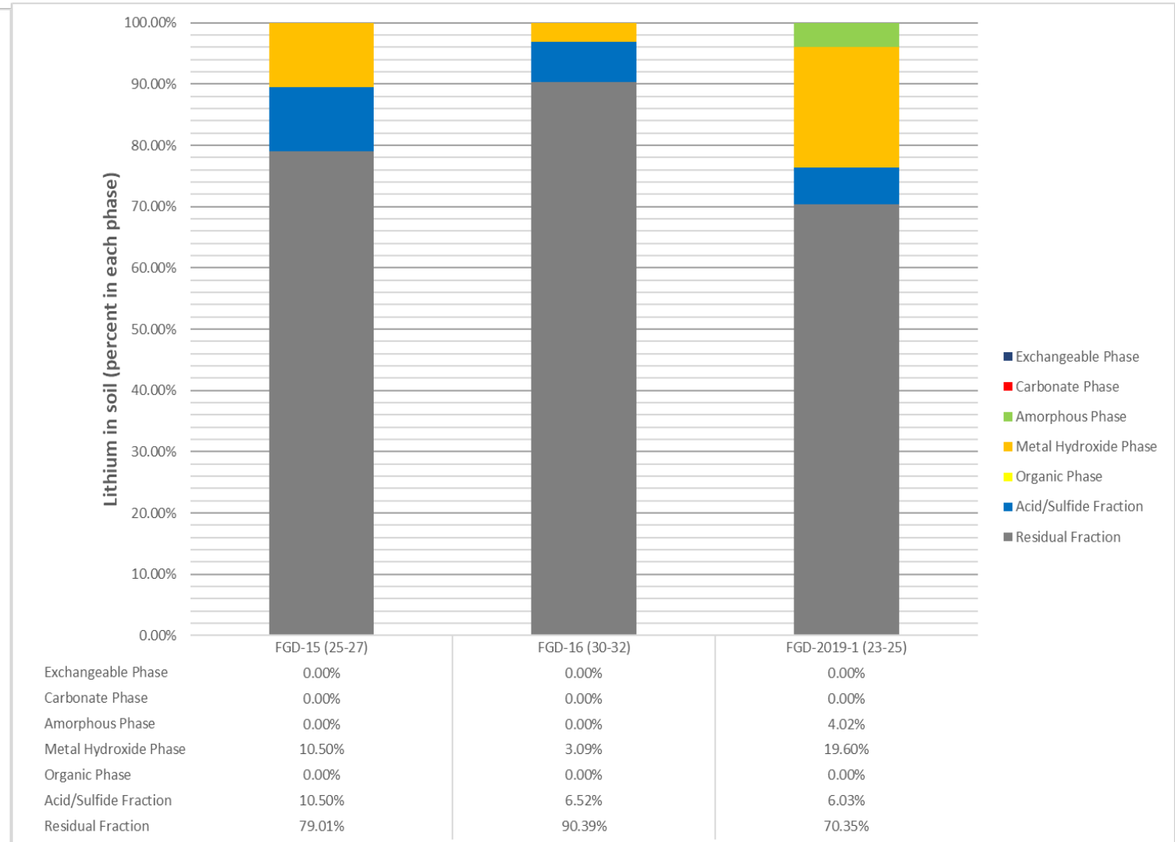
Sequential Extraction Results

PATH: C:\Users\pjnolan\Documents\Project docs\Luminant MNA\Oak Grove\Geochemistry | FILE NAME: 2020_7_6 MNA Tier 2 Data.xlsx



	FGD-15 (25-27)	FGD-16 (30-32)	FGD-2019-1 (23-25)
Exchangeable Phase	0	0	0
Carbonate Phase	0	0	0
Amorphous Phase	0	0	0.8
Metal Hydroxide Phase	0.93	0.27	3.9
Organic Phase	0	0	0
Acid/Sulfide Fraction	0.93	0.57	1.2
Residual Fraction	7	7.9	14

Borehole and depth below ground surface (Lithium in mg/kg soil)



	FGD-15 (25-27)	FGD-16 (30-32)	FGD-2019-1 (23-25)
Exchangeable Phase	0.00%	0.00%	0.00%
Carbonate Phase	0.00%	0.00%	0.00%
Amorphous Phase	0.00%	0.00%	4.02%
Metal Hydroxide Phase	10.50%	3.09%	19.60%
Organic Phase	0.00%	0.00%	0.00%
Acid/Sulfide Fraction	10.50%	6.52%	6.03%
Residual Fraction	79.01%	90.39%	70.35%

Borehole and depth below ground surface (Lithium in percent of total)

CLIENT
LUMINANT OAK GROVE SES
FGD POND AREA

CONSULTANT
GOLDER

PROJECT
ASSESSMENT OF CORRECTIVE MEASURES
GEOCHEMICAL ASSESSMENT

TITLE
SEQUENTIAL EXTRACTION

PROJECT NO.	PHASE	REV.	FIGURE
19134019	1000	A	



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APPENDIX B

BORING LOGS

RECORD OF BOREHOLE MW-FGD-01

DATUM: LOCAL

PROJECT: OAK GROVE SES
LOCATION: FRANKLIN, TEXAS

BORING STARTED: 27-Aug-2008
BORING FINISHED: 27-Aug-2008

DRILLING EQUIPMENT: MOBILE B-57 BUGGY
DRILLING OPERATOR: Lewis Environmental Drilling

NORTHING (ft): 4549.42
EASTING (ft): 2454.41
ELEVATION (ft): 421.91

DEPTH SCALE FEET	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (ft)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.5 FT	RECOVERY%	UNDRAINED SHEAR STRENGTH Cu (CU - ● P.P. - ⊕ Field Vane Shear ■; UU - ✪ TORV. - ▲ UCS - ✳; 400 800 1200 1600)	ROCK QUALITY DESIGNATION (RQD) % ★ (20 40 60 80) / WATER CONTENT PERCENT (PL W LL; 20 40 60 80)	ADDITIONAL LAB. TESTING	INSTALLATION NOTES AND GROUNDWATER OBSERVATIONS
		Muddy with vegetation										
		GROUND SURFACE		421.9								
0		Firm, brown to light brown, sandy CLAY, some vegetative presence, dry		0.0	SB-1		2 3 3 N6	40				
		trace red at 1.5'										
2		Hard, grayish brown with red, CLAY, with sand, dry		2.0	SB-2		8 20 32 N52	67				
4		Hard, gray, trace red, silty CLAY, dry		4.0	SB-3		10 14 18 N32	73				
6		red, some iron oxide at 6'										
		Compact, grayish brown, SAND, with silt, damp		7.0	SB-4		7 13 14 N27	87				
8		reddish brown, some clay at 8'			SB-5		6 7 8 N15	87				
10		trace red at 10'			SB-6		7 8 8 N16	87				
12					SB-7		3 10 13 N23	67				
14		wet at 14'			SB-8		7 9 9 N18	100				▼ 14' 08/27/2008
16					SB-9		1 10 12 N22	87				
18					SB-10		1 10 19 N29	93				
20		some yellowish brown at 19.5'										
		--- CONTINUED NEXT PAGE ---										

DEPTH SCALE
1 inch to 2.5 feet

Golder Associates

LOGGED: DH
CHECKED: BLT

RECORD OF BOREHOLE MW-FGD-01

PROJECT: OAK GROVE SES
LOCATION: FRANKLIN, TEXAS

BORING STARTED: 27-Aug-2008
BORING FINISHED: 27-Aug-2008

DRILLING EQUIPMENT: MOBILE B-57 BUGGY
DRILLING OPERATOR: Lewis Environmental Drilling

DATUM: LOCAL
NORTHING (ft): 4549.42
EASTING (ft): 2454.41
ELEVATION (ft): 421.91

DEPTH SCALE FEET	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (ft)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.5 FT	RECOVERY%	UNDRAINED SHEAR STRENGTH Cu (CU - ● P.P. - ⊕ Field Vane Shear ■; UU - ✿ TORV. - ▲ UCS - ✳; 400 800 1200 1600)	ROCK QUALITY DESIGNATION (RQD) % ★ (20 40 60 80); WATER CONTENT PERCENT (PL — W — LL; 20 40 60 80)	ADDITIONAL LAB. TESTING	INSTALLATION NOTES AND GROUNDWATER OBSERVATIONS
		--- CONTINUED FROM PREVIOUS PAGE ---										
20		very dense at 20'		20.0	SB-11		15 26 35 N61	87				
22		dense, grayish brown and mottled yellow at 22'			SB-12		17 21 27 N48	100				
24		very dense, moist at 24'			SB-13		18 25 35 N60	87				
26					SB-14		16 17 35 N52	93				
28					SB-15		20 35 36 N71	100				
30					SB-16		18 28 32 N60	87				
32					SB-17		21 36 50/5"	93				
34		Very dense, dark brownish gray, clayey SAND, trace iron oxide, damp		33.0								
		BORING TERMINATED AT 34'		34.0								
36												
38												
40												

DEPTH SCALE
1 inch to 2.5 feet

Golder Associates

LOGGED: DH
CHECKED: *BLT*

OAK GROVE - MW 94281GINT.GPJ GLDR_HOU.GDT 10/31/08

RECORD OF BOREHOLE MW-FGD-02

DATUM: LOCAL

PROJECT: OAK GROVE SES
LOCATION: FRANKLIN, TEXAS

BORING STARTED: 22-Aug-2008
BORING FINISHED: 25-Aug-2008

DRILLING EQUIPMENT: MOBILE B-57 BUGGY
DRILLING OPERATOR: Lewis Environmental Drilling

NORTHING (ft): 4261.32
EASTING (ft): 3643.72
ELEVATION (ft): 436.24

DEPTH SCALE FEET	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. DEPTH (ft)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.5 FT	RECOVERY%	UNDRAINED SHEAR STRENGTH Cu (CU - ● P.P. - ⊕ Field Vane Shear ■; UU - ♻ TORV. - ▲ UCS - ✳) 400 800 1200 1600	ROCK QUALITY DESIGNATION (RQD) % ★ 20 40 60 80; WATER CONTENT PERCENT PL W LL 20 40 60 80	ADDITIONAL LAB. TESTING	INSTALLATION NOTES AND GROUNDWATER OBSERVATIONS
		Muddy										
0		GROUND SURFACE		436.2								
		Stiff, brown with some dark brown, sandy CLAY, some gravel, damp		0.0	SB-1		4 4 5 N9	27				
2		very stiff, dark brown at 2'			SB-2		4 7 16 N23	47				
4		very stiff, brown to yellowish brown, some iron oxide traces, possible lignite traces, dry at 4'			SB-3		7 10 13 N23	53				
6		Very stiff, mottled gray and brown, CLAY, some gravel, dry		6.0	SB-4		5 13 15 N28	67				
8		Very stiff, brown, yellow, and gray, mottled, sandy CLAY		8.0	SB-5		5 13 16 N29	53				
10		hard at 10'			SB-6		7 13 20 N33	80				
		gray at 11'										
12		Dense, light gray, fine, silty SAND, with a seam of clay, damp		12.0	SB-7		14 17 21 N38	87				
14					SB-8		10 19 27 N46	93				
16					SB-9		16 23 24 N47	87				
		seam of hard CLAY		17.5								
18		very dense at 18'										
				18.5								
		seam of very hard CLAY		18.8	SB-10		10 25 36 N61	87				
				19.8								
20		--- CONTINUED NEXT PAGE ---										

DEPTH SCALE
1 inch to 2.5 feet

Golder Associates

LOGGED: DH
CHECKED: *BLT*

RECORD OF BOREHOLE MW-FGD-02

DATUM: LOCAL

PROJECT: OAK GROVE SES
LOCATION: FRANKLIN, TEXAS

BORING STARTED: 22-Aug-2008
BORING FINISHED: 25-Aug-2008

DRILLING EQUIPMENT: MOBILE B-57 BUGGY
DRILLING OPERATOR: Lewis Environmental Drilling

NORTHING (ft): 4261.32
EASTING (ft): 3643.72
ELEVATION (ft): 436.24

DEPTH SCALE FEET	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (ft)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.5 FT	RECOVERY%	UNDRAINED SHEAR STRENGTH Cu (CU - ● P.P. - ⊕ Field Vane Shear ■; UU - ✪ TORV. - ▲ UCS - ✳; 400 800 1200 1600)	ROCK QUALITY DESIGNATION (RQD) % (20 40 60 80 ★) / WATER CONTENT PERCENT (PL W LL; 20 40 60 80)	ADDITIONAL LAB. TESTING	INSTALLATION NOTES AND GROUNDWATER OBSERVATIONS
		--- CONTINUED FROM PREVIOUS PAGE ---										
20		dense at 20'		20.0	SB-11		14 19 27 N46	92				
		seam of hard CLAY		21.0								
22		very dense at 22'		22.0	SB-12		13 27 37 N64	100				
24					SB-13		17 29 28 N57	87				
26					SB-14		17 25 42 N67	67				
		yellow at 27.5'										
28					SB-15		20 39 50/5"	87				
30		gray at 30.5'			SB-16		25 45 24 N69	87				
32												▼ 32' 08/22/2008
		Very loose, brown, SAND, moist		33.0	SB-17		4 1 2 N3	80				
34					SB-18		7 14 14 N28	73				
		Very stiff, brown, sandy CLAY, moist		35.0								
36		Hard, brown, CLAY, with silt, moist		36.0	SB-19		8 25 50/4"	93				
		Very dense, brown, SAND		37.5								
38		gray and yellow, mottled at 39'			SB-20		20 45 50/3"	80				
40		*--- CONTINUED NEXT PAGE ---*										

DEPTH SCALE
1 inch to 2.5 feet

Golder Associates

LOGGED: DH
CHECKED: *BLT*

OAK GROVE - MW 94281GINT.GPJ GLDR_HOU.GDT 10/31/08

RECORD OF BOREHOLE MW-FGD-02

DATUM: LOCAL

PROJECT: OAK GROVE SES
LOCATION: FRANKLIN, TEXAS

BORING STARTED: 22-Aug-2008
BORING FINISHED: 25-Aug-2008

DRILLING EQUIPMENT: MOBILE B-57 BUGGY
DRILLING OPERATOR: Lewis Environmental Drilling

NORTHING (ft): 4261.32
EASTING (ft): 3643.72
ELEVATION (ft): 436.24

DEPTH SCALE FEET	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (ft)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.5 FT	RECOVERY%	UNDRAINED SHEAR STRENGTH Cu (CU - ● P.P. - ⊕ Field Vane Shear ■; UU - ✿ TORV. - ▲ UCS - ✳; 400 800 1200 1600)	ROCK QUALITY DESIGNATION (RQD) % (20 40 60 80 ★); WATER CONTENT PERCENT (PL W LL; 20 40 60 80)	ADDITIONAL LAB. TESTING	INSTALLATION NOTES AND GROUNDWATER OBSERVATIONS
		--- CONTINUED FROM PREVIOUS PAGE ---										
40		brownish gray at 40'		40.0	SB-21		24 42 50/4"	87				
42		gray at 41' dense at 42'			SB-22		32 25 22 N47	100				
44		seam of hard, yellowish gray and brown, CLAY at 43.5'		43.5	SB-23		18 36 50/4"	100				
		very dense at 44'		44.5								
46					SB-24		32 45 50/3"	73				
48					SB-25		24 24 50/5"	80				
50					SB-26		32 45 50/3"	87				
52		BORING TERMINATED AT 52'		52.0								
54												
56												
58												
60												

DEPTH SCALE
1 inch to 2.5 feet

Golder Associates

LOGGED: DH
CHECKED: *BLT*

OAK GROVE - MW 94281GINT.GPJ GLDR_HOU.GDT 10/31/08

RECORD OF BOREHOLE MW-FGD-03

DATUM: LOCAL

PROJECT: OAK GROVE SES
LOCATION: FRANKLIN, TEXAS

BORING STARTED: 21-Aug-2008
BORING FINISHED: 21-Aug-2008

DRILLING EQUIPMENT: MOBILE B-57 BUGGY
DRILLING OPERATOR: Lewis Environmental Drilling

NORTHING (ft): 4780.02
EASTING (ft): 3685.25
ELEVATION (ft): 432.04

DEPTH SCALE FEET	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (ft)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.5 FT	RECOVERY%	UNDRAINED SHEAR STRENGTH Cu (CU - ● P.P. - ⊕ Field Vane Shear ■; UU - ✪ TORV. - ▲ UCS - ✳; 400 800 1200 1600)	ROCK QUALITY DESIGNATION (RQD) % (20 40 60 80 ★); WATER CONTENT PERCENT (PL W LL; 20 40 60 80)	ADDITIONAL LAB. TESTING	INSTALLATION NOTES AND GROUNDWATER OBSERVATIONS
		Muddy										
0		GROUND SURFACE		432.0								
		Soft to firm, reddish brown, CLAY, with sand, some gravel		0.0	SB-1		2 2 2 N4	33				
2					ST-2			70	⊕			
4		very stiff, brown, mottled at 4'			SB-3		5 7 12 N19	83				
6					SB-4		5 12 15 N27	93				
		Very stiff, gray, silty CLAY		7.5								
8					SB-5		5 8 12 N20	87				
10		trace brown at 10'			SB-6		4 7 9 N16	93				
12		stiff, light brown at 12'			SB-7		3 5 7 N12	73				
14					SB-8		3 5 6 N11	87				
16					ST-9			55	⊕			
		Stiff, brown, CLAY, damp		17.0								
18		firm to stiff at 18'			SB-10		2 3 5 N8	100				
20												
		--- CONTINUED NEXT PAGE ---										

DEPTH SCALE
1 inch to 2.5 feet

Golder Associates

LOGGED: DH
CHECKED: BLT

RECORD OF BOREHOLE MW-FGD-03

DATUM: LOCAL

PROJECT: OAK GROVE SES
LOCATION: FRANKLIN, TEXAS

BORING STARTED: 21-Aug-2008
BORING FINISHED: 21-Aug-2008

DRILLING EQUIPMENT: MOBILE B-57 BUGGY
DRILLING OPERATOR: Lewis Environmental Drilling

NORTHING (ft): 4780.02
EASTING (ft): 3685.25
ELEVATION (ft): 432.04

DEPTH SCALE FEET	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (ft)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.5 FT	RECOVERY%	UNDRAINED SHEAR STRENGTH Cu (CU - ● P.P. - ⊕ Field Vane Shear ■; UU - ✿ TORV. - ▲ UCS - ✳; 400 800 1200 1600)	ROCK QUALITY DESIGNATION (RQD) % (20 40 60 80 ★) / WATER CONTENT PERCENT (PL W LL; 20 40 60 80)	ADDITIONAL LAB. TESTING	INSTALLATION NOTES AND GROUNDWATER OBSERVATIONS
		--- CONTINUED FROM PREVIOUS PAGE ---										
20		firm at 20'		20.0	SB-11		2 2 3 N5	100				
22		firm to stiff at 22'			SB-12		2 3 5 N8	100				
24		dark brown, some silt at 24'			SB-13		2 3 5 N8	87				
26		Dense, light brown, SAND, moist		26.0	SB-14		12 15 30 N45	73				▼ *26' 08/21/2008*
28		very dense, gray at 28'			SB-15		12 31 30 N61	73				
30		dense, trace yellowish brown at 30'			SB-16		5 14 17 N31	67				
32					SB-17		3 13 21 N34	67				
		Hard, brown, some mottled dark brown, CLAY, damp		33.0								
34		Hard, gray and yellowish brown mottled, sandy CLAY, some iron staining		34.0	SB-18		6 21 23 N44	67				
36					SB-19		5 13 20 N33	87				
38					SB-20		7 16 25 N41	80				
40		*--- CONTINUED NEXT PAGE ---*										

DEPTH SCALE
1 inch to 2.5 feet

Golder Associates

LOGGED: DH
CHECKED: *BLT*

OAK GROVE - MW 94281GINT.GPJ GLDR_HOU.GDT 10/31/08

RECORD OF BOREHOLE MW-FGD-03

DATUM: LOCAL

PROJECT: OAK GROVE SES
LOCATION: FRANKLIN, TEXAS

BORING STARTED: 21-Aug-2008
BORING FINISHED: 21-Aug-2008

DRILLING EQUIPMENT: MOBILE B-57 BUGGY
DRILLING OPERATOR: Lewis Environmental Drilling

NORTHING (ft): 4780.02
EASTING (ft): 3685.25
ELEVATION (ft): 432.04

DEPTH SCALE FEET	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (ft)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.5 FT	RECOVERY%	UNDRAINED SHEAR STRENGTH Cu (CU - ● P.P. - ⊕ Field Vane Shear ■; UU - ✪ TORV. - ▲ UCS - ✳; 400 800 1200 1600)	ROCK QUALITY DESIGNATION (RQD) % ★ (20 40 60 80); WATER CONTENT PERCENT (PL W LL; 20 40 60 80)	ADDITIONAL LAB. TESTING	INSTALLATION NOTES AND GROUNDWATER OBSERVATIONS
40		*--- CONTINUED FROM PREVIOUS PAGE ---*										
		trace iron oxide at 40'		40.0	SB-21		7 16 25 N41	80				
42												
					SB-22		10 19 29 N48	74				
44												
					ST-23			100	⊕			
46												
					SB-24		13 23 36 N59	73				
48		BORING TERMINATED AT 48'		48.0								
50												
52												
54												
56												
58												
60												

DEPTH SCALE
1 inch to 2.5 feet

Golder Associates

LOGGED: DH
CHECKED: *BLT*

OAK GROVE - MW 94281GINT.GPJ GLDR_HOU.GDT 10/31/08

RECORD OF BOREHOLE MW-FGD-04

PROJECT: OAK GROVE SES
LOCATION: FRANKLIN, TEXAS

BORING STARTED: 20-Aug-2008
BORING FINISHED: 20-Aug-2008

DRILLING EQUIPMENT: MOBILE B-57 BUGGY
DRILLING OPERATOR: Lewis Environmental Drilling

DATUM: LOCAL
NORTHING (ft): 5039.72
EASTING (ft): 3414.63
ELEVATION (ft): 429.19

DEPTH SCALE FEET	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. DEPTH (ft)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.5 FT	RECOVERY%	UNDRAINED SHEAR STRENGTH Cu (CU - ● P.P. - ⊕ Field Vane Shear ■; UU - ✪ TORV. - ▲ UCS - ✳; 400 800 1200 1600)	ROCK QUALITY DESIGNATION (RQD) % ★ (20 40 60 80); WATER CONTENT PERCENT (PL W LL; 20 40 60 80)	ADDITIONAL LAB. TESTING	INSTALLATION NOTES AND GROUNDWATER OBSERVATIONS
		Muddy										
0		GROUND SURFACE		429.2								
		Brown, sandy CLAY, damp		0.0	ST-1			75				
2		Brown, CLAY, with silt, damp		2.0	ST-2			65				
4		very stiff, reddish and yellowish brown, mottled, with occasional calcareous nodules at 4'			SB-3		4 6 10 N16	67				
6					ST-4			87				
8					SB-5		9 11 14 N25	27				
		Very stiff, brown, sandy CLAY, damp		9.0								
10		with occasional coarse, angular gravel at 9.5' reddish brown at 10'			SB-6		7 9 9 N18	53				
12		stiff at 12'			SB-7		10 5 4 N9	40				
14		Stiff, reddish brown, CLAY, with sand, damp		14.0	SB-8		4 6 5 N11	27				
		Compact, brown, fine, silty SAND, damp		15.5								
16		light brown at 16.25'			SB-9		7 12 14 N26	93				
		reddish brown at 17.25'										
18		Compact, reddish brown, clayey SAND, moist		18.0	SB-10		5 8 15 N23	87				
		Compact, light brown, fine, SAND, moist		19.0								
20		--- CONTINUED NEXT PAGE ---										

DEPTH SCALE
1 inch to 2.5 feet

Golder Associates

LOGGED: CS
CHECKED: *BLT*

RECORD OF BOREHOLE MW-FGD-04

DATUM: LOCAL

PROJECT: OAK GROVE SES
LOCATION: FRANKLIN, TEXAS

BORING STARTED: 20-Aug-2008
BORING FINISHED: 20-Aug-2008

DRILLING EQUIPMENT: MOBILE B-57 BUGGY
DRILLING OPERATOR: Lewis Environmental Drilling

NORTHING (ft): 5039.72
EASTING (ft): 3414.63
ELEVATION (ft): 429.19

DEPTH SCALE FEET	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (ft)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.5 FT	RECOVERY%	UNDRAINED SHEAR STRENGTH Cu (CU - ● P.P. - ⊕ Field Vane Shear ■; UU - ✿ TORV. - ▲ UCS - ✳; 400 800 1200 1600)	ROCK QUALITY DESIGNATION (RQD) % ★ (20 40 60 80); WATER CONTENT PERCENT (PL W LL; 20 40 60 80)	ADDITIONAL LAB. TESTING	INSTALLATION NOTES AND GROUNDWATER OBSERVATIONS
		--- CONTINUED FROM PREVIOUS PAGE ---										
20		dense, occasional seams of gray at 20'		20.0	SB-11		6 20 20 N40	100				
22		occasional streaks of yellowish brown at 22'			SB-12		12 15 19 N34	93				▼ 22' 08/20/2008
24		very dense, gray with mottled reddish brown at 24'			SB-13		14 28 30 N58	100				
26		dense, mottled, reddish brown, yellowish brown, and gray at 26'			SB-14		13 21 22 N43	100				
28		very dense at 28'			SB-15		11 15 50 N65	87				
30		dense at 30'			SB-16		8 15 21 N36	87				
32					SB-17		14 18 27 N45	80				
34		very dense at 34'			SB-18		20 31 35 N66	100				
36					SB-19		20 31 31 N62	100				
38					SB-20		21 42 50/5"	100				
40		*--- CONTINUED NEXT PAGE ---*										

DEPTH SCALE
1 inch to 2.5 feet

Golder Associates

LOGGED: CS
CHECKED: *BLT*

OAK GROVE - MW 94281GINT.GPJ GLDR_HOU.GDT 10/31/08

RECORD OF BOREHOLE MW-FGD-04

DATUM: LOCAL

PROJECT: OAK GROVE SES
LOCATION: FRANKLIN, TEXAS

BORING STARTED: 20-Aug-2008
BORING FINISHED: 20-Aug-2008

DRILLING EQUIPMENT: MOBILE B-57 BUGGY
DRILLING OPERATOR: Lewis Environmental Drilling

NORTHING (ft): 5039.72
EASTING (ft): 3414.63
ELEVATION (ft): 429.19

DEPTH SCALE FEET	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (ft)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.5 FT	RECOVERY%	UNDRAINED SHEAR STRENGTH Cu (CU - ● P.P. - ⊕ Field Vane Shear ■; UU - ✿ TORV. - ▲ UCS - ✳; 400 800 1200 1600)	ROCK QUALITY DESIGNATION (RQD) % ★ (20 40 60 80); WATER CONTENT PERCENT (PL W LL; 20 40 60 80)	ADDITIONAL LAB. TESTING	INSTALLATION NOTES AND GROUNDWATER OBSERVATIONS
		--- CONTINUED FROM PREVIOUS PAGE ---										
40				40.0	SB-21		18 35 33 N68	100				
42		Hard, gray, CLAY, with sand		42.0	SB-22		11 21 34 N55	100				
44		BORING TERMINATED AT 43.5'		43.5								
46												
48												
50												
52												
54												
56												
58												
60												

DEPTH SCALE
1 inch to 2.5 feet

Golder Associates

LOGGED: CS
CHECKED: *BLT*

OAK GROVE - MW 94281GINT.GPJ GLDR_HOU.GDT 10/31/08

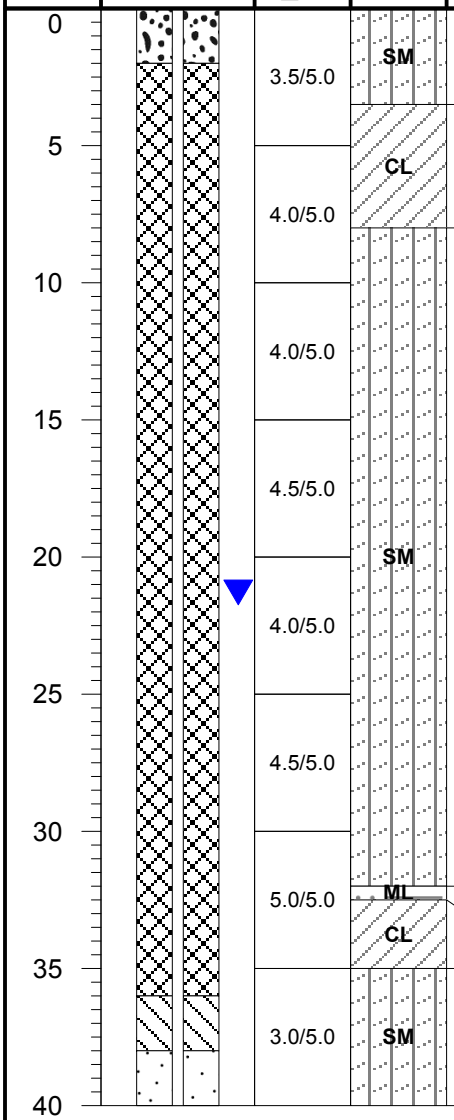
Luminant Power

Log of Boring: FGD-5

Oak Grove Steam Electric Station
Franklin, TX

PBW Project No. 1602

Completion Date:	3/3/10	Drilling Method:	HSA
Drilling Company:	Strata Core, Inc.	Borehole Diameter (in.):	6
Driller:	Roddy Qualls	Total Depth (ft):	50
Driller's License:	3121	Northing:	571950.33
Field Supervisor:	Chris Moore	Easting:	3200628.33
Sampling Method:	3"x5' Barrel	Ground Elev. (ft AMSL):	430.54



Lithologic Description
SILTY SAND, SM, brown, moist, soft.
SILTY CLAY, CL, mottled yellowish brown and yellowish red, moist, firm, with sand from 6'-8'.
SILTY SAND, SM, banded very pale brown and brownish yellow, moist, soft to firm, laminated, very fine grained, trace thinly laminated silt lenses.
SILT, ML, brown, moist to wet, very soft to soft.
CLAY, CL, dark gray, moist, firm to hard, with thinly laminated silt and sand lenses.
SILTY SAND, SM, dark gray to gray, moist, soft to firm, very fine grained, some thinly laminated silt lenses, trace thin carbonaceous lenses, wet at 40', clayey lenses at: 40.5' -41', 44'-44.5, and, 47'-48'.

PBW

Pastor, Behling & Wheeler, LLC
2201 Double Creek Dr., Suite 4004
Round Rock, TX 78664
Tel (512) 671-3434 Fax (512) 671-3446

Notes:

Initial Fluid Level (3/9/10)
▼ Depth to water: 23.67 ft BTOC

Annular Materials
(0.0 - 2.0) Concrete
(2.0 - 36.0) Cement/Bentonite Grout
(36.0 - 38.0) Bentonite Chips
(38.0 - 50.0) 12/20 Silica Sand

Well Materials
(+2.4 - 30.0) Casing, 2" Sch 40 FJT PVC
(30.0 - 40.0) Screen, 2" Sch 40 FJT PVC, 0.01 slot

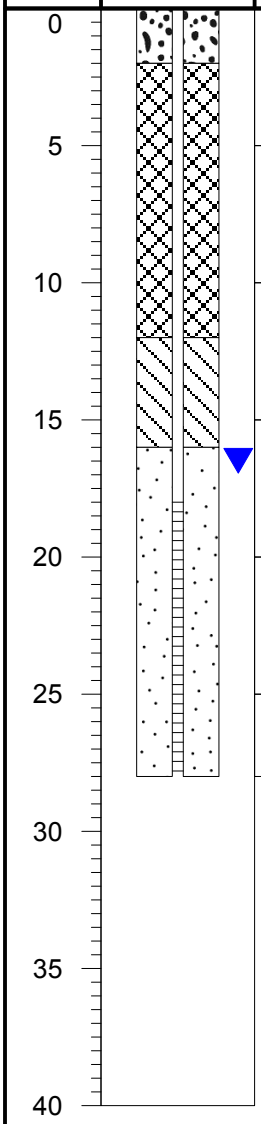
Luminant Power

Log of Boring: FGD-6

Oak Grove Steam Electric Station
Franklin, TX

PBW Project No. 1602

Completion Date:	3/4/10	Drilling Method:	HSA
Drilling Company:	Strata Core, Inc.	Borehole Diameter (in.):	6
Driller:	Roddy Qualls	Total Depth (ft):	28
Driller's License:	3121	Northing:	573195.06
Field Supervisor:	Chris Moore	Easting:	3200525.61
Sampling Method:	3"x5' Barrel	Ground Elev. (ft AMSL):	425.63



Lithologic Description

FILL, sandy clay, yellowish brown, moist, soft to firm, very fine grained sand.

FILL, clay, olive gray, moist, firm, with concrete fragments.

SAND, SP, yellowish brown, wet, soft, laminated, very fine grained, becomes gray at 26'.

PBW

Pastor, Behling & Wheeler, LLC
2201 Double Creek Dr., Suite 4004
Round Rock, TX 78664
Tel (512) 671-3434 Fax (512) 671-3446

Notes:

Initial Fluid Level (3/9/10)
▼ Depth to water: 19.48 ft BTOC

Annular Materials
(0.0 - 2.0) Concrete
(2.0 - 14.0) Cement/Bentonite Grout
(14.0 - 16.0) Bentonite Chips
(16.0 - 28.0) 12/20 Silica Sand

Well Materials
(+3.0 - 18.0) Casing, 2" Sch 40 FJT PVC
(18.0 - 28.0) Screen, 2" Sch 40 FJT PVC, 0.01 slot

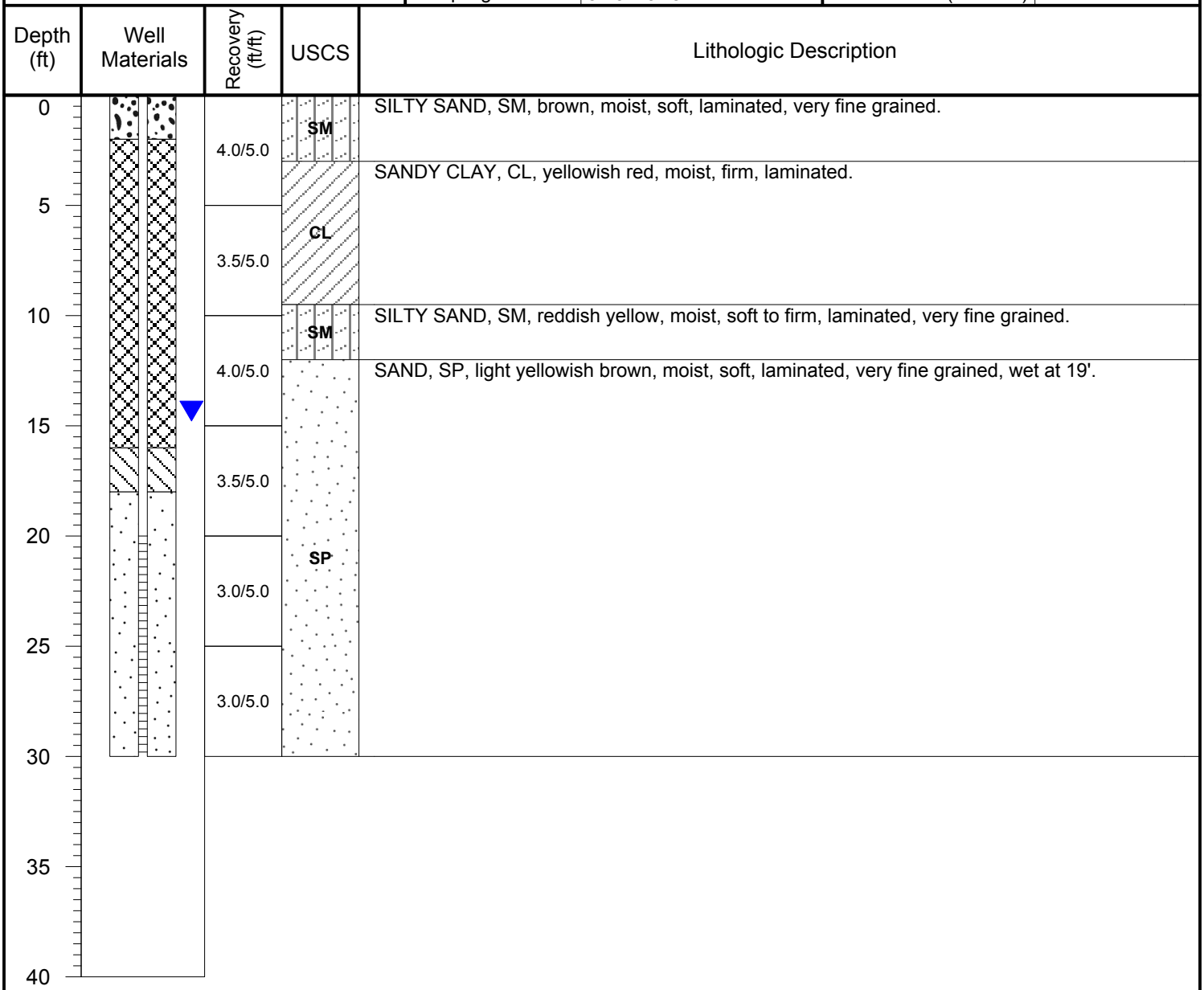
Luminant Power

Log of Boring: FGD-7

Oak Grove Steam Electric Station
Franklin, TX

PBW Project No. 1602

Completion Date:	3/3/10	Drilling Method:	HSA
Drilling Company:	Strata Core, Inc.	Borehole Diameter (in.):	6
Driller:	Roddy Qualls	Total Depth (ft):	30
Driller's License:	3121	Northing:	572591.64
Field Supervisor:	Chris Moore	Easting:	3199761.32
Sampling Method:	3"x5' Barrel	Ground Elev. (ft AMSL):	423.6



PBW

Pastor, Behling & Wheeler, LLC
2201 Double Creek Dr., Suite 4004
Round Rock, TX 78664
Tel (512) 671-3434 Fax (512) 671-3446

Notes:

Initial Fluid Level (3/9/10)
▼ Depth to water: 16.55 ft BTOC

Annular Materials
(0.0 - 2.0) Concrete
(2.0 - 16.0) Cement/Bentonite Grout
(16.0 - 18.0) Bentonite Chips
(18.0 - 30.0) 12/20 Silica Sand

Well Materials
(+2.2 - 20.0) Casing, 2" Sch 40 FJT PVC
(20.0 - 30.0) Screen, 2" Sch 40 FJT PVC, 0.01 slot

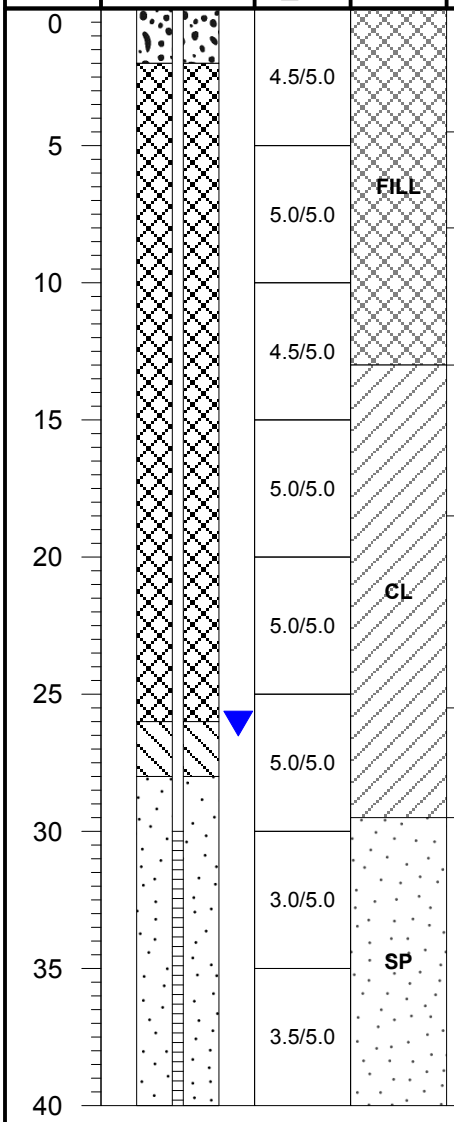
Luminant Power

Log of Boring: FGD-8

Oak Grove Steam Electric Station
Franklin, TX

PBW Project No. 1602

Completion Date:	3/4/10	Drilling Method:	HSA
Drilling Company:	Strata Core, Inc.	Borehole Diameter (in.):	6
Driller:	Roddy Qualls	Total Depth (ft):	40
Driller's License:	3121	Northing:	573033.29
Field Supervisor:	Chris Moore	Easting:	3198862.3
Sampling Method:	3"x5' Barrel	Ground Elev. (ft AMSL):	437.06



Lithologic Description

FILL, silty clay, CL, brown, moist, soft to firm.

FILL, silty sand, SM, very pale brown, dry to moist, soft, very fine grained.

FILL, silty clay, CL, dark gray, moist, firm, crumbles easily, some sand layers.

SANDY, CLAY, CL, strong brown, moist, firm, laminated, very fine grained sand

SILTY CLAY, CL, dark gray, moist, firm, with sand laminae.

SILTY CLAY, CL, mottled gray and brown, moist, firm to hard, some sand laminae, some oxidized staining.

SAND, SP, dark gray, wet, very soft to soft, very fine grained, some silty laminae.

PBW

Pastor, Behling & Wheeler, LLC
2201 Double Creek Dr., Suite 4004
Round Rock, TX 78664
Tel (512) 671-3434 Fax (512) 671-3446

Notes:

Initial Fluid Level (3/9/10)
▼ Depth to water: 29.11 ft BTOC

Annular Materials
(0.0 - 2.0) Concrete
(2.0 - 26.0) Cement/Bentonite Grout
(26.0 - 28.0) Bentonite Chips
(28.0 - 40.0) 12/20 Silica Sand

Well Materials
(+3.0 - 30.0) Casing, 2" Sch 40 FJT PVC
(30.0 - 40.0) Screen, 2" Sch 40 FJT PVC, 0.01 slot

Golder Associates
500 Century Plaza Drive, Suite 190
Houston, Texas 77073
Telephone: (281) 821-6868
Fax: (281) 821-6870

BOREHOLE FGD-11

CLIENT Luminant Power
PROJECT NAME Luminant
PROJECT NUMBER 1406296
PROJECT LOCATION Oak Grove SES
DATE STARTED 11/25/14 **COMPLETED** 11/26/14
GROUND ELEVATION 448.67 ft **HOLE SIZE** 6 inches
DRILLING CONTRACTOR Envirotech
GROUND WATER LEVELS:
DRILLING METHOD Auger
▽ **AT TIME OF DRILLING 40** 40' bgs
LOGGED BY DMW **CHECKED BY** CFR
AT END OF DRILLING
NOTES
AFTER DRILLING

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / □ FINES CONTENT (%) □ 20 40 60 80
0		Firm, brown and green, CLAY, and topsoil, moist	ST	75		1.0		
		Hard, brown and tan, SANDY CLAY, moist	ST	50		4.5		
5			ST	54		4.5		
			SS	58	3-5-7-10 (12)			
			SS	79	6-8-8-9 (16)			
10			SS	67	5-9-10-12 (19)			
			SS	71	6-8-9-12 (17)			
		Very stiff, red and black, CLAY, with brown sand, moist						
15		Stiff, brown and tan, SANDY CLAY, moist	SS	67	6-8-6-7 (14)			
		maroon, gravel sized rocks at 15.0'	SS	92	5-6-8-9 (14)			
			SS	79	4-6-8-9 (14)			
20		Compact, brown and tan, CLAYEY SAND, moist	SS	71	6-8-7-8 (15)			
		with gray and brown clay lenses at 21.0'	SS	79	7-8-11-15 (19)			
		loosely consolidated sand at 23.0'	SS	83	9-13-17-19 (30)			
25		orange mottlings at 25.0'	SS	83	9-10-14-16 (24)			
			SS	92	8-9-18-21 (27)			
30		Very stiff, gray, SAND and CLAY, moist dense at 29.5'						

(Continued Next Page)

GEOTECH BH PLOTS - GINT STD US LAB.GDT - 1/23/15 10:02 - L:\14- 2014 FILE FOLDER\1406296- LUMINANT_FGD-C\1406296 LUMINANT.GPJ

Golder Associates
500 Century Plaza Drive, Suite 190
Houston, Texas 77073
Telephone: (281) 821-6868
Fax: (281) 821-6870

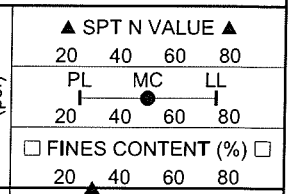
BOREHOLE FGD-11

CLIENT Luminant Power **PROJECT NAME** Luminant

PROJECT NUMBER 1406296 **PROJECT LOCATION** Oak Grove SES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN (tsf)	DRY UNIT WT. (pcf)
30		Very stiff, gray, SAND and CLAY, moist *(continued)*	SS	83	9-13-17-19 (30)		
		without clay at 31.0'	SS	88	10-16-22-22 (38)		
		Dense, gray and tan, SILTY SAND, moist					
		poorly consoldiated at 33.0'	SS	83	7-11-17-17 (28)		
35			SS	71	6-13-14-15 (27)		
		Very stiff, gray, SILTY CLAY, moist	SS	75	4-6-13-17 (19)		
		Dense, gray and tan, SILTY SAND, moist					
		moist to wet at 38.0'	SS	71	6-5-8-10 (13)		
40		Compact, gray and tan, SAND, moist to wet	SS	67	3-4-4-7 (8)		
		Compact, gray and tan, SILTY SAND, wet					
		Very stiff, gray, SILTY CLAY, moist	SS	88	7-9-10-13 (19)		
45		Dense, gray and tan, SILTY SAND, moist to wet	SS	92	3-8-24-28 (32)		
		moist at 46.0'	SS	83	4-8-26-40 (34)		
		slightly wet at 48.0'	SS	75	14-28-29-34 (57)		
50		very dense at 50.0'	SS	92	9-38-50 (88)		
		moist at 52.0'	SS	83	15-28-46-50 (74)		
		moist to wet at 54.0'	SS	71	14-36-50 (86)		
55			SS		21-39-48-113 (87)		

Bottom of borehole at 58.0 feet.



GEOTECH BH PLOTS - GINT STD US LAB.GDT - 1/23/15 10:02 - L:\14- 2014 FILE FOLDER\1406296- LUMINANT_FGD-C\1406296 LUMINANT.GPJ

Golder Associates
500 Century Plaza Drive, Suite 190
Houston, Texas 77073
Telephone: (281) 821-6868
Fax: (281) 821-6870

BOREHOLE FGD-12

CLIENT Luminant Power
PROJECT NAME Luminant
PROJECT NUMBER 1406296
PROJECT LOCATION Oak Grove SES
DATE STARTED 11/26/14 **COMPLETED** 11/26/14
GROUND ELEVATION 439.48 ft **HOLE SIZE** 6 inches
DRILLING CONTRACTOR Envirotech
GROUND WATER LEVELS:
DRILLING METHOD Auger
▽ **AT TIME OF DRILLING 32** 32' bgs
LOGGED BY DMW **CHECKED BY** CFR
AT END OF DRILLING
NOTES
AFTER DRILLING

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80
0		Firm, brown, CLAY, topsoil, moist	ST	46		1.0		
		Hard, brown, SANDY CLAY, moist	ST	63		4.5		
5			ST	42		4.5		
			SS	75	6-8-10-7 (18)			▲
		Firm, red, orange and gray, CLAY, moist, with red and orange mottling	SS	75	5-8-10-11 (18)			▲
10			SS	75	6-8-12-14 (20)			▲
		Very stiff, gray and red, SILTY CLAY, moist, silt partings	SS	71	4-8-14-15 (22)			▲
15		increasing silt at 15.0'	SS	63	8-10-19-16 (29)			▲
		decreasing silt at 16.0'	SS	75	5-9-12-16 (21)			▲
		Dense, red and gray, SANDY SILT, moist increasing silt at 17.5'	SS	79	8-14-12-8 (26)			▲
		Compact, orange and tan, SILTY SAND, moist	SS	63	7-5-5-6 (10)			▲
20		loosely consoldiated at 19.0'	SS	83	9-12-13-15 (25)			▲
		increased clay at 20.0'	SS		17-11-16-20 (27)			▲
		more consolidated at 21.0'	SS		12-18-14-15 (32)			▲
25		Stiff, gray, SILTY CLAY, moist, silt partings	SS	83	9-19-19-17 (38)			▲
		intervals of gray sand mixed with silty clay at 25.0'						
		Dense, gray, SAND, moist						
		Stiff, gray, SILTY CLAY, moist						
30		Dense, gray, SILTY SAND, with interbedded clay, moist, with red staining						

(Continued Next Page)

GEOTECH BH PLOTS - GINT STD US LAB.GDT - 1/23/15 10:02 - L:\14- 2014 FILE FOLDER\1406296- LUMINANT_FGD-C\1406296 LUMINANT.GPJ

Golder Associates
500 Century Plaza Drive, Suite 190
Houston, Texas 77073
Telephone: (281) 821-6868
Fax: (281) 821-6870

BOREHOLE FGD-12

CLIENT Luminant Power **PROJECT NAME** Luminant

PROJECT NUMBER 1406296 **PROJECT LOCATION** Oak Grove SES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN (tsf)	DRY UNIT WT. (pcf)
30		Dense, gray, SILTY SAND, with interbedded clay, moist, with red staining *(continued)*	SS	88	4-5-15-24 (20)		
		▽ red to moist, turning red at 32.0'	SS	67	10-16-30-28 (46)		
35		brown to gray at 34.0'	SS	63	14-24-48-42 (72)		
			SS	92	8-18-32-42 (50)		
		increasing sand at 38.0'	SS	92	8-26-48-50 (74)		
40			SS	92	3-4-10-26 (14)		
		gray and tan at 42.0'	SS	92	13-24-42-43 (66)		
45			SS	92	16-30-45-50 (75)		
			SS	58	20-36-50 (86)		
			SS	88	16-40-50 (90)		
50			SS	71	18-26-50 (76)		
			SS	63	4-30-50 (80)		
55			SS	50	7-24-50 (74)		
			SS	58	22-48-50 (98)		
			SS	54	24-48-50 (98)		
60		dark gray at 60.0'	SS	46	25-48-50 (98)		
			SS	50	30-50		

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
☐ FINES CONTENT (%) ☐
20 40 60 80

Bottom of borehole at 64.0 feet.

GEOTECH BH PLOTS - GINT STD US LAB.GDT - 1/23/15 10:02 - L:\14- 2014 FILE FOLDER\1406296- LUMINANT_FGD-C\1406296 LUMINANT.GPJ

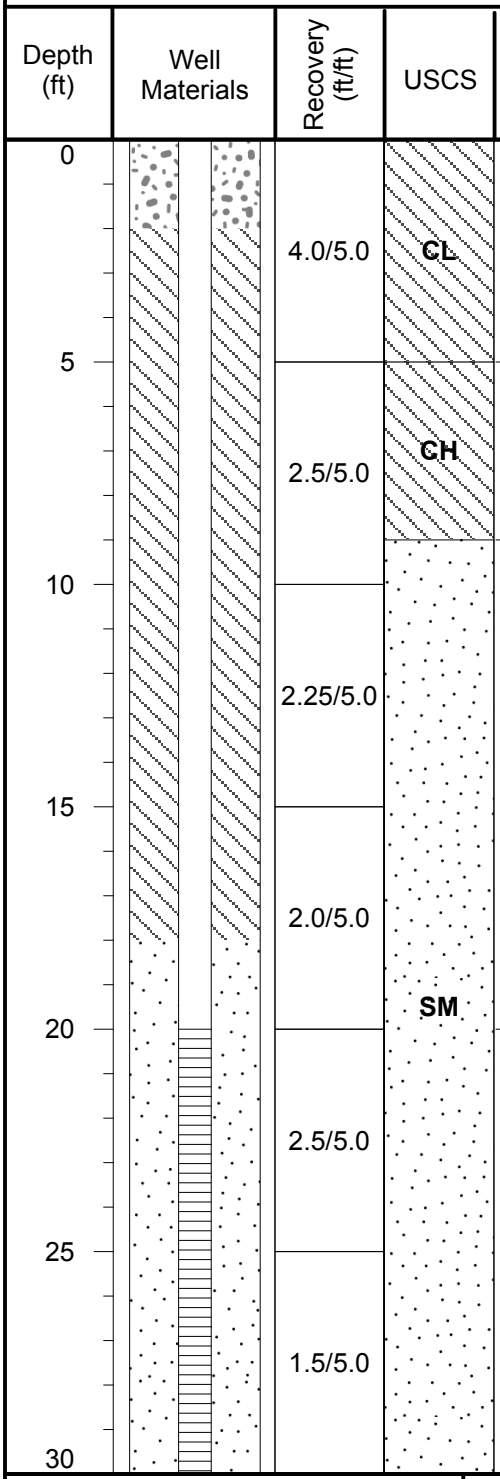
Luminant

Log of Boring: FGD-14

Oak Grove Steam Electric Station
Petteway, TX

PBW Project No. 5244

Completion Date:	7/25/2016	Drilling Method:	HSA
Drilling Company:	Sunbelt	Borehole Diameter (in.):	8.25
Driller:	Raymond Alcala	Total Depth (ft):	30
Driller's License:	59430	TOC Elevation (ft. AMSL):	428.91
Logged By:	Sara Taube	Northing:	572912.27
Sampling Method:	Split Spoon	Easting:	3201297.58



Lithologic Description
(0 - 5) Sandy CLAY, tan/orange/red layers, dry, hard, low to no plasticity, fine grained, light brown color 0'-1', red/orange clay and light gray sand below 1', gradational basal contact.
(5 - 9) Sandy, silty, CLAY, red/brown, moist, soft to firm, medium to high plasticity, softer with depth and more plastic, increased sand with depth, sharp basal contact.
(9 - 20) Silty SAND, light brown/tan, moist, unconsolidated, small amount of clay, fine grain sand, slightly gray.
(20 - 30) Silty SAND, light gray with some red/brown, moist to wet, unconsolidated, no clay, saturated below 25' and light gray.

PBW

Pastor, Behling & Wheeler, LLC
2201 Double Creek Dr., Suite 4004
Round Rock, TX 78664
Tel (512) 671-3434 Fax (512) 671-3446

Notes:

Well Materials
(+2.70 - 20) Casing, 2" Sch 40 FJT PVC
(20 - 30) Screen, 2" Sch 40 FJT PVC, 0.010" slot

Annular Materials
(0-2') Cement
(2'-18') Bentonite chips
(18'-30') 16/30 sand

Luminant

Log of Boring: FGD-15

Big Brown Steam Electric Station
Franklin, Texas

Golder Project No. 19122434E

Completion Date:	5/22/2019	Drilling Method:	HSA
Drilling Company:	Vortex	Borehole Diameter (in.):	6
Driller:	Robert Joiner	Total Depth (ft):	35
Driller's License:	54776M	TOC Elevation (ft. AMSL):	437.17
Logged By:	Sergio Ruiz	Northing:	3452427
Sampling Method:	2"X2.5' Split Spoon	Easting:	739119.1

Depth (ft)	Well Materials	Recovery (ft/ft)	USCS	Lithologic Description
0		0.0/5.0	NR	(0 - 5) HydroVAC
5		1.2/2.5	SM	(5 - 12.8) Silty SAND, fine grained, light tan with some yellow orange, trace roots, clay lense from 7.5'-7.6', slightly moist, orange at 12.2' then back to light brown, some more cohesive, some small firm pieces
		1.2/2.5		
10		1.3/2.5		
		1.6/2.5	CL	(12.8 - 16.5) Sandy, silty, CLAY, brownish gray, thin fine sand lenses throughout, orange color 12.9'-13.1'
15		1.0/2.5		
		1.0/2.5	SM	(16.5 - 20.1) Silty SAND, fine grained with silt, more clay with increased depth, some Fe staining.
20		1.9/2.5	CL	(20.1 - 23) CLAY, brownish purple, moist to wet, firm, orange red staining at 20', fine sand lenses present
		1.5/2.5	SM	(23 - 24.5) Silty SAND, moist, soft, fine silty sand, some orange Fe staining, some clay throughout
25			CL	(24.5 - 25) CLAY, brown purple, moist, low to moderate plasticity, saturated at 25',
		1.5/2.5	SM	(25 - 35) Silty SAND, grayish purple, fine to very fine, wet, very soft, trace clay, some Fe staining
		1.0/2.5		
30		1.0/2.5		
		2.5/2.5		
35				

GOLDER
2201 Double Creek Dr., Suite 4004
Round Rock, Texas 78664
O·512.671.3434 F·512.671.3446

Notes:
1. This log should not be used separately from the report to which it is attached.

Well Materials
(+3 - 25) Casing, 2" Sch 40 FJT PVC
(25 - 35) Screen, 2" Sch 40 FJT PVC, 0.010" slot

Annular Materials
(0'-2') Grout
(2'-23') Bentonite chips
(23'-35) 10/20 sand

Luminant

Log of Boring: FGD-16

Big Brown Steam Electric Station
Franklin, Texas

Golder Project No. 19122434E

Completion Date:	5/23/2019	Drilling Method:	HSA
Drilling Company:	Vortex	Borehole Diameter (in.):	6
Driller:	Robert Joiner	Total Depth (ft):	40
Driller's License:	54776M	TOC Elevation (ft. AMSL):	444.3
Logged By:	Jacob Jarvis	Northing:	3452861
Sampling Method:	2"X2.5' Split Spoon	Easting:	739235.7

Depth (ft)	Well Materials	Recovery (ft/ft)	USCS	Lithologic Description
0		0.0/5.0	NR	(0 - 5) HydroVAC
5		1.25/5.0	SC	(5 - 7.5) Sandy CLAY, dry, soft, low plasticity, clay decreases with depth, yellow orange
		1.2/2.5	SM	(7.5 - 10) Silty SAND, yellow orange, dry, very soft, subround, no plasticity, clay increases in bottom 3 inches
10		1.75/2.5		(10 - 12.5) Silty SAND, yellow orange, dry, soft, subround, no plasticity, few clay lenses, few clean sand lenses
		0.8/2.5	SW	(12.5 - 15) SAND, fine, well sorted, brown, very soft, dry, no plasticity, color change from brown to dark brown
15		1.7/2.5	CL	(15 - 17.5) Sandy CLAY, red, dry, hard, medium plasticity, hard clay with sand throughout
		1.25/2.5	SC	(17.5 - 18.5) Clayey SAND, dark red, hard, low plasticity, dry
20		1.5/2.5		
		1.7/2.5		
25		1.4/2.5		
		1.75/2.5	SW	(18.5 - 40) SAND, red to purple gray, well sorted, very soft, subround, no plasticity, gradual transition to clean sand, lighter red color, clay lenses 20.0'-22.5', saturated at 30'
30		1.75/2.5		
		1.75/2.5		
35		5.0/5.0		
40				

GOLDER
2201 Double Creek Dr., Suite 4004
Round Rock, Texas 78664
O·512.671.3434 F·512.671.3446

Notes:
1. This log should not be used separately from the report to which it is attached.

Well Materials
(3 - 30) Casing, 2" Sch 40 FJT PVC
(30 - 40) Screen, 2" Sch 40 FJT PVC, 0.010" slot

Annular Materials
(0'-2') Grout
(2'-28') Bentonite chips
(28'-40') 10/20 sand

Luminant

Log of Boring: FGD-2019-1

Big Brown Steam Electric Station
Franklin, TX

Golder Project No. 19122434E

Completion Date:	6/3/2019	Drilling Method:	HSA
Drilling Company:	Vortex	Borehole Diameter (in.):	6
Driller:	Robert Joiner	Total Depth (ft):	30
Driller's License:	54776	TOC Elevation (ft. AMSL):	
Logged By:	Jacob Jarvis	Northing:	3452823
Sampling Method:	2'X2.5' Split Spoon	Easting:	739015.9

Depth (ft)	Recovery (ft/ft)	USCS	Lithologic Description
0	0.0/5.0	NR	(0 - 5) HydroVAC
5	1.6/2.5	CL	(5 - 7.5) Silty Sandy CLAY, light tan, dry, firm, low to mod plasticity
	1.55/2.5	SC	(7.5 - 10) Silty SAND, yellow orange, dry, soft, few clay lenses throughout
10	2.5/2.5	CL	(10 - 12.5) Silty CLAY, light gray, dry to moist, soft, low to moderate plasticity, plasticity and silt increases with depth
	2.5/2.5	CH	(12.5 - 22) CLAY, wet, brown to dark brown, soft to firm, high plasticity
15	2/2.5		
	2.5/2.5		
20	2.1/2.5		
	2.2/2.5	SW	(22 - 25) SAND, light tan, saturated, soft, no plasticity
25	5.0/5.0		
30			

GOLDER
2201 Double Creek Dr., Suite 4004
Round Rock, Texas 78664
O·512.671.3434 F·512.671.3446

Notes:
1. This log should not be used separately from the report to which it is attached.

APPENDIX C

LABORATORY ANALYTICAL REPORTS

June 05, 2019

Will Vienne
Golder
2201 Double Creek Dr #4004
Round Rock, Texas 78664
TEL: (512) 671-3434
FAX (512) 671-3446

Order No.: 1905205

RE: Luminant-OGSES FGD Ponds

Dear Will Vienne:

DHL Analytical, Inc. received 9 sample(s) on 5/17/2019 for the analyses presented in the following report.

There were no problems with the analyses and all data met requirements of NELAP except where noted in the Case Narrative. All non-NELAP methods will be identified accordingly in the case narrative and all estimated uncertainties of test results are within method or EPA specifications.

If you have any questions regarding these tests results, please feel free to call. Thank you for using DHL Analytical.

Sincerely,

John DuPont
General Manager

This report was performed under the accreditation of the State of Texas Laboratory Certification Number: T104704211-19-24

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DHL ANALYTICAL
2300 Double Creek Dr. ■ Round Rock, TX 78664
Phone (512) 388-8222 ■ FAX (512) 388-8229
Web: www.dhlanalytical.com
E-Mail: login@dhlanalytical.com

№ 82719

CHAIN-OF-CUSTODY

CLIENT: GOLDER
ADDRESS: 2201 DOUBLE CREEK DR, ROUND ROCK, TX 78664
PHONE: 512-671-3434 FAX/E-MAIL: 512-671-3446
DATA REPORTED TO: WILL VIENNE
ADDITIONAL REPORT COPIES TO:

DATE: 5-17-19 PAGE 1 OF 1
PO #: DHL WORK ORDER #: 1905205
PROJECT LOCATION OR NAME: LUMINANT - OGSES FGD PONDS
CLENT PROJECT #: 19122262-F COLLECTOR: J. BRAYTON

Authorize 5% surcharge for TRRP Report? ❑ Yes ❑ No

S=SOIL P=PAINT
W=WATER SL=SLUDGE
A=AIR O=OTHER
L=LIQUID SO=SOLID
SE=SEDIMENT

PRESERVATION: HCl | HNO_3 | H_2SO_4 ❑ NaOH ❑ | ICE | UNPRESERVED

ANALYSES: BTEX ❑ MTBE ❑ [METHOD 8021] | TPH 1005 ❑ TPH 1006 ❑ HOLD 1006 ❑ | GRO [METHOD 8015] ❑ DRO [METHOD 8105] ❑ | VOC 8260 ❑ VOC 624 ❑ VOC 8260/5035 ❑ | SVOC 8270 ❑ PAH 8270 ❑ HOLD PAH ❑ SVOC 625 ❑ | 8270 PEST ❑ 625 PEST/PCB ❑ 608 PCB ❑ | 8270 O-P PEST ❑ 8082 PCB ❑ 8270 PCB ❑ | 8321 HERB ❑ T PHOS, AMMONIA ❑ | METALS 6020 ❑ METALS 200.8 ❑ DISS. METALS ❑ | RCRA ❑ TX11 ❑ | PH ❑ HEX CHROM ❑ ALKALINITY ❑ COD ❑ | CHLORIDE ❑ ANIONS ❑ | TCLP-SVOC ❑ VOC ❑ PEST ❑ HERB ❑ | TCLP-METALS ❑ RCRA 8 ❑ TX-11 ❑ Pb ❑ | RCI ❑ FLASHPOINT ❑ DGAS ❑ | TDS ❑ TSS ❑ % MOISTURE ❑ CYANIDE ❑ | ALKALINITY III & IV, ALK, NO_3, SO_4, Na, Mg, K, FERROUS & FERRIC IRON

Field Sample I.D.	DHL Lab #	Date	Time	Matrix	Container Type	# of Containers	HCl	HNO_3	H_2SO_4 ❑ NaOH ❑	ICE	UNPRESERVED	ANALYSES	FIELD NOTES
FGD-6	01	5-16-19	0920	W		7						X X X	
FGD-4	02		1015	W		7						X X X	
FGD-3	03		1110	W		7						X X X	
FGD-2	04		1200	W		7						X X X	
FGD-5	05		1350	W		7						X X X	
FGD-1	06		1450	W		7						X X X	
[redacted] JB	-		~~1450~~ JB	W		7						X X X	
FGD-8	07		1545	W		7						X X X	
FGD-11	08		1640	W		7						X X X	
FGD-12	09		1735	W		7						X X X	
[redacted] JB	-												

RELINQUISHED BY: (Signature) DATE/TIME 5-17-19 9:10 RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature) DATE/TIME 5-17-19 11:20 RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

❑ DHL DISPOSAL @ $5.00 each ❑ Return

TURN AROUND TIME
RUSH ❑ CALL FIRST
1 DAY ❑ CALL FIRST
2 DAY ❑
NORMAL ☒
OTHER ❑ _____

LABORATORY USE ONLY:
RECEIVING TEMP: 0.9/0.6 °C THERM #: 78
CUSTODY SEALS: ❑ BROKEN ❑ INTACT ☒ NOT USED
CARRIER: ❑ LONE STAR ❑ FEDEX ❑ UPS ❑ OTHER
❑ COURIER DELIVERY
☒ HAND DELIVERED

DHL COC Rev 1 | FEB 2010

Appendix III Parameters:
Metals (Ca and B)
Anions (Cl, F, and SO4)
TDS

Appendix IV Parameters:

Metals (As, Ba, Be, Cd, Co, Cr, Hg, Li, Mo, Pb, Sb, Se, and Tl)
Ra-226
Ra-228

From: Vienne, Will [mailto:William_Vienne@golder.com]
Sent: Tuesday, April 09, 2019 12:48 PM
To: John DuPont <dupont@dhlanalytical.com>
Subject: CCR Analysis

DHL Analytical, Inc.

Sample Receipt Checklist

Client Name Golder | Date Received: 5/17/2019

Work Order Number 1905205 | Received by EL

Checklist completed by: EL (Signature) 5/17/2019 (Date) | Reviewed by DL (Initials) 5/17/2019 (Date)

Carrier name Hand Delivered

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shippping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	0.9 °C
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH<2 acceptable upon receipt?	Yes ☑	No ☐	NA ☐ LOT # 11837
	Adjusted? no		Checked by EL
Water - ph>9 (S) or ph>10 (CN) acceptable upon receipt?	Yes ☐	No ☐	NA ☑ LOT #
	Adjusted?		Checked by

Any No response must be detailed in the comments section below.

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments: _____

Corrective Action _____

DHL Analytical, Inc. **Date:** *05-Jun-19*

CLIENT: Golder
Project: Luminant-OGSES FGD Ponds
Lab Order: 1905205

CASE NARRATIVE

Samples were analyzed using the methods outlined in the following references:

Method SW6020A - Metals Analysis
Method SW7470A - Mercury Analysis
Method E300 - Anions Analysis
Method M2320 B - Alkalinity Analysis
Method M3500-Fe D - Ferrous Iron Analysis (this parameter is not NELAP certified)
Method M3500-Fe D - Ferric Iron (calculation) (this calculation is not NELAP certified).
Method M4500-P E - Orthophosphate Analysis
Method M2540C - TDS Analysis
Sub-contract - Radium-228 and Radium-226 analyses by methods E904 and SM 7500 Ra B M. Analyzed at Pace Analytical.

LOG IN

The samples were received and log-in performed on 5/17/19. A total of 9 samples were received. The samples arrived in good condition and were properly packaged.

METALS ANALYSIS

For Metals analysis performed on 5/20/19 the matrix spike and matrix spike duplicate recoveries were out of control limits for three analytes. These are flagged accordingly in the QC summary report. The sample selected for the matrix spike and matrix spike duplicate was not from this work order. The LCS was within control limits for these analytes. No further corrective actions were taken.

For Metals analysis performed on 5/22/19 the RPD for the serial dilution was slightly above control limits for Boron. This is flagged accordingly. The PDS was within control limits for this analyte. No further corrective actions were taken.

For Metals analysis peformed on 5/22/19 LCVL6-190522 was above control limits for Sodium. This is flagged accordingly. The associated CCV6-190522 was within control limits for this analyte. No further corrective actions were taken.

ALKALINITY ANALYSIS

For Alkalinity analysis performed on 5/21/19 the recovery of the Initial Calibration Verification (ICV-190521) was slightly above control limits. This is flagged accordingly in the QC summary report. The remaining bracketing CCVs were within control limits. No further corrective actions were taken.

DHL Analytical, Inc.

Date: *05-Jun-19*

CLIENT: Golder
Project: Luminant-OGSES FGD Ponds
Lab Order: 1905205

Work Order Sample Summary

Lab Smp ID	Client Sample ID	Tag Number	Date Collected	Date Recved
1905205-01	FGD-6		05/16/19 09:20 AM	5/17/2019
1905205-02	FGD-4		05/16/19 10:15 AM	5/17/2019
1905205-03	FGD-3		05/16/19 11:10 AM	5/17/2019
1905205-04	FGD-2		05/16/19 12:00 PM	5/17/2019
1905205-05	FGD-5		05/16/19 01:50 PM	5/17/2019
1905205-06	FGD-1		05/16/19 02:50 PM	5/17/2019
1905205-07	FGD-8		05/16/19 03:45 PM	5/17/2019
1905205-08	FGD-11		05/16/19 04:40 PM	5/17/2019
1905205-09	FGD-12		05/16/19 05:35 PM	5/17/2019

Lab Order: 1905205
Client: Golder
Project: Luminant-OGSES FGD Ponds

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
1905205-01A	FGD-6	05/16/19 09:20 AM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	05/21/19 04:52 PM	91028
1905205-01B	FGD-6	05/16/19 09:20 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/20/19 09:30 AM	90989
	FGD-6	05/16/19 09:20 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/20/19 09:30 AM	90989
	FGD-6	05/16/19 09:20 AM	Aqueous	SW7470A	Mercury Aq Prep	05/23/19 09:27 AM	91060
1905205-01C	FGD-6	05/16/19 09:20 AM	Aqueous	M2320 B	Alkalinity Preparation	05/21/19 09:05 AM	91010
	FGD-6	05/16/19 09:20 AM	Aqueous	E300	Anion Preparation	05/17/19 09:26 AM	90965
	FGD-6	05/16/19 09:20 AM	Aqueous	E300	Anion Preparation	05/17/19 09:26 AM	90965
	FGD-6	05/16/19 09:20 AM	Aqueous	M4500-P E	Orthophosphate Prep	05/17/19 12:01 PM	90972
	FGD-6	05/16/19 09:20 AM	Aqueous	M2540C	TDS Preparation	05/21/19 08:03 AM	91019
1905205-02A	FGD-4	05/16/19 10:15 AM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	05/21/19 04:52 PM	91028
1905205-02B	FGD-4	05/16/19 10:15 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/20/19 09:30 AM	90989
	FGD-4	05/16/19 10:15 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/20/19 09:30 AM	90989
	FGD-4	05/16/19 10:15 AM	Aqueous	SW7470A	Mercury Aq Prep	05/23/19 09:27 AM	91060
1905205-02C	FGD-4	05/16/19 10:15 AM	Aqueous	M2320 B	Alkalinity Preparation	05/21/19 09:05 AM	91010
	FGD-4	05/16/19 10:15 AM	Aqueous	E300	Anion Preparation	05/17/19 09:26 AM	90965
	FGD-4	05/16/19 10:15 AM	Aqueous	E300	Anion Preparation	05/17/19 09:26 AM	90965
	FGD-4	05/16/19 10:15 AM	Aqueous	M4500-P E	Orthophosphate Prep	05/17/19 12:01 PM	90972
	FGD-4	05/16/19 10:15 AM	Aqueous	M2540C	TDS Preparation	05/21/19 08:03 AM	91019
1905205-03A	FGD-3	05/16/19 11:10 AM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	05/21/19 04:52 PM	91028
1905205-03B	FGD-3	05/16/19 11:10 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/20/19 09:30 AM	90989
	FGD-3	05/16/19 11:10 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/20/19 09:30 AM	90989
	FGD-3	05/16/19 11:10 AM	Aqueous	SW7470A	Mercury Aq Prep	05/23/19 09:27 AM	91060
1905205-03C	FGD-3	05/16/19 11:10 AM	Aqueous	M2320 B	Alkalinity Preparation	05/21/19 09:05 AM	91010
	FGD-3	05/16/19 11:10 AM	Aqueous	E300	Anion Preparation	05/17/19 09:26 AM	90965
	FGD-3	05/16/19 11:10 AM	Aqueous	E300	Anion Preparation	05/17/19 09:26 AM	90965
	FGD-3	05/16/19 11:10 AM	Aqueous	M4500-P E	Orthophosphate Prep	05/17/19 12:01 PM	90972
	FGD-3	05/16/19 11:10 AM	Aqueous	M2540C	TDS Preparation	05/21/19 08:03 AM	91019
1905205-04A	FGD-2	05/16/19 12:00 PM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	05/21/19 04:52 PM	91028

Lab Order: 1905205
Client: Golder
Project: Luminant-OGSES FGD Ponds

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
1905205-04B	FGD-2	05/16/19 12:00 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/20/19 09:30 AM	90989
	FGD-2	05/16/19 12:00 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/20/19 09:30 AM	90989
	FGD-2	05/16/19 12:00 PM	Aqueous	SW7470A	Mercury Aq Prep	05/23/19 09:27 AM	91060
1905205-04C	FGD-2	05/16/19 12:00 PM	Aqueous	M2320 B	Alkalinity Preparation	05/21/19 09:05 AM	91010
	FGD-2	05/16/19 12:00 PM	Aqueous	E300	Anion Preparation	05/17/19 09:26 AM	90965
	FGD-2	05/16/19 12:00 PM	Aqueous	E300	Anion Preparation	05/17/19 09:26 AM	90965
	FGD-2	05/16/19 12:00 PM	Aqueous	M4500-P E	Orthophosphate Prep	05/17/19 12:01 PM	90972
	FGD-2	05/16/19 12:00 PM	Aqueous	M2540C	TDS Preparation	05/21/19 08:03 AM	91019
1905205-05A	FGD-5	05/16/19 01:50 PM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	05/21/19 04:52 PM	91028
1905205-05B	FGD-5	05/16/19 01:50 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/20/19 09:30 AM	90989
	FGD-5	05/16/19 01:50 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/20/19 09:30 AM	90989
	FGD-5	05/16/19 01:50 PM	Aqueous	SW7470A	Mercury Aq Prep	05/23/19 09:27 AM	91060
1905205-05C	FGD-5	05/16/19 01:50 PM	Aqueous	M2320 B	Alkalinity Preparation	05/21/19 09:05 AM	91010
	FGD-5	05/16/19 01:50 PM	Aqueous	M2320 B	Alkalinity Preparation	05/30/19 03:00 PM	91142
	FGD-5	05/16/19 01:50 PM	Aqueous	E300	Anion Preparation	05/17/19 09:26 AM	90965
	FGD-5	05/16/19 01:50 PM	Aqueous	E300	Anion Preparation	05/17/19 09:26 AM	90965
	FGD-5	05/16/19 01:50 PM	Aqueous	M4500-P E	Orthophosphate Prep	05/17/19 12:01 PM	90972
	FGD-5	05/16/19 01:50 PM	Aqueous	M2540C	TDS Preparation	05/21/19 08:03 AM	91019
1905205-06A	FGD-1	05/16/19 02:50 PM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	05/21/19 04:52 PM	91028
1905205-06B	FGD-1	05/16/19 02:50 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/20/19 09:30 AM	90989
	FGD-1	05/16/19 02:50 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/20/19 09:30 AM	90989
	FGD-1	05/16/19 02:50 PM	Aqueous	SW7470A	Mercury Aq Prep	05/23/19 09:27 AM	91060
1905205-06C	FGD-1	05/16/19 02:50 PM	Aqueous	M2320 B	Alkalinity Preparation	05/21/19 09:05 AM	91010
	FGD-1	05/16/19 02:50 PM	Aqueous	M2320 B	Alkalinity Preparation	05/30/19 03:00 PM	91142
	FGD-1	05/16/19 02:50 PM	Aqueous	E300	Anion Preparation	05/17/19 09:26 AM	90965
	FGD-1	05/16/19 02:50 PM	Aqueous	E300	Anion Preparation	05/17/19 09:26 AM	90965
	FGD-1	05/16/19 02:50 PM	Aqueous	M4500-P E	Orthophosphate Prep	05/17/19 12:01 PM	90972
	FGD-1	05/16/19 02:50 PM	Aqueous	M2540C	TDS Preparation	05/21/19 08:03 AM	91019

Lab Order: 1905205
Client: Golder
Project: Luminant-OGSES FGD Ponds

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
1905205-07A	FGD-8	05/16/19 03:45 PM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	05/21/19 04:52 PM	91028
	FGD-8	05/16/19 03:45 PM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	05/21/19 04:52 PM	91028
	FGD-8	05/16/19 03:45 PM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	05/21/19 04:52 PM	91028
1905205-07B	FGD-8	05/16/19 03:45 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/20/19 09:30 AM	90989
	FGD-8	05/16/19 03:45 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/20/19 09:30 AM	90989
	FGD-8	05/16/19 03:45 PM	Aqueous	SW7470A	Mercury Aq Prep	05/23/19 09:27 AM	91060
1905205-07C	FGD-8	05/16/19 03:45 PM	Aqueous	M2320 B	Alkalinity Preparation	05/21/19 09:05 AM	91010
	FGD-8	05/16/19 03:45 PM	Aqueous	E300	Anion Preparation	05/17/19 09:26 AM	90965
	FGD-8	05/16/19 03:45 PM	Aqueous	E300	Anion Preparation	05/17/19 09:26 AM	90965
	FGD-8	05/16/19 03:45 PM	Aqueous	E300	Anion Preparation	05/20/19 09:14 AM	90986
	FGD-8	05/16/19 03:45 PM	Aqueous	M4500-P E	Orthophosphate Prep	05/17/19 12:01 PM	90972
	FGD-8	05/16/19 03:45 PM	Aqueous	M2540C	TDS Preparation	05/21/19 08:03 AM	91019
1905205-08A	FGD-11	05/16/19 04:40 PM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	05/21/19 04:52 PM	91028
1905205-08B	FGD-11	05/16/19 04:40 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/20/19 09:30 AM	90989
	FGD-11	05/16/19 04:40 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/20/19 09:30 AM	90989
	FGD-11	05/16/19 04:40 PM	Aqueous	SW7470A	Mercury Aq Prep	05/23/19 09:27 AM	91060
1905205-08C	FGD-11	05/16/19 04:40 PM	Aqueous	M2320 B	Alkalinity Preparation	05/21/19 09:05 AM	91010
	FGD-11	05/16/19 04:40 PM	Aqueous	E300	Anion Preparation	05/20/19 09:14 AM	90986
	FGD-11	05/16/19 04:40 PM	Aqueous	E300	Anion Preparation	05/17/19 09:26 AM	90965
	FGD-11	05/16/19 04:40 PM	Aqueous	E300	Anion Preparation	05/17/19 09:26 AM	90965
	FGD-11	05/16/19 04:40 PM	Aqueous	M4500-P E	Orthophosphate Prep	05/17/19 12:01 PM	90972
	FGD-11	05/16/19 04:40 PM	Aqueous	M2540C	TDS Preparation	05/21/19 08:03 AM	91019
1905205-09A	FGD-12	05/16/19 05:35 PM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	05/21/19 04:52 PM	91028
1905205-09B	FGD-12	05/16/19 05:35 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/20/19 09:30 AM	90989
	FGD-12	05/16/19 05:35 PM	Aqueous	SW7470A	Mercury Aq Prep	05/23/19 09:27 AM	91060
1905205-09C	FGD-12	05/16/19 05:35 PM	Aqueous	M2320 B	Alkalinity Preparation	05/21/19 09:05 AM	91010
	FGD-12	05/16/19 05:35 PM	Aqueous	E300	Anion Preparation	05/17/19 09:26 AM	90965
	FGD-12	05/16/19 05:35 PM	Aqueous	E300	Anion Preparation	05/17/19 09:26 AM	90965

Lab Order: 1905205
Client: Golder
Project: Luminant-OGSES FGD Ponds

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
1905205-09C	FGD-12	05/16/19 05:35 PM	Aqueous	M4500-P E	Orthophosphate Prep	05/17/19 12:01 PM	90972
	FGD-12	05/16/19 05:35 PM	Aqueous	M2540C	TDS Preparation	05/21/19 08:03 AM	91019

Lab Order: 1905205
Client: Golder
Project: Luminant-OGSES FGD Ponds

ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
1905205-01A	FGD-6	Aqueous	M3500-Fe D	Ferric Iron (Calculated)	91028	1	05/30/19	UV/VIS_2_190530B
	FGD-6	Aqueous	M3500-Fe D	Ferrous Iron	91028	1	05/21/19 05:41 PM	UV/VIS_2_190521B
1905205-01B	FGD-6	Aqueous	SW7470A	Mercury Total: Aqueous	91060	1	05/24/19 10:48 AM	CETAC2_HG_190524A
	FGD-6	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	90989	1	05/22/19 03:52 PM	ICP-MS4_190522D
	FGD-6	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	90989	20	05/23/19 11:55 AM	ICP-MS4_190523A
1905205-01C	FGD-6	Aqueous	M2320 B	Alkalinity	91010	1	05/21/19 10:03 AM	TITRATOR_190521A
	FGD-6	Aqueous	E300	Anions by IC method - Water	90965	10	05/17/19 01:24 PM	IC4_190517A
	FGD-6	Aqueous	E300	Anions by IC method - Water	90965	1	05/17/19 05:56 PM	IC4_190517A
	FGD-6	Aqueous	M4500-P E	Orthophosphate	90972	1	05/17/19 12:35 PM	UV/VIS_2_190517B
	FGD-6	Aqueous	M2540C	Total Dissolved Solids	91019	1	05/21/19 10:00 AM	WC_190521C
1905205-02A	FGD-4	Aqueous	M3500-Fe D	Ferric Iron (Calculated)	91028	1	05/30/19	UV/VIS_2_190530B
	FGD-4	Aqueous	M3500-Fe D	Ferrous Iron	91028	1	05/21/19 05:42 PM	UV/VIS_2_190521B
1905205-02B	FGD-4	Aqueous	SW7470A	Mercury Total: Aqueous	91060	1	05/24/19 10:50 AM	CETAC2_HG_190524A
	FGD-4	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	90989	1	05/22/19 03:54 PM	ICP-MS4_190522D
	FGD-4	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	90989	10	05/23/19 11:57 AM	ICP-MS4_190523A
1905205-02C	FGD-4	Aqueous	M2320 B	Alkalinity	91010	1	05/21/19 10:23 AM	TITRATOR_190521A
	FGD-4	Aqueous	E300	Anions by IC method - Water	90965	10	05/17/19 02:12 PM	IC4_190517A
	FGD-4	Aqueous	E300	Anions by IC method - Water	90965	1	05/17/19 06:12 PM	IC4_190517A
	FGD-4	Aqueous	M4500-P E	Orthophosphate	90972	1	05/17/19 12:35 PM	UV/VIS_2_190517B
	FGD-4	Aqueous	M2540C	Total Dissolved Solids	91019	1	05/21/19 10:00 AM	WC_190521C
1905205-03A	FGD-3	Aqueous	M3500-Fe D	Ferric Iron (Calculated)	91028	1	05/30/19	UV/VIS_2_190530B
	FGD-3	Aqueous	M3500-Fe D	Ferrous Iron	91028	1	05/21/19 05:42 PM	UV/VIS_2_190521B
1905205-03B	FGD-3	Aqueous	SW7470A	Mercury Total: Aqueous	91060	1	05/24/19 11:01 AM	CETAC2_HG_190524A
	FGD-3	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	90989	20	05/23/19 11:59 AM	ICP-MS4_190523A
	FGD-3	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	90989	1	05/22/19 03:56 PM	ICP-MS4_190522D
1905205-03C	FGD-3	Aqueous	M2320 B	Alkalinity	91010	1	05/21/19 10:42 AM	TITRATOR_190521A

Lab Order: 1905205
Client: Golder
Project: Luminant-OGSES FGD Ponds

ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
1905205-03C	FGD-3	Aqueous	E300	Anions by IC method - Water	90965	10	05/17/19 03:00 PM	IC4_190517A
	FGD-3	Aqueous	E300	Anions by IC method - Water	90965	1	05/17/19 06:28 PM	IC4_190517A
	FGD-3	Aqueous	M4500-P E	Orthophosphate	90972	1	05/17/19 12:35 PM	UV/VIS_2_190517B
	FGD-3	Aqueous	M2540C	Total Dissolved Solids	91019	1	05/21/19 10:00 AM	WC_190521C
1905205-04A	FGD-2	Aqueous	M3500-Fe D	Ferric Iron (Calculated)	91028	1	05/30/19	UV/VIS_2_190530B
	FGD-2	Aqueous	M3500-Fe D	Ferrous Iron	91028	1	05/21/19 05:43 PM	UV/VIS_2_190521B
1905205-04B	FGD-2	Aqueous	SW7470A	Mercury Total: Aqueous	91060	1	05/24/19 11:03 AM	CETAC2_HG_190524A
	FGD-2	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	90989	10	05/23/19 12:01 PM	ICP-MS4_190523A
	FGD-2	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	90989	1	05/22/19 03:58 PM	ICP-MS4_190522D
1905205-04C	FGD-2	Aqueous	M2320 B	Alkalinity	91010	1	05/21/19 10:50 AM	TITRATOR_190521A
	FGD-2	Aqueous	E300	Anions by IC method - Water	90965	1	05/17/19 06:44 PM	IC4_190517A
	FGD-2	Aqueous	E300	Anions by IC method - Water	90965	10	05/17/19 03:16 PM	IC4_190517A
	FGD-2	Aqueous	M4500-P E	Orthophosphate	90972	1	05/17/19 12:37 PM	UV/VIS_2_190517B
	FGD-2	Aqueous	M2540C	Total Dissolved Solids	91019	1	05/21/19 10:00 AM	WC_190521C
1905205-05A	FGD-5	Aqueous	M3500-Fe D	Ferric Iron (Calculated)	91028	1	05/30/19	UV/VIS_2_190530B
	FGD-5	Aqueous	M3500-Fe D	Ferrous Iron	91028	1	05/21/19 05:43 PM	UV/VIS_2_190521B
1905205-05B	FGD-5	Aqueous	SW7470A	Mercury Total: Aqueous	91060	1	05/24/19 11:06 AM	CETAC2_HG_190524A
	FGD-5	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	90989	1	05/22/19 04:00 PM	ICP-MS4_190522D
	FGD-5	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	90989	10	05/23/19 12:03 PM	ICP-MS4_190523A
1905205-05C	FGD-5	Aqueous	M2320 B	Alkalinity	91142	1	05/30/19 03:20 PM	TITRATOR_190530A
	FGD-5	Aqueous	M2320 B	Alkalinity	91010	1	05/21/19 10:54 AM	TITRATOR_190521A
	FGD-5	Aqueous	E300	Anions by IC method - Water	90965	10	05/17/19 03:32 PM	IC4_190517A
	FGD-5	Aqueous	E300	Anions by IC method - Water	90965	1	05/17/19 07:00 PM	IC4_190517A
	FGD-5	Aqueous	M4500-P E	Orthophosphate	90972	1	05/17/19 12:37 PM	UV/VIS_2_190517B
	FGD-5	Aqueous	M2540C	Total Dissolved Solids	91019	1	05/21/19 10:00 AM	WC_190521C
1905205-06A	FGD-1	Aqueous	M3500-Fe D	Ferric Iron (Calculated)	91028	1	05/30/19	UV/VIS_2_190530B
	FGD-1	Aqueous	M3500-Fe D	Ferrous Iron	91028	1	05/21/19 05:44 PM	UV/VIS_2_190521B

Lab Order: 1905205
Client: Golder
Project: Luminant-OGSES FGD Ponds

ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
1905205-06B	FGD-1	Aqueous	SW7470A	Mercury Total: Aqueous	91060	1	05/24/19 11:08 AM	CETAC2_HG_190524A
	FGD-1	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	90989	1	05/22/19 04:02 PM	ICP-MS4_190522D
	FGD-1	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	90989	10	05/23/19 12:05 PM	ICP-MS4_190523A
1905205-06C	FGD-1	Aqueous	M2320 B	Alkalinity	91010	1	05/21/19 11:03 AM	TITRATOR_190521A
	FGD-1	Aqueous	M2320 B	Alkalinity	91142	1	05/30/19 03:23 PM	TITRATOR_190530A
	FGD-1	Aqueous	E300	Anions by IC method - Water	90965	10	05/17/19 03:48 PM	IC4_190517A
	FGD-1	Aqueous	E300	Anions by IC method - Water	90965	1	05/17/19 07:16 PM	IC4_190517A
	FGD-1	Aqueous	M4500-P E	Orthophosphate	90972	1	05/17/19 12:37 PM	UV/VIS_2_190517B
	FGD-1	Aqueous	M2540C	Total Dissolved Solids	91019	1	05/21/19 10:00 AM	WC_190521C
1905205-07A	FGD-8	Aqueous	M3500-Fe D	Ferric Iron (Calculated)	91028	1	05/30/19	UV/VIS_2_190530B
	FGD-8	Aqueous	M3500-Fe D	Ferrous Iron	91028	1	05/21/19 05:44 PM	UV/VIS_2_190521B
	FGD-8	Aqueous	M3500-Fe D	Ferrous Iron	91028	100	05/21/19 05:52 PM	UV/VIS_2_190521B
	FGD-8	Aqueous	M3500-Fe D	Ferrous Iron	91028	1000	05/21/19 05:59 PM	UV/VIS_2_190521B
1905205-07B	FGD-8	Aqueous	SW7470A	Mercury Total: Aqueous	91060	1	05/24/19 11:10 AM	CETAC2_HG_190524A
	FGD-8	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	90989	1	05/22/19 04:04 PM	ICP-MS4_190522D
	FGD-8	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	90989	50	05/23/19 12:07 PM	ICP-MS4_190523A
1905205-07C	FGD-8	Aqueous	M2320 B	Alkalinity	91010	1	05/21/19 11:30 AM	TITRATOR_190521A
	FGD-8	Aqueous	E300	Anions by IC method - Water	90965	10	05/17/19 04:04 PM	IC4_190517A
	FGD-8	Aqueous	E300	Anions by IC method - Water	90986	100	05/20/19 02:43 PM	IC4_190520A
	FGD-8	Aqueous	E300	Anions by IC method - Water	90965	1	05/17/19 07:32 PM	IC4_190517A
	FGD-8	Aqueous	M4500-P E	Orthophosphate	90972	1	05/17/19 12:40 PM	UV/VIS_2_190517B
	FGD-8	Aqueous	M2540C	Total Dissolved Solids	91019	1	05/21/19 10:00 AM	WC_190521C
1905205-08A	FGD-11	Aqueous	M3500-Fe D	Ferric Iron (Calculated)	91028	1	05/30/19	UV/VIS_2_190530B
	FGD-11	Aqueous	M3500-Fe D	Ferrous Iron	91028	1	05/21/19 05:44 PM	UV/VIS_2_190521B
1905205-08B	FGD-11	Aqueous	SW7470A	Mercury Total: Aqueous	91060	1	05/24/19 11:12 AM	CETAC2_HG_190524A
	FGD-11	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	90989	1	05/22/19 04:06 PM	ICP-MS4_190522D

Lab Order: 1905205
Client: Golder
Project: Luminant-OGSES FGD Ponds

ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
1905205-08B	FGD-11	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	90989	20	05/23/19 12:09 PM	ICP-MS4_190523A
1905205-08C	FGD-11	Aqueous	M2320 B	Alkalinity	91010	1	05/21/19 11:40 AM	TITRATOR_190521A
	FGD-11	Aqueous	E300	Anions by IC method - Water	90965	1	05/17/19 07:48 PM	IC4_190517A
	FGD-11	Aqueous	E300	Anions by IC method - Water	90986	100	05/20/19 02:59 PM	IC4_190520A
	FGD-11	Aqueous	E300	Anions by IC method - Water	90965	10	05/17/19 04:20 PM	IC4_190517A
	FGD-11	Aqueous	M4500-P E	Orthophosphate	90972	1	05/17/19 12:41 PM	UV/VIS_2_190517B
	FGD-11	Aqueous	M2540C	Total Dissolved Solids	91019	1	05/21/19 10:00 AM	WC_190521C
1905205-09A	FGD-12	Aqueous	M3500-Fe D	Ferric Iron (Calculated)	91028	1	05/30/19	UV/VIS_2_190530B
	FGD-12	Aqueous	M3500-Fe D	Ferrous Iron	91028	1	05/21/19 05:44 PM	UV/VIS_2_190521B
1905205-09B	FGD-12	Aqueous	SW7470A	Mercury Total: Aqueous	91060	1	05/24/19 11:15 AM	CETAC2_HG_190524A
	FGD-12	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	90989	1	05/22/19 04:08 PM	ICP-MS4_190522D
1905205-09C	FGD-12	Aqueous	M2320 B	Alkalinity	91010	1	05/21/19 11:44 AM	TITRATOR_190521A
	FGD-12	Aqueous	E300	Anions by IC method - Water	90965	10	05/17/19 04:36 PM	IC4_190517A
	FGD-12	Aqueous	E300	Anions by IC method - Water	90965	1	05/17/19 08:04 PM	IC4_190517A
	FGD-12	Aqueous	M4500-P E	Orthophosphate	90972	1	05/17/19 12:41 PM	UV/VIS_2_190517B
	FGD-12	Aqueous	M2540C	Total Dissolved Solids	91019	1	05/21/19 10:00 AM	WC_190521C

DHL Analytical, Inc.

Date: *05-Jun-19*

CLIENT:	Golder	**Client Sample ID:**	FGD-6
Project:	Luminant-OGSES FGD Ponds	**Lab ID:**	1905205-01
Project No:	19122262-F	**Collection Date:**	05/16/19 09:20 AM
Lab Order:	1905205	**Matrix:**	AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020A**					Analyst: **RO**
Antimony	<0.000800	0.000800	0.00250		mg/L	1	05/22/19 03:52 PM
Arsenic	0.0294	0.00200	0.00500		mg/L	1	05/22/19 03:52 PM
Barium	0.107	0.00300	0.0100		mg/L	1	05/22/19 03:52 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 03:52 PM
Boron	0.116	0.0100	0.0300		mg/L	1	05/22/19 03:52 PM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 03:52 PM
Calcium	20.3	0.100	0.300		mg/L	1	05/22/19 03:52 PM
Chromium	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 03:52 PM
Cobalt	0.0132	0.00300	0.00500		mg/L	1	05/22/19 03:52 PM
Iron	4.86	0.0300	0.100		mg/L	1	05/22/19 03:52 PM
Lead	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 03:52 PM
Lithium	0.00679	0.00500	0.0100	J	mg/L	1	05/22/19 03:52 PM
Magnesium	6.61	0.100	0.300		mg/L	1	05/22/19 03:52 PM
Molybdenum	0.00770	0.00200	0.00500		mg/L	1	05/22/19 03:52 PM
Potassium	0.706	0.100	0.300		mg/L	1	05/22/19 03:52 PM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 03:52 PM
Sodium	225	2.00	6.00		mg/L	20	05/23/19 11:55 AM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	05/22/19 03:52 PM
MERCURY TOTAL: AQUEOUS		**SW7470A**					Analyst: **BM**
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	05/24/19 10:48 AM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **JL**
Chloride	170	3.00	10.0		mg/L	10	05/17/19 01:24 PM
Fluoride	0.669	0.100	0.400		mg/L	1	05/17/19 05:56 PM
Nitrate-N	<0.100	0.100	0.500		mg/L	1	05/17/19 05:56 PM
Sulfate	51.3	1.00	3.00		mg/L	1	05/17/19 05:56 PM
ALKALINITY		**M2320 B**					Analyst: **CC**
Alkalinity, Bicarbonate (As CaCO3)	262	10.0	20.0		mg/L @ pH 4.53	1	05/21/19 10:03 AM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.53	1	05/21/19 10:03 AM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.53	1	05/21/19 10:03 AM
Alkalinity, Total (As CaCO3)	262	20.0	20.0		mg/L @ pH 4.53	1	05/21/19 10:03 AM
FERRIC IRON (CALCULATED)		**M3500-FE D**					Analyst: **CAC**
Iron, Ferric	4.86	0.0500	0.100	N	mg/L	1	05/30/19
FERROUS IRON		**M3500-FE D**					Analyst: **BTJ**
Iron, Ferrous	<0.0500	0.0500	0.100	N	mg/L	1	05/21/19 05:41 PM

Qualifiers:

*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
S	Spike Recovery outside control limits	N	Parameter not NELAP certified

DHL Analytical, Inc.

Date: *05-Jun-19*

CLIENT:	Golder	**Client Sample ID:**	FGD-6
Project:	Luminant-OGSES FGD Ponds	**Lab ID:**	1905205-01
Project No:	19122262-F	**Collection Date:**	05/16/19 09:20 AM
Lab Order:	1905205	**Matrix:**	AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
ORTHOPHOSPHATE		**M4500-P E**					Analyst: **CC**
Phosphorus, Total Orthophosphate (As P)	0.714	0.0300	0.100		mg/L	1	05/17/19 12:35 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	710	10.0	10.0		mg/L	1	05/21/19 10:00 AM

Qualifiers:	*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
	DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit
	ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
	S	Spike Recovery outside control limits	N	Parameter not NELAP certified

DHL Analytical, Inc.

Date: *05-Jun-19*

CLIENT:	Golder	**Client Sample ID:**	FGD-4
Project:	Luminant-OGSES FGD Ponds	**Lab ID:**	1905205-02
Project No:	19122262-F	**Collection Date:**	05/16/19 10:15 AM
Lab Order:	1905205	**Matrix:**	AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020A**					Analyst: **RO**
Antimony	<0.000800	0.000800	0.00250		mg/L	1	05/22/19 03:54 PM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 03:54 PM
Barium	0.117	0.00300	0.0100		mg/L	1	05/22/19 03:54 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 03:54 PM
Boron	0.0733	0.0100	0.0300		mg/L	1	05/22/19 03:54 PM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 03:54 PM
Calcium	41.7	1.00	3.00		mg/L	10	05/23/19 11:57 AM
Chromium	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 03:54 PM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	05/22/19 03:54 PM
Iron	0.103	0.0300	0.100		mg/L	1	05/22/19 03:54 PM
Lead	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 03:54 PM
Lithium	0.0325	0.00500	0.0100		mg/L	1	05/22/19 03:54 PM
Magnesium	18.6	0.100	0.300		mg/L	1	05/22/19 03:54 PM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 03:54 PM
Potassium	1.62	0.100	0.300		mg/L	1	05/22/19 03:54 PM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 03:54 PM
Sodium	160	1.00	3.00		mg/L	10	05/23/19 11:57 AM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	05/22/19 03:54 PM
MERCURY TOTAL: AQUEOUS		**SW7470A**					Analyst: **BM**
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	05/24/19 10:50 AM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **JL**
Chloride	205	3.00	10.0		mg/L	10	05/17/19 02:12 PM
Fluoride	0.327	0.100	0.400	J	mg/L	1	05/17/19 06:12 PM
Nitrate-N	<0.100	0.100	0.500		mg/L	1	05/17/19 06:12 PM
Sulfate	41.7	1.00	3.00		mg/L	1	05/17/19 06:12 PM
ALKALINITY		**M2320 B**					Analyst: **CC**
Alkalinity, Bicarbonate (As CaCO3)	201	10.0	20.0		mg/L @ pH 4.52	1	05/21/19 10:23 AM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.52	1	05/21/19 10:23 AM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.52	1	05/21/19 10:23 AM
Alkalinity, Total (As CaCO3)	201	20.0	20.0		mg/L @ pH 4.52	1	05/21/19 10:23 AM
FERRIC IRON (CALCULATED)		**M3500-FE D**					Analyst: **CAC**
Iron, Ferric	0.103	0.0500	0.100	N	mg/L	1	05/30/19
FERROUS IRON		**M3500-FE D**					Analyst: **BTJ**
Iron, Ferrous	<0.0500	0.0500	0.100	N	mg/L	1	05/21/19 05:42 PM

Qualifiers:

*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
S	Spike Recovery outside control limits	N	Parameter not NELAP certified

DHL Analytical, Inc.

Date: *05-Jun-19*

CLIENT:	Golder	**Client Sample ID:**	FGD-4
Project:	Luminant-OGSES FGD Ponds	**Lab ID:**	1905205-02
Project No:	19122262-F	**Collection Date:**	05/16/19 10:15 AM
Lab Order:	1905205	**Matrix:**	AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
ORTHOPHOSPHATE		**M4500-P E**					Analyst: **CC**
Phosphorus, Total Orthophosphate (As P)	0.251	0.0300	0.100		mg/L	1	05/17/19 12:35 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	651	10.0	10.0		mg/L	1	05/21/19 10:00 AM

Qualifiers:	*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
	DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit
	ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
	S	Spike Recovery outside control limits	N	Parameter not NELAP certified

DHL Analytical, Inc.

Date: *05-Jun-19*

CLIENT:	Golder	**Client Sample ID:**	FGD-3
Project:	Luminant-OGSES FGD Ponds	**Lab ID:**	1905205-03
Project No:	19122262-F	**Collection Date:**	05/16/19 11:10 AM
Lab Order:	1905205	**Matrix:**	AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020A**					Analyst: **RO**
Antimony	<0.000800	0.000800	0.00250		mg/L	1	05/22/19 03:56 PM
Arsenic	0.00230	0.00200	0.00500	J	mg/L	1	05/22/19 03:56 PM
Barium	0.0510	0.00300	0.0100		mg/L	1	05/22/19 03:56 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 03:56 PM
Boron	0.117	0.0100	0.0300		mg/L	1	05/22/19 03:56 PM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 03:56 PM
Calcium	60.1	2.00	6.00		mg/L	20	05/23/19 11:59 AM
Chromium	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 03:56 PM
Cobalt	0.00520	0.00300	0.00500		mg/L	1	05/22/19 03:56 PM
Iron	0.126	0.0300	0.100		mg/L	1	05/22/19 03:56 PM
Lead	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 03:56 PM
Lithium	0.0570	0.00500	0.0100		mg/L	1	05/22/19 03:56 PM
Magnesium	33.6	2.00	6.00		mg/L	20	05/23/19 11:59 AM
Molybdenum	0.00311	0.00200	0.00500	J	mg/L	1	05/22/19 03:56 PM
Potassium	2.50	0.100	0.300		mg/L	1	05/22/19 03:56 PM
Selenium	0.0423	0.00200	0.00500		mg/L	1	05/22/19 03:56 PM
Sodium	277	2.00	6.00		mg/L	20	05/23/19 11:59 AM
Thallium	0.000600	0.000500	0.00150	J	mg/L	1	05/22/19 03:56 PM
MERCURY TOTAL: AQUEOUS		**SW7470A**					Analyst: **BM**
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	05/24/19 11:01 AM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **JL**
Chloride	117	3.00	10.0		mg/L	10	05/17/19 03:00 PM
Fluoride	0.776	0.100	0.400		mg/L	1	05/17/19 06:28 PM
Nitrate-N	1.41	0.100	0.500		mg/L	1	05/17/19 06:28 PM
Sulfate	182	10.0	30.0		mg/L	10	05/17/19 03:00 PM
ALKALINITY		**M2320 B**					Analyst: **CC**
Alkalinity, Bicarbonate (As CaCO3)	533	10.0	20.0		mg/L @ pH 4.53	1	05/21/19 10:42 AM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.53	1	05/21/19 10:42 AM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.53	1	05/21/19 10:42 AM
Alkalinity, Total (As CaCO3)	533	20.0	20.0		mg/L @ pH 4.53	1	05/21/19 10:42 AM
FERRIC IRON (CALCULATED)		**M3500-FE D**					Analyst: **CAC**
Iron, Ferric	0.126	0.0500	0.100	N	mg/L	1	05/30/19
FERROUS IRON		**M3500-FE D**					Analyst: **BTJ**
Iron, Ferrous	<0.0500	0.0500	0.100	N	mg/L	1	05/21/19 05:42 PM

Qualifiers:

*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
S	Spike Recovery outside control limits	N	Parameter not NELAP certified

DHL Analytical, Inc.

Date: *05-Jun-19*

CLIENT:	Golder	**Client Sample ID:**	FGD-3
Project:	Luminant-OGSES FGD Ponds	**Lab ID:**	1905205-03
Project No:	19122262-F	**Collection Date:**	05/16/19 11:10 AM
Lab Order:	1905205	**Matrix:**	AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
ORTHOPHOSPHATE		**M4500-P E**					Analyst: **CC**
Phosphorus, Total Orthophosphate (As P)	0.0960	0.0300	0.100	J	mg/L	1	05/17/19 12:35 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	1100	50.0	50.0		mg/L	1	05/21/19 10:00 AM

Qualifiers:	*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
	DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit
	ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
	S	Spike Recovery outside control limits	N	Parameter not NELAP certified

DHL Analytical, Inc.

Date: *05-Jun-19*

CLIENT:	Golder	**Client Sample ID:**	FGD-2
Project:	Luminant-OGSES FGD Ponds	**Lab ID:**	1905205-04
Project No:	19122262-F	**Collection Date:**	05/16/19 12:00 PM
Lab Order:	1905205	**Matrix:**	AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020A**					Analyst: **RO**
Antimony	<0.000800	0.000800	0.00250		mg/L	1	05/22/19 03:58 PM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 03:58 PM
Barium	0.0993	0.00300	0.0100		mg/L	1	05/22/19 03:58 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 03:58 PM
Boron	0.105	0.0100	0.0300		mg/L	1	05/22/19 03:58 PM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 03:58 PM
Calcium	38.9	1.00	3.00		mg/L	10	05/23/19 12:01 PM
Chromium	0.00266	0.00200	0.00500	J	mg/L	1	05/22/19 03:58 PM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	05/22/19 03:58 PM
Iron	0.0799	0.0300	0.100	J	mg/L	1	05/22/19 03:58 PM
Lead	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 03:58 PM
Lithium	0.0228	0.00500	0.0100		mg/L	1	05/22/19 03:58 PM
Magnesium	16.7	0.100	0.300		mg/L	1	05/22/19 03:58 PM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 03:58 PM
Potassium	2.57	0.100	0.300		mg/L	1	05/22/19 03:58 PM
Selenium	0.0214	0.00200	0.00500		mg/L	1	05/22/19 03:58 PM
Sodium	198	1.00	3.00		mg/L	10	05/23/19 12:01 PM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	05/22/19 03:58 PM
MERCURY TOTAL: AQUEOUS		**SW7470A**					Analyst: **BM**
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	05/24/19 11:03 AM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **JL**
Chloride	260	3.00	10.0		mg/L	10	05/17/19 03:16 PM
Fluoride	0.383	0.100	0.400	J	mg/L	1	05/17/19 06:44 PM
Nitrate-N	1.54	0.100	0.500		mg/L	1	05/17/19 06:44 PM
Sulfate	70.7	1.00	3.00		mg/L	1	05/17/19 06:44 PM
ALKALINITY		**M2320 B**					Analyst: **CC**
Alkalinity, Bicarbonate (As CaCO3)	157	10.0	20.0		mg/L @ pH 4.51	1	05/21/19 10:50 AM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.51	1	05/21/19 10:50 AM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.51	1	05/21/19 10:50 AM
Alkalinity, Total (As CaCO3)	157	20.0	20.0		mg/L @ pH 4.51	1	05/21/19 10:50 AM
FERRIC IRON (CALCULATED)		**M3500-FE D**					Analyst: **CAC**
Iron, Ferric	0.0799	0.0500	0.100	JN	mg/L	1	05/30/19
FERROUS IRON		**M3500-FE D**					Analyst: **BTJ**
Iron, Ferrous	<0.0500	0.0500	0.100	N	mg/L	1	05/21/19 05:43 PM

Qualifiers:

*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
S	Spike Recovery outside control limits	N	Parameter not NELAP certified

DHL Analytical, Inc.

Date: *05-Jun-19*

CLIENT:	Golder	**Client Sample ID:**	FGD-2
Project:	Luminant-OGSES FGD Ponds	**Lab ID:**	1905205-04
Project No:	19122262-F	**Collection Date:**	05/16/19 12:00 PM
Lab Order:	1905205	**Matrix:**	AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
ORTHOPHOSPHATE		**M4500-P E**					Analyst: **CC**
Phosphorus, Total Orthophosphate (As P)	0.237	0.0300	0.100		mg/L	1	05/17/19 12:37 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	729	10.0	10.0		mg/L	1	05/21/19 10:00 AM

Qualifiers:	*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
	DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit
	ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
	S	Spike Recovery outside control limits	N	Parameter not NELAP certified

DHL Analytical, Inc.

Date: *05-Jun-19*

CLIENT:	Golder	**Client Sample ID:**	FGD-5
Project:	Luminant-OGSES FGD Ponds	**Lab ID:**	1905205-05
Project No:	19122262-F	**Collection Date:**	05/16/19 01:50 PM
Lab Order:	1905205	**Matrix:**	AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020A**					Analyst: **RO**
Antimony	<0.000800	0.000800	0.00250		mg/L	1	05/22/19 04:00 PM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 04:00 PM
Barium	0.0926	0.00300	0.0100		mg/L	1	05/22/19 04:00 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 04:00 PM
Boron	0.108	0.0100	0.0300		mg/L	1	05/22/19 04:00 PM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 04:00 PM
Calcium	77.7	1.00	3.00		mg/L	10	05/23/19 12:03 PM
Chromium	0.0240	0.00200	0.00500		mg/L	1	05/22/19 04:00 PM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	05/22/19 04:00 PM
Iron	<0.0300	0.0300	0.100		mg/L	1	05/22/19 04:00 PM
Lead	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 04:00 PM
Lithium	0.145	0.00500	0.0100		mg/L	1	05/22/19 04:00 PM
Magnesium	50.0	1.00	3.00		mg/L	10	05/23/19 12:03 PM
Molybdenum	0.00256	0.00200	0.00500	J	mg/L	1	05/22/19 04:00 PM
Potassium	3.46	0.100	0.300		mg/L	1	05/22/19 04:00 PM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 04:00 PM
Sodium	123	1.00	3.00		mg/L	10	05/23/19 12:03 PM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	05/22/19 04:00 PM
MERCURY TOTAL: AQUEOUS		**SW7470A**					Analyst: **BM**
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	05/24/19 11:06 AM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **JL**
Chloride	287	3.00	10.0		mg/L	10	05/17/19 03:32 PM
Fluoride	0.579	0.100	0.400		mg/L	1	05/17/19 07:00 PM
Nitrate-N	0.859	0.100	0.500		mg/L	1	05/17/19 07:00 PM
Sulfate	67.2	1.00	3.00		mg/L	1	05/17/19 07:00 PM
ALKALINITY		**M2320 B**					Analyst: **CC**
Alkalinity, Bicarbonate (As CaCO3)	237	10.0	20.0		mg/L @ pH 4.52	1	05/30/19 03:20 PM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.52	1	05/30/19 03:20 PM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.52	1	05/30/19 03:20 PM
Alkalinity, Total (As CaCO3)	237	20.0	20.0		mg/L @ pH 4.52	1	05/30/19 03:20 PM
FERRIC IRON (CALCULATED)		**M3500-FE D**					Analyst: **CAC**
Iron, Ferric	<0.0500	0.0500	0.100	N	mg/L	1	05/30/19
FERROUS IRON		**M3500-FE D**					Analyst: **BTJ**
Iron, Ferrous	<0.0500	0.0500	0.100	N	mg/L	1	05/21/19 05:43 PM

Qualifiers:

*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
S	Spike Recovery outside control limits	N	Parameter not NELAP certified

DHL Analytical, Inc.

Date: *05-Jun-19*

CLIENT:	Golder	**Client Sample ID:**	FGD-5
Project:	Luminant-OGSES FGD Ponds	**Lab ID:**	1905205-05
Project No:	19122262-F	**Collection Date:**	05/16/19 01:50 PM
Lab Order:	1905205	**Matrix:**	AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
ORTHOPHOSPHATE		**M4500-P E**					Analyst: **CC**
Phosphorus, Total Orthophosphate (As P)	0.176	0.0300	0.100		mg/L	1	05/17/19 12:37 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	801	10.0	10.0		mg/L	1	05/21/19 10:00 AM

Qualifiers:	*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
	DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit
	ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
	S	Spike Recovery outside control limits	N	Parameter not NELAP certified

DHL Analytical, Inc.

Date: *05-Jun-19*

CLIENT:	Golder	**Client Sample ID:**	FGD-1
Project:	Luminant-OGSES FGD Ponds	**Lab ID:**	1905205-06
Project No:	19122262-F	**Collection Date:**	05/16/19 02:50 PM
Lab Order:	1905205	**Matrix:**	AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020A**					Analyst: **RO**
Antimony	<0.000800	0.000800	0.00250		mg/L	1	05/22/19 04:02 PM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 04:02 PM
Barium	0.0485	0.00300	0.0100		mg/L	1	05/22/19 04:02 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 04:02 PM
Boron	0.0803	0.0100	0.0300		mg/L	1	05/22/19 04:02 PM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 04:02 PM
Calcium	19.5	0.100	0.300		mg/L	1	05/22/19 04:02 PM
Chromium	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 04:02 PM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	05/22/19 04:02 PM
Iron	0.186	0.0300	0.100		mg/L	1	05/22/19 04:02 PM
Lead	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 04:02 PM
Lithium	0.0442	0.00500	0.0100		mg/L	1	05/22/19 04:02 PM
Magnesium	11.2	0.100	0.300		mg/L	1	05/22/19 04:02 PM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 04:02 PM
Potassium	2.11	0.100	0.300		mg/L	1	05/22/19 04:02 PM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 04:02 PM
Sodium	49.4	1.00	3.00		mg/L	10	05/23/19 12:05 PM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	05/22/19 04:02 PM
MERCURY TOTAL: AQUEOUS		**SW7470A**					Analyst: **BM**
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	05/24/19 11:08 AM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **JL**
Chloride	62.4	3.00	10.0		mg/L	10	05/17/19 03:48 PM
Fluoride	0.362	0.100	0.400	J	mg/L	1	05/17/19 07:16 PM
Nitrate-N	<0.100	0.100	0.500		mg/L	1	05/17/19 07:16 PM
Sulfate	78.7	1.00	3.00		mg/L	1	05/17/19 07:16 PM
ALKALINITY		**M2320 B**					Analyst: **CC**
Alkalinity, Bicarbonate (As CaCO3)	52.8	10.0	20.0		mg/L @ pH 4.5	1	05/30/19 03:23 PM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.5	1	05/30/19 03:23 PM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.5	1	05/30/19 03:23 PM
Alkalinity, Total (As CaCO3)	52.8	20.0	20.0		mg/L @ pH 4.5	1	05/30/19 03:23 PM
FERRIC IRON (CALCULATED)		**M3500-FE D**					Analyst: **CAC**
Iron, Ferric	0.186	0.0500	0.100	N	mg/L	1	05/30/19
FERROUS IRON		**M3500-FE D**					Analyst: **BTJ**
Iron, Ferrous	<0.0500	0.0500	0.100	N	mg/L	1	05/21/19 05:44 PM

Qualifiers:

*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
S	Spike Recovery outside control limits	N	Parameter not NELAP certified

DHL Analytical, Inc.

Date: *05-Jun-19*

CLIENT:	Golder	**Client Sample ID:**	FGD-1
Project:	Luminant-OGSES FGD Ponds	**Lab ID:**	1905205-06
Project No:	19122262-F	**Collection Date:**	05/16/19 02:50 PM
Lab Order:	1905205	**Matrix:**	AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
ORTHOPHOSPHATE		**M4500-P E**					Analyst: **CC**
Phosphorus, Total Orthophosphate (As P)	0.473	0.0300	0.100		mg/L	1	05/17/19 12:37 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	320	10.0	10.0		mg/L	1	05/21/19 10:00 AM

Qualifiers:	*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
	DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit
	ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
	S	Spike Recovery outside control limits	N	Parameter not NELAP certified

DHL Analytical, Inc.

Date: *05-Jun-19*

CLIENT:	Golder	**Client Sample ID:**	FGD-8
Project:	Luminant-OGSES FGD Ponds	**Lab ID:**	1905205-07
Project No:	19122262-F	**Collection Date:**	05/16/19 03:45 PM
Lab Order:	1905205	**Matrix:**	AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020A**					Analyst: **RO**
Antimony	<0.000800	0.000800	0.00250		mg/L	1	05/22/19 04:04 PM
Arsenic	0.0126	0.00200	0.00500		mg/L	1	05/22/19 04:04 PM
Barium	0.864	0.00300	0.0100		mg/L	1	05/22/19 04:04 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 04:04 PM
Boron	0.0687	0.0100	0.0300		mg/L	1	05/22/19 04:04 PM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 04:04 PM
Calcium	314	5.00	15.0		mg/L	50	05/23/19 12:07 PM
Chromium	0.00346	0.00200	0.00500	J	mg/L	1	05/22/19 04:04 PM
Cobalt	0.0146	0.00300	0.00500		mg/L	1	05/22/19 04:04 PM
Iron	263	1.50	5.00		mg/L	50	05/23/19 12:07 PM
Lead	0.00194	0.000300	0.00100		mg/L	1	05/22/19 04:04 PM
Lithium	0.00864	0.00500	0.0100	J	mg/L	1	05/22/19 04:04 PM
Magnesium	204	5.00	15.0		mg/L	50	05/23/19 12:07 PM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 04:04 PM
Potassium	19.2	0.100	0.300		mg/L	1	05/22/19 04:04 PM
Selenium	0.00274	0.00200	0.00500	J	mg/L	1	05/22/19 04:04 PM
Sodium	792	5.00	15.0		mg/L	50	05/23/19 12:07 PM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	05/22/19 04:04 PM
MERCURY TOTAL: AQUEOUS		**SW7470A**					Analyst: **BM**
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	05/24/19 11:10 AM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **JL**
Chloride	2040	30.0	100		mg/L	100	05/20/19 02:43 PM
Fluoride	<0.100	0.100	0.400		mg/L	1	05/17/19 07:32 PM
Nitrate-N	0.107	0.100	0.500	J	mg/L	1	05/17/19 07:32 PM
Sulfate	173	10.0	30.0		mg/L	10	05/17/19 04:04 PM
ALKALINITY		**M2320 B**					Analyst: **CC**
Alkalinity, Bicarbonate (As CaCO3)	516	10.0	20.0		mg/L @ pH 4.54	1	05/21/19 11:30 AM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.54	1	05/21/19 11:30 AM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.54	1	05/21/19 11:30 AM
Alkalinity, Total (As CaCO3)	516	20.0	20.0		mg/L @ pH 4.54	1	05/21/19 11:30 AM
FERRIC IRON (CALCULATED)		**M3500-FE D**					Analyst: **CAC**
Iron, Ferric	61.0	0.0500	0.100	N	mg/L	1	05/30/19
FERROUS IRON		**M3500-FE D**					Analyst: **BTJ**
Iron, Ferrous	202	50.0	100	N	mg/L	1000	05/21/19 05:59 PM

Qualifiers:	*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
	DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit
	ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
	S	Spike Recovery outside control limits	N	Parameter not NELAP certified

DHL Analytical, Inc.

Date: *05-Jun-19*

CLIENT:	Golder	**Client Sample ID:**	FGD-8
Project:	Luminant-OGSES FGD Ponds	**Lab ID:**	1905205-07
Project No:	19122262-F	**Collection Date:**	05/16/19 03:45 PM
Lab Order:	1905205	**Matrix:**	AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
ORTHOPHOSPHATE		**M4500-P E**					Analyst: **CC**
Phosphorus, Total Orthophosphate (As P)	0.219	0.0300	0.100		mg/L	1	05/17/19 12:40 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	3970	50.0	50.0		mg/L	1	05/21/19 10:00 AM

Qualifiers:	*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
	DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit
	ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
	S	Spike Recovery outside control limits	N	Parameter not NELAP certified

DHL Analytical, Inc.

Date: *05-Jun-19*

CLIENT:	Golder	**Client Sample ID:**	FGD-11
Project:	Luminant-OGSES FGD Ponds	**Lab ID:**	1905205-08
Project No:	19122262-F	**Collection Date:**	05/16/19 04:40 PM
Lab Order:	1905205	**Matrix:**	AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020A**					Analyst: **RO**
Antimony	<0.000800	0.000800	0.00250		mg/L	1	05/22/19 04:06 PM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 04:06 PM
Barium	0.347	0.00300	0.0100		mg/L	1	05/22/19 04:06 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 04:06 PM
Boron	0.108	0.0100	0.0300		mg/L	1	05/22/19 04:06 PM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 04:06 PM
Calcium	85.0	2.00	6.00		mg/L	20	05/23/19 12:09 PM
Chromium	0.0280	0.00200	0.00500		mg/L	1	05/22/19 04:06 PM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	05/22/19 04:06 PM
Iron	1.28	0.0300	0.100		mg/L	1	05/22/19 04:06 PM
Lead	0.000576	0.000300	0.00100	J	mg/L	1	05/22/19 04:06 PM
Lithium	0.0145	0.00500	0.0100		mg/L	1	05/22/19 04:06 PM
Magnesium	30.6	2.00	6.00		mg/L	20	05/23/19 12:09 PM
Molybdenum	0.00358	0.00200	0.00500	J	mg/L	1	05/22/19 04:06 PM
Potassium	4.13	0.100	0.300		mg/L	1	05/22/19 04:06 PM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 04:06 PM
Sodium	328	2.00	6.00		mg/L	20	05/23/19 12:09 PM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	05/22/19 04:06 PM
MERCURY TOTAL: AQUEOUS		**SW7470A**					Analyst: **BM**
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	05/24/19 11:12 AM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **JL**
Chloride	566	30.0	100		mg/L	100	05/20/19 02:59 PM
Fluoride	0.380	0.100	0.400	J	mg/L	1	05/17/19 07:48 PM
Nitrate-N	<0.100	0.100	0.500		mg/L	1	05/17/19 07:48 PM
Sulfate	50.9	1.00	3.00		mg/L	1	05/17/19 07:48 PM
ALKALINITY		**M2320 B**					Analyst: **CC**
Alkalinity, Bicarbonate (As CaCO3)	256	10.0	20.0		mg/L @ pH 4.52	1	05/21/19 11:40 AM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.52	1	05/21/19 11:40 AM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.52	1	05/21/19 11:40 AM
Alkalinity, Total (As CaCO3)	256	20.0	20.0		mg/L @ pH 4.52	1	05/21/19 11:40 AM
FERRIC IRON (CALCULATED)		**M3500-FE D**					Analyst: **CAC**
Iron, Ferric	1.28	0.0500	0.100	N	mg/L	1	05/30/19
FERROUS IRON		**M3500-FE D**					Analyst: **BTJ**
Iron, Ferrous	<0.0500	0.0500	0.100	N	mg/L	1	05/21/19 05:44 PM

Qualifiers:

*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
S	Spike Recovery outside control limits	N	Parameter not NELAP certified

DHL Analytical, Inc.

Date: *05-Jun-19*

CLIENT:	Golder	**Client Sample ID:**	FGD-11
Project:	Luminant-OGSES FGD Ponds	**Lab ID:**	1905205-08
Project No:	19122262-F	**Collection Date:**	05/16/19 04:40 PM
Lab Order:	1905205	**Matrix:**	AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
ORTHOPHOSPHATE		**M4500-P E**					Analyst: **CC**
Phosphorus, Total Orthophosphate (As P)	0.200	0.0300	0.100		mg/L	1	05/17/19 12:41 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	1350	50.0	50.0		mg/L	1	05/21/19 10:00 AM

Qualifiers:	*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
	DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit
	ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
	S	Spike Recovery outside control limits	N	Parameter not NELAP certified

DHL Analytical, Inc.

Date: *05-Jun-19*

CLIENT:	Golder	**Client Sample ID:**	FGD-12
Project:	Luminant-OGSES FGD Ponds	**Lab ID:**	1905205-09
Project No:	19122262-F	**Collection Date:**	05/16/19 05:35 PM
Lab Order:	1905205	**Matrix:**	AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020A**					Analyst: **RO**
Antimony	<0.000800	0.000800	0.00250		mg/L	1	05/22/19 04:08 PM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 04:08 PM
Barium	0.0474	0.00300	0.0100		mg/L	1	05/22/19 04:08 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 04:08 PM
Boron	0.0723	0.0100	0.0300		mg/L	1	05/22/19 04:08 PM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 04:08 PM
Calcium	6.79	0.100	0.300		mg/L	1	05/22/19 04:08 PM
Chromium	0.00295	0.00200	0.00500	J	mg/L	1	05/22/19 04:08 PM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	05/22/19 04:08 PM
Iron	0.425	0.0300	0.100		mg/L	1	05/22/19 04:08 PM
Lead	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 04:08 PM
Lithium	0.0221	0.00500	0.0100		mg/L	1	05/22/19 04:08 PM
Magnesium	2.97	0.100	0.300		mg/L	1	05/22/19 04:08 PM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 04:08 PM
Potassium	1.55	0.100	0.300		mg/L	1	05/22/19 04:08 PM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 04:08 PM
Sodium	20.1	0.100	0.300		mg/L	1	05/22/19 04:08 PM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	05/22/19 04:08 PM
MERCURY TOTAL: AQUEOUS		**SW7470A**					Analyst: **BM**
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	05/24/19 11:15 AM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **JL**
Chloride	15.6	0.300	1.00		mg/L	1	05/17/19 08:04 PM
Fluoride	<0.100	0.100	0.400		mg/L	1	05/17/19 08:04 PM
Nitrate-N	1.42	0.100	0.500		mg/L	1	05/17/19 08:04 PM
Sulfate	15.0	1.00	3.00		mg/L	1	05/17/19 08:04 PM
ALKALINITY		**M2320 B**					Analyst: **CC**
Alkalinity, Bicarbonate (As CaCO3)	36.6	10.0	20.0		mg/L @ pH 4.49	1	05/21/19 11:44 AM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.49	1	05/21/19 11:44 AM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.49	1	05/21/19 11:44 AM
Alkalinity, Total (As CaCO3)	36.6	20.0	20.0		mg/L @ pH 4.49	1	05/21/19 11:44 AM
FERRIC IRON (CALCULATED)		**M3500-FE D**					Analyst: **CAC**
Iron, Ferric	0.425	0.0500	0.100	N	mg/L	1	05/30/19
FERROUS IRON		**M3500-FE D**					Analyst: **BTJ**
Iron, Ferrous	<0.0500	0.0500	0.100	N	mg/L	1	05/21/19 05:44 PM

Qualifiers:

*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
S	Spike Recovery outside control limits	N	Parameter not NELAP certified

DHL Analytical, Inc.

Date: *05-Jun-19*

CLIENT:	Golder	**Client Sample ID:**	FGD-12
Project:	Luminant-OGSES FGD Ponds	**Lab ID:**	1905205-09
Project No:	19122262-F	**Collection Date:**	05/16/19 05:35 PM
Lab Order:	1905205	**Matrix:**	AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
ORTHOPHOSPHATE		**M4500-P E**					Analyst: **CC**
Phosphorus, Total Orthophosphate (As P)	0.168	0.0300	0.100		mg/L	1	05/17/19 12:41 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	140	10.0	10.0		mg/L	1	05/21/19 10:00 AM

Qualifiers:	*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
	DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit
	ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
	S	Spike Recovery outside control limits	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: CETAC2_HG_190524A

The QC data in batch 91060 applies to the following samples: 1905205-01B, 1905205-02B, 1905205-03B, 1905205-04B, 1905205-05B, 1905205-06B, 1905205-07B, 1905205-08B, 1905205-09B

Sample ID **MB-91060**	Batch ID: **91060**		TestNo: **SW7470A**				Units: **mg/L**				
SampType: **MBLK**	Run ID: **CETAC2_HG_190524A**		Analysis Date: **5/24/2019 10:41:16 AM**				Prep Date: **5/23/2019**				
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Mercury	<0.0000800	0.000200									

Sample ID **LCS-91060**	Batch ID: **91060**		TestNo: **SW7470A**				Units: **mg/L**				
SampType: **LCS**	Run ID: **CETAC2_HG_190524A**		Analysis Date: **5/24/2019 10:43:31 AM**				Prep Date: **5/23/2019**				
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Mercury	0.00188	0.000200	0.00200	0	94.0	85	115				

Sample ID **LCSD-91060**	Batch ID: **91060**		TestNo: **SW7470A**				Units: **mg/L**				
SampType: **LCSD**	Run ID: **CETAC2_HG_190524A**		Analysis Date: **5/24/2019 10:45:47 AM**				Prep Date: **5/23/2019**				
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Mercury	0.00188	0.000200	0.00200	0	94.0	85	115	0	15		

Sample ID **1905205-02B MS**	Batch ID: **91060**		TestNo: **SW7470A**				Units: **mg/L**				
SampType: **MS**	Run ID: **CETAC2_HG_190524A**		Analysis Date: **5/24/2019 10:52:35 AM**				Prep Date: **5/23/2019**				
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Mercury	0.00183	0.000200	0.00200	0	91.5	80	120				

Sample ID **1905205-02B MSD**	Batch ID: **91060**		TestNo: **SW7470A**				Units: **mg/L**				
SampType: **MSD**	Run ID: **CETAC2_HG_190524A**		Analysis Date: **5/24/2019 10:54:51 AM**				Prep Date: **5/23/2019**				
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Mercury	0.00186	0.000200	0.00200	0	93.0	80	120	1.63	15		

Sample ID **1905205-02B SD**	Batch ID: **91060**		TestNo: **SW7470A**				Units: **mg/L**				
SampType: **SD**	Run ID: **CETAC2_HG_190524A**		Analysis Date: **5/24/2019 10:57:06 AM**				Prep Date: **5/23/2019**				
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Mercury	<0.000400	0.00100	0	0				0	10		

Sample ID **1905205-02B PDS**	Batch ID: **91060**		TestNo: **SW7470A**				Units: **mg/L**				
SampType: **PDS**	Run ID: **CETAC2_HG_190524A**		Analysis Date: **5/24/2019 10:59:22 AM**				Prep Date: **5/23/2019**				
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Mercury	0.00233	0.000200	0.00250	0	93.2	85	115				

Qualifiers:	B	Analyte detected in the associated Method Blank	DF	Dilution Factor	
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit	
	ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits	
	RL	Reporting Limit	S	Spike Recovery outside control limits	
	J	Analyte detected between SDL and RL	N	Parameter not NELAP certified	

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: CETAC2_HG_190524A

Sample ID	**ICV-190524**	Batch ID:	**R104261**	TestNo:	**SW7470A**	Units:	**mg/L**
SampType:	**ICV**	Run ID:	**CETAC2_HG_190524A**	Analysis Date:	**5/24/2019 9:24:00 AM**	Prep Date:	

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00400	0.000200	0.00400	0	100	90	110			

Sample ID	**CCV2-190524**	Batch ID:	**R104261**	TestNo:	**SW7470A**	Units:	**mg/L**
SampType:	**CCV**	Run ID:	**CETAC2_HG_190524A**	Analysis Date:	**5/24/2019 10:36:42 AM**	Prep Date:	

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00212	0.000200	0.00200	0	106	90	110			

Sample ID	**CCV3-190524**	Batch ID:	**R104261**	TestNo:	**SW7470A**	Units:	**mg/L**
SampType:	**CCV**	Run ID:	**CETAC2_HG_190524A**	Analysis Date:	**5/24/2019 11:19:48 AM**	Prep Date:	

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00200	0.000200	0.00200	0	100	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: **ICP-MS4_190522D**

The QC data in batch 90989 applies to the following samples: 1905205-01B, 1905205-02B, 1905205-03B, 1905205-04B, 1905205-05B, 1905205-06B, 1905205-07B, 1905205-08B, 1905205-09B

Sample ID **MB-90989** Batch ID: **90989** TestNo: **SW6020A** Units: **mg/L**
SampType: **MBLK** Run ID: **ICP-MS4_190522D** Analysis Date: **5/22/2019 2:44:00 PM** Prep Date: **5/20/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	<0.000800	0.00250								
Arsenic	<0.00200	0.00500								
Barium	<0.00300	0.0100								
Beryllium	<0.000300	0.00100								
Boron	<0.0100	0.0300								
Cadmium	<0.000300	0.00100								
Calcium	<0.100	0.300								
Chromium	<0.00200	0.00500								
Cobalt	<0.00300	0.00500								
Iron	<0.0300	0.100								
Lead	<0.000300	0.00100								
Lithium	<0.00500	0.0100								
Magnesium	<0.100	0.300								
Molybdenum	<0.00200	0.00500								
Potassium	<0.100	0.300								
Selenium	<0.00200	0.00500								
Sodium	<0.100	0.300								
Thallium	<0.000500	0.00150								

Sample ID **LCS-90989** Batch ID: **90989** TestNo: **SW6020A** Units: **mg/L**
SampType: **LCS** Run ID: **ICP-MS4_190522D** Analysis Date: **5/22/2019 2:46:00 PM** Prep Date: **5/20/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.202	0.00250	0.200	0	101	80	120			
Arsenic	0.201	0.00500	0.200	0	100	80	120			
Barium	0.198	0.0100	0.200	0	99.2	80	120			
Beryllium	0.198	0.00100	0.200	0	99.2	80	120			
Boron	0.202	0.0300	0.200	0	101	80	120			
Cadmium	0.199	0.00100	0.200	0	99.6	80	120			
Calcium	4.60	0.300	5.00	0	92.1	80	120			
Chromium	0.200	0.00500	0.200	0	99.8	80	120			
Cobalt	0.202	0.00500	0.200	0	101	80	120			
Iron	5.23	0.100	5.00	0	105	80	120			
Lead	0.184	0.00100	0.200	0	91.9	80	120			
Lithium	0.196	0.0100	0.200	0	98.0	80	120			
Magnesium	5.02	0.300	5.00	0	100	80	120			
Molybdenum	0.190	0.00500	0.200	0	95.1	80	120			
Potassium	5.06	0.300	5.00	0	101	80	120			
Selenium	0.209	0.00500	0.200	0	104	80	120			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190522D

Sample ID **LCS-90989**	Batch ID: **90989**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **LCS**	Run ID: **ICP-MS4_190522D**	Analysis Date: **5/22/2019 2:46:00 PM**	Prep Date: **5/20/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sodium	5.02	0.300	5.00	0	100	80	120			
Thallium	0.202	0.00150	0.200	0	101	80	120			

Sample ID **LCSD-90989**	Batch ID: **90989**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **LCSD**	Run ID: **ICP-MS4_190522D**	Analysis Date: **5/22/2019 2:48:00 PM**	Prep Date: **5/20/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.201	0.00250	0.200	0	100	80	120	0.333	15	
Arsenic	0.203	0.00500	0.200	0	101	80	120	0.942	15	
Barium	0.199	0.0100	0.200	0	99.3	80	120	0.128	15	
Beryllium	0.198	0.00100	0.200	0	99.1	80	120	0.129	15	
Boron	0.201	0.0300	0.200	0	101	80	120	0.298	15	
Cadmium	0.198	0.00100	0.200	0	99.2	80	120	0.362	15	
Calcium	4.62	0.300	5.00	0	92.4	80	120	0.325	15	
Chromium	0.199	0.00500	0.200	0	99.7	80	120	0.085	15	
Cobalt	0.203	0.00500	0.200	0	102	80	120	0.820	15	
Iron	5.15	0.100	5.00	0	103	80	120	1.50	15	
Lead	0.185	0.00100	0.200	0	92.3	80	120	0.421	15	
Lithium	0.200	0.0100	0.200	0	100	80	120	2.22	15	
Magnesium	5.07	0.300	5.00	0	101	80	120	0.937	15	
Molybdenum	0.190	0.00500	0.200	0	95.0	80	120	0.081	15	
Potassium	5.12	0.300	5.00	0	102	80	120	1.16	15	
Selenium	0.204	0.00500	0.200	0	102	80	120	2.39	15	
Sodium	5.05	0.300	5.00	0	101	80	120	0.519	15	
Thallium	0.199	0.00150	0.200	0	99.3	80	120	1.55	15	

Sample ID **1905185-06B SD**	Batch ID: **90989**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **SD**	Run ID: **ICP-MS4_190522D**	Analysis Date: **5/22/2019 2:54:00 PM**	Prep Date: **5/20/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	<0.00400	0.0125	0	0				0	10	
Arsenic	<0.0100	0.0250	0	0				0	10	
Barium	0.0256	0.0500	0	0.0253				1.30	10	
Beryllium	<0.00150	0.00500	0	0				0	10	
Boron	0.501	0.150	0	0.449				10.8	10	R
Cadmium	<0.00150	0.00500	0	0				0	10	
Chromium	<0.0100	0.0250	0	0				0	10	
Cobalt	<0.0150	0.0250	0	0				0	10	
Iron	<0.150	0.500	0	0				0	10	
Lead	<0.00150	0.00500	0	0				0	10	
Lithium	0.109	0.0500	0	0.101				7.40	10	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190522D

Sample ID **1905185-06B SD**	Batch ID: **90989**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **SD**	Run ID: **ICP-MS4_190522D**	Analysis Date: **5/22/2019 2:54:00 PM**	Prep Date: **5/20/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Molybdenum	<0.0100	0.0250	0	0.00218				0	10	
Potassium	13.4	1.50	0	13.2				1.21	10	
Selenium	<0.0100	0.0250	0	0				0	10	
Thallium	<0.00250	0.00750	0	0				0	10	

Sample ID **1905185-06B PDS**	Batch ID: **90989**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **PDS**	Run ID: **ICP-MS4_190522D**	Analysis Date: **5/22/2019 3:13:00 PM**	Prep Date: **5/20/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.201	0.00250	0.200	0	100	80	120			
Arsenic	0.204	0.00500	0.200	0	102	80	120			
Barium	0.218	0.0100	0.200	0.0253	96.3	80	120			
Beryllium	0.174	0.00100	0.200	0	87.2	80	120			
Boron	0.613	0.0300	0.200	0.449	81.7	80	120			
Cadmium	0.183	0.00100	0.200	0	91.4	80	120			
Chromium	0.188	0.00500	0.200	0	94.2	80	120			
Cobalt	0.193	0.00500	0.200	0	96.4	80	120			
Iron	4.70	0.100	5.00	0	94.1	80	120			
Lead	0.186	0.00100	0.200	0	93.0	80	120			
Lithium	0.265	0.0100	0.200	0.101	81.8	80	120			
Molybdenum	0.186	0.00500	0.200	0.00218	91.9	80	120			
Potassium	17.5	0.300	5.00	13.3	84.0	80	120			
Selenium	0.213	0.00500	0.200	0	106	80	120			
Thallium	0.200	0.00150	0.200	0	100	80	120			

Sample ID **1905185-06B MS**	Batch ID: **90989**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **MS**	Run ID: **ICP-MS4_190522D**	Analysis Date: **5/22/2019 3:15:00 PM**	Prep Date: **5/20/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.202	0.00250	0.200	0	101	80	120			
Arsenic	0.208	0.00500	0.200	0	104	80	120			
Barium	0.226	0.0100	0.200	0.0253	100	80	120			
Beryllium	0.174	0.00100	0.200	0	87.0	80	120			
Boron	0.654	0.0300	0.200	0.449	103	80	120			
Cadmium	0.185	0.00100	0.200	0	92.7	80	120			
Calcium	197	0.300	5.00	194	64.2	80	120			S
Chromium	0.186	0.00500	0.200	0	93.0	80	120			
Cobalt	0.193	0.00500	0.200	0	96.7	80	120			
Iron	4.82	0.100	5.00	0	96.4	80	120			
Lead	0.187	0.00100	0.200	0	93.7	80	120			
Lithium	0.270	0.0100	0.200	0.101	84.2	80	120			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190522D

Sample ID **1905185-06B MS**	Batch ID: **90989**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **MS**	Run ID: **ICP-MS4_190522D**	Analysis Date: **5/22/2019 3:15:00 PM**	Prep Date: **5/20/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Magnesium	128	0.300	5.00	128	-3.79	80	120			S
Molybdenum	0.195	0.00500	0.200	0.00218	96.2	80	120			
Potassium	18.5	0.300	5.00	13.3	105	80	120			
Selenium	0.214	0.00500	0.200	0	107	80	120			
Sodium	252	0.300	5.00	257	-103	80	120			S
Thallium	0.203	0.00150	0.200	0	101	80	120			

Sample ID **1905185-06B MSD**	Batch ID: **90989**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **MSD**	Run ID: **ICP-MS4_190522D**	Analysis Date: **5/22/2019 3:17:00 PM**	Prep Date: **5/20/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.200	0.00250	0.200	0	100	80	120	0.836	15	
Arsenic	0.208	0.00500	0.200	0	104	80	120	0.067	15	
Barium	0.227	0.0100	0.200	0.0253	101	80	120	0.141	15	
Beryllium	0.174	0.00100	0.200	0	86.8	80	120	0.265	15	
Boron	0.618	0.0300	0.200	0.449	84.6	80	120	5.65	15	
Cadmium	0.184	0.00100	0.200	0	92.1	80	120	0.555	15	
Calcium	195	0.300	5.00	194	16.8	80	120	1.21	15	S
Chromium	0.187	0.00500	0.200	0	93.6	80	120	0.569	15	
Cobalt	0.192	0.00500	0.200	0	95.8	80	120	1.00	15	
Iron	4.73	0.100	5.00	0	94.7	80	120	1.78	15	
Lead	0.190	0.00100	0.200	0	94.8	80	120	1.15	15	
Lithium	0.265	0.0100	0.200	0.101	81.8	80	120	1.82	15	
Magnesium	127	0.300	5.00	128	-17.7	80	120	0.544	15	S
Molybdenum	0.197	0.00500	0.200	0.00218	97.5	80	120	1.33	15	
Potassium	18.3	0.300	5.00	13.3	100	80	120	1.25	15	
Selenium	0.213	0.00500	0.200	0	107	80	120	0.639	15	
Sodium	256	0.300	5.00	257	-34.0	80	120	1.36	15	S
Thallium	0.206	0.00150	0.200	0	103	80	120	1.46	15	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190522D

Sample ID **ICV-190522**	Batch ID: **R104232**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **ICV**	Run ID: **ICP-MS4_190522D**	Analysis Date: **5/22/2019 11:38:00 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.101	0.00250	0.100	0	101	90	110			
Arsenic	0.102	0.00500	0.100	0	102	90	110			
Barium	0.0975	0.0100	0.100	0	97.5	90	110			
Beryllium	0.0986	0.00100	0.100	0	98.6	90	110			
Boron	0.104	0.0300	0.100	0	104	90	110			
Cadmium	0.0995	0.00100	0.100	0	99.5	90	110			
Calcium	2.35	0.300	2.50	0	94.2	90	110			
Chromium	0.104	0.00500	0.100	0	104	90	110			
Cobalt	0.105	0.00500	0.100	0	105	90	110			
Iron	2.57	0.100	2.50	0	103	90	110			
Lead	0.0926	0.00100	0.100	0	92.6	90	110			
Lithium	0.103	0.0100	0.100	0	103	90	110			
Magnesium	2.45	0.300	2.50	0	98.2	90	110			
Molybdenum	0.0911	0.00500	0.100	0	91.1	90	110			
Potassium	2.52	0.300	2.50	0	101	90	110			
Selenium	0.102	0.00500	0.100	0	102	90	110			
Sodium	2.53	0.300	2.50	0	101	90	110			
Thallium	0.0926	0.00150	0.100	0	92.6	90	110			

Sample ID **LCVL-190522**	Batch ID: **R104232**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **LCVL**	Run ID: **ICP-MS4_190522D**	Analysis Date: **5/22/2019 11:43:00 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00190	0.00250	0.00200	0	95.0	70	130			
Arsenic	0.00497	0.00500	0.00500	0	99.4	70	130			
Barium	0.00463	0.0100	0.00500	0	92.6	70	130			
Beryllium	0.00117	0.00100	0.00100	0	117	70	130			
Boron	0.0197	0.0300	0.0200	0	98.5	70	130			
Cadmium	0.000953	0.00100	0.00100	0	95.3	70	130			
Calcium	0.0981	0.300	0.100	0	98.1	70	130			
Chromium	0.00486	0.00500	0.00500	0	97.2	70	130			
Cobalt	0.00493	0.00500	0.00500	0	98.7	70	130			
Iron	0.111	0.100	0.100	0	111	70	130			
Lead	0.000870	0.00100	0.00100	0	87.0	70	130			
Lithium	0.00926	0.0100	0.0100	0	92.6	70	130			
Magnesium	0.0967	0.300	0.100	0	96.7	70	130			
Molybdenum	0.00458	0.00500	0.00500	0	91.5	70	130			
Potassium	0.0964	0.300	0.100	0	96.4	70	130			
Selenium	0.00494	0.00500	0.00500	0	98.8	70	130			
Sodium	0.0966	0.300	0.100	0	96.6	70	130			
Thallium	0.000843	0.00150	0.00100	0	84.3	70	130			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190522D

Sample ID **CCV4-190522**	Batch ID: **R104232**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS4_190522D**	Analysis Date: **5/22/2019 2:34:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.203	0.00250	0.200	0	102	90	110			
Arsenic	0.209	0.00500	0.200	0	104	90	110			
Barium	0.202	0.0100	0.200	0	101	90	110			
Beryllium	0.201	0.00100	0.200	0	100	90	110			
Boron	0.215	0.0300	0.200	0	108	90	110			
Cadmium	0.202	0.00100	0.200	0	101	90	110			
Calcium	4.66	0.300	5.00	0	93.3	90	110			
Chromium	0.203	0.00500	0.200	0	102	90	110			
Cobalt	0.208	0.00500	0.200	0	104	90	110			
Iron	5.05	0.100	5.00	0	101	90	110			
Lead	0.193	0.00100	0.200	0	96.7	90	110			
Lithium	0.195	0.0100	0.200	0	97.5	90	110			
Magnesium	5.05	0.300	5.00	0	101	90	110			
Molybdenum	0.193	0.00500	0.200	0	96.4	90	110			
Potassium	5.13	0.300	5.00	0	103	90	110			
Selenium	0.212	0.00500	0.200	0	106	90	110			
Sodium	5.03	0.300	5.00	0	101	90	110			
Thallium	0.205	0.00150	0.200	0	103	90	110			

Sample ID **LCVL4-190522**	Batch ID: **R104232**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **LCVL**	Run ID: **ICP-MS4_190522D**	Analysis Date: **5/22/2019 2:40:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00194	0.00250	0.00200	0	96.9	70	130			
Arsenic	0.00504	0.00500	0.00500	0	101	70	130			
Barium	0.00472	0.0100	0.00500	0	94.5	70	130			
Beryllium	0.00124	0.00100	0.00100	0	124	70	130			
Boron	0.0223	0.0300	0.0200	0	111	70	130			
Cadmium	0.000955	0.00100	0.00100	0	95.5	70	130			
Calcium	0.111	0.300	0.100	0	111	70	130			
Chromium	0.00487	0.00500	0.00500	0	97.4	70	130			
Cobalt	0.00501	0.00500	0.00500	0	100	70	130			
Iron	0.114	0.100	0.100	0	114	70	130			
Lead	0.000846	0.00100	0.00100	0	84.6	70	130			
Lithium	0.00964	0.0100	0.0100	0	96.4	70	130			
Magnesium	0.101	0.300	0.100	0	101	70	130			
Molybdenum	0.00453	0.00500	0.00500	0	90.7	70	130			
Potassium	0.0997	0.300	0.100	0	99.7	70	130			
Selenium	0.00427	0.00500	0.00500	0	85.3	70	130			
Sodium	0.111	0.300	0.100	0	111	70	130			
Thallium	0.000835	0.00150	0.00100	0	83.5	70	130			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190522D

Sample ID **CCV5-190522**	Batch ID: **R104232**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS4_190522D**	Analysis Date: **5/22/2019 3:26:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.205	0.00250	0.200	0	102	90	110			
Arsenic	0.205	0.00500	0.200	0	103	90	110			
Barium	0.200	0.0100	0.200	0	99.8	90	110			
Beryllium	0.200	0.00100	0.200	0	100	90	110			
Boron	0.220	0.0300	0.200	0	110	90	110			
Cadmium	0.202	0.00100	0.200	0	101	90	110			
Calcium	4.68	0.300	5.00	0	93.5	90	110			
Chromium	0.203	0.00500	0.200	0	101	90	110			
Cobalt	0.205	0.00500	0.200	0	102	90	110			
Iron	5.15	0.100	5.00	0	103	90	110			
Lead	0.188	0.00100	0.200	0	93.8	90	110			
Lithium	0.203	0.0100	0.200	0	102	90	110			
Magnesium	5.17	0.300	5.00	0	103	90	110			
Molybdenum	0.195	0.00500	0.200	0	97.3	90	110			
Potassium	5.20	0.300	5.00	0	104	90	110			
Selenium	0.213	0.00500	0.200	0	107	90	110			
Sodium	5.13	0.300	5.00	0	103	90	110			
Thallium	0.201	0.00150	0.200	0	101	90	110			

Sample ID **LCVL5-190522**	Batch ID: **R104232**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **LCVL**	Run ID: **ICP-MS4_190522D**	Analysis Date: **5/22/2019 3:46:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00186	0.00250	0.00200	0	93.2	70	130			
Arsenic	0.00475	0.00500	0.00500	0	95.0	70	130			
Barium	0.00461	0.0100	0.00500	0	92.3	70	130			
Beryllium	0.000947	0.00100	0.00100	0	94.7	70	130			
Boron	0.0229	0.0300	0.0200	0	115	70	130			
Cadmium	0.000924	0.00100	0.00100	0	92.4	70	130			
Calcium	0.102	0.300	0.100	0	102	70	130			
Chromium	0.00452	0.00500	0.00500	0	90.4	70	130			
Cobalt	0.00479	0.00500	0.00500	0	95.8	70	130			
Iron	0.106	0.100	0.100	0	106	70	130			
Lead	0.000756	0.00100	0.00100	0	75.6	70	130			
Lithium	0.00948	0.0100	0.0100	0	94.8	70	130			
Magnesium	0.0981	0.300	0.100	0	98.1	70	130			
Molybdenum	0.00455	0.00500	0.00500	0	91.0	70	130			
Potassium	0.0951	0.300	0.100	0	95.1	70	130			
Selenium	0.00474	0.00500	0.00500	0	94.7	70	130			
Sodium	0.126	0.300	0.100	0	126	70	130			
Thallium	0.000763	0.00150	0.00100	0	76.3	70	130			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190522D

Sample ID **CCV6-190522**	Batch ID: **R104232**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS4_190522D**	Analysis Date: **5/22/2019 4:12:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.208	0.00250	0.200	0	104	90	110			
Arsenic	0.211	0.00500	0.200	0	106	90	110			
Barium	0.208	0.0100	0.200	0	104	90	110			
Beryllium	0.195	0.00100	0.200	0	97.5	90	110			
Boron	0.207	0.0300	0.200	0	104	90	110			
Cadmium	0.202	0.00100	0.200	0	101	90	110			
Calcium	4.74	0.300	5.00	0	94.8	90	110			
Chromium	0.202	0.00500	0.200	0	101	90	110			
Cobalt	0.209	0.00500	0.200	0	104	90	110			
Iron	5.12	0.100	5.00	0	102	90	110			
Lead	0.192	0.00100	0.200	0	96.1	90	110			
Lithium	0.197	0.0100	0.200	0	98.7	90	110			
Magnesium	5.05	0.300	5.00	0	101	90	110			
Molybdenum	0.197	0.00500	0.200	0	98.4	90	110			
Potassium	5.17	0.300	5.00	0	103	90	110			
Selenium	0.213	0.00500	0.200	0	107	90	110			
Sodium	5.09	0.300	5.00	0	102	90	110			
Thallium	0.206	0.00150	0.200	0	103	90	110			

Sample ID **LCVL6-190522**	Batch ID: **R104232**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **LCVL**	Run ID: **ICP-MS4_190522D**	Analysis Date: **5/22/2019 4:22:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00200	0.00250	0.00200	0	100	70	130			
Arsenic	0.00486	0.00500	0.00500	0	97.1	70	130			
Barium	0.00495	0.0100	0.00500	0	99.0	70	130			
Beryllium	0.000939	0.00100	0.00100	0	93.9	70	130			
Boron	0.0216	0.0300	0.0200	0	108	70	130			
Cadmium	0.00101	0.00100	0.00100	0	101	70	130			
Calcium	0.113	0.300	0.100	0	113	70	130			
Chromium	0.00486	0.00500	0.00500	0	97.1	70	130			
Cobalt	0.00489	0.00500	0.00500	0	97.8	70	130			
Iron	0.113	0.100	0.100	0	113	70	130			
Lead	0.000805	0.00100	0.00100	0	80.5	70	130			
Lithium	0.00903	0.0100	0.0100	0	90.3	70	130			
Magnesium	0.104	0.300	0.100	0	104	70	130			
Molybdenum	0.00464	0.00500	0.00500	0	92.8	70	130			
Potassium	0.0982	0.300	0.100	0	98.2	70	130			
Selenium	0.00531	0.00500	0.00500	0	106	70	130			
Sodium	0.147	0.300	0.100	0	147	70	130			S
Thallium	0.000807	0.00150	0.00100	0	80.7	70	130			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190523A

The QC data in batch 90989 applies to the following samples: 1905205-01B, 1905205-02B, 1905205-03B, 1905205-04B, 1905205-05B, 1905205-06B, 1905205-07B, 1905205-08B, 1905205-09B

Sample ID **1905185-06B SD** Batch ID: **90989** TestNo: **SW6020A** Units: **mg/L**
SampType: **SD** Run ID: **ICP-MS4_190523A** Analysis Date: **5/23/2019 11:20:00 AM** Prep Date: **5/20/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	207	30.0	0	200				3.62	10	
Magnesium	134	30.0	0	130				2.71	10	
Sodium	266	30.0	0	265				0.189	10	

Sample ID **1905185-06B PDS** Batch ID: **90989** TestNo: **SW6020A** Units: **mg/L**
SampType: **PDS** Run ID: **ICP-MS4_190523A** Analysis Date: **5/23/2019 11:40:00 AM** Prep Date: **5/20/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	295	6.00	100	200	95.2	80	120			
Magnesium	227	6.00	100	130	96.8	80	120			
Sodium	365	6.00	100	265	99.6	80	120			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190523A

Sample ID **ICV-190523**	Batch ID: **R104240**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **ICV**	Run ID: **ICP-MS4_190523A**	Analysis Date: **5/23/2019 11:01:00 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	2.39	0.300	2.50	0	95.8	90	110			
Iron	2.56	0.100	2.50	0	102	90	110			
Magnesium	2.53	0.300	2.50	0	101	90	110			
Sodium	2.56	0.300	2.50	0	102	90	110			

Sample ID **LCVL-190523**	Batch ID: **R104240**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **LCVL**	Run ID: **ICP-MS4_190523A**	Analysis Date: **5/23/2019 11:09:00 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	0.0901	0.300	0.100	0	90.1	70	130			
Iron	0.105	0.100	0.100	0	105	70	130			
Magnesium	0.0985	0.300	0.100	0	98.5	70	130			
Sodium	0.0949	0.300	0.100	0	94.9	70	130			

Sample ID **CCV1-190523**	Batch ID: **R104240**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS4_190523A**	Analysis Date: **5/23/2019 11:42:00 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	4.76	0.300	5.00	0	95.2	90	110			
Iron	5.10	0.100	5.00	0	102	90	110			
Magnesium	5.21	0.300	5.00	0	104	90	110			
Sodium	5.14	0.300	5.00	0	103	90	110			

Sample ID **LCVL1-190523**	Batch ID: **R104240**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **LCVL**	Run ID: **ICP-MS4_190523A**	Analysis Date: **5/23/2019 11:48:00 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	0.0899	0.300	0.100	0	89.9	70	130			
Iron	0.105	0.100	0.100	0	105	70	130			
Magnesium	0.0985	0.300	0.100	0	98.5	70	130			
Sodium	0.0973	0.300	0.100	0	97.3	70	130			

Sample ID **CCV2-190523**	Batch ID: **R104240**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS4_190523A**	Analysis Date: **5/23/2019 12:21:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	4.79	0.300	5.00	0	95.7	90	110			
Iron	5.15	0.100	5.00	0	103	90	110			
Magnesium	5.29	0.300	5.00	0	106	90	110			
Sodium	5.22	0.300	5.00	0	104	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190523A

Sample ID **LCVL2-190523**	Batch ID: **R104240**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **LCVL**	Run ID: **ICP-MS4_190523A**	Analysis Date: **5/23/2019 12:29:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	0.101	0.300	0.100	0	101	70	130			
Iron	0.105	0.100	0.100	0	105	70	130			
Magnesium	0.0985	0.300	0.100	0	98.5	70	130			
Sodium	0.0994	0.300	0.100	0	99.4	70	130			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_190517A

The QC data in batch 90965 applies to the following samples: 1905205-01C, 1905205-02C, 1905205-03C, 1905205-04C, 1905205-05C, 1905205-06C, 1905205-07C, 1905205-08C, 1905205-09C

Sample ID **MB-90965** Batch ID: **90965** TestNo: **E300** Units: **mg/L**
SampType: **MBLK** Run ID: **IC4_190517A** Analysis Date: **5/17/2019 10:28:41 AM** Prep Date: **5/17/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	<0.300	1.00								
Fluoride	<0.100	0.400								
Nitrate-N	<0.100	0.500								
Sulfate	<1.00	3.00								

Sample ID **LCS-90965** Batch ID: **90965** TestNo: **E300** Units: **mg/L**
SampType: **LCS** Run ID: **IC4_190517A** Analysis Date: **5/17/2019 10:44:41 AM** Prep Date: **5/17/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.65	1.00	10.00	0	96.5	90	110			
Fluoride	4.17	0.400	4.000	0	104	90	110			
Nitrate-N	5.13	0.500	5.000	0	103	90	110			
Sulfate	29.8	3.00	30.00	0	99.5	90	110			

Sample ID **LCSD-90965** Batch ID: **90965** TestNo: **E300** Units: **mg/L**
SampType: **LCSD** Run ID: **IC4_190517A** Analysis Date: **5/17/2019 11:00:41 AM** Prep Date: **5/17/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.72	1.00	10.00	0	97.2	90	110	0.774	20	
Fluoride	4.22	0.400	4.000	0	106	90	110	1.24	20	
Nitrate-N	5.18	0.500	5.000	0	104	90	110	0.847	20	
Sulfate	30.0	3.00	30.00	0	100	90	110	0.565	20	

Sample ID **1905205-01CMS** Batch ID: **90965** TestNo: **E300** Units: **mg/L**
SampType: **MS** Run ID: **IC4_190517A** Analysis Date: **5/17/2019 1:40:13 PM** Prep Date: **5/17/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	365	10.0	200.0	170.3	97.2	90	110			
Fluoride	216	4.00	200.0	0	108	90	110			
Nitrate-N	44.7	5.00	45.16	0	99.1	90	110			
Sulfate	251	30.0	200.0	49.70	101	90	110			

Sample ID **1905205-01CMSD** Batch ID: **90965** TestNo: **E300** Units: **mg/L**
SampType: **MSD** Run ID: **IC4_190517A** Analysis Date: **5/17/2019 1:56:13 PM** Prep Date: **5/17/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	363	10.0	200.0	170.3	96.3	90	110	0.462	20	
Fluoride	217	4.00	200.0	0	108	90	110	0.421	20	
Nitrate-N	46.1	5.00	45.16	0	102	90	110	2.98	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_190517A

Sample ID **1905205-01CMSD**	Batch ID: **90965**	TestNo: **E300**	Units: **mg/L**
SampType: **MSD**	Run ID: **IC4_190517A**	Analysis Date: **5/17/2019 1:56:13 PM**	Prep Date: **5/17/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	251	30.0	200.0	49.70	101	90	110	0.050	20	

Sample ID **1905205-02CMS**	Batch ID: **90965**	TestNo: **E300**	Units: **mg/L**
SampType: **MS**	Run ID: **IC4_190517A**	Analysis Date: **5/17/2019 2:28:13 PM**	Prep Date: **5/17/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	393	10.0	200.0	204.5	94.3	90	110			
Fluoride	215	4.00	200.0	0	107	90	110			
Nitrate-N	45.4	5.00	45.16	0	100	90	110			
Sulfate	239	30.0	200.0	41.25	98.7	90	110			

Sample ID **1905205-02CMSD**	Batch ID: **90965**	TestNo: **E300**	Units: **mg/L**
SampType: **MSD**	Run ID: **IC4_190517A**	Analysis Date: **5/17/2019 2:44:13 PM**	Prep Date: **5/17/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	396	10.0	200.0	204.5	95.8	90	110	0.770	20	
Fluoride	218	4.00	200.0	0	109	90	110	1.50	20	
Nitrate-N	46.0	5.00	45.16	0	102	90	110	1.44	20	
Sulfate	242	30.0	200.0	41.25	100	90	110	1.42	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_190517A

Sample ID **ICV-190517**	Batch ID: **R104153**	TestNo: **E300**	Units: **mg/L**
SampType: **ICV**	Run ID: **IC4_190517A**	Analysis Date: **5/17/2019 9:56:41 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	25.0	1.00	25.00	0	99.8	90	110			
Fluoride	10.2	0.400	10.00	0	102	90	110			
Nitrate-N	13.0	0.500	12.50	0	104	90	110			
Sulfate	75.7	3.00	75.00	0	101	90	110			

Sample ID **CCV1-190517**	Batch ID: **R104153**	TestNo: **E300**	Units: **mg/L**
SampType: **CCV**	Run ID: **IC4_190517A**	Analysis Date: **5/17/2019 5:24:12 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.74	1.00	10.00	0	97.4	90	110			
Fluoride	4.33	0.400	4.000	0	108	90	110			
Nitrate-N	5.19	0.500	5.000	0	104	90	110			
Sulfate	30.1	3.00	30.00	0	100	90	110			

Sample ID **CCV2-190517**	Batch ID: **R104153**	TestNo: **E300**	Units: **mg/L**
SampType: **CCV**	Run ID: **IC4_190517A**	Analysis Date: **5/17/2019 9:08:12 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.75	1.00	10.00	0	97.5	90	110			
Fluoride	4.40	0.400	4.000	0	110	90	110			
Nitrate-N	5.18	0.500	5.000	0	104	90	110			
Sulfate	30.1	3.00	30.00	0	100	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_190520A

The QC data in batch 90986 applies to the following samples: 1905205-07C, 1905205-08C

Sample ID	**MB-90986**	Batch ID:	**90986**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**MBLK**	Run ID:	**IC4_190520A**	Analysis Date:	**5/20/2019 10:20:17 AM**	Prep Date:	**5/20/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	<0.300	1.00								

Sample ID	**LCS-90986**	Batch ID:	**90986**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**LCS**	Run ID:	**IC4_190520A**	Analysis Date:	**5/20/2019 10:36:17 AM**	Prep Date:	**5/20/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.25	1.00	10.00	0	92.5	90	110			

Sample ID	**LCSD-90986**	Batch ID:	**90986**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**LCSD**	Run ID:	**IC4_190520A**	Analysis Date:	**5/20/2019 10:52:17 AM**	Prep Date:	**5/20/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.37	1.00	10.00	0	93.7	90	110	1.29	20	

Sample ID	**1905193-02DMS**	Batch ID:	**90986**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**MS**	Run ID:	**IC4_190520A**	Analysis Date:	**5/20/2019 12:51:06 PM**	Prep Date:	**5/20/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	2120	100	2000	187.2	96.4	90	110			

Sample ID	**1905193-02DMSD**	Batch ID:	**90986**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**MSD**	Run ID:	**IC4_190520A**	Analysis Date:	**5/20/2019 1:07:06 PM**	Prep Date:	**5/20/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	2130	100	2000	187.2	97.0	90	110	0.536	20	

Sample ID	**1905194-01DMS**	Batch ID:	**90986**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**MS**	Run ID:	**IC4_190520A**	Analysis Date:	**5/20/2019 1:39:06 PM**	Prep Date:	**5/20/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	2020	100	2000	0	101	90	110			

Sample ID	**1905194-01DMSD**	Batch ID:	**90986**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**MSD**	Run ID:	**IC4_190520A**	Analysis Date:	**5/20/2019 1:55:06 PM**	Prep Date:	**5/20/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	2020	100	2000	0	101	90	110	0.304	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_190520A

Sample ID **ICV-190520**	Batch ID: **R104175**	TestNo: **E300**	Units: **mg/L**
SampType: **ICV**	Run ID: **IC4_190520A**	Analysis Date: **5/20/2019 9:48:17 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	23.6	1.00	25.00	0	94.4	90	110			

Sample ID **CCV1-190520**	Batch ID: **R104175**	TestNo: **E300**	Units: **mg/L**
SampType: **CCV**	Run ID: **IC4_190520A**	Analysis Date: **5/20/2019 4:03:05 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.60	1.00	10.00	0	96.0	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: TITRATOR_190521A

The QC data in batch 91010 applies to the following samples: 1905205-01C, 1905205-02C, 1905205-03C, 1905205-04C, 1905205-05C, 1905205-06C, 1905205-07C, 1905205-08C, 1905205-09C

Sample ID **MB-91010** Batch ID: **91010** TestNo: **M2320 B** Units: **mg/L @ pH 4.17**
SampType: **MBLK** Run ID: **TITRATOR_190521A** Analysis Date: **5/21/2019 9:19:00 AM** Prep Date: **5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	<10.0	20.0								
Alkalinity, Carbonate (As CaCO3)	<10.0	20.0								
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0								
Alkalinity, Total (As CaCO3)	<20.0	20.0								

Sample ID **LCS-91010** Batch ID: **91010** TestNo: **M2320 B** Units: **mg/L @ pH 3.91**
SampType: **LCS** Run ID: **TITRATOR_190521A** Analysis Date: **5/21/2019 9:23:00 AM** Prep Date: **5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	54.4	20.0	50.00	0	109	74	129			

Sample ID **LCSD-91010** Batch ID: **91010** TestNo: **M2320 B** Units: **mg/L @ pH 3.97**
SampType: **LCSD** Run ID: **TITRATOR_190521A** Analysis Date: **5/21/2019 9:27:00 AM** Prep Date: **5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	53.6	20.0	50.00	0	107	74	129	1.48	20	

Sample ID **1905205-01C DUP** Batch ID: **91010** TestNo: **M2320 B** Units: **mg/L @ pH 4.53**
SampType: **DUP** Run ID: **TITRATOR_190521A** Analysis Date: **5/21/2019 10:14:00 AM** Prep Date: **5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	267	20.0	0	261.5				2.04	20	
Alkalinity, Carbonate (As CaCO3)	<10.0	20.0	0	0				0	20	
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0	0				0	20	
Alkalinity, Total (As CaCO3)	267	20.0	0	261.5				2.04	20	

Sample ID **1905229-02B DUP** Batch ID: **91010** TestNo: **M2320 B** Units: **mg/L @ pH 4.53**
SampType: **DUP** Run ID: **TITRATOR_190521A** Analysis Date: **5/21/2019 4:14:00 PM** Prep Date: **5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	250	20.0	0	251.0				0.319	20	
Alkalinity, Carbonate (As CaCO3)	<10.0	20.0	0	0				0	20	
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0	0				0	20	
Alkalinity, Total (As CaCO3)	250	20.0	0	251.0				0.319	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: TITRATOR_190521A

Sample ID **ICV-190521**	Batch ID: **R104203**	TestNo: **M2320 B**	Units: **mg/L @ pH 4.08**
SampType: **ICV**	Run ID: **TITRATOR_190521A**	Analysis Date: **5/21/2019 9:15:00 AM**	Prep Date: **5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	8.08	20.0	0							
Alkalinity, Carbonate (As CaCO3)	96.5	20.0	0							
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0							
Alkalinity, Total (As CaCO3)	105	20.0	100.0	0	105	98	102			S

Sample ID **CCV1-190521**	Batch ID: **R104203**	TestNo: **M2320 B**	Units: **mg/L @ pH 4.14**
SampType: **CCV**	Run ID: **TITRATOR_190521A**	Analysis Date: **5/21/2019 12:25:00 PM**	Prep Date: **5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	13.9	20.0	0							
Alkalinity, Carbonate (As CaCO3)	86.6	20.0	0							
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0							
Alkalinity, Total (As CaCO3)	100	20.0	100.0	0	100	90	110			

Sample ID **CCV2-190521**	Batch ID: **R104203**	TestNo: **M2320 B**	Units: **mg/L @ pH 4.2**
SampType: **CCV**	Run ID: **TITRATOR_190521A**	Analysis Date: **5/21/2019 4:19:00 PM**	Prep Date: **5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	16.2	20.0	0							
Alkalinity, Carbonate (As CaCO3)	82.9	20.0	0							
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0							
Alkalinity, Total (As CaCO3)	99.0	20.0	100.0	0	99.0	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: TITRATOR_190530A

The QC data in batch 91142 applies to the following samples: 1905205-05C, 1905205-06C

Sample ID **MB-91142**	Batch ID: **91142**	TestNo: **M2320 B**	Units: **mg/L @ pH 4.2**
SampType: **MBLK**	Run ID: **TITRATOR_190530A**	Analysis Date: **5/30/2019 3:08:00 PM**	Prep Date: **5/30/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	<10.0	20.0								
Alkalinity, Carbonate (As CaCO3)	<10.0	20.0								
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0								
Alkalinity, Total (As CaCO3)	<20.0	20.0								

Sample ID **LCS-91142**	Batch ID: **91142**	TestNo: **M2320 B**	Units: **mg/L @ pH 4.3**
SampType: **LCS**	Run ID: **TITRATOR_190530A**	Analysis Date: **5/30/2019 3:12:00 PM**	Prep Date: **5/30/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	50.5	20.0	50.00	0	101	74	129			

Sample ID **1905205-05C DUP**	Batch ID: **91142**	TestNo: **M2320 B**	Units: **mg/L @ pH 4.52**
SampType: **DUP**	Run ID: **TITRATOR_190530A**	Analysis Date: **5/30/2019 3:41:00 PM**	Prep Date: **5/30/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	236	20.0	0	237.0				0.296	20	
Alkalinity, Carbonate (As CaCO3)	<10.0	20.0	0	0				0	20	
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0	0				0	20	
Alkalinity, Total (As CaCO3)	236	20.0	0	237.0				0.296	20	

Sample ID **LCSD-91142**	Batch ID: **91142**	TestNo: **M2320 B**	Units: **mg/L @ pH 4.18**
SampType: **LCSD**	Run ID: **TITRATOR_190530A**	Analysis Date: **5/30/2019 4:10:00 PM**	Prep Date: **5/30/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	50.9	20.0	50.00	0	102	74	129	0.789	20	

Sample ID **1905321-02A DUP**	Batch ID: **91142**	TestNo: **M2320 B**	Units: **mg/L @ pH 4.51**
SampType: **DUP**	Run ID: **TITRATOR_190530A**	Analysis Date: **5/30/2019 5:07:00 PM**	Prep Date: **5/30/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	142	20.0	0	138.0				2.86	20	
Alkalinity, Carbonate (As CaCO3)	<10.0	20.0	0	0				0	20	
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0	0				0	20	
Alkalinity, Total (As CaCO3)	142	20.0	0	138.0				2.86	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: TITRATOR_190530A

Sample ID **ICV-190530**	Batch ID: **R104367**	TestNo: **M2320 B**	Units: **mg/L @ pH 4.31**
SampType: **ICV**	Run ID: **TITRATOR_190530A**	Analysis Date: **5/30/2019 2:50:00 PM**	Prep Date: **5/30/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	11.8	20.0	0							
Alkalinity, Carbonate (As CaCO3)	88.0	20.0	0							
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0							
Alkalinity, Total (As CaCO3)	99.8	20.0	100.0	0	99.8	98	102			

Sample ID **CCV1-190530**	Batch ID: **R104367**	TestNo: **M2320 B**	Units: **mg/L @ pH 4.27**
SampType: **CCV**	Run ID: **TITRATOR_190530A**	Analysis Date: **5/30/2019 4:23:00 PM**	Prep Date: **5/30/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	14.6	20.0	0							
Alkalinity, Carbonate (As CaCO3)	83.2	20.0	0							
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0							
Alkalinity, Total (As CaCO3)	97.8	20.0	100.0	0	97.8	90	110			

Sample ID **CCV2-190530**	Batch ID: **R104367**	TestNo: **M2320 B**	Units: **mg/L @ pH 4.5**
SampType: **CCV**	Run ID: **TITRATOR_190530A**	Analysis Date: **5/30/2019 5:10:00 PM**	Prep Date: **5/30/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	95.8	20.0	0							
Alkalinity, Carbonate (As CaCO3)	<10.0	20.0	0							
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0							
Alkalinity, Total (As CaCO3)	95.8	20.0	100.0	0	95.8	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: UV/VIS_2_190517B

The QC data in batch 90972 applies to the following samples: 1905205-01C, 1905205-02C, 1905205-03C, 1905205-04C, 1905205-05C, 1905205-06C, 1905205-07C, 1905205-08C, 1905205-09C

Sample ID	**MB-90972**	Batch ID:	**90972**	TestNo:	**M4500-P E**	Units:	**mg/L**
SampType:	**MBLK**	Run ID:	**UV/VIS_2_190517B**	Analysis Date:	**5/17/2019 12:34:00 PM**	Prep Date:	**5/17/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total Orthophosphate (As	<0.0300	0.100								

Sample ID	**LCS-90972**	Batch ID:	**90972**	TestNo:	**M4500-P E**	Units:	**mg/L**
SampType:	**LCS**	Run ID:	**UV/VIS_2_190517B**	Analysis Date:	**5/17/2019 12:34:00 PM**	Prep Date:	**5/17/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total Orthophosphate (As	0.520	0.100	0.5000	0	104	80	120			

Sample ID	**LCSD-90972**	Batch ID:	**90972**	TestNo:	**M4500-P E**	Units:	**mg/L**
SampType:	**LCSD**	Run ID:	**UV/VIS_2_190517B**	Analysis Date:	**5/17/2019 12:34:00 PM**	Prep Date:	**5/17/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total Orthophosphate (As	0.503	0.100	0.5000	0	101	80	120	3.32	15	

Sample ID	**1905205-01CMS**	Batch ID:	**90972**	TestNo:	**M4500-P E**	Units:	**mg/L**
SampType:	**MS**	Run ID:	**UV/VIS_2_190517B**	Analysis Date:	**5/17/2019 12:42:00 PM**	Prep Date:	**5/17/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total Orthophosphate (As	1.61	0.200	1.000	0.7140	90.0	80	120			

Sample ID	**1905205-01CMSD**	Batch ID:	**90972**	TestNo:	**M4500-P E**	Units:	**mg/L**
SampType:	**MSD**	Run ID:	**UV/VIS_2_190517B**	Analysis Date:	**5/17/2019 12:42:00 PM**	Prep Date:	**5/17/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total Orthophosphate (As	1.59	0.200	1.000	0.7140	87.2	80	120	1.75	15	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: UV/VIS_2_190517B

Sample ID **ICV-190517**	Batch ID: **R104132**	TestNo: **M4500-P E**	Units: **mg/L**
SampType: **ICV**	Run ID: **UV/VIS_2_190517B**	Analysis Date: **5/17/2019 12:33:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total Orthophosphate (As	0.218	0.100	0.2000	0	109	85	115			

Sample ID **CCV1-190517**	Batch ID: **R104132**	TestNo: **M4500-P E**	Units: **mg/L**
SampType: **CCV**	Run ID: **UV/VIS_2_190517B**	Analysis Date: **5/17/2019 12:42:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total Orthophosphate (As	0.536	0.100	0.5000	0	107	85	115			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: UV/VIS_2_190521B

The QC data in batch 91028 applies to the following samples: 1905205-01A, 1905205-02A, 1905205-03A, 1905205-04A, 1905205-05A, 1905205-06A, 1905205-07A, 1905205-08A, 1905205-09A

Sample ID	**MB-91028**	Batch ID:	**91028**	TestNo:	**M3500-Fe D**	Units:	**mg/L**
SampType:	**MBLK**	Run ID:	**UV/VIS_2_190521B**	Analysis Date:	**5/21/2019 5:39:00 PM**	Prep Date:	**5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	<0.0500	0.100								N

Sample ID	**LCS-91028**	Batch ID:	**91028**	TestNo:	**M3500-Fe D**	Units:	**mg/L**
SampType:	**LCS**	Run ID:	**UV/VIS_2_190521B**	Analysis Date:	**5/21/2019 5:40:00 PM**	Prep Date:	**5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.103	0.100	0.1000	0	103	85	115			N

Sample ID	**LCSD-91028**	Batch ID:	**91028**	TestNo:	**M3500-Fe D**	Units:	**mg/L**
SampType:	**LCSD**	Run ID:	**UV/VIS_2_190521B**	Analysis Date:	**5/21/2019 5:40:00 PM**	Prep Date:	**5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.0959	0.100	0.1000	0	95.9	85	115	7.39	15	N

Sample ID	**1905205-09AMS**	Batch ID:	**91028**	TestNo:	**M3500-Fe D**	Units:	**mg/L**
SampType:	**MS**	Run ID:	**UV/VIS_2_190521B**	Analysis Date:	**5/21/2019 5:45:00 PM**	Prep Date:	**5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.108	0.100	0.1000	0	108	85	115			N

Sample ID	**1905205-09AMSD**	Batch ID:	**91028**	TestNo:	**M3500-Fe D**	Units:	**mg/L**
SampType:	**MSD**	Run ID:	**UV/VIS_2_190521B**	Analysis Date:	**5/21/2019 5:45:00 PM**	Prep Date:	**5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.110	0.100	0.1000	0	110	85	115	2.25	15	N

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: UV/VIS_2_190521B

Sample ID	**ICV-190521**	Batch ID:	**R104200**	TestNo:	**M3500-Fe D**	Units:	**mg/L**
SampType:	**ICV**	Run ID:	**UV/VIS_2_190521B**	Analysis Date:	**5/21/2019 5:38:00 PM**	Prep Date:	

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.0971	0.100	0.1000	0	97.1	85	115			N

Sample ID	**CCV1-190521**	Batch ID:	**R104200**	TestNo:	**M3500-Fe D**	Units:	**mg/L**
SampType:	**CCV**	Run ID:	**UV/VIS_2_190521B**	Analysis Date:	**5/21/2019 5:46:00 PM**	Prep Date:	

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.221	0.100	0.2000	0	111	85	115			N

Sample ID	**CCV2-190521**	Batch ID:	**R104200**	TestNo:	**M3500-Fe D**	Units:	**mg/L**
SampType:	**CCV**	Run ID:	**UV/VIS_2_190521B**	Analysis Date:	**5/21/2019 6:00:00 PM**	Prep Date:	

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.212	0.100	0.2000	0	106	85	115			N

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: WC_190521C

The QC data in batch 91019 applies to the following samples: 1905205-01C, 1905205-02C, 1905205-03C, 1905205-04C, 1905205-05C, 1905205-06C, 1905205-07C, 1905205-08C, 1905205-09C

Sample ID	**MB-91019**	Batch ID:	**91019**	TestNo:	**M2540C**	Units:	**mg/L**
SampType:	**MBLK**	Run ID:	**WC_190521C**	Analysis Date:	**5/21/2019 10:00:00 AM**	Prep Date:	**5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	<10.0	10.0								

Sample ID	**LCS-91019**	Batch ID:	**91019**	TestNo:	**M2540C**	Units:	**mg/L**
SampType:	**LCS**	Run ID:	**WC_190521C**	Analysis Date:	**5/21/2019 10:00:00 AM**	Prep Date:	**5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	748	10.0	745.6	0	100	90	113			

Sample ID	**1905188-01E-DUP**	Batch ID:	**91019**	TestNo:	**M2540C**	Units:	**mg/L**
SampType:	**DUP**	Run ID:	**WC_190521C**	Analysis Date:	**5/21/2019 10:00:00 AM**	Prep Date:	**5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	9980	200	0	10160				1.79	5	

Sample ID	**1905188-02E-DUP**	Batch ID:	**91019**	TestNo:	**M2540C**	Units:	**mg/L**
SampType:	**DUP**	Run ID:	**WC_190521C**	Analysis Date:	**5/21/2019 10:00:00 AM**	Prep Date:	**5/21/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	10800	200	0	10840				0.370	5	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

May 29, 2019

DHL Analytical, Inc.

Sample Delivery Group:	L1100949
Samples Received:	05/21/2019
Project Number:	1905205
Description:	

Report To: John DuPont
2300 Double Creek Drive
Round Rock, TX 78664

Entire Report Reviewed By:

Donna Eidson
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace National is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

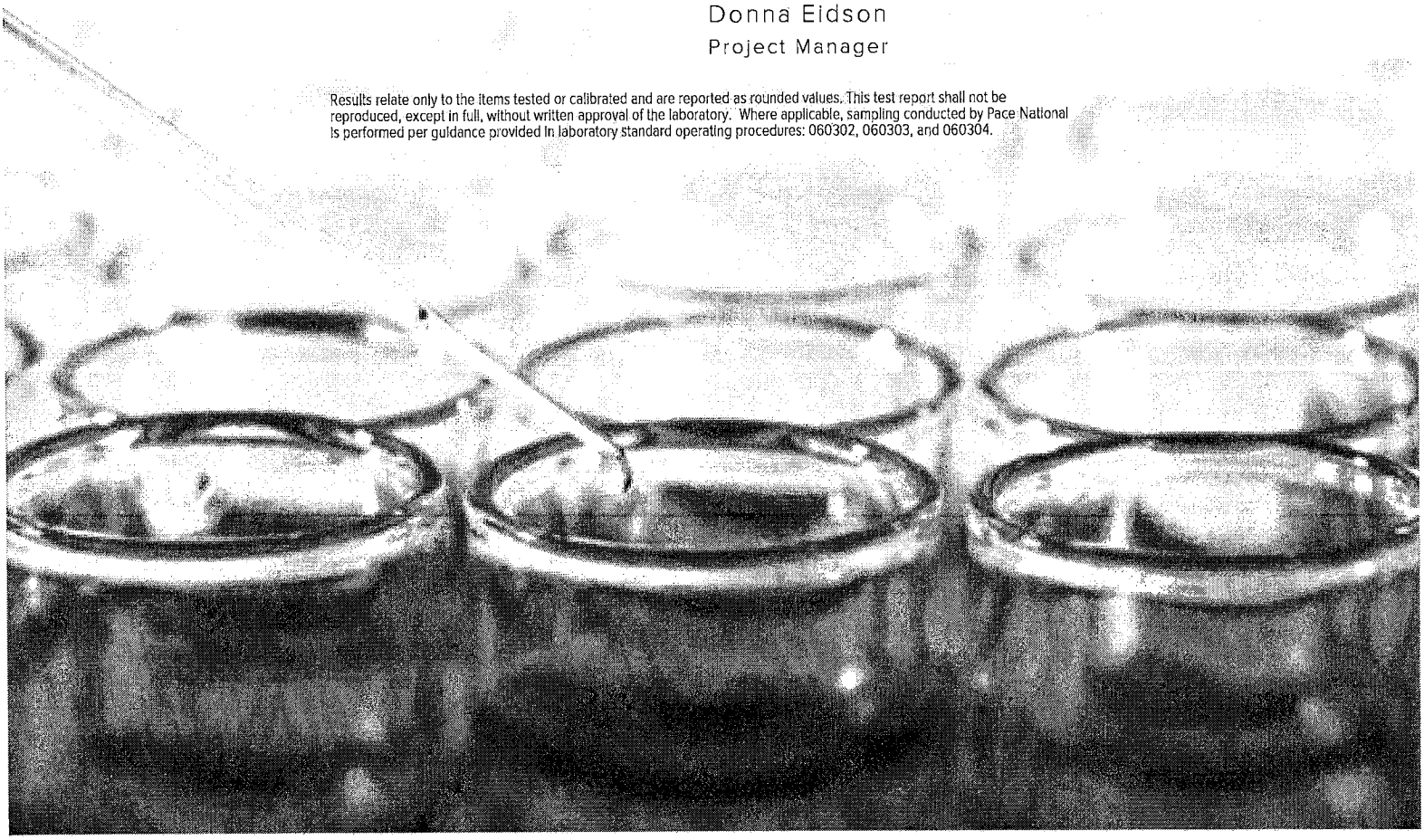


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FGD-6 L1100949-01 Non-Potable Water

			Collected by	Collected date/time	Received date/time
				05/16/19 09:20	05/21/19 10:10

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1284744	1	05/22/19 08:25	05/28/19 10:55	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1284773	1	05/23/19 15:02	05/28/19 10:55	RRE	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1284773	1	05/23/19 15:02	05/24/19 17:05	RRE	Mt. Juliet, TN

FGD-4 L1100949-02 Non-Potable Water

			Collected by	Collected date/time	Received date/time
				05/16/19 10:15	05/21/19 10:10

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1284744	1	05/22/19 08:25	05/28/19 10:55	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1284773	1	05/23/19 15:02	05/28/19 10:55	RRE	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1284773	1	05/23/19 15:02	05/24/19 17:05	RRE	Mt. Juliet, TN

FGD-3 L1100949-03 Non-Potable Water

			Collected by	Collected date/time	Received date/time
				05/16/19 11:10	05/21/19 10:10

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1284744	1	05/22/19 08:25	05/28/19 14:05	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1284773	1	05/23/19 15:02	05/28/19 14:05	RRE	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1284773	1	05/23/19 15:02	05/24/19 17:05	RRE	Mt. Juliet, TN

FGD-2 L1100949-04 Non-Potable Water

			Collected by	Collected date/time	Received date/time
				05/16/19 12:00	05/21/19 10:10

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1284744	1	05/22/19 08:25	05/28/19 14:05	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1284773	1	05/23/19 15:02	05/28/19 14:05	RRE	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1284773	1	05/23/19 15:02	05/24/19 17:18	RRE	Mt. Juliet, TN

FGD-5 L1100949-05 Non-Potable Water

			Collected by	Collected date/time	Received date/time
				05/16/19 13:50	05/21/19 10:10

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1284744	1	05/22/19 08:25	05/28/19 14:05	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1284773	1	05/23/19 15:02	05/28/19 14:05	RRE	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1284773	1	05/23/19 15:02	05/24/19 17:18	RRE	Mt. Juliet, TN

FGD-1 L1100949-06 Non-Potable Water

			Collected by	Collected date/time	Received date/time
				05/16/19 14:50	05/21/19 10:10

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1284744	1	05/22/19 08:25	05/28/19 14:05	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1284773	1	05/23/19 15:02	05/28/19 14:05	RRE	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1284773	1	05/23/19 15:02	05/24/19 17:18	RRE	Mt. Juliet, TN

FGD-8 L1100949-07 Non-Potable Water

			Collected by	Collected date/time	Received date/time
				05/16/19 15:45	05/21/19 10:10

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1284744	1	05/22/19 08:25	05/28/19 14:05	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1284773	1	05/23/19 15:02	05/28/19 14:05	RRE	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1284773	1	05/23/19 15:02	05/24/19 17:18	RRE	Mt. Juliet, TN

FGD-11 L1100949-08 Non-Potable Water

			Collected by	Collected date/time	Received date/time
				05/16/19 16:40	05/21/19 10:10

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1284744	1	05/22/19 08:25	05/28/19 14:05	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1284773	1	05/23/19 15:02	05/28/19 14:05	RRE	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1284773	1	05/23/19 15:02	05/24/19 17:18	RRE	Mt. Juliet, TN

FGD-12 L1100949-09 Non-Potable Water

			Collected by	Collected date/time	Received date/time
				05/16/19 17:35	05/21/19 10:10

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1284744	1	05/22/19 08:25	05/28/19 14:05	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1284773	1	05/23/19 15:02	05/28/19 14:05	RRE	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1284773	1	05/23/19 15:02	05/24/19 17:18	RRE	Mt. Juliet, TN

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Donna Eidson
Project Manager

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+/-	pCi/l	date / time	
RADIUM-228	1.67		0.422	0.593	05/28/2019 10:55	WG1284744
(T) Barium	*97.9*			*62.0-143*	*05/28/2019 10:55*	WG1284744
(T) Yttrium	*113*			*79.0-136*	*05/28/2019 10:55*	WG1284744

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+/-	pCi/l	date / time	
Combined Radium	3.10		0.890	0.863	05/28/2019 10:55	WG1284773

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+/-	pCi/l	date / time	
RADIUM-226	1.43		0.468	0.27	05/24/2019 17:05	WG1284773
(T) Barium-133	*90.8*			*30.0-143*	*05/24/2019 17:05*	WG1284773

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.745		0.407	0.556	05/28/2019 10:55	WG1284744
(T) Barium	*109*			*62.0-143*	*05/28/2019 10:55*	WG1284744
(T) Yttrium	*110*			*79.0-136*	*05/28/2019 10:55*	WG1284744

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	1.37		0.716	0.755	05/28/2019 10:55	WG1284773

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.627		0.309	0.199	05/24/2019 17:05	WG1284773
(T) Barium-133	*92.0*			*30.0-143*	*05/24/2019 17:05*	WG1284773

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.403		0.412	0.638	05/28/2019 14:05	WG1284744
(T) Barium	*92.8*			*62.0-143*	*05/28/2019 14:05*	WG1284744
(T) Yttrium	*112*			*79.0-136*	*05/28/2019 14:05*	WG1284744

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.797		0.752	1.04	05/28/2019 14:05	WG1284773

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.394		0.340	0.403	05/24/2019 17:05	WG1284773
(T) Barium-133	*59.2*			*30.0-143*	*05/24/2019 17:05*	WG1284773

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.588		0.391	0.541	05/28/2019 14:05	WG1284744
(T) Barium	*109*			*62.0-143*	*05/28/2019 14:05*	WG1284744
(T) Yttrium	*109*			*79.0-136*	*05/28/2019 14:05*	WG1284744

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	1.24		0.819	0.937	05/28/2019 14:05	WG1284773

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.648		0.428	0.396	05/24/2019 17:18	WG1284773
(T) Barium-133	*92.1*			*30.0-143*	*05/24/2019 17:18*	WG1284773

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.0624		0.333	0.506	05/28/2019 14:05	WG1284744
(T) Barium	*105*			*62.0-143*	*05/28/2019 14:05*	WG1284744
(T) Yttrium	*108*			*79.0-136*	*05/28/2019 14:05*	WG1284744

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.404		0.552	0.696	05/28/2019 14:05	WG1284773

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.342		0.219	0.19	05/24/2019 17:18	WG1284773
(T) Barium-133	*86.7*			*30.0-143*	*05/24/2019 17:18*	WG1284773

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	-0.0608		0.401	0.593	05/28/2019 14:05	WG1284744
(T) Barium	*95.4*			*62.0-143*	*05/28/2019 14:05*	WG1284744
(T) Yttrium	*110*			*79.0-136*	*05/28/2019 14:05*	WG1284744

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.184		0.635	0.923	05/28/2019 14:05	WG1284773

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.184		0.234	0.33	05/24/2019 17:18	WG1284773
(T) Barium-133	*83.4*			*30.0-143*	*05/24/2019 17:18*	WG1284773

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+/-	pCi/l	date / time	
RADIUM-228	5.27		0.459	0.616	05/28/2019 14:05	WG1284744
(T) Barium	*91.3*			*62.0-143*	*05/28/2019 14:05*	WG1284744
(T) Yttrium	*107*			*79.0-136*	*05/28/2019 14:05*	WG1284744

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+/-	pCi/l	date / time	
Combined Radium	8.40		1.14	0.795	05/28/2019 14:05	WG1284773

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+/-	pCi/l	date / time	
RADIUM-226	3.14		0.685	0.179	05/24/2019 17:18	WG1284773
(T) Barium-133	*88.2*			*30.0-143*	*05/24/2019 17:18*	WG1284773

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	2.75		0.444	0.645	05/28/2019 14:05	WG1284744
(T) Barium	*112*			*62.0-143*	*05/28/2019 14:05*	WG1284744
(T) Yttrium	*108*			*79.0-136*	*05/28/2019 14:05*	WG1284744

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	5.14		0.963	0.952	05/28/2019 14:05	WG1284773

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	2.39		0.519	0.307	05/24/2019 17:18	WG1284773
(T) Barium-133	*97.4*			*30.0-143*	*05/24/2019 17:18*	WG1284773

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+/-	pCi/l	date / time	
RADIUM-228	1.43		0.395	0.572	05/28/2019 14:05	WG1284744
(T) Barium	*111*			*62.0-143*	*05/28/2019 14:05*	WG1284744
(T) Yttrium	*115*			*79.0-136*	*05/28/2019 14:05*	WG1284744

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+/-	pCi/l	date / time	
Combined Radium	1.81		0.642	0.813	05/28/2019 14:05	WG1284773

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+/-	pCi/l	date / time	
RADIUM-226	0.385		0.247	0.241	05/24/2019 17:18	WG1284773
(T) Barium-133	*96.0*			*30.0-143*	*05/24/2019 17:18*	WG1284773

Method Blank (MB)

(MB) R3415641-1 05/28/19 10:55

Analyte	MB Result pCi/l	MB Qualifier	MB MDA pCi/l
Radium-228	-0.164		0.413
(T) Barium	*108*		
(T) Yttrium	*115*		

L1100192-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1100192-01 05/28/19 10:55 • (DUP) R3415641-5 05/28/19 10:55

Analyte	Original Result pCi/l	DUP Result pCi/l	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-228	0.157	-0.0367	1	200	0.366		20	3
(T) Barium	*91.7*	*102*						
(T) Yttrium	*110*	*107*						

Laboratory Control Sample (LCS)

(LCS) R3415641-2 05/28/19 10:55

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	4.47	89.4	80.0-120	
(T) Barium			*103*		
(T) Yttrium			*107*		

L1100922-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1100922-01 05/28/19 10:55 • (MS) R3415641-3 05/28/19 10:55 • (MSD) R3415641-4 05/28/19 10:55

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	7.14	-0.136	7.62	7.50	107	105	1	70.0-130			1.50		20
(T) Barium		*111*			*107*	*110*							
(T) Yttrium		*114*			*107*	*110*							

Method Blank (MB)

(MB) R3415635-1 05/24/19 17:04

Analyte	MB Result pCi/l	MB Qualifier	MB MDA pCi/l
Radium-226	0.459		0.209
(T) Barium-133	*84.6*		

L1100844-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1100844-01 05/24/19 17:04 • (DUP) R3415635-5 05/24/19 17:04

Analyte	Original Result pCi/l	DUP Result pCi/l	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-226	0.495	0.573	1	14.6	0.182		20	3
(T) Barium-133	*90.4*	*88.8*						

Laboratory Control Sample (LCS)

(LCS) R3415635-2 05/24/19 17:04

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-226	20.1	19.1	95.0	80.0-120	
(T) Barium-133			*79.1*		

L1100433-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1100433-01 05/24/19 17:04 • (MS) R3415635-3 05/24/19 17:04 • (MSD) R3415635-4 05/24/19 17:04

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-226	20.1	1.16	19.9	20.9	93.2	98.0	1	75.0-125			4.71		20
(T) Barium-133		*83.2*			*81.1*	*84.7*							

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

MDA	Minimum Detectable Activity.
Rec.	Recovery.
RER	Replicate Error Ratio.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(T)	Tracer - A radioisotope of known concentration added to a solution of chemically equivalent radioisotopes at a known concentration to assist in monitoring the yield of the chemical separation.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description

The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

ACCREDITATIONS & LOCATIONS

ONE LAB. NATIONWIDE.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

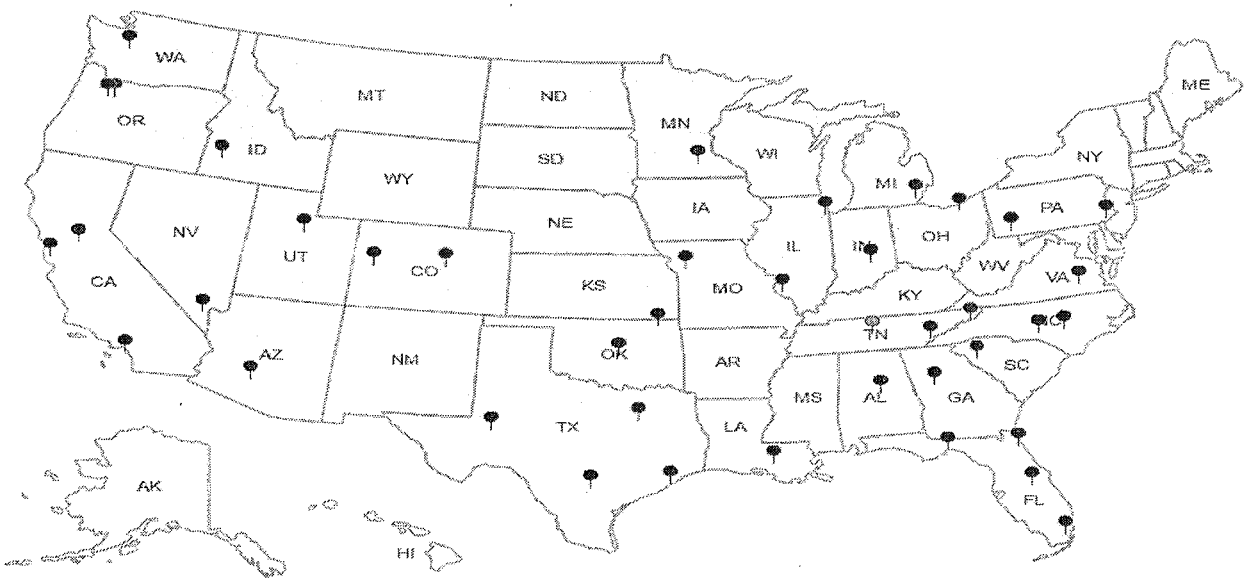
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



Pace Analytical National Center for Testing & Innovation
Cooler Receipt Form

Client: DHLRTX	SDG#:	1100949	
Cooler Received/Opened On: 5/21/19	Temperature:	Amb	
Received By: Brock Fariss			
Signature: BF Fariss			

Receipt Check List	NP	Yes	No
COC Seal Present / Intact?	✓		
COC Signed / Accurate?		✓	
Bottles arrive intact?		✓	
Correct bottles used?		✓	
Sufficient volume sent?		✓	
If Applicable			
VOA Zero headspace?			
Preservation Correct / Checked?			✓

Pace Analytical®
National Center for Testing & Innovation

Login #:L1100949	Client:DHLRRTX	Date:05/21	Evaluated by:Kelsey S

Non-Conformance (check applicable items)

	Sample Integrity		Chain of Custody Clarification		
	Parameter(s) past holding time		Login Clarification Needed		**If Broken Container:**
	Temperature not in range		Chain of custody is incomplete		Insufficient packing material around container
	Improper container type		Please specify Metals requested.		Insufficient packing material inside cooler
x	pH not in range.		Please specify TCLP requested.		Improper handling by carrier (FedEx / UPS / Courie
	Insufficient sample volume.		Received additional samples not listed on coc.		Sample was frozen
	Sample is biphasic.		Sample ids on containers do not match ids on coc		Container lid not intact
	Vials received with headspace.		Trip Blank not received.		**If no Chain of Custody:**
	Broken container		Client did not "X" analysis.		Received by:
	Broken container:		Chain of Custody is missing		Date/Time:
	Sufficient sample remains				Temp./Cont. Rec./pH:
					Carrier:
					Tracking#

Login Comments: 2 of 2 FGD-8 was received with a pH of 6. pH adj in login 1424 05/21

Client informed by:		Call		Email		Voice Mail		Date:	Time:
TSR Initials:	Client Contact:								

Login Instructions:

Noted. DE 5/24/19

1100949

DHL Analytical, Inc.

2300 Double Creek Drive
Round Rock, TX 78664

TEL: *(512) 388-8222* FAX: *(512) 388-8229*

Work Order: 1905205

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

H005

Subcontractor:

Pace Analytical
12065 Lebanon Rd
Mt. Juliet, TN 37122

TEL: (615) 773-5923
FAX:
Acct #: DHLRRTX

17-May-19

Sample Id	Matrix	DHL#	Date Collected	Bottle Type	Ra-228 E904.0	Ra-226 M7500 Ra B M	Requested Tests			
FGD-6	Aqueous	-01D	05/16/19 09:20 AM	1LHDPEHNO3		1				-01
FGD-6	Aqueous	-01E	05/16/19 09:20 AM	1LHDPEHNO3	1					01
FGD-4	Aqueous	-02D	05/16/19 10:15 AM	1LHDPEHNO3		1				02
FGD-4	Aqueous	-02E	05/16/19 10:15 AM	1LHDPEHNO3	1					02
FGD-3	Aqueous	-03D	05/16/19 11:10 AM	1LHDPEHNO3		1				03
FGD-3	Aqueous	-03E	05/16/19 11:10 AM	1LHDPEHNO3	1					03
FGD-2	Aqueous	-04D	05/16/19 12:00 PM	1LHDPEHNO3		1				04
FGD-2	Aqueous	-04E	05/16/19 12:00 PM	1LHDPEHNO3	1					04
FGD-5	Aqueous	-05D	05/16/19 01:50 PM	1LHDPEHNO3		1				05
FGD-5	Aqueous	-05E	05/16/19 01:50 PM	1LHDPEHNO3	1					05
FGD-1	Aqueous	-06D	05/16/19 02:50 PM	1LHDPEHNO3		1				06
FGD-1	Aqueous	-06E	05/16/19 02:50 PM	1LHDPEHNO3	1					06
FGD-8	Aqueous	-07D	05/16/19 03:45 PM	1LHDPEHNO3		1				07
FGD-8	Aqueous	-07E	05/16/19 03:45 PM	1LHDPEHNO3	1					07
FGD-11	Aqueous	-08D	05/16/19 04:40 PM	1LHDPEHNO3		1				08
FGD-11	Aqueous	-08E	05/16/19 04:40 PM	1LHDPEHNO3	1					08
FGD-12	Aqueous	-09D	05/16/19 05:35 PM	1LHDPEHNO3		1				09
FGD-12	Aqueous	-09E	05/16/19 05:35 PM	1LHDPEHNO3	1					09

< 2 < 2

General Comments:

Please analyze these samples with Normal Turnaround Time.
Report RA-226, Ra-228 & Combined per Specs.
Quality Control Package Needed: Standard - NELAC Rad Test compliant
Email to cac@dhlanalytical.com & dupont@dhlanalytical.com

UPS
Rec: 18

	Date/Time		Date/Time
Relinquished by:	5/17/19 1700	**Received by:**	5/21/19 1010
Relinquished by:		**Received by:**	

pH adj @ 1424

NCL

AM RAD SCREEN: <0.5 mR/hr

May 29, 2019

Will Vienne
Golder
2201 Double Creek Dr #4004
Round Rock, Texas 78664
TEL: (512) 671-3434
FAX (512) 671-3446

Order No.: 1905222

RE: Luminant-OGSES-FGD Pond

Dear Will Vienne:

DHL Analytical, Inc. received 1 sample(s) on 5/18/2019 for the analyses presented in the following report.

There were no problems with the analyses and all data met requirements of NELAP except where noted in the Case Narrative. All non-NELAP methods will be identified accordingly in the case narrative and all estimated uncertainties of test results are within method or EPA specifications.

If you have any questions regarding these tests results, please feel free to call. Thank you for using DHL Analytical.

Sincerely,

John DuPont
General Manager

This report was performed under the accreditation of the State of Texas Laboratory Certification Number: T104704211-19-24

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AnalyticalDatesReport 1905222 ..... **9**

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AnalyticalQCSummaryReport 1905222 ..... **11**

DHL ANALYTICAL
2300 Double Creek Dr. ■ Round Rock, TX 78664
Phone (512) 388-8222 ■ FAX (512) 388-8229
Web: www.dhlanalytical.com
E-Mail: login@dhlanalytical.com

№ 86481

CHAIN-OF-CUSTODY

CLIENT: GOLDER
ADDRESS: 2201 DOUBLE CREEK DR, ROUND ROCK, TX 78664
PHONE: 512-671-3434 FAX/E-MAIL: 512-671-3446
DATA REPORTED TO: WILL VIENNE
ADDITIONAL REPORT COPIES TO:

DATE: 5-17-19 PAGE 1 OF 1
PO #: DHL WORK ORDER #: 1905222
PROJECT LOCATION OR NAME: LUMINANT - OGSES - FGD POND
CLENT PROJECT #: 19122262-F COLLECTOR: J. BRAYTON

Authorize 5% surcharge for TRRP Report? ☐ Yes ☐ No

S=SOIL P=PAINT
W=WATER SL=SLUDGE
A=AIR O=OTHER
L=LIQUID SO=SOLID
SE=SEDIMENT

PRESERVATION: HCl, HNO_3, H_2SO_4 ☐ NaOH ☐, ICE, UNPRESERVED

ANALYSES: BTEX ☐ MTBE ☐ [METHOD 8021] | TPH 1005 ☐ TPH 1006 ☐ HOLD 1006 ☐ | GRO [METHOD 8015] ☐ DRO [METHOD 8105] ☐ | VOC 8260 ☐ VOC 624 ☐ VOC 8260/5035 ☐ | SVOC 8270 ☐ PAH 8270 ☐ HOLD PAH ☐ SVOC 625 ☐ | 8270 PEST ☐ 625 PEST/PCB ☐ 608 PCB ☐ 8082 PCB ☐ 8270 PCB ☐ | 8270 O-P PEST ☐ 8321 HERB ☐ T PHOS, AMMONIA ☐ | METALS 6020 ☐ METALS 200.8 ☐ DISS. METALS ☐ ____ ☐ | RCRA ☐ TX11 ☐ ____ | PH ☐ HEX CHROM ☐ ALKALINITY ☐ COD ☐ | CHLORIDE ☐ ANIONS ____ ☐ | TCLP SVOC ☐ VOC ☐ PEST ☐ HERB ☐ | TCLP METALS ☐ RCRA 8 ☐ TX-11 ☐ Pb ☐ | RCI ☐ FLASHPOINT ☐ DGAS ☐ | TDS ☐ TSS ☐ % MOISTURE ☐ CYANIDE ☐ | SULFATE, COBALT, LITHIUM, SELENIUM

Field Sample I.D.	DHL Lab #	Date	Time	Matrix	Container Type	# of Containers	HCl	HNO_3	H_2SO_4 ☐ NaOH ☐	ICE	UNPRESERVED	ANALYSES	FIELD NOTES
FGD-14	01	5-17-19	0750	W	P	2						X X	

RELINQUISHED BY: (Signature) DATE/TIME 5-17-19 1730 RECEIVED BY: (Signature) FEDEX
RELINQUISHED BY: (Signature) DATE/TIME 5/18/19 4:30 PM RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

☐ DHL DISPOSAL @ $5.00 each ☐ Return

3

TURN AROUND TIME
RUSH ☐ CALL FIRST
1 DAY ☐ CALL FIRST
2 DAY ☐
NORMAL ☒
OTHER ☐ ____

LABORATORY USE ONLY:
RECEIVING TEMP: 3.0 THERM #: 78
CUSTODY SEALS: ☐ BROKEN ☐ INTACT ☒ NOT USED
CARRIER: ☐ LONE STAR ☒ FEDEX ☐ UPS ☐ OTHER
☐ COURIER DELIVERY
☐ HAND DELIVERED

DHL COC Rev 1 | FEB 2010

ORIGIN ID:FWHA (512) 671-3434
J. BRAYTON
GOLDER
2201 DOUBLE CREEK DR

ROUND ROCK, TX 78664
UNITED STATES US

SHIP DATE: 17MAY19
ACTWGT: 45.40 LB
CAD: 6981003/SSFO2002
DIMS: 25x14x14 IN

BILL THIRD PARTY

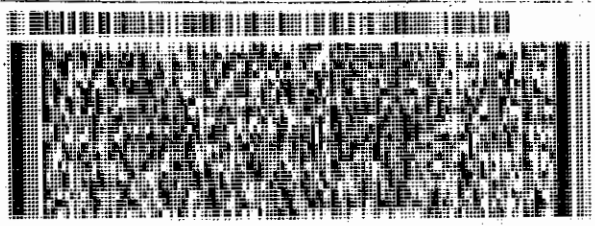
Part # 156[illegible]
DB2 EXP 03/20

TO

DHL
2300 DOUBLE CREEK DR

ROUND ROCK TX 78664

(512) 388-8222 REF:
INV:
PO: DEPT:



FedEx
Express

2 of 2

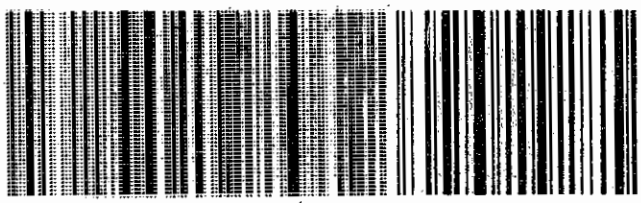
MPS# 0263 7873 2787 1824

Mstr# 7873 2787 1813 0201

SATURDAY 12:00P
PRIORITY OVERNIGHT

XO BSMA

AHS
78664
TX-US AUS



DHL Analytical, Inc.

Sample Receipt Checklist

Client Name Golder | Date Received: 5/18/2019

Work Order Number 1905222 | Received by AH

Checklist completed by: _____ (Signature) 5/20/2019 (Date) | Reviewed by CC (Initials) 5/20/2019 (Date)

Carrier name FedEx 1day

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shippping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	3.0 °C
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH<2 acceptable upon receipt?	Yes ☑	No ☐	NA ☐ LOT # 11837
	Adjusted? no		Checked by CC
Water - ph>9 (S) or ph>10 (CN) acceptable upon receipt?	Yes	No	NA ☑ LOT #
	Adjusted?		Checked by

Any No response must be detailed in the comments section below.

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments: _____

Corrective Action _____

Page 1 of 1

DHL Analytical, Inc. **Date:** *29-May-19*

CLIENT: Golder
Project: Luminant-OGSES-FGD Pond
Lab Order: 1905222

CASE NARRATIVE

Samples were analyzed using the methods outlined in the following references:

Method SW6020A - Metals Analysis
Method E300 - Anions Analysis

LOG IN

The sample was received and log-in performed on 5/18/19. A total of 1 sample was received. The sample arrived in good condition and was properly packaged. All method blanks, laboratory spikes, and/or matrix spikes met quality assurance objectives.

DHL Analytical, Inc.

Date: *29-May-19*

CLIENT: Golder
Project: Luminant-OGSES-FGD Pond
Lab Order: 1905222

Work Order Sample Summary

Lab Smp ID	Client Sample ID	Tag Number	Date Collected	Date Recved
1905222-01	FGD-14		05/17/19 07:50 AM	5/18/2019

Lab Order: 1905222
Client: Golder
Project: Luminant-OGSES-FGD Pond

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
1905222-01A	FGD-14	05/17/19 07:50 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/20/19 09:41 AM	90992
1905222-01B	FGD-14	05/17/19 07:50 AM	Aqueous	E300	Anion Preparation	05/20/19 09:15 AM	90987

Lab Order: 1905222
Client: Golder
Project: Luminant-OGSES-FGD Pond

ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
1905222-01A	FGD-14	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	90992	1	05/21/19 01:06 PM	ICP-MS4_190521B
1905222-01B	FGD-14	Aqueous	E300	Anions by IC method - Water	90987	10	05/20/19 05:25 PM	IC2_190520A

DHL Analytical, Inc.

Date: *29-May-19*

CLIENT:	Golder	**Client Sample ID:**	FGD-14
Project:	Luminant-OGSES-FGD Pond	**Lab ID:**	1905222-01
Project No:	19122262-F	**Collection Date:**	05/17/19 07:50 AM
Lab Order:	1905222	**Matrix:**	AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020A**					Analyst: **RO**
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	05/21/19 01:06 PM
Lithium	0.00564	0.00500	0.0100	J	mg/L	1	05/21/19 01:06 PM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	05/21/19 01:06 PM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **JL**
Sulfate	41.6	10.0	30.0		mg/L	10	05/20/19 05:25 PM

Qualifiers:	*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
	DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit
	ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
	S	Spike Recovery outside control limits	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905222
Project: Luminant-OGSES-FGD Pond

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190521B

The QC data in batch 90992 applies to the following samples: 1905222-01A

Sample ID	**MB-90992**	Batch ID:	**90992**	TestNo:	**SW6020A**	Units:	**mg/L**
SampType:	**MBLK**	Run ID:	**ICP-MS4_190521B**	Analysis Date:	**5/21/2019 12:50:00 PM**	Prep Date:	**5/20/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cobalt	<0.00300	0.00500								
Lithium	<0.00500	0.0100								
Selenium	<0.00200	0.00500								

Sample ID	**LCS-90992**	Batch ID:	**90992**	TestNo:	**SW6020A**	Units:	**mg/L**
SampType:	**LCS**	Run ID:	**ICP-MS4_190521B**	Analysis Date:	**5/21/2019 12:52:00 PM**	Prep Date:	**5/20/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cobalt	0.205	0.00500	0.200	0	102	80	120			
Lithium	0.199	0.0100	0.200	0	99.6	80	120			
Selenium	0.202	0.00500	0.200	0	101	80	120			

Sample ID	**LCSD-90992**	Batch ID:	**90992**	TestNo:	**SW6020A**	Units:	**mg/L**
SampType:	**LCSD**	Run ID:	**ICP-MS4_190521B**	Analysis Date:	**5/21/2019 12:54:00 PM**	Prep Date:	**5/20/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cobalt	0.203	0.00500	0.200	0	101	80	120	1.11	15	
Lithium	0.205	0.0100	0.200	0	103	80	120	3.06	15	
Selenium	0.203	0.00500	0.200	0	102	80	120	0.424	15	

Sample ID	**1905201-01A SD**	Batch ID:	**90992**	TestNo:	**SW6020A**	Units:	**mg/L**
SampType:	**SD**	Run ID:	**ICP-MS4_190521B**	Analysis Date:	**5/21/2019 1:00:00 PM**	Prep Date:	**5/20/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cobalt	<0.0150	0.0250	0	0				0	10	
Lithium	<0.0250	0.0500	0	0.0251				0	10	
Selenium	<0.0100	0.0250	0	0				0	10	

Sample ID	**1905201-01A PDS**	Batch ID:	**90992**	TestNo:	**SW6020A**	Units:	**mg/L**
SampType:	**PDS**	Run ID:	**ICP-MS4_190521B**	Analysis Date:	**5/21/2019 1:14:00 PM**	Prep Date:	**5/20/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cobalt	0.197	0.00500	0.200	0	98.4	80	120			
Lithium	0.209	0.0100	0.200	0.0251	92.0	80	120			
Selenium	0.199	0.00500	0.200	0	99.7	80	120			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905222
Project: Luminant-OGSES-FGD Pond

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190521B

Sample ID **1905201-01A MS**	Batch ID: **90992**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **MS**	Run ID: **ICP-MS4_190521B**	Analysis Date: **5/21/2019 1:16:00 PM**	Prep Date: **5/20/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cobalt	0.194	0.00500	0.200	0	96.8	80	120			
Lithium	0.211	0.0100	0.200	0.0251	93.2	80	120			
Selenium	0.197	0.00500	0.200	0	98.6	80	120			

Sample ID **1905201-01A MSD**	Batch ID: **90992**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **MSD**	Run ID: **ICP-MS4_190521B**	Analysis Date: **5/21/2019 1:18:00 PM**	Prep Date: **5/20/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cobalt	0.193	0.00500	0.200	0	96.5	80	120	0.256	15	
Lithium	0.216	0.0100	0.200	0.0251	95.3	80	120	2.00	15	
Selenium	0.201	0.00500	0.200	0	101	80	120	2.05	15	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905222
Project: Luminant-OGSES-FGD Pond

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190521B

Sample ID **ICV-190521**	Batch ID: **R104193**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **ICV**	Run ID: **ICP-MS4_190521B**	Analysis Date: **5/21/2019 11:02:00 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cobalt	0.104	0.00500	0.100	0	104	90	110			
Lithium	0.105	0.0100	0.100	0	105	90	110			
Selenium	0.102	0.00500	0.100	0	102	90	110			

Sample ID **LCVL-190521**	Batch ID: **R104193**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **LCVL**	Run ID: **ICP-MS4_190521B**	Analysis Date: **5/21/2019 11:07:00 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cobalt	0.00507	0.00500	0.00500	0	101	70	130			
Lithium	0.0101	0.0100	0.0100	0	101	70	130			
Selenium	0.00506	0.00500	0.00500	0	101	70	130			

Sample ID **CCV2-190521**	Batch ID: **R104193**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS4_190521B**	Analysis Date: **5/21/2019 12:37:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cobalt	0.206	0.00500	0.200	0	103	90	110			
Lithium	0.196	0.0100	0.200	0	97.9	90	110			
Selenium	0.202	0.00500	0.200	0	101	90	110			

Sample ID **LCVL2-190521**	Batch ID: **R104193**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **LCVL**	Run ID: **ICP-MS4_190521B**	Analysis Date: **5/21/2019 12:42:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cobalt	0.00505	0.00500	0.00500	0	101	70	130			
Lithium	0.0106	0.0100	0.0100	0	106	70	130			
Selenium	0.00483	0.00500	0.00500	0	96.6	70	130			

Sample ID **CCV3-190521**	Batch ID: **R104193**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS4_190521B**	Analysis Date: **5/21/2019 1:20:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cobalt	0.201	0.00500	0.200	0	100	90	110			
Lithium	0.201	0.0100	0.200	0	100	90	110			
Selenium	0.201	0.00500	0.200	0	100	90	110			

Sample ID **LCVL3-190521**	Batch ID: **R104193**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **LCVL**	Run ID: **ICP-MS4_190521B**	Analysis Date: **5/21/2019 1:26:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cobalt	0.00509	0.00500	0.00500	0	102	70	130			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905222
Project: Luminant-OGSES-FGD Pond

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190521B

Sample ID **LCVL3-190521**	Batch ID: **R104193**	TestNo: **SW6020A**	Units: **mg/L**		
SampType: **LCVL**	Run ID: **ICP-MS4_190521B**	Analysis Date: **5/21/2019 1:26:00 PM**	Prep Date:		

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lithium	0.0102	0.0100	0.0100	0	102	70	130			
Selenium	0.00554	0.00500	0.00500	0	111	70	130			

Qualifiers:

B	Analyte detected in the associated Method Blank
J	Analyte detected between MDL and RL
ND	Not Detected at the Method Detection Limit
RL	Reporting Limit
J	Analyte detected between SDL and RL
DF	Dilution Factor
MDL	Method Detection Limit
R	RPD outside accepted control limits
S	Spike Recovery outside control limits
N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905222
Project: Luminant-OGSES-FGD Pond

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_190520A

The QC data in batch 90987 applies to the following samples: 1905222-01B

Sample ID	**MB-90987**	Batch ID:	**90987**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**MBLK**	Run ID:	**IC2_190520A**	Analysis Date:	**5/20/2019 10:20:40 AM**	Prep Date:	**5/20/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	<1.00	3.00								

Sample ID	**LCS-90987**	Batch ID:	**90987**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**LCS**	Run ID:	**IC2_190520A**	Analysis Date:	**5/20/2019 10:36:40 AM**	Prep Date:	**5/20/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	30.7	3.00	30.00	0	102	90	110			

Sample ID	**LCSD-90987**	Batch ID:	**90987**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**LCSD**	Run ID:	**IC2_190520A**	Analysis Date:	**5/20/2019 10:52:40 AM**	Prep Date:	**5/20/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	30.7	3.00	30.00	0	102	90	110	0.038	20	

Sample ID	**1905221-01BMS**	Batch ID:	**90987**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**MS**	Run ID:	**IC2_190520A**	Analysis Date:	**5/20/2019 3:01:53 PM**	Prep Date:	**5/20/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	238	30.0	200.0	29.76	104	90	110			

Sample ID	**1905221-01BMSD**	Batch ID:	**90987**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**MSD**	Run ID:	**IC2_190520A**	Analysis Date:	**5/20/2019 3:17:53 PM**	Prep Date:	**5/20/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	236	30.0	200.0	29.76	103	90	110	0.887	20	

Sample ID	**1905221-02BMS**	Batch ID:	**90987**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**MS**	Run ID:	**IC2_190520A**	Analysis Date:	**5/20/2019 3:49:53 PM**	Prep Date:	**5/20/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	218	30.0	200.0	12.12	103	90	110			

Sample ID	**1905221-02BMSD**	Batch ID:	**90987**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**MSD**	Run ID:	**IC2_190520A**	Analysis Date:	**5/20/2019 4:05:53 PM**	Prep Date:	**5/20/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	221	30.0	200.0	12.12	104	90	110	1.08	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905222
Project: Luminant-OGSES-FGD Pond

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_190520A

Sample ID **ICV-190520**	Batch ID: **R104174**	TestNo: **E300**	Units: **mg/L**
SampType: **ICV**	Run ID: **IC2_190520A**	Analysis Date: **5/20/2019 9:48:40 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	78.2	3.00	75.00	0	104	90	110			

Sample ID **CCV1-190520**	Batch ID: **R104174**	TestNo: **E300**	Units: **mg/L**
SampType: **CCV**	Run ID: **IC2_190520A**	Analysis Date: **5/20/2019 6:29:53 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	31.3	3.00	30.00	0	104	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank
J	Analyte detected between MDL and RL
ND	Not Detected at the Method Detection Limit
RL	Reporting Limit
J	Analyte detected between SDL and RL
DF	Dilution Factor
MDL	Method Detection Limit
R	RPD outside accepted control limits
S	Spike Recovery outside control limits
N	Parameter not NELAP certified

June 18, 2019

Will Vienne
Golder
2201 Double Creek Dr #4004
Round Rock, Texas 78664
TEL: (512) 671-3434
FAX (512) 671-3446

Order No.: 1906072

RE: LUMINANT-OGSES-FGD

Dear Will Vienne:

DHL Analytical, Inc. received 2 sample(s) on 6/7/2019 for the analyses presented in the following report.

There were no problems with the analyses and all data met requirements of NELAP except where noted in the Case Narrative. All non-NELAP methods will be identified accordingly in the case narrative and all estimated uncertainties of test results are within method or EPA specifications.

If you have any questions regarding these tests results, please feel free to call. Thank you for using DHL Analytical.

Sincerely,

John DuPont
General Manager

This report was performed under the accreditation of the State of Texas Laboratory Certification Number: T104704211-19-24

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DHL ANALYTICAL
2300 Double Creek Dr. ■ Round Rock, TX 78664
Phone (512) 388-8222 ■ FAX (512) 388-8229
Web: www.dhlanalytical.com
E-Mail: login@dhlanalytical.com

№ 83076 CHAIN-OF-CUSTODY

CLIENT: GOLDER
ADDRESS: 2201 DOUBLE CREEK DR ROUND ROCK, TX 78664
PHONE: 512-671-3434 FAX/E-MAIL: 512-671 3446
DATA REPORTED TO: WILL VIENNE
ADDITIONAL REPORT COPIES TO:

DATE: 6-6-19 PAGE 1 OF 1
PO #: 19122262-F DHL WORK ORDER #: 190607 2
PROJECT LOCATION OR NAME: LUMINANT - OGSES - FGD
CLENT PROJECT #: 19122262-F COLLECTOR: J. BRAYTON

Authorize 5% surcharge for TRRP Report? ☐ Yes ☐ No

S=SOIL W=WATER A=AIR L=LIQUID SE=SEDIMENT P=PAINT SL=SLUDGE O=OTHER SO=SOLID

PRESERVATION: HCl | HNO_3 | H_2SO_4 ☐ NaOH ☐ | ICE | UNPRESERVED

ANALYSES: BTEX ☐ MTBE ☐ (METHOD 8021) | TPH 1005 ☐ TPH 1006 ☐ HOLD 1006 ☐ | GRO (METHOD 8015) ☐ DRO (METHOD 8105) ☐ | VOC 8260 ☐ VOC 624 ☐ VOC 8260/5035 ☐ | SVOC 8270 ☐ PAH 8270 ☐ HOLD PAH ☐ SVOC 625 ☐ | 8270 PEST ☐ 625 PEST/PCB ☐ 608 PCB ☐ | 8270 O-P PEST ☐ 8082 PCB ☐ 8270 PCB ☐ | 8321 HERB ☐ T PHOS, AMMONIA ☐ | METALS 6020 ☐ METALS 200.8 ☐ DISS. METALS ☐ _____ ☐ | RCRA ☐ TX11 ☐ | PH ☐ HEX CHROM ☐ ALKALINITY ☐ COD ☐ | CHLORIDE ☐ ANIONS _____ ☐ | TCLP-SVOC ☐ VOC ☐ PEST ☐ HERB ☐ | TCLP-METALS ☐ RCRA 8 ☐ TX-11 ☐ Pb ☐ | RCI ☐ FLASHPOINT ☐ DGAS ☐ | TDS ☐ TSS ☐ % MOISTURE ☐ CYANIDE ☐ | LITHIUM | CATIONS | ANIONS | FERROUS | FERRIC | TDS

Field Sample I.D.	DHL Lab #	Date	Time	Matrix	Container Type	# of Containers	HCl	HNO_3	H_2SO_4 ☐ NaOH ☐	ICE	UNPRESERVED	FIELD NOTES
FGD-16	01	6-6-19	1300	W		7		X		X		JG X X X
FGD-15	02	6-6-19	1445	W		7		X		X		X X X

RELINQUISHED BY: (Signature) DATE/TIME 6-6-19 1830 RECEIVED BY: (Signature) Fed EX
RELINQUISHED BY: (Signature) Fed EX DATE/TIME 6-7-19 1029 RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

☐ DHL DISPOSAL @ $5.00 each ☐ Return 3

TURN AROUND TIME
RUSH ☐ CALL FIRST
1 DAY ☐ CALL FIRST
2 DAY ☐
NORMAL ☒
OTHER ☐ _____

LABORATORY USE ONLY:
RECEIVING TEMP: 5.3°C THERM #: 78
CUSTODY SEALS: ☐ BROKEN ☐ INTACT ☒ NOT USED
CARRIER: ☐ LONE STAR ☒ FEDEX ☐ UPS ☐ OTHER
☐ COURIER DELIVERY
☐ HAND DELIVERED

DHL COC Rev 1 | FEB 2010

Eric Lau

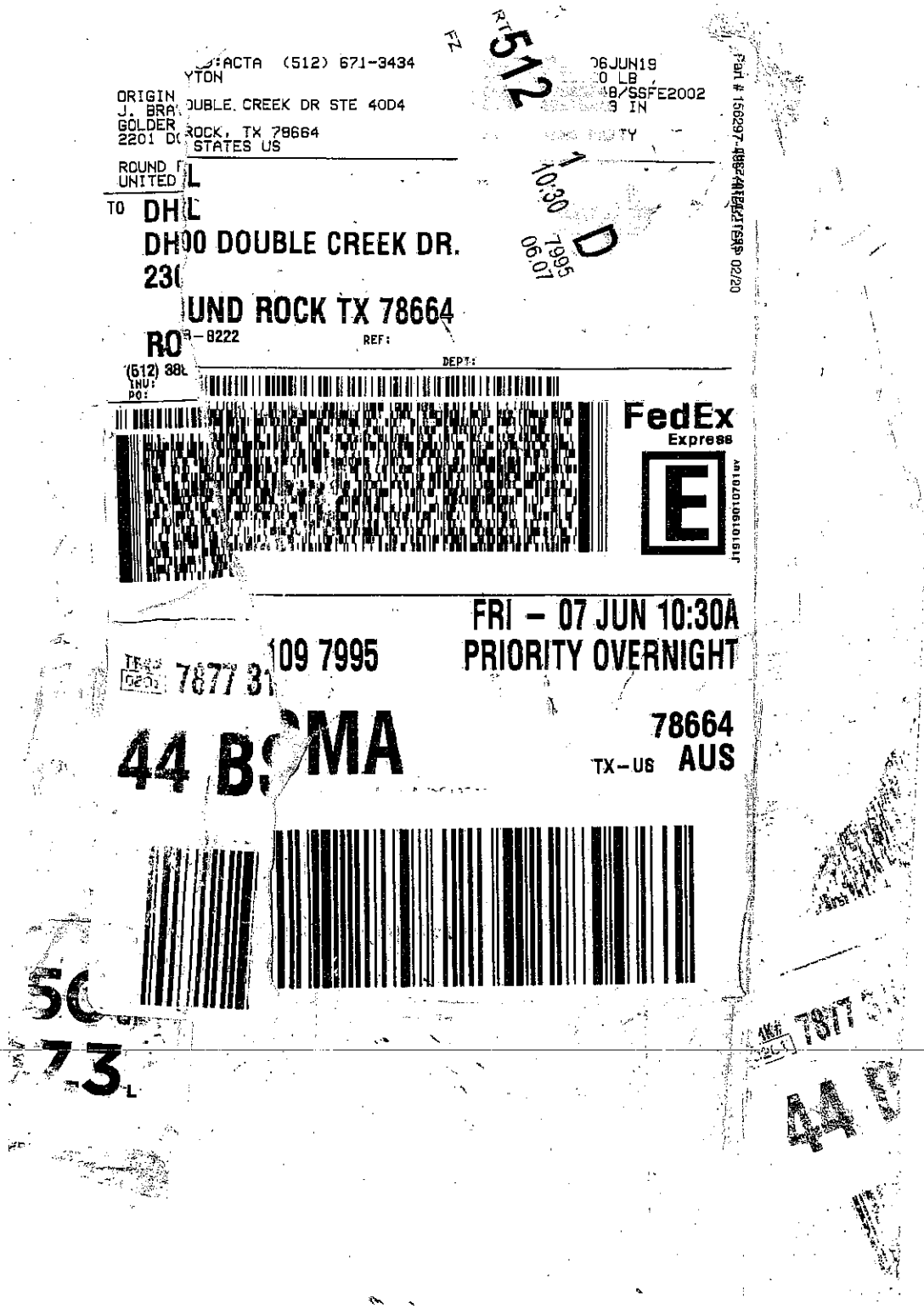
From: John DuPont
Sent: Tuesday, May 28, 2019 11:35 AM
To: Eric Lau
Subject: FW: CCR Analysis

Appendix III Parameters:
Metals (Ca and B)
Anions (Cl, F, and SO4)
TDS

Appendix IV Parameters:

Metals (As, Ba, Be, Cd, Co, Cr, Hg, Li, Mo, Pb, Sb, Se, and Tl)
Ra-226
Ra-228

From: Vienne, Will [mailto:William_Vienne@golder.com]
Sent: Tuesday, April 09, 2019 12:48 PM
To: John DuPont <dupont@dhlanalytical.com>
Subject: CCR Analysis


ORIGIN
DOUBLE CREEK DR STE 40D4
ROCK, TX 78664
STATES US
TO DH
DH00 DOUBLE CREEK DR.
UND ROCK TX 78664
REF:
DEPT:
FedEx
Express
FRI - 07 JUN 10:30A
PRIORITY OVERNIGHT
78664
TX-US AUS

DHL Analytical, Inc.

Sample Receipt Checklist

Client Name Golder

Date Received: 6/7/2019

Work Order Number 1906072

Received by EL

Checklist completed by: _____ 6/17/2019
Signature | Date

Reviewed by JD 6/17/2019
Initials | Date

Carrier name FedEx 1day

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shippping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	5.5 °C
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH<2 acceptable upon receipt?	Yes ☑	No ☐	NA ☐ LOT # 11837
	Adjusted? no		Checked by EL
Water - ph>9 (S) or ph>10 (CN) acceptable upon receipt?	Yes ☐	No ☐	NA ☑ LOT #
	Adjusted? _____		Checked by _____

Any No response must be detailed in the comments section below.

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments: _____

Corrective Action _____

Page 1 of 1

DHL Analytical, Inc. **Date:** *18-Jun-19*

CLIENT: Golder
Project: LUMINANT-OGSES-FGD
Lab Order: 1906072

CASE NARRATIVE

Samples were analyzed using the methods outlined in the following references:

Method SW6020A - Metals Analysis
Method E300 - Anions Analysis
Method M2320 B - Alkalinity Analysis
Method M3500-Fe D - Ferrous Iron Analysis (this parameter is not NELAP certified)
Method M3500-Fe D - Ferric Iron (calculation) (this calculation is not NELAP certified).
Method M4500-P E - Orthophosphate Analysis
Method M2540C - TDS Analysis

LOG IN

The samples were received and log-in performed on 6/7/19. A total of 2 samples were received. The samples arrived in good condition and were properly packaged.

METALS ANALYSIS

For Metals analysis performed on 6/12/19 the matrix spike and matrix spike duplicate recoveries were below control limits for Sodium. These are flagged accordingly in the QC summary report. The sample selected for the matrix spike and matrix spike duplicate was not from this work order. The LCS was within control limits for this analyte. No further corrective actions were taken.

FERRIC IRON CALCULATION

The Ferric Iron is calculated as the Total Iron minus the Ferrous Iron.

DHL Analytical, Inc.

Date: *18-Jun-19*

CLIENT: Golder
Project: LUMINANT-OGSES-FGD
Lab Order: 1906072

Work Order Sample Summary

Lab Smp ID	Client Sample ID	Tag Number	Date Collected	Date Recved
1906072-01	FGD-16		06/06/19 01:00 PM	6/7/2019
1906072-02	FGD-15		06/06/19 02:45 PM	6/7/2019

Lab Order: 1906072
Client: Golder
Project: LUMINANT-OGSES-FGD

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
1906072-01A	FGD-16	06/06/19 01:00 PM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	06/10/19 09:28 AM	91267
1906072-01B	FGD-16	06/06/19 01:00 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	06/10/19 08:17 AM	91261
	FGD-16	06/06/19 01:00 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	06/10/19 08:17 AM	91261
	FGD-16	06/06/19 01:00 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	06/10/19 08:17 AM	91261
1906072-01C	FGD-16	06/06/19 01:00 PM	Aqueous	M2320 B	Alkalinity Preparation	06/10/19 09:34 AM	91271
	FGD-16	06/06/19 01:00 PM	Aqueous	E300	Anion Preparation	06/07/19 12:27 PM	91226
	FGD-16	06/06/19 01:00 PM	Aqueous	E300	Anion Preparation	06/17/19 08:40 AM	91349
	FGD-16	06/06/19 01:00 PM	Aqueous	E300	Anion Preparation	06/17/19 08:40 AM	91349
	FGD-16	06/06/19 01:00 PM	Aqueous	M4500-P E	Orthophosphate Prep	06/07/19 01:20 PM	91254
	FGD-16	06/06/19 01:00 PM	Aqueous	M2540C	TDS Preparation	06/13/19 04:04 PM	91332
1906072-02A	FGD-15	06/06/19 02:45 PM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	06/10/19 09:28 AM	91267
1906072-02B	FGD-15	06/06/19 02:45 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	06/10/19 08:17 AM	91261
	FGD-15	06/06/19 02:45 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	06/10/19 08:17 AM	91261
	FGD-15	06/06/19 02:45 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	06/10/19 08:17 AM	91261
1906072-02C	FGD-15	06/06/19 02:45 PM	Aqueous	M2320 B	Alkalinity Preparation	06/10/19 09:34 AM	91271
	FGD-15	06/06/19 02:45 PM	Aqueous	E300	Anion Preparation	06/07/19 12:27 PM	91226
	FGD-15	06/06/19 02:45 PM	Aqueous	E300	Anion Preparation	06/17/19 08:40 AM	91349
	FGD-15	06/06/19 02:45 PM	Aqueous	M4500-P E	Orthophosphate Prep	06/07/19 01:20 PM	91254
	FGD-15	06/06/19 02:45 PM	Aqueous	M2540C	TDS Preparation	06/13/19 04:04 PM	91332

Lab Order: 1906072
Client: Golder
Project: LUMINANT-OGSES-FGD

ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
1906072-01A	FGD-16	Aqueous	M3500-Fe D	Ferric Iron (Calculated)	R104593	1	06/14/19	UV/VIS_2_190614A
	FGD-16	Aqueous	M3500-Fe D	Ferrous Iron	91267	1	06/10/19 11:01 AM	UV/VIS_2_190610A
1906072-01B	FGD-16	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	91261	10	06/12/19 11:53 AM	ICP-MS4_190612A
	FGD-16	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	91261	1	06/12/19 01:41 PM	ICP-MS4_190612A
	FGD-16	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	91261	1	06/11/19 04:05 PM	ICP-MS5_190611D
1906072-01C	FGD-16	Aqueous	M2320 B	Alkalinity	91271	1	06/10/19 12:47 PM	TITRATOR_190610A
	FGD-16	Aqueous	E300	Anions by IC method - Water	91226	1	06/07/19 04:58 PM	IC2_190607A
	FGD-16	Aqueous	E300	Anions by IC method - Water	91349	10	06/17/19 10:56 AM	IC2_190617A
	FGD-16	Aqueous	E300	Anions by IC method - Water	91349	1	06/17/19 12:16 PM	IC2_190617A
	FGD-16	Aqueous	M4500-P E	Orthophosphate	91254	1	06/07/19 01:51 PM	UV/VIS_2_190607B
	FGD-16	Aqueous	M2540C	Total Dissolved Solids	91332	1	06/14/19 12:00 PM	WC_190614B
1906072-02A	FGD-15	Aqueous	M3500-Fe D	Ferric Iron (Calculated)	R104593	1	06/14/19	UV/VIS_2_190614A
	FGD-15	Aqueous	M3500-Fe D	Ferrous Iron	91267	1	06/10/19 11:03 AM	UV/VIS_2_190610A
1906072-02B	FGD-15	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	91261	50	06/12/19 11:55 AM	ICP-MS4_190612A
	FGD-15	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	91261	1	06/12/19 01:43 PM	ICP-MS4_190612A
	FGD-15	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	91261	1	06/11/19 04:08 PM	ICP-MS5_190611D
1906072-02C	FGD-15	Aqueous	M2320 B	Alkalinity	91271	1	06/10/19 12:56 PM	TITRATOR_190610A
	FGD-15	Aqueous	E300	Anions by IC method - Water	91226	1	06/07/19 05:14 PM	IC2_190607A
	FGD-15	Aqueous	E300	Anions by IC method - Water	91349	100	06/17/19 11:44 AM	IC2_190617A
	FGD-15	Aqueous	M4500-P E	Orthophosphate	91254	1	06/07/19 01:52 PM	UV/VIS_2_190607B
	FGD-15	Aqueous	M2540C	Total Dissolved Solids	91332	1	06/14/19 12:00 PM	WC_190614B

DHL Analytical, Inc.

Date: *18-Jun-19*

CLIENT:	Golder	**Client Sample ID:**	FGD-16
Project:	LUMINANT-OGSES-FGD	**Lab ID:**	1906072-01
Project No:	19122262-F	**Collection Date:**	06/06/19 01:00 PM
Lab Order:	1906072	**Matrix:**	AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020A**					Analyst: **SP**
Calcium	16.5	1.00	3.00		mg/L	10	06/12/19 11:53 AM
Iron	<0.0300	0.0300	0.100		mg/L	1	06/11/19 04:05 PM
Magnesium	3.33	0.100	0.300		mg/L	1	06/11/19 04:05 PM
Potassium	3.06	0.100	0.300		mg/L	1	06/12/19 01:41 PM
Sodium	82.1	1.00	3.00		mg/L	10	06/12/19 11:53 AM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **JL**
Chloride	74.8	3.00	10.0		mg/L	10	06/17/19 10:56 AM
Fluoride	0.164	0.100	0.400	J	mg/L	1	06/07/19 04:58 PM
Nitrate-N	0.361	0.100	0.500	J	mg/L	1	06/07/19 04:58 PM
Sulfate	13.9	1.00	3.00		mg/L	1	06/17/19 12:16 PM
ALKALINITY		**M2320 B**					Analyst: **CC**
Alkalinity, Bicarbonate (As CaCO3)	159	10.0	20.0		mg/L @ pH 4.55	1	06/10/19 12:47 PM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.55	1	06/10/19 12:47 PM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.55	1	06/10/19 12:47 PM
Alkalinity, Total (As CaCO3)	159	20.0	20.0		mg/L @ pH 4.55	1	06/10/19 12:47 PM
FERRIC IRON (CALCULATED)		**M3500-FE D**					Analyst: **CAC**
Iron, Ferric	<0.0500	0.0500	0.100	N	mg/L	1	06/14/19
FERROUS IRON		**M3500-FE D**					Analyst: **BTJ**
Iron, Ferrous	<0.0500	0.0500	0.100	N	mg/L	1	06/10/19 11:01 AM
ORTHOPHOSPHATE		**M4500-P E**					Analyst: **BTJ**
Phosphorus, Total Orthophosphate (As P)	0.0490	0.0300	0.100	J	mg/L	1	06/07/19 01:51 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	325	10.0	10.0		mg/L	1	06/14/19 12:00 PM

Qualifiers:	*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
	DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit
	ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
	S	Spike Recovery outside control limits	N	Parameter not NELAP certified

DHL Analytical, Inc.

Date: *18-Jun-19*

CLIENT:	Golder	**Client Sample ID:**	FGD-15
Project:	LUMINANT-OGSES-FGD	**Lab ID:**	1906072-02
Project No:	19122262-F	**Collection Date:**	06/06/19 02:45 PM
Lab Order:	1906072	**Matrix:**	AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020A**					Analyst: **SP**
Calcium	252	5.00	15.0		mg/L	50	06/12/19 11:55 AM
Iron	<0.0300	0.0300	0.100		mg/L	1	06/11/19 04:08 PM
Lithium	0.0768	0.00500	0.0100		mg/L	1	06/11/19 04:08 PM
Magnesium	97.2	5.00	15.0		mg/L	50	06/12/19 11:55 AM
Potassium	5.06	0.100	0.300		mg/L	1	06/12/19 01:43 PM
Sodium	457	5.00	15.0		mg/L	50	06/12/19 11:55 AM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **JL**
Chloride	634	30.0	100		mg/L	100	06/17/19 11:44 AM
Fluoride	0.622	0.100	0.400		mg/L	1	06/07/19 05:14 PM
Nitrate-N	<0.100	0.100	0.500		mg/L	1	06/07/19 05:14 PM
Sulfate	926	100	300		mg/L	100	06/17/19 11:44 AM
ALKALINITY		**M2320 B**					Analyst: **CC**
Alkalinity, Bicarbonate (As CaCO3)	178	10.0	20.0		mg/L @ pH 4.54	1	06/10/19 12:56 PM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.54	1	06/10/19 12:56 PM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.54	1	06/10/19 12:56 PM
Alkalinity, Total (As CaCO3)	178	20.0	20.0		mg/L @ pH 4.54	1	06/10/19 12:56 PM
FERRIC IRON (CALCULATED)		**M3500-FE D**					Analyst: **CAC**
Iron, Ferric	<0.0500	0.0500	0.100	N	mg/L	1	06/14/19
FERROUS IRON		**M3500-FE D**					Analyst: **BTJ**
Iron, Ferrous	<0.0500	0.0500	0.100	N	mg/L	1	06/10/19 11:03 AM
ORTHOPHOSPHATE		**M4500-P E**					Analyst: **BTJ**
Phosphorus, Total Orthophosphate (As P)	0.0840	0.0300	0.100	J	mg/L	1	06/07/19 01:52 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	2880	50.0	50.0		mg/L	1	06/14/19 12:00 PM

Qualifiers:	*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
	DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit
	ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
	S	Spike Recovery outside control limits	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906072
Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190612A

The QC data in batch 91261 applies to the following samples: 1906072-01B, 1906072-02B

Sample ID **MB-91261** Batch ID: **91261** TestNo: **SW6020A** Units: **mg/L**
SampType: **MBLK** Run ID: **ICP-MS4_190612A** Analysis Date: **6/12/2019 10:50:00 AM** Prep Date: **6/10/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	<0.100	0.300								
Potassium	<0.100	0.300								
Sodium	<0.100	0.300								

Sample ID **LCS-91261** Batch ID: **91261** TestNo: **SW6020A** Units: **mg/L**
SampType: **LCS** Run ID: **ICP-MS4_190612A** Analysis Date: **6/12/2019 10:52:00 AM** Prep Date: **6/10/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	4.66	0.300	5.00	0	93.2	80	120			
Potassium	4.97	0.300	5.00	0	99.4	80	120			
Sodium	5.11	0.300	5.00	0	102	80	120			

Sample ID **LCSD-91261** Batch ID: **91261** TestNo: **SW6020A** Units: **mg/L**
SampType: **LCSD** Run ID: **ICP-MS4_190612A** Analysis Date: **6/12/2019 10:54:00 AM** Prep Date: **6/10/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	4.67	0.300	5.00	0	93.4	80	120	0.234	15	
Potassium	4.93	0.300	5.00	0	98.5	80	120	0.913	15	
Sodium	5.15	0.300	5.00	0	103	80	120	0.824	15	

Sample ID **1906056-01A SD** Batch ID: **91261** TestNo: **SW6020A** Units: **mg/L**
SampType: **SD** Run ID: **ICP-MS4_190612A** Analysis Date: **6/12/2019 11:00:00 AM** Prep Date: **6/10/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	39.0	75.0	0	38.0				2.46	10	
Potassium	<25.0	75.0	0	0				0	10	
Sodium	116	75.0	0	115				0.316	10	

Sample ID **1906056-01A PDS** Batch ID: **91261** TestNo: **SW6020A** Units: **mg/L**
SampType: **PDS** Run ID: **ICP-MS4_190612A** Analysis Date: **6/12/2019 11:20:00 AM** Prep Date: **6/10/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	276	15.0	250	38.0	95.0	80	120			
Potassium	247	15.0	250	0	98.7	80	120			
Sodium	379	15.0	250	115	105	80	120			

Qualifiers:				
	B	Analyte detected in the associated Method Blank	DF	Dilution Factor
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit
	ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
	RL	Reporting Limit	S	Spike Recovery outside control limits
	J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906072
Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190612A

Sample ID **1906056-01A MS** Batch ID: **91261** TestNo: **SW6020A** Units: **mg/L**
SampType: **MS** Run ID: **ICP-MS4_190612A** Analysis Date: **6/12/2019 11:22:00 AM** Prep Date: **6/10/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	42.9	15.0	5.00	38.0	98.3	80	120			
Potassium	5.61	15.0	5.00	0	112	80	120			
Sodium	118	15.0	5.00	115	44.1	80	120			S

Sample ID **1906056-01A MSD** Batch ID: **91261** TestNo: **SW6020A** Units: **mg/L**
SampType: **MSD** Run ID: **ICP-MS4_190612A** Analysis Date: **6/12/2019 11:24:00 AM** Prep Date: **6/10/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	42.4	15.0	5.00	38.0	87.2	80	120	1.30	15	
Potassium	5.65	15.0	5.00	0	113	80	120	0.726	15	
Sodium	116	15.0	5.00	115	20.3	80	120	1.02	15	S

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906072
Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190612A

Sample ID **ICV-190612**	Batch ID: **R104563**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **ICV**	Run ID: **ICP-MS4_190612A**	Analysis Date: **6/12/2019 10:34:00 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	2.45	0.300	2.50	0	98.1	90	110			
Magnesium	2.44	0.300	2.50	0	97.4	90	110			
Potassium	2.48	0.300	2.50	0	99.1	90	110			
Sodium	2.55	0.300	2.50	0	102	90	110			

Sample ID **LCVL-190612**	Batch ID: **R104563**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **LCVL**	Run ID: **ICP-MS4_190612A**	Analysis Date: **6/12/2019 10:44:00 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	0.0989	0.300	0.100	0	98.9	70	130			
Magnesium	0.0972	0.300	0.100	0	97.2	70	130			
Potassium	0.101	0.300	0.100	0	101	70	130			
Sodium	0.103	0.300	0.100	0	103	70	130			

Sample ID **CCV1-190612**	Batch ID: **R104563**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS4_190612A**	Analysis Date: **6/12/2019 11:26:00 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	4.71	0.300	5.00	0	94.3	90	110			
Magnesium	4.96	0.300	5.00	0	99.1	90	110			
Potassium	5.03	0.300	5.00	0	101	90	110			
Sodium	4.99	0.300	5.00	0	99.8	90	110			

Sample ID **LCVL1-190612**	Batch ID: **R104563**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **LCVL**	Run ID: **ICP-MS4_190612A**	Analysis Date: **6/12/2019 11:42:00 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	0.102	0.300	0.100	0	102	70	130			
Magnesium	0.0966	0.300	0.100	0	96.6	70	130			
Potassium	0.0990	0.300	0.100	0	99.0	70	130			
Sodium	0.103	0.300	0.100	0	103	70	130			

Sample ID **CCV2-190612**	Batch ID: **R104563**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS4_190612A**	Analysis Date: **6/12/2019 12:01:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	4.65	0.300	5.00	0	93.1	90	110			
Magnesium	5.02	0.300	5.00	0	100	90	110			
Sodium	5.11	0.300	5.00	0	102	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906072
Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190612A

Sample ID	**LCVL2-190612**	Batch ID:	**R104563**	TestNo:	**SW6020A**	Units:	**mg/L**
SampType:	**LCVL**	Run ID:	**ICP-MS4_190612A**	Analysis Date:	**6/12/2019 12:08:00 PM**	Prep Date:	

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	0.0958	0.300	0.100	0	95.8	70	130			
Magnesium	0.0967	0.300	0.100	0	96.7	70	130			
Sodium	0.103	0.300	0.100	0	103	70	130			

Sample ID	**CCV4-190612**	Batch ID:	**R104563**	TestNo:	**SW6020A**	Units:	**mg/L**
SampType:	**CCV**	Run ID:	**ICP-MS4_190612A**	Analysis Date:	**6/12/2019 1:23:00 PM**	Prep Date:	

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Potassium	5.05	0.300	5.00	0	101	90	110			

Sample ID	**LCVL4-190612**	Batch ID:	**R104563**	TestNo:	**SW6020A**	Units:	**mg/L**
SampType:	**LCVL**	Run ID:	**ICP-MS4_190612A**	Analysis Date:	**6/12/2019 1:27:00 PM**	Prep Date:	

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Potassium	0.0950	0.300	0.100	0	95.0	70	130			

Sample ID	**CCV5-190612**	Batch ID:	**R104563**	TestNo:	**SW6020A**	Units:	**mg/L**
SampType:	**CCV**	Run ID:	**ICP-MS4_190612A**	Analysis Date:	**6/12/2019 1:45:00 PM**	Prep Date:	

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Potassium	5.00	0.300	5.00	0	100	90	110			

Sample ID	**LCVL5-190612**	Batch ID:	**R104563**	TestNo:	**SW6020A**	Units:	**mg/L**
SampType:	**LCVL**	Run ID:	**ICP-MS4_190612A**	Analysis Date:	**6/12/2019 1:50:00 PM**	Prep Date:	

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Potassium	0.0947	0.300	0.100	0	94.7	70	130			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906072
Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: **ICP-MS5_190611D**

The QC data in batch 91261 applies to the following samples: 1906072-01B, 1906072-02B

Sample ID	**MB-91261**	Batch ID:	**91261**	TestNo:	**SW6020A**	Units:	**mg/L**
SampType:	**MBLK**	Run ID:	**ICP-MS5_190611D**	Analysis Date:	**6/11/2019 3:05:00 PM**	Prep Date:	**6/10/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	<0.0300	0.100								
Lithium	<0.00500	0.0100								
Magnesium	<0.100	0.300								

Sample ID	**LCS-91261**	Batch ID:	**91261**	TestNo:	**SW6020A**	Units:	**mg/L**
SampType:	**LCS**	Run ID:	**ICP-MS5_190611D**	Analysis Date:	**6/11/2019 3:07:00 PM**	Prep Date:	**6/10/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	5.05	0.100	5.00	0	101	80	120			
Lithium	0.208	0.0100	0.200	0	104	80	120			
Magnesium	5.05	0.300	5.00	0	101	80	120			

Sample ID	**LCSD-91261**	Batch ID:	**91261**	TestNo:	**SW6020A**	Units:	**mg/L**
SampType:	**LCSD**	Run ID:	**ICP-MS5_190611D**	Analysis Date:	**6/11/2019 3:10:00 PM**	Prep Date:	**6/10/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	5.01	0.100	5.00	0	100	80	120	0.604	15	
Lithium	0.206	0.0100	0.200	0	103	80	120	0.952	15	
Magnesium	5.04	0.300	5.00	0	101	80	120	0.085	15	

Sample ID	**1906056-01A SD**	Batch ID:	**91261**	TestNo:	**SW6020A**	Units:	**mg/L**
SampType:	**SD**	Run ID:	**ICP-MS5_190611D**	Analysis Date:	**6/11/2019 3:16:00 PM**	Prep Date:	**6/10/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	0.190	0.500	0	0.0550				110	10	
Lithium	<0.0250	0.0500	0	0.00980				0	10	
Magnesium	8.05	1.50	0	7.98				0.840	10	

Sample ID	**1906056-01A PDS**	Batch ID:	**91261**	TestNo:	**SW6020A**	Units:	**mg/L**
SampType:	**PDS**	Run ID:	**ICP-MS5_190611D**	Analysis Date:	**6/11/2019 3:39:00 PM**	Prep Date:	**6/10/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	4.99	0.100	5.00	0.0550	98.7	80	120			
Lithium	0.215	0.0100	0.200	0.00980	103	80	120			
Magnesium	12.3	0.300	5.00	7.98	87.2	80	120			

Sample ID	**1906056-01A MS**	Batch ID:	**91261**	TestNo:	**SW6020A**	Units:	**mg/L**
SampType:	**MS**	Run ID:	**ICP-MS5_190611D**	Analysis Date:	**6/11/2019 3:41:00 PM**	Prep Date:	**6/10/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906072
Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_190611D

Sample ID **1906056-01A MS**	Batch ID: **91261**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **MS**	Run ID: **ICP-MS5_190611D**	Analysis Date: **6/11/2019 3:41:00 PM**	Prep Date: **6/10/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	5.06	0.100	5.00	0.0550	100	80	120			
Lithium	0.210	0.0100	0.200	0.00980	100	80	120			
Magnesium	12.9	0.300	5.00	7.98	97.7	80	120			

Sample ID **1906056-01A MSD**	Batch ID: **91261**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **MSD**	Run ID: **ICP-MS5_190611D**	Analysis Date: **6/11/2019 3:43:00 PM**	Prep Date: **6/10/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	5.08	0.100	5.00	0.0550	101	80	120	0.370	15	
Lithium	0.209	0.0100	0.200	0.00980	99.7	80	120	0.400	15	
Magnesium	13.0	0.300	5.00	7.98	99.4	80	120	0.654	15	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906072
Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_190611D

Sample ID **ICV-190611**	Batch ID: **R104548**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **ICV**	Run ID: **ICP-MS5_190611D**	Analysis Date: **6/11/2019 10:46:00 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	2.45	0.100	2.50	0	98.2	90	110			
Lithium	0.102	0.0100	0.100	0	102	90	110			
Magnesium	2.39	0.300	2.50	0	95.6	90	110			

Sample ID **LCVL-190611**	Batch ID: **R104548**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **LCVL**	Run ID: **ICP-MS5_190611D**	Analysis Date: **6/11/2019 10:52:00 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	0.0944	0.100	0.100	0	94.4	70	130			
Lithium	0.0101	0.0100	0.0100	0	101	70	130			
Magnesium	0.0959	0.300	0.100	0	95.9	70	130			

Sample ID **CCV3-190611**	Batch ID: **R104548**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS5_190611D**	Analysis Date: **6/11/2019 2:53:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	4.97	0.100	5.00	0	99.4	90	110			
Lithium	0.204	0.0100	0.200	0	102	90	110			
Magnesium	4.96	0.300	5.00	0	99.2	90	110			

Sample ID **LCVL3-190611**	Batch ID: **R104548**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **LCVL**	Run ID: **ICP-MS5_190611D**	Analysis Date: **6/11/2019 2:57:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	0.0963	0.100	0.100	0	96.3	70	130			
Lithium	0.0104	0.0100	0.0100	0	104	70	130			
Magnesium	0.0942	0.300	0.100	0	94.2	70	130			

Sample ID **CCV4-190611**	Batch ID: **R104548**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS5_190611D**	Analysis Date: **6/11/2019 3:48:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	4.93	0.100	5.00	0	98.6	90	110			
Lithium	0.202	0.0100	0.200	0	101	90	110			
Magnesium	4.99	0.300	5.00	0	99.7	90	110			

Sample ID **LCVL4-190611**	Batch ID: **R104548**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **LCVL**	Run ID: **ICP-MS5_190611D**	Analysis Date: **6/11/2019 3:59:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	0.0969	0.100	0.100	0	96.9	70	130			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906072
Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_190611D

Sample ID **LCVL4-190611**	Batch ID: **R104548**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **LCVL**	Run ID: **ICP-MS5_190611D**	Analysis Date: **6/11/2019 3:59:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lithium	0.0106	0.0100	0.0100	0	106	70	130			
Magnesium	0.100	0.300	0.100	0	100	70	130			

Sample ID **CCV5-190611**	Batch ID: **R104548**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS5_190611D**	Analysis Date: **6/11/2019 4:21:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	4.87	0.100	5.00	0	97.5	90	110			
Lithium	0.204	0.0100	0.200	0	102	90	110			
Magnesium	5.01	0.300	5.00	0	100	90	110			

Sample ID **LCVL5-190611**	Batch ID: **R104548**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **LCVL**	Run ID: **ICP-MS5_190611D**	Analysis Date: **6/11/2019 4:26:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	0.0924	0.100	0.100	0	92.4	70	130			
Lithium	0.0101	0.0100	0.0100	0	101	70	130			
Magnesium	0.100	0.300	0.100	0	100	70	130			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906072
Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_190607A

The QC data in batch 91226 applies to the following samples: 1906072-01C, 1906072-02C

Sample ID	**MB-91226**	Batch ID:	**91226**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**MBLK**	Run ID:	**IC2_190607A**	Analysis Date:	**6/7/2019 10:25:46 AM**	Prep Date:	**6/7/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	<0.100	0.400								
Nitrate-N	<0.100	0.500								

Sample ID	**LCS-91226**	Batch ID:	**91226**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**LCS**	Run ID:	**IC2_190607A**	Analysis Date:	**6/7/2019 10:41:46 AM**	Prep Date:	**6/7/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	4.06	0.400	4.000	0	101	90	110			
Nitrate-N	5.17	0.500	5.000	0	103	90	110			

Sample ID	**LCSD-91226**	Batch ID:	**91226**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**LCSD**	Run ID:	**IC2_190607A**	Analysis Date:	**6/7/2019 10:57:46 AM**	Prep Date:	**6/7/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	4.07	0.400	4.000	0	102	90	110	0.405	20	
Nitrate-N	5.11	0.500	5.000	0	102	90	110	1.10	20	

Sample ID	**1906064-01EMS**	Batch ID:	**91226**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**MS**	Run ID:	**IC2_190607A**	Analysis Date:	**6/7/2019 12:01:26 PM**	Prep Date:	**6/7/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	21.2	0.400	20.00	0.1842	105	90	110			
Nitrate-N	4.75	0.500	4.516	0.1911	101	90	110			

Sample ID	**1906064-01EMSD**	Batch ID:	**91226**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**MSD**	Run ID:	**IC2_190607A**	Analysis Date:	**6/7/2019 12:17:26 PM**	Prep Date:	**6/7/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	21.2	0.400	20.00	0.1842	105	90	110	0.188	20	
Nitrate-N	4.75	0.500	4.516	0.1911	101	90	110	0.115	20	

Sample ID	**1906066-01DMS**	Batch ID:	**91226**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**MS**	Run ID:	**IC2_190607A**	Analysis Date:	**6/7/2019 1:46:15 PM**	Prep Date:	**6/7/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	2110	40.0	2000	0	106	90	110			
Nitrate-N	456	50.0	451.6	0	101	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906072
Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_190607A

Sample ID **1906066-01DMSD**	Batch ID: **91226**	TestNo: **E300**	Units: **mg/L**		
SampType: **MSD**	Run ID: **IC2_190607A**	Analysis Date: **6/7/2019 2:02:15 PM**	Prep Date: **6/7/2019**		

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	2110	40.0	2000	0	105	90	110	0.071	20	
Nitrate-N	455	50.0	451.6	0	101	90	110	0.150	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906072
Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_190607A

Sample ID **ICV-190607**	Batch ID: **R104496**	TestNo: **E300**	Units: **mg/L**
SampType: **ICV**	Run ID: **IC2_190607A**	Analysis Date: **6/7/2019 9:53:47 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	10.4	0.400	10.00	0	104	90	110			
Nitrate-N	13.2	0.500	12.50	0	106	90	110			

Sample ID **CCV1-190607**	Batch ID: **R104496**	TestNo: **E300**	Units: **mg/L**
SampType: **CCV**	Run ID: **IC2_190607A**	Analysis Date: **6/7/2019 3:38:14 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	4.14	0.400	4.000	0	104	90	110			
Nitrate-N	5.23	0.500	5.000	0	105	90	110			

Sample ID **CCV2-190607**	Batch ID: **R104496**	TestNo: **E300**	Units: **mg/L**
SampType: **CCV**	Run ID: **IC2_190607A**	Analysis Date: **6/7/2019 6:18:14 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	4.16	0.400	4.000	0	104	90	110			
Nitrate-N	5.17	0.500	5.000	0	103	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906072
Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_190617A

The QC data in batch 91349 applies to the following samples: 1906072-01C, 1906072-02C

Sample ID	**MB-91349**	Batch ID:	**91349**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**MBLK**	Run ID:	**IC2_190617A**	Analysis Date:	**6/17/2019 9:53:33 AM**	Prep Date:	**6/17/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	<0.300	1.00								
Sulfate	<1.00	3.00								

Sample ID	**LCS-91349**	Batch ID:	**91349**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**LCS**	Run ID:	**IC2_190617A**	Analysis Date:	**6/17/2019 10:09:33 AM**	Prep Date:	**6/17/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.0	1.00	10.00	0	100	90	110			
Sulfate	30.4	3.00	30.00	0	101	90	110			

Sample ID	**LCSD-91349**	Batch ID:	**91349**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**LCSD**	Run ID:	**IC2_190617A**	Analysis Date:	**6/17/2019 10:25:33 AM**	Prep Date:	**6/17/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.2	1.00	10.00	0	102	90	110	1.27	20	
Sulfate	30.8	3.00	30.00	0	103	90	110	1.19	20	

Sample ID	**1906072-01CMS**	Batch ID:	**91349**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**MS**	Run ID:	**IC2_190617A**	Analysis Date:	**6/17/2019 11:12:11 AM**	Prep Date:	**6/17/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	284	10.0	200.0	74.78	105	90	110			
Sulfate	219	30.0	200.0	15.57	102	90	110			

Sample ID	**1906072-01CMSD**	Batch ID:	**91349**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**MSD**	Run ID:	**IC2_190617A**	Analysis Date:	**6/17/2019 11:28:11 AM**	Prep Date:	**6/17/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	287	10.0	200.0	74.78	106	90	110	0.914	20	
Sulfate	222	30.0	200.0	15.57	103	90	110	1.08	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906072
Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_190617A

Sample ID **ICV-190615**	Batch ID: **R104618**	TestNo: **E300**	Units: **mg/L**
SampType: **ICV**	Run ID: **IC2_190617A**	Analysis Date: **6/17/2019 9:21:33 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	25.5	1.00	25.00	0	102	90	110			
Sulfate	77.0	3.00	75.00	0	103	90	110			

Sample ID **CCV1-190617**	Batch ID: **R104618**	TestNo: **E300**	Units: **mg/L**
SampType: **CCV**	Run ID: **IC2_190617A**	Analysis Date: **6/17/2019 1:20:11 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.2	1.00	10.00	0	102	90	110			
Sulfate	30.8	3.00	30.00	0	103	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906072
Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: TITRATOR_190610A

The QC data in batch 91271 applies to the following samples: 1906072-01C, 1906072-02C

Sample ID **MB-91271** Batch ID: **91271** TestNo: **M2320 B** Units: **mg/L @ pH 4.27**
SampType: **MBLK** Run ID: **TITRATOR_190610A** Analysis Date: **6/10/2019 10:17:00 AM** Prep Date: **6/10/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	<10.0	20.0								
Alkalinity, Carbonate (As CaCO3)	<10.0	20.0								
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0								
Alkalinity, Total (As CaCO3)	<20.0	20.0								

Sample ID **LCS-91271** Batch ID: **91271** TestNo: **M2320 B** Units: **mg/L @ pH 4.39**
SampType: **LCS** Run ID: **TITRATOR_190610A** Analysis Date: **6/10/2019 10:22:00 AM** Prep Date: **6/10/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	49.8	20.0	50.00	0	99.5	74	129			

Sample ID **1906073-02C DUP** Batch ID: **91271** TestNo: **M2320 B** Units: **mg/L @ pH 4.54**
SampType: **DUP** Run ID: **TITRATOR_190610A** Analysis Date: **6/10/2019 1:11:00 PM** Prep Date: **6/10/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	66.8	20.0	0	68.00				1.78	20	
Alkalinity, Carbonate (As CaCO3)	<10.0	20.0	0	0				0	20	
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0	0				0	20	
Alkalinity, Total (As CaCO3)	66.8	20.0	0	68.00				1.78	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906072
Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: TITRATOR_190610A

Sample ID **ICV-190610**	Batch ID: **R104513**	TestNo: **M2320 B**	Units: **mg/L @ pH 4.29**
SampType: **ICV**	Run ID: **TITRATOR_190610A**	Analysis Date: **6/10/2019 10:15:00 AM**	Prep Date: **6/10/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	4.00	20.0	0							
Alkalinity, Carbonate (As CaCO3)	96.2	20.0	0							
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0							
Alkalinity, Total (As CaCO3)	100	20.0	100.0	0	100	98	102			

Sample ID **CCV1-190610**	Batch ID: **R104513**	TestNo: **M2320 B**	Units: **mg/L @ pH 4.22**
SampType: **CCV**	Run ID: **TITRATOR_190610A**	Analysis Date: **6/10/2019 1:08:00 PM**	Prep Date: **6/10/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	27.7	20.0	0							
Alkalinity, Carbonate (As CaCO3)	74.1	20.0	0							
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0							
Alkalinity, Total (As CaCO3)	102	20.0	100.0	0	102	90	110			

Sample ID **CCV2-190610**	Batch ID: **R104513**	TestNo: **M2320 B**	Units: **mg/L @ pH 4.21**
SampType: **CCV**	Run ID: **TITRATOR_190610A**	Analysis Date: **6/10/2019 1:16:00 PM**	Prep Date: **6/10/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	26.1	20.0	0							
Alkalinity, Carbonate (As CaCO3)	73.8	20.0	0							
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0							
Alkalinity, Total (As CaCO3)	99.8	20.0	100.0	0	99.8	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906072
Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: UV/VIS_2_190607B

The QC data in batch 91254 applies to the following samples: 1906072-01C, 1906072-02C

Sample ID **MB-91254**	Batch ID: **91254**			TestNo: **M4500-P E**				Units: **mg/L**			
SampType: **MBLK**	Run ID: **UV/VIS_2_190607B**			Analysis Date: **6/7/2019 1:50:00 PM**				Prep Date: **6/7/2019**			
Analyte		Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total Orthophosphate (As		<0.0300	0.100								

Sample ID **LCS-91254**	Batch ID: **91254**			TestNo: **M4500-P E**				Units: **mg/L**			
SampType: **LCS**	Run ID: **UV/VIS_2_190607B**			Analysis Date: **6/7/2019 1:50:00 PM**				Prep Date: **6/7/2019**			
Analyte		Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total Orthophosphate (As		0.509	0.100	0.5000	0	102	80	120			

Sample ID **LCSD-91254**	Batch ID: **91254**			TestNo: **M4500-P E**				Units: **mg/L**			
SampType: **LCSD**	Run ID: **UV/VIS_2_190607B**			Analysis Date: **6/7/2019 1:50:00 PM**				Prep Date: **6/7/2019**			
Analyte		Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total Orthophosphate (As		0.507	0.100	0.5000	0	101	80	120	0.394	15	

Sample ID **1906073-02CMS**	Batch ID: **91254**			TestNo: **M4500-P E**				Units: **mg/L**			
SampType: **MS**	Run ID: **UV/VIS_2_190607B**			Analysis Date: **6/7/2019 1:53:00 PM**				Prep Date: **6/7/2019**			
Analyte		Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total Orthophosphate (As		0.517	0.100	0.5000	0	103	80	120			

Sample ID **1906073-02CMSD**	Batch ID: **91254**			TestNo: **M4500-P E**				Units: **mg/L**			
SampType: **MSD**	Run ID: **UV/VIS_2_190607B**			Analysis Date: **6/7/2019 1:53:00 PM**				Prep Date: **6/7/2019**			
Analyte		Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total Orthophosphate (As		0.518	0.100	0.5000	0	104	80	120	0.193	15	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906072
Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: UV/VIS_2_190607B

Sample ID **ICV-190607**	Batch ID: **R104504**	TestNo: **M4500-P E**	Units: **mg/L**
SampType: **ICV**	Run ID: **UV/VIS_2_190607B**	Analysis Date: **6/7/2019 1:49:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total Orthophosphate (As	0.203	0.100	0.2000	0	102	85	115			

Sample ID **CCV1-190607**	Batch ID: **R104504**	TestNo: **M4500-P E**	Units: **mg/L**
SampType: **CCV**	Run ID: **UV/VIS_2_190607B**	Analysis Date: **6/7/2019 1:53:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total Orthophosphate (As	0.566	0.100	0.5000	0	113	85	115			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906072
Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: UV/VIS_2_190610A

The QC data in batch 91267 applies to the following samples: 1906072-01A, 1906072-02A

Sample ID	**MB-91267**	Batch ID:	**91267**	TestNo:	**M3500-Fe D**	Units:	**mg/L**
SampType:	**MBLK**	Run ID:	**UV/VIS_2_190610A**	Analysis Date:	**6/10/2019 10:55:00 AM**	Prep Date:	**6/10/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	<0.0500	0.100								N

Sample ID	**LCS-91267**	Batch ID:	**91267**	TestNo:	**M3500-Fe D**	Units:	**mg/L**
SampType:	**LCS**	Run ID:	**UV/VIS_2_190610A**	Analysis Date:	**6/10/2019 10:57:00 AM**	Prep Date:	**6/10/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.110	0.100	0.1000	0	110	85	115			N

Sample ID	**LCSD-91267**	Batch ID:	**91267**	TestNo:	**M3500-Fe D**	Units:	**mg/L**
SampType:	**LCSD**	Run ID:	**UV/VIS_2_190610A**	Analysis Date:	**6/10/2019 10:57:00 AM**	Prep Date:	**6/10/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.110	0.100	0.1000	0	110	85	115	0.609	15	N

Sample ID	**1906073-02AMS**	Batch ID:	**91267**	TestNo:	**M3500-Fe D**	Units:	**mg/L**
SampType:	**MS**	Run ID:	**UV/VIS_2_190610A**	Analysis Date:	**6/10/2019 11:05:00 AM**	Prep Date:	**6/10/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.107	0.100	0.1000	0	107	85	115			N

Sample ID	**1906073-02AMSD**	Batch ID:	**91267**	TestNo:	**M3500-Fe D**	Units:	**mg/L**
SampType:	**MSD**	Run ID:	**UV/VIS_2_190610A**	Analysis Date:	**6/10/2019 11:05:00 AM**	Prep Date:	**6/10/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.102	0.100	0.1000	0	102	85	115	4.86	15	N

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906072
Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: UV/VIS_2_190610A

Sample ID **ICV-190610**	Batch ID: **R104507**	TestNo: **M3500-Fe D**	Units: **mg/L**
SampType: **ICV**	Run ID: **UV/VIS_2_190610A**	Analysis Date: **6/10/2019 10:51:00 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.0908	0.100	0.1000	0	90.8	85	115			N

Sample ID **CCV1-190610**	Batch ID: **R104507**	TestNo: **M3500-Fe D**	Units: **mg/L**
SampType: **CCV**	Run ID: **UV/VIS_2_190610A**	Analysis Date: **6/10/2019 11:01:00 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.223	0.100	0.2000	0	112	85	115			N

Sample ID **CCV2-190610**	Batch ID: **R104507**	TestNo: **M3500-Fe D**	Units: **mg/L**
SampType: **CCV**	Run ID: **UV/VIS_2_190610A**	Analysis Date: **6/10/2019 11:06:00 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.204	0.100	0.2000	0	102	85	115			N

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906072
Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: WC_190614B

The QC data in batch 91332 applies to the following samples: 1906072-01C, 1906072-02C

Sample ID	**MB-91332**	Batch ID:	**91332**	TestNo:	**M2540C**	Units:	**mg/L**
SampType:	**MBLK**	Run ID:	**WC_190614B**	Analysis Date:	**6/14/2019 12:00:00 PM**	Prep Date:	**6/13/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	<10.0	10.0								

Sample ID	**LCS-91332**	Batch ID:	**91332**	TestNo:	**M2540C**	Units:	**mg/L**
SampType:	**LCS**	Run ID:	**WC_190614B**	Analysis Date:	**6/14/2019 12:00:00 PM**	Prep Date:	**6/13/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	762	10.0	745.6	0	102	90	113			

Sample ID	**1906109-02B-DUP**	Batch ID:	**91332**	TestNo:	**M2540C**	Units:	**mg/L**
SampType:	**DUP**	Run ID:	**WC_190614B**	Analysis Date:	**6/14/2019 12:00:00 PM**	Prep Date:	**6/13/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	1800	50.0	0	1825				1.38	5	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

September 25, 2019

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FAX (512) 671-3446

Order No.: 1908215

RE: Luminant-OGSES FGD Ponds

Dear Will Vienne:

DHL Analytical, Inc. received 12 sample(s) on 8/21/2019 for the analyses presented in the following report.

There were no problems with the analyses and all data met requirements of NELAP except where noted in the Case Narrative. All non-NELAP methods will be identified accordingly in the case narrative and all estimated uncertainties of test results are within method or EPA specifications.

If you have any questions regarding these tests results, please feel free to call. Thank you for using DHL Analytical.

Sincerely,

John DuPont
General Manager

This report was performed under the accreditation of the State of Texas Laboratory Certification Number: T104704211-19-24

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DHL ANALYTICAL
2300 Double Creek Dr. ■ Round Rock, TX 78664
Phone (512) 388-8222 ■ FAX (512) 388-8229
Web: www.dhlanalytical.com
E-Mail: login@dhlanalytical.com

№ 85731

CHAIN-OF-CUSTODY

CLIENT: GOLDER
ADDRESS: 2201 DOUBLE CREEK DR ROUND ROCK, TX 78664
PHONE: 512-671-3434 FAX/E-MAIL:
DATA REPORTED TO: WILL VIENNE
ADDITIONAL REPORT COPIES TO:

DATE: 8-20-19 PAGE 1 OF 1
PO #: 1912262-F DHL WORK ORDER #: 1908215
PROJECT LOCATION OR NAME: LUMINANT - OGSES FGD PONDS
CLENT PROJECT #: 19122262-F COLLECTOR: J BEAUDOIN

Authorize 5% surcharge for TRRP Report? ☐ Yes ☐ No

S=SOIL W=WATER A=AIR L=LIQUID SE=SEDIMENT P=PAINT SL=SLUDGE O=OTHER SO=SOLID

PRESERVATION: HCl | HNO_3 | H_2SO_4 ☐ NaOH ☐ | ICE | UNPRESERVED

ANALYSES: BTEX ☐ MTBE ☐ [METHOD 8021] | TPH 1005 ☐ TPH 1006 ☐ HOLD 1006 ☐ | GRO [METHOD 8015] ☐ DRO [METHOD 8105] ☐ | VOC 8260 ☐ VOC 624 ☐ VOC 8260/5035 ☐ | SVOC 8270 ☐ PAH 8270 ☐ HOLD PAH ☐ SVOC 625 ☐ | 8270 PEST ☐ 625 PEST/PCB ☐ 608 PCB ☐ | 8270 O-P PEST ☐ 8082 PCB ☐ 8270 PCB ☐ | 8321 HERB ☐ T PHOS, AMMONIA ☐ | METALS 6020 ☐ METALS 200.8 ☐ DISS. METALS ☐ | RCRA ☐ TX11 ☐ ☐ | PH ☐ HEX CHROM ☐ ALKALINITY ☐ COD ☐ | CHLORIDE ☐ ANIONS ☐ | TCLP-SVOC ☐ VOC ☐ PEST ☐ HERB ☐ | TCLP-METALS ☐ RCRA 8 ☐ TX-11 ☐ Pb ☐ | RCI ☐ FLASHPOINT ☐ DGAS ☐ | TDS ☐ TSS ☐ % MOISTURE ☐ CYANIDE ☐ | APPENDIX III & IV

Field Sample I.D.	DHL Lab #	Date	Time	Matrix	Container Type	# of Containers	HCl	HNO_3	H_2SO_4 ☐ NaOH ☐	ICE	UNPRESERVED	ANALYSES	FIELD NOTES
FGD-6	01	8-19-19	0735	W	P	4						X	
FGD-3	02		0825	W	P	4						X	
FGD-2	03		0915	W	P	4						X	
FGD-5	04		1000	W	P	4						X	
DUP-1	05		1000	W	P	4						X	
FGD-8	06		1100	W	P	4						X	
FGD-1	07		1205	W	P	4						X	
FGD-14	08		1315	W	P	4						X	
FGD-4	09		1415	W	P	4						X	
FGD-11	10		1520	W	P	4						X	
FGD-12	11		1625	W	P	4						X	
FGD-15	12		1730	W	P	4						X	

RELINQUISHED BY: (Signature) DATE/TIME 8-20-19 1945 RECEIVED BY: (Signature) FEDEX
RELINQUISHED BY: (Signature) FEDEX DATE/TIME 8/21/19 9:19 RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

☐ DHL DISPOSAL @ $5.00 each ☐ Return

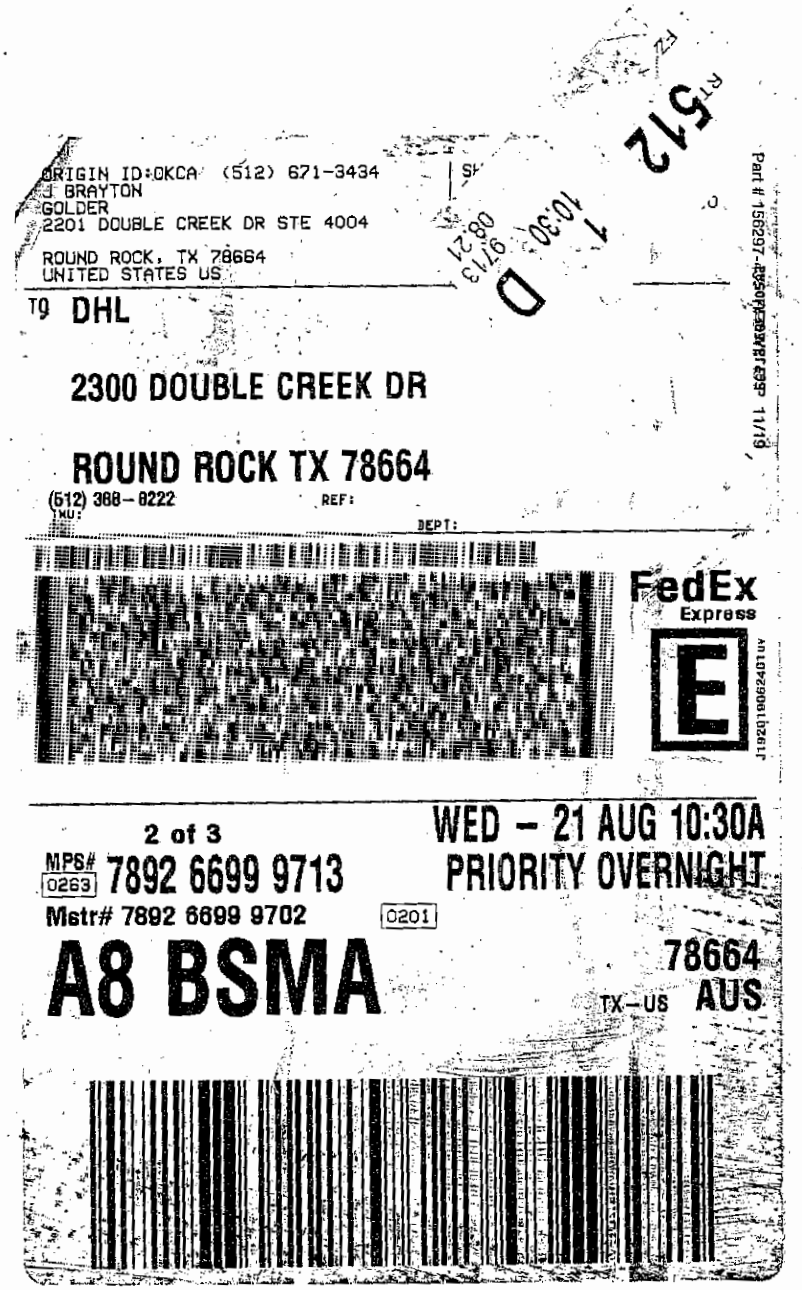
3

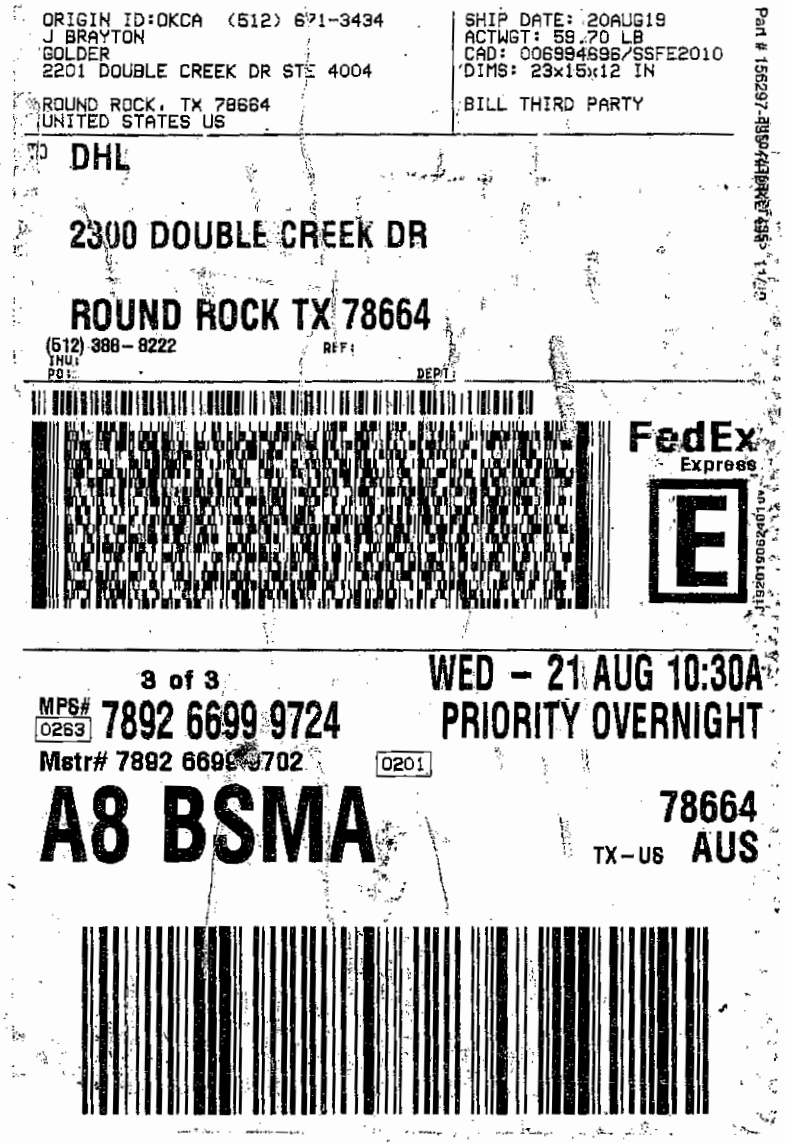
TURN AROUND TIME
RUSH ☐ CALL FIRST
1 DAY ☐ CALL FIRST
2 DAY ☐
NORMAL ☒
OTHER ☐ _____

LABORATORY USE ONLY:
RECEIVING TEMP: 2.2/1.0/3.2.2 THERM #: 78
CUSTODY SEALS: ☐ BROKEN ☐ INTACT ☒ NOT USED
CARRIER: ☐ LONE STAR ☒ FEDEX ☐ UPS ☐ OTHER
☐ COURIER DELIVERY
☐ HAND DELIVERED

DHL COC Rev 1 | FEB 2010


ORIGIN ID:OKCA (512) 671-3434
J BRAYTON
GOLDER
2201 DOUBLE CREEK DR STE 4004
ROUND ROCK, TX 78664
UNITED STATES US
SHIP DATE: 20AUG19
ACTWGT: 60.00 LB
CAD: 006994696/SSFE2010
DIMS: 29x15x12 IN
BILL THIRD PARTY
TO DHL
2300 DOUBLE CREEK DR
ROUND ROCK TX 78664
(512) 388-8222
REF:
DEPT:
FedEx
Express
1 of 3
TRK# 7892 6699 9702
0201
WED - 21 AUG 10:30A
PRIORITY OVERNIGHT
MASTER
A8 BSMA
78664
TX-US AUS


ORIGIN ID:OKCA (512) 671-3434
J BRAYTON
GOLDER
2201 DOUBLE CREEK DR STE 4004
ROUND ROCK, TX 78664
UNITED STATES US
SH
512
08.21
10:30
TO DHL
2300 DOUBLE CREEK DR
ROUND ROCK TX 78664
(512) 388-8222
REF:
DEPT:
FedEx
Express
2 of 3
MPS# 0283 7892 6699 9713
Mstr# 7892 6699 9702
0201
WED - 21 AUG 10:30A
PRIORITY OVERNIGHT
A8 BSMA
78664
TX-US
AUS



ORIGIN ID:OKCA (512) 671-3434
J BRAYTON
GOLDER
2201 DOUBLE CREEK DR STE 4004

ROUND ROCK, TX 78664
UNITED STATES US

SHIP DATE: 20AUG19
ACTWGT: 59.70 LB
CAD: 006994696/SSFE2010
DIMS: 23x15x12 IN

BILL THIRD PARTY

TO DHL

2300 DOUBLE CREEK DR

ROUND ROCK TX 78664

(512) 388-8222 REF:

INV:
PO: DEPT:

FedEx Express

3 of 3

MPS# 0263 7892 6699 9724

Mstr# 7892 6699 9702 0201

WED - 21 AUG 10:30A
PRIORITY OVERNIGHT

A8 BSMA

78664
TX-US AUS

Part # 156297-2850 RMA 1/19

DHL Analytical, Inc.

Sample Receipt Checklist

Client Name Golder

Date Received: 8/21/2019

Work Order Number 1908215

Received by JW

Checklist completed by: _____ 8/21/2019
Signature Date

Reviewed by PL 8/21/2019
Initials Date

Carrier name FedEx 1day

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shippping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	2.2 °C
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH<2 acceptable upon receipt?	Yes ☑	No ☐	NA ☐ LOT # 13171
	Adjusted? no		Checked by CC
Water - ph>9 (S) or ph>10 (CN) acceptable upon receipt?	Yes ☐	No ☐	NA ☑ LOT #
	Adjusted?		Checked by

Any No response must be detailed in the comments section below.

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments: _____

Corrective Action _____

Page 1 of 1

Laboratory Name: DHL Analytical, Inc.

Laboratory Review Checklist: Reportable Data

Project Name: Luminant-OGSES FGD Ponds	**LRC Date:** 9/25/19
Reviewer Name: Carlos Castro	**Laboratory Work Order:** 1908215
Prep Batch Number(s): See Prep Dates Report	**Run Batch:** See Analytical Dates Report

#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
		Chain-of-Custody (C-O-C)					
R1	OI	**1)** Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	**X**				**R1-01**
		2) Were all departures from standard conditions described in an exception report?			**X**		
R2	OI	**Sample and Quality Control (QC) Identification**					
		1) Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	**X**				
		2) Are all laboratory ID numbers cross-referenced to the corresponding QC data?	**X**				
R3	OI	**Test Reports**					
		1) Were all samples prepared and analyzed within holding times?	**X**				
		2) Other than those results < MQL, were all other raw values bracketed by calibration standards?	**X**				
		3) Were calculations checked by a peer or supervisor?	**X**				
		4) Were all analyte identifications checked by a peer or supervisor?	**X**				
		5) Were sample detection limits reported for all analytes not detected?	**X**				
		6) Were all results for soil and sediment samples reported on a dry weight basis?			**X**		
		7) Were % moisture (or solids) reported for all soil and sediment samples?			**X**		
		8) Were bulk soils/solids samples for volatile analysis extracted with methanol per EPA Method 5035?			**X**		
		9) If required for the project, TICs reported?			**X**		
R4	O	**Surrogate Recovery Data**					
		1) Were surrogates added prior to extraction?			**X**		
		2) Were surrogate percent recoveries in all samples within the laboratory QC limits?			**X**		
R5	OI	**Test Reports/Summary Forms for Blank Samples**					
		1) Were appropriate type(s) of blanks analyzed?	**X**				
		2) Were blanks analyzed at the appropriate frequency?	**X**				
		3) Where method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	**X**				
		4) Were blank concentrations < MDL?	**X**				
		5) For analyte(s) detected in a blank sample, was the concentration, unadjusted for sample specific factors, in all associated field samples, **greater** than 10 times the concentration in the blank sample?			**X**		
R6	OI	**Laboratory Control Samples (LCS):**					
		1) Were all COCs included in the LCS?	**X**				
		2) Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	**X**				
		3) Were LCSs analyzed at the required frequency?	**X**				
		4) Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	**X**				
		5) Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	**X**				
		6) Was the LCSD RPD within QC limits (if applicable)?	**X**				
R7	OI	**Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Data**					
		1) Were the project/method specified analytes included in the MS and MSD?	**X**				
		2) Were MS/MSD analyzed at the appropriate frequency?	**X**				
		3) Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		**X**			**R7-03**
		4) Were MS/MSD RPDs within laboratory QC limits?	**X**				
R8	OI	**Analytical Duplicate Data**					
		1) Were appropriate analytical duplicates analyzed for each matrix?			**X**		
		2) Were analytical duplicates analyzed at the appropriate frequency?			**X**		
		3) Were RPDs or relative standard deviations within the laboratory QC limits?			**X**		
R9	OI	**Method Quantitation Limits (MQLs):**					
		1) Are the MQLs for each method analyte included in the laboratory data package?	**X**				
		2) Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	**X**				
		3) Are unadjusted MQLs and DCSs included in the laboratory data package?	**X**				
R10	OI	**Other Problems/Anomalies**					
		1) Are all known problems/anomalies/special conditions noted in this LRC and ER?	**X**				
		2) Was applicable and available technology used to lower the SDL to minimize the matrix interference affects on the sample results?	**X**				
		3) Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	**X**				

Laboratory Name: DHL Analytical, Inc.

Laboratory Review Checklist (continued): Supporting Data

Project Name: Luminant-OGSES FGD Ponds	**LRC Date:** 9/25/19
Reviewer Name: Carlos Castro	**Laboratory Work Order:** 1908215
Prep Batch Number(s): See Prep Dates Report	**Run Batch:** See Analytical Dates Report

#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
S1	OI	**Initial Calibration (ICAL)**					
		1) Were response factors and/or relative response factors for each analyte within QC limits?	**X**				
		2) Were percent RSDs or correlation coefficient criteria met?	**X**				
		3) Was the number of standards recommended in the method used for all analytes?	**X**				
		4) Were all points generated between the lowest and highest standard used to calculate the curve?	**X**				
		5) Are ICAL data available for all instruments used?	**X**				
		6) Has the initial calibration curve been verified using an appropriate second source standard?	**X**				
S2	OI	**Initial and Continuing calibration Verification (ICCV and CCV) and Continuing Calibration blank (CCB):**					
		1) Was the CCV analyzed at the method-required frequency?	**X**				
		2) Were percent differences for each analyte within the method-required QC limits?	**X**				
		3) Was the ICAL curve verified for each analyte?	**X**				
		4) Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	**X**				
S3	O	**Mass Spectral Tuning:**					
		1) Was the appropriate compound for the method used for tuning?	**X**				
		2) Were ion abundance data within the method-required QC limits?	**X**				
S4	O	**Internal Standards (IS):**					
		1) Were IS area counts and retention times within the method-required QC limits?	**X**				
S5	OI	**Raw Data (NELAC Section 5.5.10)**					
		1) Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	**X**				
		2) Were data associated with manual integrations flagged on the raw data?	**X**				
S6	O	**Dual Column Confirmation**					
		1) Did dual column confirmation results meet the method-required QC?			**X**		
S7	O	**Tentatively Identified Compounds (TICs):**					
		1) If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			**X**		
S8	I	**Interference Check Sample (ICS) Results:**					
		1) Were percent recoveries within method QC limits?	**X**				
S9	I	**Serial Dilutions, Post Digestion Spikes, and Method of Standard Additions**					
		1) Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		**X**			**S9-01**
S10	OI	**Method Detection Limit (MDL) Studies**					
		1) Was a MDL study performed for each reported analyte?	**X**				
		2) Is the MDL either adjusted or supported by the analysis of DCSs?	**X**				
S11	OI	**Proficiency Test Reports:**					
		1) Was the lab's performance acceptable on the applicable proficiency tests or evaluation studies?	**X**				
S12	OI	**Standards Documentation**					
		1) Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	**X**				
S13	OI	**Compound/Analyte Identification Procedures**					
		1) Are the procedures for compound/analyte identification documented?	**X**				
S14	OI	**Demonstration of Analyst Competency (DOC)**					
		1) Was DOC conducted consistent with NELAC Chapter 5 – Appendix C?	**X**				
		2) Is documentation of the analyst's competency up-to-date and on file?	**X**				
S15	OI	**Verification/Validation Documentation for Methods** (NELAC Chapter 5)					
		1) Are all the methods used to generate the data documented, verified, and validated, where applicable?	**X**				
S16	OI	**Laboratory Standard Operating Procedures (SOPs):**					
		1) Are laboratory SOPs current and on file for each method performed?	**X**				

1 Items identified by the letter "R" should be included in the laboratory data package submitted to the TCEQ in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
2 O = organic analyses; I = inorganic analyses (and general chemistry, when applicable).
3 NA = Not applicable.
4 NR = Not Reviewed.
5 ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Data Package Signature Page – RG-366/TRRP-13

This data package consists of:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;
R2 Sample identification cross-reference;
R3 Test reports (analytical data sheets) for each environmental sample that includes:
  a) Items consistent with NELAC Chapter 5,
  b) dilution factors,
  c) preparation methods,
  d) cleanup methods, and
  e) if required for the project, tentatively identified compounds (TICs).
R4 Surrogate recovery data including:
  a) Calculated recovery (%R), and
  b) The laboratory's surrogate QC limits.
R5 Test reports/summary forms for blank samples;
R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  a) LCS spiking amounts,
  b) Calculated %R for each analyte, and
  c) The laboratory's LCS QC limits.
R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  a) Samples associated with the MS/MSD clearly identified,
  b) MS/MSD spiking amounts,
  c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
  d) Calculated %Rs and relative percent differences (RPDs), and
  e) The laboratory's MS/MSD QC limits
R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  a) The amount of analyte measured in the duplicate,
  b) The calculated RPD, and
  c) The laboratory's QC limits for analytical duplicates.
R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix;
R10 Other problems or anomalies.

The Exception Report for each "No" or "Not Reviewed (NR)" item in the Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory is not accredited under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge that all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information or data affecting the quality of the data has been knowingly withheld.

This laboratory was last inspected by TCEQ on February 25-28 2019. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Name: John DuPont
Official Title: General Manager



Signature

09/25/19

Date

Name: Dr. Derhsing Luu
Official Title: Technical Director

DHL Analytical, Inc. **Date:** *25-Sep-19*

CLIENT: Golder
Project: Luminant-OGSES FGD Ponds
Lab Order: 1908215

CASE NARRATIVE

Samples were analyzed using the following references:

Method SW6020A - Metals Analysis
Method SW7470A - Mercury Analysis
Method E300 - Anions Analysis
Method M2540C - TDS Analysis

Exception Report R1-01

The samples were received and log-in performed on 8/21/19. A total of 12 samples were received. The samples arrived in good condition and were properly packaged.

Exception Report R7-03

For Metals analysis performed on 8/27/19 the matrix spike and matrix spike duplicate recoveries were out of control limits for Calcium. These are flagged accordingly in the QC summary report. The sample selected for the matrix spike and matrix spike duplicate was from this work order. The LCS was within control limits for this analyte. No further corrective actions were taken.

For Anions analysis performed on 8/23/19 (batch 92504) the matrix spike and matrix spike duplicate recoveries (1908250-05 MS/MSD) were slightly below control limits for Chloride. These are flagged accordingly. The sample selected for the matrix spike and matrix spike duplicate was not from this work order. The LCS was within control limits for this analyte. No further corrective actions were taken.

Exception Report S9-01

For Metals analysis performed on 8/27/19 the RPD of the serial dilution was above control limits for Boron. This is flagged accordingly in the QC summary report. The PDS was within control limits for this analyte. No further corrective actions were taken.

DHL Analytical, Inc.

Date: *25-Sep-19*

CLIENT: Golder
Project: Luminant-OGSES FGD Ponds
Lab Order: 1908215

Work Order Sample Summary

Lab Smp ID	Client Sample ID	Tag Number	Date Collected	Date Recved
1908215-01	FGD-6		08/19/19 07:35 AM	8/21/2019
1908215-02	FGD-3		08/19/19 08:25 AM	8/21/2019
1908215-03	FGD-2		08/19/19 09:15 AM	8/21/2019
1908215-04	FGD-5		08/19/19 10:00 AM	8/21/2019
1908215-05	DUP-1		08/19/19 10:00 AM	8/21/2019
1908215-06	FGD-8		08/19/19 11:00 AM	8/21/2019
1908215-07	FGD-1		08/19/19 12:05 PM	8/21/2019
1908215-08	FGD-14		08/19/19 01:15 PM	8/21/2019
1908215-09	FGD-4		08/19/19 02:15 PM	8/21/2019
1908215-10	FGD-11		08/19/19 03:20 PM	8/21/2019
1908215-11	FGD-12		08/19/19 04:25 PM	8/21/2019
1908215-12	FGD-15		08/19/19 05:30 PM	8/21/2019

Lab Order: 1908215
Client: Golder
Project: Luminant-OGSES FGD Ponds

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
1908215-01A	FGD-6	08/19/19 07:35 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	FGD-6	08/19/19 07:35 AM	Aqueous	SW7470A	Mercury Aq Prep	08/22/19 11:17 AM	92489
1908215-01B	FGD-6	08/19/19 07:35 AM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-6	08/19/19 07:35 AM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-6	08/19/19 07:35 AM	Aqueous	M2540C	TDS Preparation	08/22/19 01:31 PM	92494
1908215-02A	FGD-3	08/19/19 08:25 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	FGD-3	08/19/19 08:25 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	FGD-3	08/19/19 08:25 AM	Aqueous	SW7470A	Mercury Aq Prep	08/22/19 11:17 AM	92489
1908215-02B	FGD-3	08/19/19 08:25 AM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-3	08/19/19 08:25 AM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-3	08/19/19 08:25 AM	Aqueous	M2540C	TDS Preparation	08/22/19 01:31 PM	92494
1908215-03A	FGD-2	08/19/19 09:15 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	FGD-2	08/19/19 09:15 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	FGD-2	08/19/19 09:15 AM	Aqueous	SW7470A	Mercury Aq Prep	08/22/19 11:17 AM	92489
1908215-03B	FGD-2	08/19/19 09:15 AM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-2	08/19/19 09:15 AM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-2	08/19/19 09:15 AM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-2	08/19/19 09:15 AM	Aqueous	M2540C	TDS Preparation	08/22/19 01:31 PM	92494
1908215-04A	FGD-5	08/19/19 10:00 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	FGD-5	08/19/19 10:00 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	FGD-5	08/19/19 10:00 AM	Aqueous	SW7470A	Mercury Aq Prep	08/22/19 11:17 AM	92489
1908215-04B	FGD-5	08/19/19 10:00 AM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-5	08/19/19 10:00 AM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-5	08/19/19 10:00 AM	Aqueous	M2540C	TDS Preparation	08/22/19 01:31 PM	92494
1908215-05A	DUP-1	08/19/19 10:00 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	DUP-1	08/19/19 10:00 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	DUP-1	08/19/19 10:00 AM	Aqueous	SW7470A	Mercury Aq Prep	08/22/19 11:17 AM	92489
1908215-05B	DUP-1	08/19/19 10:00 AM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485

Lab Order: 1908215
Client: Golder
Project: Luminant-OGSES FGD Ponds

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
1908215-05B	DUP-1	08/19/19 10:00 AM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	DUP-1	08/19/19 10:00 AM	Aqueous	M2540C	TDS Preparation	08/22/19 01:31 PM	92494
1908215-06A	FGD-8	08/19/19 11:00 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	FGD-8	08/19/19 11:00 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	FGD-8	08/19/19 11:00 AM	Aqueous	SW7470A	Mercury Aq Prep	08/22/19 11:17 AM	92489
1908215-06B	FGD-8	08/19/19 11:00 AM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-8	08/19/19 11:00 AM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-8	08/19/19 11:00 AM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-8	08/19/19 11:00 AM	Aqueous	M2540C	TDS Preparation	08/22/19 01:31 PM	92494
1908215-07A	FGD-1	08/19/19 12:05 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	FGD-1	08/19/19 12:05 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	FGD-1	08/19/19 12:05 PM	Aqueous	SW7470A	Mercury Aq Prep	08/22/19 11:17 AM	92489
1908215-07B	FGD-1	08/19/19 12:05 PM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-1	08/19/19 12:05 PM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-1	08/19/19 12:05 PM	Aqueous	M2540C	TDS Preparation	08/22/19 01:31 PM	92494
1908215-08A	FGD-14	08/19/19 01:15 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	FGD-14	08/19/19 01:15 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	FGD-14	08/19/19 01:15 PM	Aqueous	SW7470A	Mercury Aq Prep	08/22/19 11:17 AM	92489
1908215-08B	FGD-14	08/19/19 01:15 PM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-14	08/19/19 01:15 PM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-14	08/19/19 01:15 PM	Aqueous	M2540C	TDS Preparation	08/22/19 01:31 PM	92494
1908215-09A	FGD-4	08/19/19 02:15 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	FGD-4	08/19/19 02:15 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	FGD-4	08/19/19 02:15 PM	Aqueous	SW7470A	Mercury Aq Prep	08/22/19 11:17 AM	92489
1908215-09B	FGD-4	08/19/19 02:15 PM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-4	08/19/19 02:15 PM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-4	08/19/19 02:15 PM	Aqueous	M2540C	TDS Preparation	08/22/19 01:31 PM	92494
1908215-10A	FGD-11	08/19/19 03:20 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519

Lab Order: 1908215
Client: Golder
Project: Luminant-OGSES FGD Ponds

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
1908215-10A	FGD-11	08/19/19 03:20 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	FGD-11	08/19/19 03:20 PM	Aqueous	SW7470A	Mercury Aq Prep	08/22/19 11:17 AM	92489
1908215-10B	FGD-11	08/19/19 03:20 PM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-11	08/19/19 03:20 PM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-11	08/19/19 03:20 PM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-11	08/19/19 03:20 PM	Aqueous	M2540C	TDS Preparation	08/22/19 01:31 PM	92494
1908215-11A	FGD-12	08/19/19 04:25 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	FGD-12	08/19/19 04:25 PM	Aqueous	SW7470A	Mercury Aq Prep	08/22/19 11:17 AM	92489
1908215-11B	FGD-12	08/19/19 04:25 PM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-12	08/19/19 04:25 PM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-12	08/19/19 04:25 PM	Aqueous	M2540C	TDS Preparation	08/22/19 01:31 PM	92494
1908215-12A	FGD-15	08/19/19 05:30 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	FGD-15	08/19/19 05:30 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	FGD-15	08/19/19 05:30 PM	Aqueous	SW7470A	Mercury Aq Prep	08/22/19 11:17 AM	92489
1908215-12B	FGD-15	08/19/19 05:30 PM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-15	08/19/19 05:30 PM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-15	08/19/19 05:30 PM	Aqueous	E300	Anion Preparation	08/23/19 09:53 AM	92504
	FGD-15	08/19/19 05:30 PM	Aqueous	M2540C	TDS Preparation	08/22/19 01:31 PM	92494

Lab Order: 1908215
Client: Golder
Project: Luminant-OGSES FGD Ponds

ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
1908215-01A	FGD-6	Aqueous	SW7470A	Mercury Total: Aqueous	92489	1	08/23/19 11:05 AM	CETAC2_HG_190823A
	FGD-6	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	1	08/27/19 10:55 AM	ICP-MS4_190827B
1908215-01B	FGD-6	Aqueous	E300	Anions by IC method - Water	92485	10	08/22/19 11:55 AM	IC4_190822A
	FGD-6	Aqueous	E300	Anions by IC method - Water	92485	1	08/22/19 05:42 PM	IC4_190822A
	FGD-6	Aqueous	M2540C	Total Dissolved Solids	92494	1	08/22/19 03:40 PM	WC_190822A
1908215-02A	FGD-3	Aqueous	SW7470A	Mercury Total: Aqueous	92489	1	08/23/19 11:07 AM	CETAC2_HG_190823A
	FGD-3	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	1	08/27/19 10:57 AM	ICP-MS4_190827B
	FGD-3	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	10	08/27/19 12:09 PM	ICP-MS4_190827B
1908215-02B	FGD-3	Aqueous	E300	Anions by IC method - Water	92485	10	08/22/19 12:11 PM	IC4_190822A
	FGD-3	Aqueous	E300	Anions by IC method - Water	92485	1	08/22/19 05:58 PM	IC4_190822A
	FGD-3	Aqueous	M2540C	Total Dissolved Solids	92494	1	08/22/19 03:40 PM	WC_190822A
1908215-03A	FGD-2	Aqueous	SW7470A	Mercury Total: Aqueous	92489	1	08/23/19 11:09 AM	CETAC2_HG_190823A
	FGD-2	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	1	08/27/19 10:59 AM	ICP-MS4_190827B
	FGD-2	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	10	08/27/19 12:11 PM	ICP-MS4_190827B
1908215-03B	FGD-2	Aqueous	E300	Anions by IC method - Water	92485	10	08/22/19 12:27 PM	IC4_190822A
	FGD-2	Aqueous	E300	Anions by IC method - Water	92485	100	08/22/19 04:06 PM	IC4_190822A
	FGD-2	Aqueous	E300	Anions by IC method - Water	92485	1	08/22/19 06:14 PM	IC4_190822A
	FGD-2	Aqueous	M2540C	Total Dissolved Solids	92494	1	08/22/19 03:40 PM	WC_190822A
1908215-04A	FGD-5	Aqueous	SW7470A	Mercury Total: Aqueous	92489	1	08/23/19 11:11 AM	CETAC2_HG_190823A
	FGD-5	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	1	08/27/19 10:51 AM	ICP-MS4_190827B
	FGD-5	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	10	08/27/19 12:05 PM	ICP-MS4_190827B
1908215-04B	FGD-5	Aqueous	E300	Anions by IC method - Water	92485	10	08/22/19 12:43 PM	IC4_190822A
	FGD-5	Aqueous	E300	Anions by IC method - Water	92485	1	08/22/19 06:30 PM	IC4_190822A
	FGD-5	Aqueous	M2540C	Total Dissolved Solids	92494	1	08/22/19 03:40 PM	WC_190822A
1908215-05A	DUP-1	Aqueous	SW7470A	Mercury Total: Aqueous	92489	1	08/23/19 11:14 AM	CETAC2_HG_190823A
	DUP-1	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	10	08/27/19 12:13 PM	ICP-MS4_190827B

Lab Order: 1908215
Client: Golder
Project: Luminant-OGSES FGD Ponds

ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
1908215-05A	DUP-1	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	1	08/27/19 11:01 AM	ICP-MS4_190827B
1908215-05B	DUP-1	Aqueous	E300	Anions by IC method - Water	92485	10	08/22/19 12:59 PM	IC4_190822A
	DUP-1	Aqueous	E300	Anions by IC method - Water	92485	1	08/22/19 09:10 PM	IC4_190822A
	DUP-1	Aqueous	M2540C	Total Dissolved Solids	92494	1	08/22/19 03:40 PM	WC_190822A
1908215-06A	FGD-8	Aqueous	SW7470A	Mercury Total: Aqueous	92489	1	08/23/19 11:16 AM	CETAC2_HG_190823A
	FGD-8	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	1	08/27/19 11:03 AM	ICP-MS4_190827B
	FGD-8	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	50	08/27/19 12:15 PM	ICP-MS4_190827B
1908215-06B	FGD-8	Aqueous	E300	Anions by IC method - Water	92485	10	08/22/19 01:15 PM	IC4_190822A
	FGD-8	Aqueous	E300	Anions by IC method - Water	92485	100	08/22/19 04:22 PM	IC4_190822A
	FGD-8	Aqueous	E300	Anions by IC method - Water	92485	1	08/22/19 09:26 PM	IC4_190822A
	FGD-8	Aqueous	M2540C	Total Dissolved Solids	92494	1	08/22/19 03:40 PM	WC_190822A
1908215-07A	FGD-1	Aqueous	SW7470A	Mercury Total: Aqueous	92489	1	08/23/19 11:23 AM	CETAC2_HG_190823A
	FGD-1	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	1	08/27/19 11:05 AM	ICP-MS4_190827B
	FGD-1	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	5	08/27/19 12:17 PM	ICP-MS4_190827B
1908215-07B	FGD-1	Aqueous	E300	Anions by IC method - Water	92485	10	08/22/19 01:31 PM	IC4_190822A
	FGD-1	Aqueous	E300	Anions by IC method - Water	92485	1	08/22/19 09:42 PM	IC4_190822A
	FGD-1	Aqueous	M2540C	Total Dissolved Solids	92494	1	08/22/19 03:40 PM	WC_190822A
1908215-08A	FGD-14	Aqueous	SW7470A	Mercury Total: Aqueous	92489	1	08/23/19 11:25 AM	CETAC2_HG_190823A
	FGD-14	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	10	08/27/19 12:19 PM	ICP-MS4_190827B
	FGD-14	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	1	08/27/19 11:07 AM	ICP-MS4_190827B
1908215-08B	FGD-14	Aqueous	E300	Anions by IC method - Water	92485	10	08/22/19 01:47 PM	IC4_190822A
	FGD-14	Aqueous	E300	Anions by IC method - Water	92485	1	08/22/19 09:58 PM	IC4_190822A
	FGD-14	Aqueous	M2540C	Total Dissolved Solids	92494	1	08/22/19 03:40 PM	WC_190822A
1908215-09A	FGD-4	Aqueous	SW7470A	Mercury Total: Aqueous	92489	1	08/23/19 11:27 AM	CETAC2_HG_190823A
	FGD-4	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	1	08/27/19 11:09 AM	ICP-MS4_190827B
	FGD-4	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	10	08/27/19 12:21 PM	ICP-MS4_190827B

Lab Order: 1908215
Client: Golder
Project: Luminant-OGSES FGD Ponds

ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
1908215-09B	FGD-4	Aqueous	E300	Anions by IC method - Water	92485	10	08/22/19 02:03 PM	IC4_190822A
	FGD-4	Aqueous	E300	Anions by IC method - Water	92485	1	08/22/19 10:14 PM	IC4_190822A
	FGD-4	Aqueous	M2540C	Total Dissolved Solids	92494	1	08/22/19 03:40 PM	WC_190822A
1908215-10A	FGD-11	Aqueous	SW7470A	Mercury Total: Aqueous	92489	1	08/23/19 11:30 AM	CETAC2_HG_190823A
	FGD-11	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	1	08/27/19 11:11 AM	ICP-MS4_190827B
	FGD-11	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	10	08/27/19 12:23 PM	ICP-MS4_190827B
1908215-10B	FGD-11	Aqueous	E300	Anions by IC method - Water	92485	10	08/22/19 02:19 PM	IC4_190822A
	FGD-11	Aqueous	E300	Anions by IC method - Water	92485	100	08/22/19 04:38 PM	IC4_190822A
	FGD-11	Aqueous	E300	Anions by IC method - Water	92485	1	08/22/19 10:30 PM	IC4_190822A
	FGD-11	Aqueous	M2540C	Total Dissolved Solids	92494	1	08/22/19 03:40 PM	WC_190822A
1908215-11A	FGD-12	Aqueous	SW7470A	Mercury Total: Aqueous	92489	1	08/23/19 11:32 AM	CETAC2_HG_190823A
	FGD-12	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	1	08/27/19 11:32 AM	ICP-MS4_190827B
1908215-11B	FGD-12	Aqueous	E300	Anions by IC method - Water	92485	10	08/22/19 04:54 PM	IC4_190822A
	FGD-12	Aqueous	E300	Anions by IC method - Water	92485	1	08/22/19 10:46 PM	IC4_190822A
	FGD-12	Aqueous	M2540C	Total Dissolved Solids	92494	1	08/22/19 03:40 PM	WC_190822A
1908215-12A	FGD-15	Aqueous	SW7470A	Mercury Total: Aqueous	92489	1	08/23/19 11:34 AM	CETAC2_HG_190823A
	FGD-15	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	1	08/27/19 11:34 AM	ICP-MS4_190827B
	FGD-15	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	50	08/27/19 12:25 PM	ICP-MS4_190827B
1908215-12B	FGD-15	Aqueous	E300	Anions by IC method - Water	92485	10	08/22/19 05:10 PM	IC4_190822A
	FGD-15	Aqueous	E300	Anions by IC method - Water	92485	1	08/22/19 11:02 PM	IC4_190822A
	FGD-15	Aqueous	E300	Anions by IC method - Water	92504	100	08/23/19 05:00 PM	IC4_190823A
	FGD-15	Aqueous	M2540C	Total Dissolved Solids	92494	1	08/22/19 03:40 PM	WC_190822A

DHL Analytical, Inc.

Date: *25-Sep-19*

CLIENT:	Golder	**Client Sample ID:**	FGD-6
Project:	Luminant-OGSES FGD Ponds	**Lab ID:**	1908215-01
Project No:	19122262-F	**Collection Date:**	08/19/19 07:35 AM
Lab Order:	1908215	**Matrix:**	AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020A**					Analyst: **SP**
Antimony	<0.000800	0.000800	0.00250		mg/L	1	08/27/19 10:55 AM
Arsenic	0.0146	0.00200	0.00500		mg/L	1	08/27/19 10:55 AM
Barium	0.0903	0.00300	0.0100		mg/L	1	08/27/19 10:55 AM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 10:55 AM
Boron	0.102	0.0100	0.0300		mg/L	1	08/27/19 10:55 AM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 10:55 AM
Calcium	23.6	0.100	0.300		mg/L	1	08/27/19 10:55 AM
Chromium	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 10:55 AM
Cobalt	0.00493	0.00300	0.00500	J	mg/L	1	08/27/19 10:55 AM
Lead	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 10:55 AM
Lithium	0.00820	0.00500	0.0100	J	mg/L	1	08/27/19 10:55 AM
Molybdenum	0.00332	0.00200	0.00500	J	mg/L	1	08/27/19 10:55 AM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 10:55 AM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	08/27/19 10:55 AM
MERCURY TOTAL: AQUEOUS		**SW7470A**					Analyst: **BM**
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	08/23/19 11:05 AM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **SNM**
Chloride	158	3.00	10.0		mg/L	10	08/22/19 11:55 AM
Fluoride	0.741	0.100	0.400		mg/L	1	08/22/19 05:42 PM
Sulfate	60.3	1.00	3.00		mg/L	1	08/22/19 05:42 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	754	10.0	10.0		mg/L	1	08/22/19 03:40 PM

Qualifiers:

- ND - Not Detected at the SDL
- J - Analyte detected between SDL and RL
- B - Analyte detected in the associated Method Blank
- DF- Dilution Factor
- N - Parameter not NELAP certified
- See Final Page of Report for MQLs and MDLs
- S - Spike Recovery outside control limits
- C - Sample Result or QC discussed in Case Narrative
- RL - Reporting Limit (MQL adjusted for moisture and sample size)
- SDL - Sample Detection Limit
- E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: *25-Sep-19*

CLIENT:	Golder	**Client Sample ID:**	FGD-3
Project:	Luminant-OGSES FGD Ponds	**Lab ID:**	1908215-02
Project No:	19122262-F	**Collection Date:**	08/19/19 08:25 AM
Lab Order:	1908215	**Matrix:**	AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020A**					Analyst: **SP**
Antimony	<0.000800	0.000800	0.00250		mg/L	1	08/27/19 10:57 AM
Arsenic	0.00248	0.00200	0.00500	J	mg/L	1	08/27/19 10:57 AM
Barium	0.0365	0.00300	0.0100		mg/L	1	08/27/19 10:57 AM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 10:57 AM
Boron	0.134	0.0100	0.0300		mg/L	1	08/27/19 10:57 AM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 10:57 AM
Calcium	51.1	1.00	3.00		mg/L	10	08/27/19 12:09 PM
Chromium	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 10:57 AM
Cobalt	0.00364	0.00300	0.00500	J	mg/L	1	08/27/19 10:57 AM
Lead	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 10:57 AM
Lithium	0.0546	0.00500	0.0100		mg/L	1	08/27/19 10:57 AM
Molybdenum	0.00231	0.00200	0.00500	J	mg/L	1	08/27/19 10:57 AM
Selenium	0.0245	0.00200	0.00500		mg/L	1	08/27/19 10:57 AM
Thallium	0.000588	0.000500	0.00150	J	mg/L	1	08/27/19 10:57 AM
MERCURY TOTAL: AQUEOUS		**SW7470A**					Analyst: **BM**
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	08/23/19 11:07 AM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **SNM**
Chloride	84.9	3.00	10.0		mg/L	10	08/22/19 12:11 PM
Fluoride	0.874	0.100	0.400		mg/L	1	08/22/19 05:58 PM
Sulfate	150	10.0	30.0		mg/L	10	08/22/19 12:11 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	882	10.0	10.0		mg/L	1	08/22/19 03:40 PM

Qualifiers:

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B - Analyte detected in the associated Method Blank
DF- Dilution Factor
N - Parameter not NELAP certified
See Final Page of Report for MQLs and MDLs
S - Spike Recovery outside control limits
C - Sample Result or QC discussed in Case Narrative
RL - Reporting Limit (MQL adjusted for moisture and sample size)
SDL - Sample Detection Limit
E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: *25-Sep-19*

CLIENT:	Golder	**Client Sample ID:**	FGD-2
Project:	Luminant-OGSES FGD Ponds	**Lab ID:**	1908215-03
Project No:	19122262-F	**Collection Date:**	08/19/19 09:15 AM
Lab Order:	1908215	**Matrix:**	AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020A**					Analyst: **SP**
Antimony	<0.000800	0.000800	0.00250		mg/L	1	08/27/19 10:59 AM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 10:59 AM
Barium	0.181	0.00300	0.0100		mg/L	1	08/27/19 10:59 AM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 10:59 AM
Boron	0.192	0.0100	0.0300		mg/L	1	08/27/19 10:59 AM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 10:59 AM
Calcium	167	1.00	3.00		mg/L	10	08/27/19 12:11 PM
Chromium	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 10:59 AM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	08/27/19 10:59 AM
Lead	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 10:59 AM
Lithium	0.0257	0.00500	0.0100		mg/L	1	08/27/19 10:59 AM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 10:59 AM
Selenium	0.0249	0.00200	0.00500		mg/L	1	08/27/19 10:59 AM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	08/27/19 10:59 AM
MERCURY TOTAL: AQUEOUS		**SW7470A**					Analyst: **BM**
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	08/23/19 11:09 AM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **SNM**
Chloride	863	30.0	100		mg/L	100	08/22/19 04:06 PM
Fluoride	0.413	0.100	0.400		mg/L	1	08/22/19 06:14 PM
Sulfate	218	10.0	30.0		mg/L	10	08/22/19 12:27 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	1890	50.0	50.0		mg/L	1	08/22/19 03:40 PM

Qualifiers:

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DF- Dilution Factor
N - Parameter not NELAP certified
See Final Page of Report for MQLs and MDLs
S - Spike Recovery outside control limits
C - Sample Result or QC discussed in Case Narrative
RL - Reporting Limit (MQL adjusted for moisture and sample size)
SDL - Sample Detection Limit
E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: *25-Sep-19*

CLIENT:	Golder	**Client Sample ID:**	FGD-5
Project:	Luminant-OGSES FGD Ponds	**Lab ID:**	1908215-04
Project No:	19122262-F	**Collection Date:**	08/19/19 10:00 AM
Lab Order:	1908215	**Matrix:**	AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020A**					Analyst: **SP**
Antimony	<0.000800	0.000800	0.00250		mg/L	1	08/27/19 10:51 AM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 10:51 AM
Barium	0.106	0.00300	0.0100		mg/L	1	08/27/19 10:51 AM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 10:51 AM
Boron	0.114	0.0100	0.0300		mg/L	1	08/27/19 10:51 AM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 10:51 AM
Calcium	90.7	1.00	3.00		mg/L	10	08/27/19 12:05 PM
Chromium	0.0103	0.00200	0.00500		mg/L	1	08/27/19 10:51 AM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	08/27/19 10:51 AM
Lead	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 10:51 AM
Lithium	0.152	0.00500	0.0100		mg/L	1	08/27/19 10:51 AM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 10:51 AM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 10:51 AM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	08/27/19 10:51 AM
MERCURY TOTAL: AQUEOUS		**SW7470A**					Analyst: **BM**
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	08/23/19 11:11 AM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **SNM**
Chloride	283	3.00	10.0		mg/L	10	08/22/19 12:43 PM
Fluoride	0.863	0.100	0.400		mg/L	1	08/22/19 06:30 PM
Sulfate	70.7	1.00	3.00		mg/L	1	08/22/19 06:30 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	816	10.0	10.0		mg/L	1	08/22/19 03:40 PM

Qualifiers:

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- DF- Dilution Factor
- N - Parameter not NELAP certified
- S - Spike Recovery outside control limits
- C - Sample Result or QC discussed in Case Narrative
- RL - Reporting Limit (MQL adjusted for moisture and sample size)
- SDL - Sample Detection Limit
- E - TPH pattern not Gas or Diesel Range Pattern

See Final Page of Report for MQLs and MDLs

DHL Analytical, Inc.

Date: *25-Sep-19*

CLIENT:	Golder	**Client Sample ID:**	DUP-1
Project:	Luminant-OGSES FGD Ponds	**Lab ID:**	1908215-05
Project No:	19122262-F	**Collection Date:**	08/19/19 10:00 AM
Lab Order:	1908215	**Matrix:**	AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020A**					Analyst: **SP**
Antimony	<0.000800	0.000800	0.00250		mg/L	1	08/27/19 11:01 AM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:01 AM
Barium	0.0972	0.00300	0.0100		mg/L	1	08/27/19 11:01 AM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:01 AM
Boron	0.112	0.0100	0.0300		mg/L	1	08/27/19 11:01 AM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:01 AM
Calcium	91.0	1.00	3.00		mg/L	10	08/27/19 12:13 PM
Chromium	0.0115	0.00200	0.00500		mg/L	1	08/27/19 11:01 AM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	08/27/19 11:01 AM
Lead	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:01 AM
Lithium	0.151	0.00500	0.0100		mg/L	1	08/27/19 11:01 AM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:01 AM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:01 AM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	08/27/19 11:01 AM
MERCURY TOTAL: AQUEOUS		**SW7470A**					Analyst: **BM**
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	08/23/19 11:14 AM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **SNM**
Chloride	283	3.00	10.0		mg/L	10	08/22/19 12:59 PM
Fluoride	0.915	0.100	0.400		mg/L	1	08/22/19 09:10 PM
Sulfate	70.1	1.00	3.00		mg/L	1	08/22/19 09:10 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	816	10.0	10.0		mg/L	1	08/22/19 03:40 PM

Qualifiers:

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S - Spike Recovery outside control limits
C - Sample Result or QC discussed in Case Narrative
RL - Reporting Limit (MQL adjusted for moisture and sample size)
SDL - Sample Detection Limit
E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: *25-Sep-19*

CLIENT:	Golder	**Client Sample ID:**	FGD-8
Project:	Luminant-OGSES FGD Ponds	**Lab ID:**	1908215-06
Project No:	19122262-F	**Collection Date:**	08/19/19 11:00 AM
Lab Order:	1908215	**Matrix:**	AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020A**					Analyst: **SP**
Antimony	<0.000800	0.000800	0.00250		mg/L	1	08/27/19 11:03 AM
Arsenic	0.00645	0.00200	0.00500		mg/L	1	08/27/19 11:03 AM
Barium	0.608	0.00300	0.0100		mg/L	1	08/27/19 11:03 AM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:03 AM
Boron	0.0756	0.0100	0.0300		mg/L	1	08/27/19 11:03 AM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:03 AM
Calcium	427	5.00	15.0		mg/L	50	08/27/19 12:15 PM
Chromium	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:03 AM
Cobalt	0.0135	0.00300	0.00500		mg/L	1	08/27/19 11:03 AM
Lead	0.00134	0.000300	0.00100		mg/L	1	08/27/19 11:03 AM
Lithium	0.0144	0.00500	0.0100		mg/L	1	08/27/19 11:03 AM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:03 AM
Selenium	0.00252	0.00200	0.00500	J	mg/L	1	08/27/19 11:03 AM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	08/27/19 11:03 AM
MERCURY TOTAL: AQUEOUS		**SW7470A**					Analyst: **BM**
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	08/23/19 11:16 AM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **SNM**
Chloride	2260	30.0	100		mg/L	100	08/22/19 04:22 PM
Fluoride	<0.100	0.100	0.400		mg/L	1	08/22/19 09:26 PM
Sulfate	452	10.0	30.0		mg/L	10	08/22/19 01:15 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	4600	50.0	50.0		mg/L	1	08/22/19 03:40 PM

Qualifiers:

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S - Spike Recovery outside control limits
C - Sample Result or QC discussed in Case Narrative
RL - Reporting Limit (MQL adjusted for moisture and sample size)
SDL - Sample Detection Limit
E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: *25-Sep-19*

CLIENT:	Golder	**Client Sample ID:**	FGD-1
Project:	Luminant-OGSES FGD Ponds	**Lab ID:**	1908215-07
Project No:	19122262-F	**Collection Date:**	08/19/19 12:05 PM
Lab Order:	1908215	**Matrix:**	AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020A**					Analyst: **SP**
Antimony	<0.000800	0.000800	0.00250		mg/L	1	08/27/19 11:05 AM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:05 AM
Barium	0.0538	0.00300	0.0100		mg/L	1	08/27/19 11:05 AM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:05 AM
Boron	0.0864	0.0100	0.0300		mg/L	1	08/27/19 11:05 AM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:05 AM
Calcium	26.1	0.500	1.50		mg/L	5	08/27/19 12:17 PM
Chromium	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:05 AM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	08/27/19 11:05 AM
Lead	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:05 AM
Lithium	0.0441	0.00500	0.0100		mg/L	1	08/27/19 11:05 AM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:05 AM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:05 AM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	08/27/19 11:05 AM
MERCURY TOTAL: AQUEOUS		**SW7470A**					Analyst: **BM**
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	08/23/19 11:23 AM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **SNM**
Chloride	69.3	3.00	10.0		mg/L	10	08/22/19 01:31 PM
Fluoride	0.486	0.100	0.400		mg/L	1	08/22/19 09:42 PM
Sulfate	80.9	1.00	3.00		mg/L	1	08/22/19 09:42 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	328	10.0	10.0		mg/L	1	08/22/19 03:40 PM

Qualifiers:

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S - Spike Recovery outside control limits
C - Sample Result or QC discussed in Case Narrative
RL - Reporting Limit (MQL adjusted for moisture and sample size)
SDL - Sample Detection Limit
E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: *25-Sep-19*

CLIENT:	Golder	**Client Sample ID:**	FGD-14
Project:	Luminant-OGSES FGD Ponds	**Lab ID:**	1908215-08
Project No:	19122262-F	**Collection Date:**	08/19/19 01:15 PM
Lab Order:	1908215	**Matrix:**	AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020A**					Analyst: **SP**
Antimony	<0.000800	0.000800	0.00250		mg/L	1	08/27/19 11:07 AM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:07 AM
Barium	0.426	0.00300	0.0100		mg/L	1	08/27/19 11:07 AM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:07 AM
Boron	0.0714	0.0100	0.0300		mg/L	1	08/27/19 11:07 AM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:07 AM
Calcium	84.4	1.00	3.00		mg/L	10	08/27/19 12:19 PM
Chromium	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:07 AM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	08/27/19 11:07 AM
Lead	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:07 AM
Lithium	0.00542	0.00500	0.0100	J	mg/L	1	08/27/19 11:07 AM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:07 AM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:07 AM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	08/27/19 11:07 AM
MERCURY TOTAL: AQUEOUS		**SW7470A**					Analyst: **BM**
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	08/23/19 11:25 AM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **SNM**
Chloride	387	3.00	10.0		mg/L	10	08/22/19 01:47 PM
Fluoride	0.318	0.100	0.400	J	mg/L	1	08/22/19 09:58 PM
Sulfate	33.2	1.00	3.00		mg/L	1	08/22/19 09:58 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	925	50.0	50.0		mg/L	1	08/22/19 03:40 PM

Qualifiers:

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- B - Analyte detected in the associated Method Blank
- DF- Dilution Factor
- N - Parameter not NELAP certified
- See Final Page of Report for MQLs and MDLs
- S - Spike Recovery outside control limits
- C - Sample Result or QC discussed in Case Narrative
- RL - Reporting Limit (MQL adjusted for moisture and sample size)
- SDL - Sample Detection Limit
- E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: *25-Sep-19*

CLIENT:	Golder	**Client Sample ID:**	FGD-4
Project:	Luminant-OGSES FGD Ponds	**Lab ID:**	1908215-09
Project No:	19122262-F	**Collection Date:**	08/19/19 02:15 PM
Lab Order:	1908215	**Matrix:**	AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020A**					Analyst: **SP**
Antimony	<0.000800	0.000800	0.00250		mg/L	1	08/27/19 11:09 AM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:09 AM
Barium	0.100	0.00300	0.0100		mg/L	1	08/27/19 11:09 AM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:09 AM
Boron	0.0850	0.0100	0.0300		mg/L	1	08/27/19 11:09 AM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:09 AM
Calcium	42.5	1.00	3.00		mg/L	10	08/27/19 12:21 PM
Chromium	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:09 AM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	08/27/19 11:09 AM
Lead	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:09 AM
Lithium	0.0190	0.00500	0.0100		mg/L	1	08/27/19 11:09 AM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:09 AM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:09 AM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	08/27/19 11:09 AM
MERCURY TOTAL: AQUEOUS		**SW7470A**					Analyst: **BM**
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	08/23/19 11:27 AM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **SNM**
Chloride	188	3.00	10.0		mg/L	10	08/22/19 02:03 PM
Fluoride	0.670	0.100	0.400		mg/L	1	08/22/19 10:14 PM
Sulfate	55.4	1.00	3.00		mg/L	1	08/22/19 10:14 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	681	10.0	10.0		mg/L	1	08/22/19 03:40 PM

Qualifiers:

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- J - Analyte detected between SDL and RL
- B - Analyte detected in the associated Method Blank
- DF- Dilution Factor
- N - Parameter not NELAP certified
- S - Spike Recovery outside control limits
- C - Sample Result or QC discussed in Case Narrative
- RL - Reporting Limit (MQL adjusted for moisture and sample size)
- SDL - Sample Detection Limit
- E - TPH pattern not Gas or Diesel Range Pattern

See Final Page of Report for MQLs and MDLs

DHL Analytical, Inc.

Date: *25-Sep-19*

CLIENT:	Golder	**Client Sample ID:**	FGD-11
Project:	Luminant-OGSES FGD Ponds	**Lab ID:**	1908215-10
Project No:	19122262-F	**Collection Date:**	08/19/19 03:20 PM
Lab Order:	1908215	**Matrix:**	AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020A**					Analyst: **SP**
Antimony	<0.000800	0.000800	0.00250		mg/L	1	08/27/19 11:11 AM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:11 AM
Barium	0.310	0.00300	0.0100		mg/L	1	08/27/19 11:11 AM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:11 AM
Boron	0.120	0.0100	0.0300		mg/L	1	08/27/19 11:11 AM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:11 AM
Calcium	92.5	1.00	3.00		mg/L	10	08/27/19 12:23 PM
Chromium	0.00391	0.00200	0.00500	J	mg/L	1	08/27/19 11:11 AM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	08/27/19 11:11 AM
Lead	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:11 AM
Lithium	0.0136	0.00500	0.0100		mg/L	1	08/27/19 11:11 AM
Molybdenum	0.00238	0.00200	0.00500	J	mg/L	1	08/27/19 11:11 AM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:11 AM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	08/27/19 11:11 AM
MERCURY TOTAL: AQUEOUS		**SW7470A**					Analyst: **BM**
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	08/23/19 11:30 AM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **SNM**
Chloride	535	30.0	100		mg/L	100	08/22/19 04:38 PM
Fluoride	0.630	0.100	0.400		mg/L	1	08/22/19 10:30 PM
Sulfate	44.7	1.00	3.00		mg/L	1	08/22/19 10:30 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	1430	50.0	50.0		mg/L	1	08/22/19 03:40 PM

Qualifiers:

ND - Not Detected at the SDL
J - Analyte detected between SDL and RL
B - Analyte detected in the associated Method Blank
DF- Dilution Factor
N - Parameter not NELAP certified
See Final Page of Report for MQLs and MDLs
S - Spike Recovery outside control limits
C - Sample Result or QC discussed in Case Narrative
RL - Reporting Limit (MQL adjusted for moisture and sample size)
SDL - Sample Detection Limit
E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: *25-Sep-19*

CLIENT:	Golder	**Client Sample ID:**	FGD-12
Project:	Luminant-OGSES FGD Ponds	**Lab ID:**	1908215-11
Project No:	19122262-F	**Collection Date:**	08/19/19 04:25 PM
Lab Order:	1908215	**Matrix:**	AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020A**					Analyst: **SP**
Antimony	<0.000800	0.000800	0.00250		mg/L	1	08/27/19 11:32 AM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:32 AM
Barium	0.0631	0.00300	0.0100		mg/L	1	08/27/19 11:32 AM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:32 AM
Boron	0.0794	0.0100	0.0300		mg/L	1	08/27/19 11:32 AM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:32 AM
Calcium	10.5	0.100	0.300		mg/L	1	08/27/19 11:32 AM
Chromium	0.00218	0.00200	0.00500	J	mg/L	1	08/27/19 11:32 AM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	08/27/19 11:32 AM
Lead	0.00139	0.000300	0.00100		mg/L	1	08/27/19 11:32 AM
Lithium	0.0251	0.00500	0.0100		mg/L	1	08/27/19 11:32 AM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:32 AM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:32 AM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	08/27/19 11:32 AM
MERCURY TOTAL: AQUEOUS		**SW7470A**					Analyst: **BM**
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	08/23/19 11:32 AM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **SNM**
Chloride	16.1	0.300	1.00		mg/L	1	08/22/19 10:46 PM
Fluoride	0.145	0.100	0.400	J	mg/L	1	08/22/19 10:46 PM
Sulfate	17.1	1.00	3.00		mg/L	1	08/22/19 10:46 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	209	10.0	10.0		mg/L	1	08/22/19 03:40 PM

Qualifiers:

- ND - Not Detected at the SDL
- J - Analyte detected between SDL and RL
- B - Analyte detected in the associated Method Blank
- DF- Dilution Factor
- N - Parameter not NELAP certified
- See Final Page of Report for MQLs and MDLs
- S - Spike Recovery outside control limits
- C - Sample Result or QC discussed in Case Narrative
- RL - Reporting Limit (MQL adjusted for moisture and sample size)
- SDL - Sample Detection Limit
- E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: *25-Sep-19*

CLIENT:	Golder	**Client Sample ID:**	FGD-15
Project:	Luminant-OGSES FGD Ponds	**Lab ID:**	1908215-12
Project No:	19122262-F	**Collection Date:**	08/19/19 05:30 PM
Lab Order:	1908215	**Matrix:**	AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020A**					Analyst: **SP**
Antimony	<0.000800	0.000800	0.00250		mg/L	1	08/27/19 11:34 AM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:34 AM
Barium	0.0236	0.00300	0.0100		mg/L	1	08/27/19 11:34 AM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:34 AM
Boron	0.631	0.0100	0.0300		mg/L	1	08/27/19 11:34 AM
Cadmium	0.000838	0.000300	0.00100	J	mg/L	1	08/27/19 11:34 AM
Calcium	335	5.00	15.0		mg/L	50	08/27/19 12:25 PM
Chromium	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:34 AM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	08/27/19 11:34 AM
Lead	0.000934	0.000300	0.00100	J	mg/L	1	08/27/19 11:34 AM
Lithium	0.0823	0.00500	0.0100		mg/L	1	08/27/19 11:34 AM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:34 AM
Selenium	0.0221	0.00200	0.00500		mg/L	1	08/27/19 11:34 AM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	08/27/19 11:34 AM
MERCURY TOTAL: AQUEOUS		**SW7470A**					Analyst: **BM**
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	08/23/19 11:34 AM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **SNM**
Chloride	1030	30.0	100		mg/L	100	08/23/19 05:00 PM
Fluoride	0.483	0.100	0.400		mg/L	1	08/22/19 11:02 PM
Sulfate	985	10.0	30.0		mg/L	10	08/22/19 05:10 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	3180	50.0	50.0		mg/L	1	08/22/19 03:40 PM

Qualifiers:

ND - Not Detected at the SDL
J - Analyte detected between SDL and RL
B - Analyte detected in the associated Method Blank
DF- Dilution Factor
N - Parameter not NELAP certified
See Final Page of Report for MQLs and MDLs
S - Spike Recovery outside control limits
C - Sample Result or QC discussed in Case Narrative
RL - Reporting Limit (MQL adjusted for moisture and sample size)
SDL - Sample Detection Limit
E - TPH pattern not Gas or Diesel Range Pattern

CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: CETAC2_HG_190611B

Sample ID **DCS-91284**	Batch ID: **91284**	TestNo: **SW7470A**	Units: **mg/L**
SampType: **DCS**	Run ID: **CETAC2_HG_190611**	Analysis Date: **6/11/2019 5:01:26 PM**	Prep Date: **6/11/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.000206	0.000200	0.000200	0	103	82	119	0	0	

Qualifiers:	B	Analyte detected in the associated Method Blank	DF	Dilution Factor	
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit	Page 1 of 19
	ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits	
	RL	Reporting Limit	S	Spike Recovery outside control limits	
	J	Analyte detected between SDL and RL	N	Parameter not NELAP certified	

CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: CETAC2_HG_190823A

The QC data in batch 92489 applies to the following samples: 1908215-01A, 1908215-02A, 1908215-03A, 1908215-04A, 1908215-05A, 1908215-06A, 1908215-07A, 1908215-08A, 1908215-09A, 1908215-10A, 1908215-11A, 1908215-12A

Sample ID **MB-92489** Batch ID: **92489** TestNo: **SW7470A** Units: **mg/L**
SampType: **MBLK** Run ID: **CETAC2_HG_190823A** Analysis Date: **8/23/2019 10:37:58 AM** Prep Date: **8/22/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	<0.0000800	0.000200								

Sample ID **LCS-92489** Batch ID: **92489** TestNo: **SW7470A** Units: **mg/L**
SampType: **LCS** Run ID: **CETAC2_HG_190823A** Analysis Date: **8/23/2019 10:42:30 AM** Prep Date: **8/22/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00188	0.000200	0.00200	0	94.0	85	115			

Sample ID **LCSD-92489** Batch ID: **92489** TestNo: **SW7470A** Units: **mg/L**
SampType: **LCSD** Run ID: **CETAC2_HG_190823A** Analysis Date: **8/23/2019 10:44:46 AM** Prep Date: **8/22/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00186	0.000200	0.00200	0	93.0	85	115	1.07	15	

Sample ID **1908173-01B MS** Batch ID: **92489** TestNo: **SW7470A** Units: **mg/L**
SampType: **MS** Run ID: **CETAC2_HG_190823A** Analysis Date: **8/23/2019 10:49:18 AM** Prep Date: **8/22/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00940	0.00100	0.0100	0	94.0	80	120			

Sample ID **1908173-01B MSD** Batch ID: **92489** TestNo: **SW7470A** Units: **mg/L**
SampType: **MSD** Run ID: **CETAC2_HG_190823A** Analysis Date: **8/23/2019 10:51:33 AM** Prep Date: **8/22/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00915	0.00100	0.0100	0	91.5	80	120	2.70	15	

Sample ID **1908173-01B SD** Batch ID: **92489** TestNo: **SW7470A** Units: **mg/L**
SampType: **SD** Run ID: **CETAC2_HG_190823A** Analysis Date: **8/23/2019 10:53:49 AM** Prep Date: **8/22/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	<0.00200	0.00500	0	0				0	10	

Sample ID **1908173-01B PDS** Batch ID: **92489** TestNo: **SW7470A** Units: **mg/L**
SampType: **PDS** Run ID: **CETAC2_HG_190823A** Analysis Date: **8/23/2019 10:56:05 AM** Prep Date: **8/22/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0116	0.00100	0.0125	0	92.8	85	115			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: CETAC2_HG_190823A

Sample ID	**ICV-190823**	Batch ID:	**R106002**	TestNo:	**SW7470A**	Units:	**mg/L**
SampType:	**ICV**	Run ID:	**CETAC2_HG_190823A**	Analysis Date:	**8/23/2019 10:33:24 AM**	Prep Date:	

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00384	0.000200	0.00400	0	96.0	90	110			

Sample ID	**CCV1-190823**	Batch ID:	**R106002**	TestNo:	**SW7470A**	Units:	**mg/L**
SampType:	**CCV**	Run ID:	**CETAC2_HG_190823A**	Analysis Date:	**8/23/2019 11:18:47 AM**	Prep Date:	

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00199	0.000200	0.00200	0	99.5	90	110			

Sample ID	**CCV2-190823**	Batch ID:	**R106002**	TestNo:	**SW7470A**	Units:	**mg/L**
SampType:	**CCV**	Run ID:	**CETAC2_HG_190823A**	Analysis Date:	**8/23/2019 11:39:17 AM**	Prep Date:	

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00199	0.000200	0.00200	0	99.5	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190621B

Sample ID **DCS2-91398**	Batch ID: **91398**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **DCS2**	Run ID: **ICP-MS4_190621B**	Analysis Date: **6/21/2019 1:24:00 PM**	Prep Date: **6/20/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	0.321	0.300	0.300	0	107	70	130	0	0	

Sample ID **DCS3-91398**	Batch ID: **91398**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **DCS3**	Run ID: **ICP-MS4_190621B**	Analysis Date: **6/21/2019 1:27:00 PM**	Prep Date: **6/20/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.00522	0.00500	0.00500	0	104	70	130	0	0	
Barium	0.00479	0.0100	0.00500	0	95.8	70	130	0	0	
Chromium	0.00523	0.00500	0.00500	0	105	70	130	0	0	
Cobalt	0.00564	0.00500	0.00500	0	113	70	130	0	0	
Lithium	0.00602	0.0100	0.00500	0	120	70	130	0	0	
Molybdenum	0.00480	0.00500	0.00500	0	95.9	70	130	0	0	
Selenium	0.00569	0.00500	0.00500	0	114	70	130	0	0	

Sample ID **DCS4-91398**	Batch ID: **91398**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **DCS4**	Run ID: **ICP-MS4_190621B**	Analysis Date: **6/21/2019 1:30:00 PM**	Prep Date: **6/20/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	0.0311	0.0300	0.0300	0	104	70	130	0	0	

Sample ID **DCS1-91398**	Batch ID: **91398**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **DCS**	Run ID: **ICP-MS4_190621B**	Analysis Date: **6/21/2019 1:34:00 PM**	Prep Date: **6/20/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.000904	0.00250	0.00100	0	90.4	70	130	0	0	
Beryllium	0.000493	0.00100	0.000500	0	98.6	70	130	0	0	
Cadmium	0.000516	0.00100	0.000500	0	103	70	130	0	0	
Lead	0.000475	0.00100	0.000500	0	95.0	70	130	0	0	
Thallium	0.000471	0.00150	0.000500	0	94.2	70	130	0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190827B

The QC data in batch 92519 applies to the following samples: 1908215-01A, 1908215-02A, 1908215-03A, 1908215-04A, 1908215-05A, 1908215-06A, 1908215-07A, 1908215-08A, 1908215-09A, 1908215-10A, 1908215-11A, 1908215-12A

Sample ID **MB-92519** Batch ID: **92519** TestNo: **SW6020A** Units: **mg/L**
SampType: **MBLK** Run ID: **ICP-MS4_190827B** Analysis Date: **8/27/2019 10:43:00 AM** Prep Date: **8/26/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	<0.000800	0.00250								
Arsenic	<0.00200	0.00500								
Barium	<0.00300	0.0100								
Beryllium	<0.000300	0.00100								
Boron	<0.0100	0.0300								
Cadmium	<0.000300	0.00100								
Calcium	<0.100	0.300								
Chromium	<0.00200	0.00500								
Cobalt	<0.00300	0.00500								
Lead	<0.000300	0.00100								
Lithium	<0.00500	0.0100								
Molybdenum	<0.00200	0.00500								
Selenium	<0.00200	0.00500								
Thallium	<0.000500	0.00150								

Sample ID **LCS-92519** Batch ID: **92519** TestNo: **SW6020A** Units: **mg/L**
SampType: **LCS** Run ID: **ICP-MS4_190827B** Analysis Date: **8/27/2019 10:45:00 AM** Prep Date: **8/26/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.203	0.00250	0.200	0	102	80	120			
Arsenic	0.200	0.00500	0.200	0	99.8	80	120			
Barium	0.198	0.0100	0.200	0	99.1	80	120			
Beryllium	0.200	0.00100	0.200	0	100	80	120			
Boron	0.215	0.0300	0.200	0	107	80	120			
Cadmium	0.200	0.00100	0.200	0	99.8	80	120			
Calcium	4.93	0.300	5.00	0	98.7	80	120			
Chromium	0.206	0.00500	0.200	0	103	80	120			
Cobalt	0.206	0.00500	0.200	0	103	80	120			
Lead	0.198	0.00100	0.200	0	99.0	80	120			
Lithium	0.204	0.0100	0.200	0	102	80	120			
Molybdenum	0.203	0.00500	0.200	0	101	80	120			
Selenium	0.195	0.00500	0.200	0	97.7	80	120			
Thallium	0.197	0.00150	0.200	0	98.6	80	120			

Sample ID **LCSD-92519** Batch ID: **92519** TestNo: **SW6020A** Units: **mg/L**
SampType: **LCSD** Run ID: **ICP-MS4_190827B** Analysis Date: **8/27/2019 10:47:00 AM** Prep Date: **8/26/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.202	0.00250	0.200	0	101	80	120	0.325	15	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190827B

Sample ID **LCSD-92519**	Batch ID: **92519**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **LCSD**	Run ID: **ICP-MS4_190827B**	Analysis Date: **8/27/2019 10:47:00 AM**	Prep Date: **8/26/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.200	0.00500	0.200	0	100	80	120	0.372	15	
Barium	0.199	0.0100	0.200	0	99.6	80	120	0.515	15	
Beryllium	0.197	0.00100	0.200	0	98.5	80	120	1.57	15	
Boron	0.202	0.0300	0.200	0	101	80	120	5.99	15	
Cadmium	0.198	0.00100	0.200	0	99.2	80	120	0.663	15	
Calcium	4.91	0.300	5.00	0	98.2	80	120	0.485	15	
Chromium	0.204	0.00500	0.200	0	102	80	120	0.986	15	
Cobalt	0.208	0.00500	0.200	0	104	80	120	1.01	15	
Lead	0.198	0.00100	0.200	0	98.8	80	120	0.219	15	
Lithium	0.199	0.0100	0.200	0	99.3	80	120	2.71	15	
Molybdenum	0.203	0.00500	0.200	0	102	80	120	0.275	15	
Selenium	0.204	0.00500	0.200	0	102	80	120	4.26	15	
Thallium	0.195	0.00150	0.200	0	97.7	80	120	0.896	15	

Sample ID **1908215-04A SD**	Batch ID: **92519**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **SD**	Run ID: **ICP-MS4_190827B**	Analysis Date: **8/27/2019 10:53:00 AM**	Prep Date: **8/26/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	<0.00400	0.0125	0	0				0	10	
Arsenic	<0.0100	0.0250	0	0				0	10	
Barium	0.108	0.0500	0	0.106				2.23	10	
Beryllium	<0.00150	0.00500	0	0				0	10	
Boron	0.157	0.150	0	0.114				32.1	10	R
Cadmium	<0.00150	0.00500	0	0				0	10	
Chromium	0.0107	0.0250	0	0.0103				4.05	10	
Cobalt	<0.0150	0.0250	0	0				0	10	
Lead	<0.00150	0.00500	0	0				0	10	
Lithium	0.160	0.0500	0	0.152				4.97	10	
Molybdenum	<0.0100	0.0250	0	0				0	10	
Selenium	<0.0100	0.0250	0	0				0	10	
Thallium	<0.00250	0.00750	0	0				0	10	

Sample ID **1908215-04A PDS**	Batch ID: **92519**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **PDS**	Run ID: **ICP-MS4_190827B**	Analysis Date: **8/27/2019 11:13:00 AM**	Prep Date: **8/26/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.211	0.00250	0.200	0	106	80	120			
Arsenic	0.200	0.00500	0.200	0	100	80	120			
Barium	0.301	0.0100	0.200	0.106	97.6	80	120			
Beryllium	0.192	0.00100	0.200	0	96.1	80	120			
Boron	0.301	0.0300	0.200	0.114	93.4	80	120			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190827B

Sample ID **1908215-04A PDS**	Batch ID: **92519**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **PDS**	Run ID: **ICP-MS4_190827B**	Analysis Date: **8/27/2019 11:13:00 AM**	Prep Date: **8/26/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cadmium	0.199	0.00100	0.200	0	99.4	80	120			
Chromium	0.216	0.00500	0.200	0.0103	103	80	120			
Cobalt	0.205	0.00500	0.200	0	102	80	120			
Lead	0.205	0.00100	0.200	0	102	80	120			
Lithium	0.329	0.0100	0.200	0.152	88.5	80	120			
Molybdenum	0.202	0.00500	0.200	0	101	80	120			
Selenium	0.201	0.00500	0.200	0	100	80	120			
Thallium	0.202	0.00150	0.200	0	101	80	120			

Sample ID **1908215-04A MS**	Batch ID: **92519**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **MS**	Run ID: **ICP-MS4_190827B**	Analysis Date: **8/27/2019 11:15:00 AM**	Prep Date: **8/26/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.205	0.00250	0.200	0	102	80	120			
Arsenic	0.200	0.00500	0.200	0	99.8	80	120			
Barium	0.303	0.0100	0.200	0.106	98.4	80	120			
Beryllium	0.189	0.00100	0.200	0	94.5	80	120			
Boron	0.303	0.0300	0.200	0.114	94.9	80	120			
Cadmium	0.192	0.00100	0.200	0	96.0	80	120			
Calcium	90.5	0.300	5.00	86.7	75.4	80	120			S
Chromium	0.207	0.00500	0.200	0.0103	98.3	80	120			
Cobalt	0.199	0.00500	0.200	0	99.5	80	120			
Lead	0.201	0.00100	0.200	0	101	80	120			
Lithium	0.335	0.0100	0.200	0.152	91.6	80	120			
Molybdenum	0.205	0.00500	0.200	0	102	80	120			
Selenium	0.203	0.00500	0.200	0	101	80	120			
Thallium	0.200	0.00150	0.200	0	99.8	80	120			

Sample ID **1908215-04A MSD**	Batch ID: **92519**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **MSD**	Run ID: **ICP-MS4_190827B**	Analysis Date: **8/27/2019 11:17:00 AM**	Prep Date: **8/26/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.208	0.00250	0.200	0	104	80	120	1.58	15	
Arsenic	0.203	0.00500	0.200	0	102	80	120	1.95	15	
Barium	0.310	0.0100	0.200	0.106	102	80	120	2.30	15	
Beryllium	0.192	0.00100	0.200	0	96.1	80	120	1.61	15	
Boron	0.307	0.0300	0.200	0.114	96.9	80	120	1.27	15	
Cadmium	0.198	0.00100	0.200	0	98.8	80	120	2.81	15	
Calcium	92.8	0.300	5.00	86.7	122	80	120	2.55	15	S
Chromium	0.212	0.00500	0.200	0.0103	101	80	120	2.58	15	
Cobalt	0.204	0.00500	0.200	0	102	80	120	2.49	15	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190827B

Sample ID **1908215-04A MSD**	Batch ID: **92519**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **MSD**	Run ID: **ICP-MS4_190827B**	Analysis Date: **8/27/2019 11:17:00 AM**	Prep Date: **8/26/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	0.204	0.00100	0.200	0	102	80	120	1.47	15	
Lithium	0.339	0.0100	0.200	0.152	93.6	80	120	1.18	15	
Molybdenum	0.212	0.00500	0.200	0	106	80	120	3.60	15	
Selenium	0.206	0.00500	0.200	0	103	80	120	1.84	15	
Thallium	0.202	0.00150	0.200	0	101	80	120	1.20	15	

Sample ID **1908215-04A SD**	Batch ID: **92519**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **SD**	Run ID: **ICP-MS4_190827B**	Analysis Date: **8/27/2019 12:07:00 PM**	Prep Date: **8/26/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	90.7	15.0	0	90.7				0.035	10	

Sample ID **1908215-04A PDS**	Batch ID: **92519**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **PDS**	Run ID: **ICP-MS4_190827B**	Analysis Date: **8/27/2019 12:27:00 PM**	Prep Date: **8/26/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	141	3.00	50.0	90.7	101	80	120			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190827B

Sample ID **ICV-190827**	Batch ID: **R106089**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **ICV**	Run ID: **ICP-MS4_190827B**	Analysis Date: **8/27/2019 10:30:00 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.105	0.00250	0.100	0	105	90	110			
Arsenic	0.0984	0.00500	0.100	0	98.4	90	110			
Barium	0.101	0.0100	0.100	0	101	90	110			
Beryllium	0.102	0.00100	0.100	0	102	90	110			
Boron	0.108	0.0300	0.100	0	108	90	110			
Cadmium	0.102	0.00100	0.100	0	102	90	110			
Calcium	2.61	0.300	2.50	0	105	90	110			
Chromium	0.108	0.00500	0.100	0	108	90	110			
Cobalt	0.105	0.00500	0.100	0	105	90	110			
Lead	0.101	0.00100	0.100	0	101	90	110			
Lithium	0.102	0.0100	0.100	0	102	90	110			
Molybdenum	0.0968	0.00500	0.100	0	96.8	90	110			
Selenium	0.100	0.00500	0.100	0	100	90	110			
Thallium	0.102	0.00150	0.100	0	102	90	110			

Sample ID **LCVL-190827**	Batch ID: **R106089**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **LCVL**	Run ID: **ICP-MS4_190827B**	Analysis Date: **8/27/2019 10:36:00 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00217	0.00250	0.00200	0	108	70	130			
Arsenic	0.00534	0.00500	0.00500	0	107	70	130			
Barium	0.00530	0.0100	0.00500	0	106	70	130			
Beryllium	0.00109	0.00100	0.00100	0	109	70	130			
Boron	0.0259	0.0300	0.0200	0	129	70	130			
Cadmium	0.00108	0.00100	0.00100	0	108	70	130			
Calcium	0.105	0.300	0.100	0	105	70	130			
Chromium	0.00547	0.00500	0.00500	0	109	70	130			
Cobalt	0.00550	0.00500	0.00500	0	110	70	130			
Lead	0.00103	0.00100	0.00100	0	103	70	130			
Lithium	0.0106	0.0100	0.0100	0	106	70	130			
Molybdenum	0.00536	0.00500	0.00500	0	107	70	130			
Selenium	0.00522	0.00500	0.00500	0	104	70	130			
Thallium	0.00103	0.00150	0.00100	0	103	70	130			

Sample ID **CCV1-190827**	Batch ID: **R106089**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS4_190827B**	Analysis Date: **8/27/2019 11:20:00 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.202	0.00250	0.200	0	101	90	110			
Arsenic	0.199	0.00500	0.200	0	99.5	90	110			
Barium	0.200	0.0100	0.200	0	100	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190827B

Sample ID **CCV1-190827**	Batch ID: **R106089**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS4_190827B**	Analysis Date: **8/27/2019 11:20:00 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Beryllium	0.201	0.00100	0.200	0	100	90	110			
Boron	0.219	0.0300	0.200	0	110	90	110			
Cadmium	0.198	0.00100	0.200	0	98.9	90	110			
Calcium	4.85	0.300	5.00	0	97.0	90	110			
Chromium	0.202	0.00500	0.200	0	101	90	110			
Cobalt	0.207	0.00500	0.200	0	104	90	110			
Lead	0.198	0.00100	0.200	0	99.1	90	110			
Lithium	0.198	0.0100	0.200	0	99.2	90	110			
Molybdenum	0.201	0.00500	0.200	0	100	90	110			
Selenium	0.205	0.00500	0.200	0	102	90	110			
Thallium	0.201	0.00150	0.200	0	101	90	110			

Sample ID **LCVL1-190827**	Batch ID: **R106089**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **LCVL**	Run ID: **ICP-MS4_190827B**	Analysis Date: **8/27/2019 11:27:00 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00209	0.00250	0.00200	0	104	70	130			
Arsenic	0.00508	0.00500	0.00500	0	102	70	130			
Barium	0.00528	0.0100	0.00500	0	106	70	130			
Beryllium	0.000921	0.00100	0.00100	0	92.1	70	130			
Boron	0.0236	0.0300	0.0200	0	118	70	130			
Cadmium	0.00107	0.00100	0.00100	0	107	70	130			
Calcium	0.111	0.300	0.100	0	111	70	130			
Chromium	0.00533	0.00500	0.00500	0	107	70	130			
Cobalt	0.00534	0.00500	0.00500	0	107	70	130			
Lead	0.000965	0.00100	0.00100	0	96.5	70	130			
Lithium	0.0103	0.0100	0.0100	0	103	70	130			
Molybdenum	0.00512	0.00500	0.00500	0	102	70	130			
Selenium	0.00554	0.00500	0.00500	0	111	70	130			
Thallium	0.000957	0.00150	0.00100	0	95.7	70	130			

Sample ID **CCV2-190827**	Batch ID: **R106089**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS4_190827B**	Analysis Date: **8/27/2019 11:57:00 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.201	0.00250	0.200	0	101	90	110			
Arsenic	0.194	0.00500	0.200	0	97.2	90	110			
Barium	0.198	0.0100	0.200	0	99.2	90	110			
Beryllium	0.202	0.00100	0.200	0	101	90	110			
Boron	0.205	0.0300	0.200	0	102	90	110			
Cadmium	0.198	0.00100	0.200	0	99.2	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190827B

Sample ID **CCV2-190827**	Batch ID: **R106089**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS4_190827B**	Analysis Date: **8/27/2019 11:57:00 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	4.88	0.300	5.00	0	97.5	90	110			
Chromium	0.207	0.00500	0.200	0	104	90	110			
Cobalt	0.204	0.00500	0.200	0	102	90	110			
Lead	0.194	0.00100	0.200	0	97.0	90	110			
Lithium	0.198	0.0100	0.200	0	99.0	90	110			
Molybdenum	0.198	0.00500	0.200	0	98.9	90	110			
Selenium	0.196	0.00500	0.200	0	98.2	90	110			
Thallium	0.193	0.00150	0.200	0	96.4	90	110			

Sample ID **LCVL2-190827**	Batch ID: **R106089**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **LCVL**	Run ID: **ICP-MS4_190827B**	Analysis Date: **8/27/2019 12:01:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00211	0.00250	0.00200	0	106	70	130			
Arsenic	0.00509	0.00500	0.00500	0	102	70	130			
Barium	0.00507	0.0100	0.00500	0	101	70	130			
Beryllium	0.000874	0.00100	0.00100	0	87.4	70	130			
Boron	0.0232	0.0300	0.0200	0	116	70	130			
Cadmium	0.00108	0.00100	0.00100	0	108	70	130			
Calcium	0.104	0.300	0.100	0	104	70	130			
Chromium	0.00529	0.00500	0.00500	0	106	70	130			
Cobalt	0.00536	0.00500	0.00500	0	107	70	130			
Lead	0.000973	0.00100	0.00100	0	97.3	70	130			
Lithium	0.0106	0.0100	0.0100	0	106	70	130			
Molybdenum	0.00522	0.00500	0.00500	0	104	70	130			
Selenium	0.00513	0.00500	0.00500	0	103	70	130			
Thallium	0.000980	0.00150	0.00100	0	98.0	70	130			

Sample ID **CCV3-190827**	Batch ID: **R106089**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS4_190827B**	Analysis Date: **8/27/2019 12:29:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	4.92	0.300	5.00	0	98.4	90	110			

Sample ID **LCVL3-190827**	Batch ID: **R106089**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **LCVL**	Run ID: **ICP-MS4_190827B**	Analysis Date: **8/27/2019 12:33:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	0.109	0.300	0.100	0	109	70	130			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_190815B

Sample ID **DCS2-92363**	Batch ID: **92363**	TestNo: **E300**		Units: **mg/L**	
SampType: **DCS2**	Run ID: **IC4_190815B**	Analysis Date: **8/15/2019 2:55:31 PM**		Prep Date: **8/15/2019**	

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	0.490	1.00	0.5000	0	98.0	65	135	0	0	
Fluoride	0.244	0.400	0.2000	0	122	65	135	0	0	
Sulfate	1.57	3.00	1.500	0	104	65	135	0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_190822A

The QC data in batch 92485 applies to the following samples: 1908215-01B, 1908215-02B, 1908215-03B, 1908215-04B, 1908215-05B, 1908215-06B, 1908215-07B, 1908215-08B, 1908215-09B, 1908215-10B, 1908215-11B, 1908215-12B

Sample ID **MB-92485** Batch ID: **92485** TestNo: **E300** Units: **mg/L**
SampType: **MBLK** Run ID: **IC4_190822A** Analysis Date: **8/22/2019 11:01:32 AM** Prep Date: **8/22/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	<0.300	1.00								
Fluoride	<0.100	0.400								
Sulfate	<1.00	3.00								

Sample ID **LCS-92485** Batch ID: **92485** TestNo: **E300** Units: **mg/L**
SampType: **LCS** Run ID: **IC4_190822A** Analysis Date: **8/22/2019 11:17:32 AM** Prep Date: **8/22/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.76	1.00	10.00	0	97.6	90	110			
Fluoride	4.13	0.400	4.000	0	103	90	110			
Sulfate	29.2	3.00	30.00	0	97.5	90	110			

Sample ID **LCSD-92485** Batch ID: **92485** TestNo: **E300** Units: **mg/L**
SampType: **LCSD** Run ID: **IC4_190822A** Analysis Date: **8/22/2019 11:33:32 AM** Prep Date: **8/22/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.69	1.00	10.00	0	96.9	90	110	0.732	20	
Fluoride	4.03	0.400	4.000	0	101	90	110	2.46	20	
Sulfate	29.4	3.00	30.00	0	98.0	90	110	0.517	20	

Sample ID **1908215-01BMS** Batch ID: **92485** TestNo: **E300** Units: **mg/L**
SampType: **MS** Run ID: **IC4_190822A** Analysis Date: **8/22/2019 8:06:15 PM** Prep Date: **8/22/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	343	10.0	200.0	158.1	92.5	90	110			
Fluoride	212	4.00	200.0	1.743	105	90	110			
Sulfate	248	30.0	200.0	59.02	94.7	90	110			

Sample ID **1908215-01BMSD** Batch ID: **92485** TestNo: **E300** Units: **mg/L**
SampType: **MSD** Run ID: **IC4_190822A** Analysis Date: **8/22/2019 8:22:15 PM** Prep Date: **8/22/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	342	10.0	200.0	158.1	92.0	90	110	0.283	20	
Fluoride	212	4.00	200.0	1.743	105	90	110	0.201	20	
Sulfate	249	30.0	200.0	59.02	94.8	90	110	0.020	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_190822A

Sample ID **1908215-02BMS**	Batch ID: **92485**	TestNo: **E300**	Units: **mg/L**
SampType: **MS**	Run ID: **IC4_190822A**	Analysis Date: **8/22/2019 8:38:15 PM**	Prep Date: **8/22/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	276	10.0	200.0	84.87	95.7	90	110			
Fluoride	214	4.00	200.0	1.927	106	90	110			
Sulfate	340	30.0	200.0	149.7	95.3	90	110			

Sample ID **1908215-02BMSD**	Batch ID: **92485**	TestNo: **E300**	Units: **mg/L**
SampType: **MSD**	Run ID: **IC4_190822A**	Analysis Date: **8/22/2019 8:54:15 PM**	Prep Date: **8/22/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	277	10.0	200.0	84.87	96.0	90	110	0.164	20	
Fluoride	216	4.00	200.0	1.927	107	90	110	0.814	20	
Sulfate	340	30.0	200.0	149.7	95.2	90	110	0.093	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_190822A

Sample ID **ICV-190822**	Batch ID: **R105997**	TestNo: **E300**	Units: **mg/L**
SampType: **ICV**	Run ID: **IC4_190822A**	Analysis Date: **8/22/2019 10:29:32 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	25.0	1.00	25.00	0	100	90	110			
Fluoride	10.4	0.400	10.00	0	104	90	110			
Sulfate	75.7	3.00	75.00	0	101	90	110			

Sample ID **CCV1-190822**	Batch ID: **R105997**	TestNo: **E300**	Units: **mg/L**
SampType: **CCV**	Run ID: **IC4_190822A**	Analysis Date: **8/22/2019 3:23:51 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.66	1.00	10.00	0	96.6	90	110			
Fluoride	4.18	0.400	4.000	0	104	90	110			
Sulfate	29.4	3.00	30.00	0	97.9	90	110			

Sample ID **CCV2-190822**	Batch ID: **R105997**	TestNo: **E300**	Units: **mg/L**
SampType: **CCV**	Run ID: **IC4_190822A**	Analysis Date: **8/22/2019 7:34:15 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.74	1.00	10.00	0	97.4	90	110			
Fluoride	4.24	0.400	4.000	0	106	90	110			
Sulfate	29.6	3.00	30.00	0	98.7	90	110			

Sample ID **CCV3-190822**	Batch ID: **R105997**	TestNo: **E300**	Units: **mg/L**
SampType: **CCV**	Run ID: **IC4_190822A**	Analysis Date: **8/23/2019 12:22:15 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.66	1.00	10.00	0	96.6	90	110			
Fluoride	4.26	0.400	4.000	0	106	90	110			
Sulfate	29.5	3.00	30.00	0	98.2	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_190823A

The QC data in batch 92504 applies to the following samples: 1908215-12B

Sample ID	**MB-92504**	Batch ID:	**92504**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**MBLK**	Run ID:	**IC4_190823A**	Analysis Date:	**8/23/2019 11:05:54 AM**	Prep Date:	**8/23/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	<0.300	1.00								
Fluoride	<0.100	0.400								
Sulfate	<1.00	3.00								

Sample ID	**LCS-92504**	Batch ID:	**92504**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**LCS**	Run ID:	**IC4_190823A**	Analysis Date:	**8/23/2019 11:21:54 AM**	Prep Date:	**8/23/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.57	1.00	10.00	0	95.7	90	110			
Fluoride	4.12	0.400	4.000	0	103	90	110			
Sulfate	29.1	3.00	30.00	0	97.0	90	110			

Sample ID	**LCSD-92504**	Batch ID:	**92504**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**LCSD**	Run ID:	**IC4_190823A**	Analysis Date:	**8/23/2019 11:37:54 AM**	Prep Date:	**8/23/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.41	1.00	10.00	0	94.1	90	110	1.68	20	
Fluoride	4.06	0.400	4.000	0	101	90	110	1.56	20	
Sulfate	29.3	3.00	30.00	0	97.5	90	110	0.598	20	

Sample ID	**1908215-12BMS**	Batch ID:	**92504**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**MS**	Run ID:	**IC4_190823A**	Analysis Date:	**8/23/2019 5:16:48 PM**	Prep Date:	**8/23/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	2950	100	2000	1032	96.1	90	110			
Fluoride	2150	40.0	2000	0	108	90	110			
Sulfate	2880	300	2000	977.6	95.0	90	110			

Sample ID	**1908215-12BMSD**	Batch ID:	**92504**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**MSD**	Run ID:	**IC4_190823A**	Analysis Date:	**8/23/2019 5:32:48 PM**	Prep Date:	**8/23/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	2930	100	2000	1032	95.0	90	110	0.718	20	
Fluoride	2130	40.0	2000	0	107	90	110	0.802	20	
Sulfate	2870	300	2000	977.6	94.4	90	110	0.414	20	

Sample ID	**1908250-05EMS**	Batch ID:	**92504**	TestNo:	**E300**	Units:	**mg/L**
SampType:	**MS**	Run ID:	**IC4_190823A**	Analysis Date:	**8/23/2019 5:48:48 PM**	Prep Date:	**8/23/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_190823A

Sample ID **1908250-05EMS**	Batch ID: **92504**	TestNo: **E300**	Units: **mg/L**
SampType: **MS**	Run ID: **IC4_190823A**	Analysis Date: **8/23/2019 5:48:48 PM**	Prep Date: **8/23/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	50.8	1.00	20.00	34.64	80.6	90	110			S
Fluoride	23.5	0.400	20.00	2.518	105	90	110			
Sulfate	66.9	3.00	20.00	48.35	92.9	90	110			

Sample ID **1908250-05EMSD**	Batch ID: **92504**	TestNo: **E300**	Units: **mg/L**
SampType: **MSD**	Run ID: **IC4_190823A**	Analysis Date: **8/23/2019 6:04:48 PM**	Prep Date: **8/23/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	50.9	1.00	20.00	34.64	81.1	90	110	0.228	20	S
Fluoride	23.6	0.400	20.00	2.518	105	90	110	0.391	20	
Sulfate	66.8	3.00	20.00	48.35	92.4	90	110	0.148	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_190823A

Sample ID **ICV-190823**	Batch ID: **R106018**	TestNo: **E300**	Units: **mg/L**
SampType: **ICV**	Run ID: **IC4_190823A**	Analysis Date: **8/23/2019 10:33:55 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	24.4	1.00	25.00	0	97.8	90	110			
Fluoride	10.2	0.400	10.00	0	102	90	110			
Sulfate	75.3	3.00	75.00	0	100	90	110			

Sample ID **CCV1-190823**	Batch ID: **R106018**	TestNo: **E300**	Units: **mg/L**
SampType: **CCV**	Run ID: **IC4_190823A**	Analysis Date: **8/23/2019 3:24:19 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.61	1.00	10.00	0	96.1	90	110			
Fluoride	4.23	0.400	4.000	0	106	90	110			
Sulfate	29.3	3.00	30.00	0	97.6	90	110			

Sample ID **CCV2-190823**	Batch ID: **R106018**	TestNo: **E300**	Units: **mg/L**
SampType: **CCV**	Run ID: **IC4_190823A**	Analysis Date: **8/23/2019 8:44:48 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.68	1.00	10.00	0	96.8	90	110			
Fluoride	4.26	0.400	4.000	0	106	90	110			
Sulfate	29.2	3.00	30.00	0	97.5	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: WC_190822A

The QC data in batch 92494 applies to the following samples: 1908215-01B, 1908215-02B, 1908215-03B, 1908215-04B, 1908215-05B, 1908215-06B, 1908215-07B, 1908215-08B, 1908215-09B, 1908215-10B, 1908215-11B, 1908215-12B

Sample ID	**MB-92944**	Batch ID:	**92494**	TestNo:	**M2540C**	Units:	**mg/L**
SampType:	**MBLK**	Run ID:	**WC_190822A**	Analysis Date:	**8/22/2019 3:40:00 PM**	Prep Date:	**8/22/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	<10.0	10.0								

Sample ID	**LCS-92494**	Batch ID:	**92494**	TestNo:	**M2540C**	Units:	**mg/L**
SampType:	**LCS**	Run ID:	**WC_190822A**	Analysis Date:	**8/22/2019 3:40:00 PM**	Prep Date:	**8/22/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	737	10.0	745.6	0	98.8	90	113			

Sample ID	**1908215-03B-DUP**	Batch ID:	**92494**	TestNo:	**M2540C**	Units:	**mg/L**
SampType:	**DUP**	Run ID:	**WC_190822A**	Analysis Date:	**8/22/2019 3:40:00 PM**	Prep Date:	**8/22/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	1880	50.0	0	1885				0.532	5	

Sample ID	**1908215-06B-DUP**	Batch ID:	**92494**	TestNo:	**M2540C**	Units:	**mg/L**
SampType:	**DUP**	Run ID:	**WC_190822A**	Analysis Date:	**8/22/2019 3:40:00 PM**	Prep Date:	**8/22/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	4530	50.0	0	4595				1.42	5	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

MQL SUMMARY REPORT

TestNo: E300	MDL	MQL
Analyte	**mg/L**	**mg/L**
Chloride	0.300	1.00
Fluoride	0.100	0.400
Sulfate	1.00	3.00

TestNo: SW6020A	MDL	MQL
Analyte	**mg/L**	**mg/L**
Antimony	0.000800	0.00250
Arsenic	0.00200	0.00500
Barium	0.00300	0.0100
Beryllium	0.000300	0.00100
Boron	0.0100	0.0300
Cadmium	0.000300	0.00100
Calcium	0.100	0.300
Chromium	0.00200	0.00500
Cobalt	0.00300	0.00500
Lead	0.000300	0.00100
Lithium	0.00500	0.0100
Molybdenum	0.00200	0.00500
Selenium	0.00200	0.00500
Thallium	0.000500	0.00150

TestNo: SW7470A	MDL	MQL
Analyte	**mg/L**	**mg/L**
Mercury	0.0000800	0.000200

TestNo: M2540C	MDL	MQL
Analyte	**mg/L**	**mg/L**
Total Dissolved Solids (Residue, Filt	10.0	10.0

Qualifiers: MQL -Method Quantitation Limit as defined by TRRP
MDL -Method Detection Limit as defined by TRRP

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

September 13, 2019

DHL Analytical, Inc.

Sample Delivery Group:	L1133289
Samples Received:	08/27/2019
Project Number:	1908215
Description:	
Report To:	John DuPont
	2300 Double Creek Drive
	Round Rock, TX 78664

Entire Report Reviewed By:

Donna Eidson
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and on the samples are received.

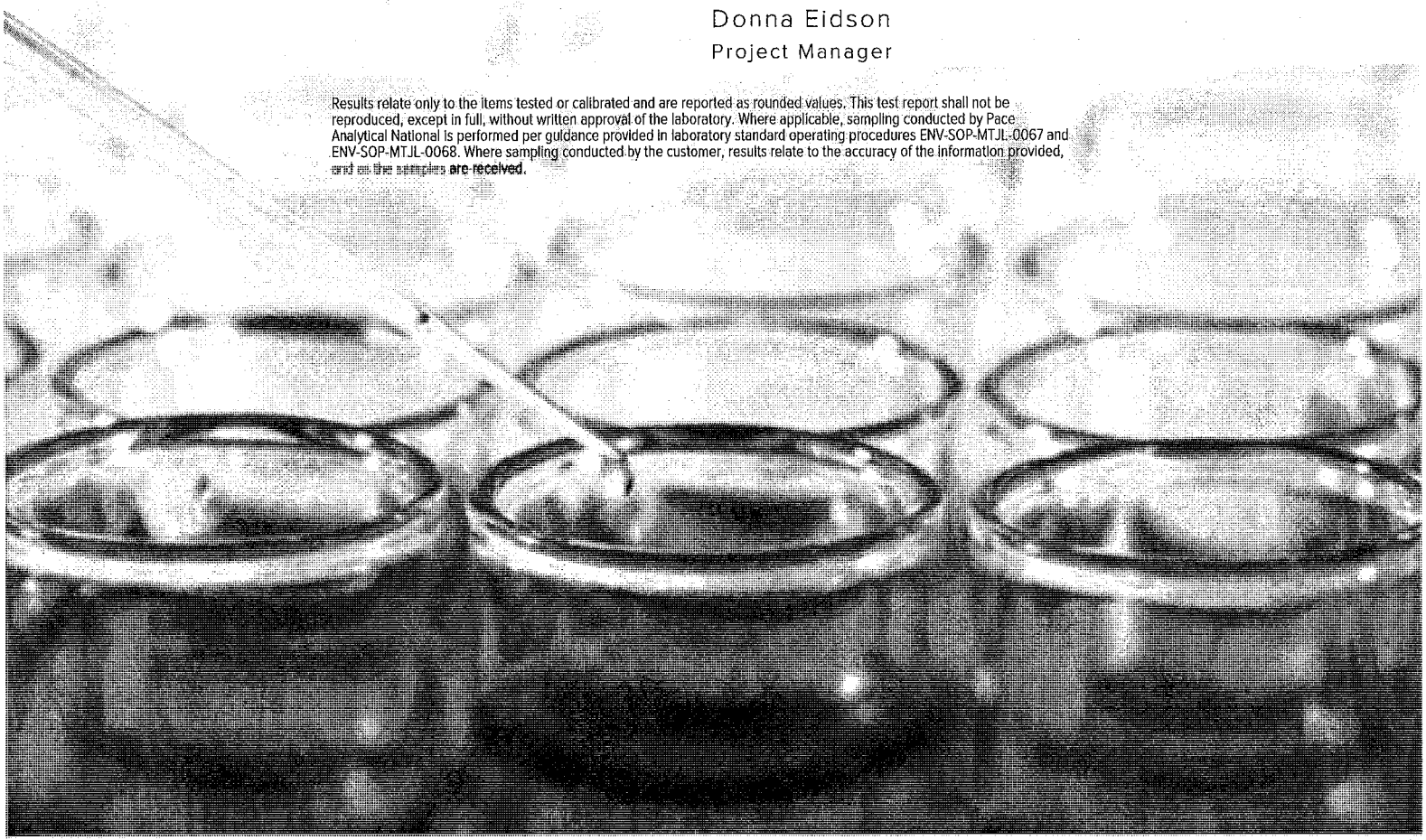


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FGD-6 L1133289-01 Non-Potable Water

			Collected by	Collected date/time	Received date/time	
				08/19/19 07:35	08/27/19 08:45	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1340987	1	09/06/19 10:27	09/11/19 11:06	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1337055	1	08/29/19 13:56	09/11/19 11:06	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1337055	1	08/29/19 13:56	08/30/19 14:54	RGT	Mt. Juliet, TN

FGD-3 L1133289-02 Non-Potable Water

			Collected by	Collected date/time	Received date/time	
				08/19/19 08:25	08/27/19 08:45	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1340987	1	09/06/19 10:27	09/11/19 11:06	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1337055	1	08/29/19 13:56	09/11/19 11:06	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1337055	1	08/29/19 13:56	08/30/19 14:54	RGT	Mt. Juliet, TN

FGD-2 L1133289-03 Non-Potable Water

			Collected by	Collected date/time	Received date/time	
				08/19/19 09:15	08/27/19 08:45	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1340987	1	09/06/19 10:27	09/11/19 11:06	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1337055	1	08/29/19 13:56	09/11/19 11:06	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1337055	1	08/29/19 13:56	08/30/19 14:54	RGT	Mt. Juliet, TN

FGD-5 L1133289-04 Non-Potable Water

			Collected by	Collected date/time	Received date/time	
				08/19/19 10:00	08/27/19 08:45	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1340987	1	09/06/19 10:27	09/11/19 11:06	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1337055	1	08/29/19 13:56	09/11/19 11:06	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1337055	1	08/29/19 13:56	08/30/19 14:54	RGT	Mt. Juliet, TN

DUP-1 L1133289-05 Non-Potable Water

			Collected by	Collected date/time	Received date/time	
				08/19/19 10:00	08/27/19 08:45	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1340987	1	09/06/19 10:27	09/11/19 11:06	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1337055	1	08/29/19 13:56	09/11/19 11:06	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1337055	1	08/29/19 13:56	08/30/19 14:54	RGT	Mt. Juliet, TN

FGD-8 L1133289-06 Non-Potable Water

			Collected by	Collected date/time	Received date/time	
				08/19/19 11:00	08/27/19 08:45	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1340987	1	09/06/19 10:27	09/11/19 11:06	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1337055	1	08/29/19 13:56	09/11/19 11:06	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1337055	1	08/29/19 13:56	09/10/19 17:42	RGT	Mt. Juliet, TN

FGD-1 L1133289-07 Non-Potable Water

Collected by | Collected date/time 08/19/19 12:05 | Received date/time 08/27/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1340987	1	09/06/19 10:27	09/11/19 11:06	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1337055	1	08/29/19 13:56	09/11/19 11:06	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1337055	1	08/29/19 13:56	08/30/19 14:54	RGT	Mt. Juliet, TN

FGD-14 L1133289-08 Non-Potable Water

Collected by | Collected date/time 08/19/19 13:15 | Received date/time 08/27/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1340987	1	09/06/19 10:27	09/11/19 11:06	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1337055	1	08/29/19 13:56	09/11/19 11:06	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1337055	1	08/29/19 13:56	08/30/19 14:54	RGT	Mt. Juliet, TN

FGD-4 L1133289-09 Non-Potable Water

Collected by | Collected date/time 08/19/19 14:15 | Received date/time 08/27/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1340987	1	09/06/19 10:27	09/11/19 15:45	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1337055	1	08/29/19 13:56	09/11/19 15:45	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1337055	1	08/29/19 13:56	08/30/19 14:54	RGT	Mt. Juliet, TN

FGD-11 L1133289-10 Non-Potable Water

Collected by | Collected date/time 08/19/19 15:20 | Received date/time 08/27/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1340987	1	09/06/19 10:27	09/11/19 15:45	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1337055	1	09/03/19 11:00	09/11/19 15:45	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1337055	1	09/03/19 11:00	09/04/19 17:23	RGT	Mt. Juliet, TN

FGD-12 L1133289-11 Non-Potable Water

Collected by | Collected date/time 08/19/19 16:25 | Received date/time 08/27/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1340987	1	09/06/19 10:27	09/11/19 15:45	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1337055	1	08/29/19 13:56	09/11/19 15:45	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1337055	1	08/29/19 13:56	08/30/19 14:55	RGT	Mt. Juliet, TN

FGD-15 L1133289-12 Non-Potable Water

Collected by | Collected date/time 08/19/19 17:30 | Received date/time 08/27/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1340987	1	09/06/19 10:27	09/11/19 15:45	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1337055	1	09/04/19 12:00	09/11/19 15:45	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1337055	1	09/04/19 12:00	09/04/19 17:23	RGT	Mt. Juliet, TN

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Donna Eidson
Project Manager

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	2.55		0.597	0.902	09/11/2019 11:06	WG1340987
(T) Barium	*98.1*			*62.0-143*	*09/11/2019 11:06*	WG1340987
(T) Yttrium	*109*			*79.0-136*	*09/11/2019 11:06*	WG1340987

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	2.93		0.844	1.12	09/11/2019 11:06	WG1337055

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.385		0.247	0.214	08/30/2019 14:54	WG1337055
(T) Barium-133	*95.1*			*30.0-143*	*08/30/2019 14:54*	WG1337055

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.858		0.443	0.782	09/11/2019 11:06	WG1340987
(T) Barium	*83.7*			*62.0-143*	*09/11/2019 11:06*	WG1340987
(T) Yttrium	*97.4*			*79.0-136*	*09/11/2019 11:06*	WG1340987

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	1.38		0.748	1.05	09/11/2019 11:06	WG1337055

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.523		0.305	0.266	08/30/2019 14:54	WG1337055
(T) Barium-133	*71.0*			*30.0-143*	*08/30/2019 14:54*	WG1337055

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+/-	pCi/l	date / time	
RADIUM-228	2.80		0.477	0.761	09/11/2019 11:06	WG1340987
(T) Barium	*87.3*			*62.0-143*	*09/11/2019 11:06*	WG1340987
(T) Yttrium	*101*			*79.0-136*	*09/11/2019 11:06*	WG1340987

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+/-	pCi/l	date / time	
Combined Radium	3.26		1.07	1.6	09/11/2019 11:06	WG1337055

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+/-	pCi/l	date / time	
RADIUM-226	0.456		0.596	0.841	08/30/2019 14:54	WG1337055
(T) Barium-133	*35.3*			*30.0-143*	*08/30/2019 14:54*	WG1337055

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.659		0.360	0.677	09/11/2019 11:06	WG1340987
(T) Barium	*93.6*			*62.0-143*	*09/11/2019 11:06*	WG1340987
(T) Yttrium	*103*			*79.0-136*	*09/11/2019 11:06*	WG1340987

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	1.21		0.874	1.27	09/11/2019 11:06	WG1337055

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.551		0.514	0.591	08/30/2019 14:54	WG1337055
(T) Barium-133	*33.9*			*30.0-143*	*08/30/2019 14:54*	WG1337055

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.251		0.441	0.67	09/11/2019 11:06	WG1340987
(T) Barium	*92.3*			*62.0-143*	*09/11/2019 11:06*	WG1340987
(T) Yttrium	*106*			*79.0-136*	*09/11/2019 11:06*	WG1340987

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.251		0.815	1.36	09/11/2019 11:06	WG1337055

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	-0.130		0.374	0.693	08/30/2019 14:54	WG1337055
(T) Barium-133	*46.9*			*30.0-143*	*08/30/2019 14:54*	WG1337055

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	6.82		0.503	0.674	09/11/2019 11:06	WG1340987
(T) Barium	*85.4*			*62.0-143*	*09/11/2019 11:06*	WG1340987
(T) Yttrium	*107*			*79.0-136*	*09/11/2019 11:06*	WG1340987

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	8.61		1.17	1.14	09/11/2019 11:06	WG1337055

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	1.79		0.667	0.467	09/10/2019 17:42	WG1337055
(T) Barium-133	*19.5*	C2		*30.0-143*	*09/10/2019 17:42*	WG1337055

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	1.09		0.429	0.686	09/11/2019 11:06	WG1340987
(T) Barium	*89.6*			*62.0-143*	*09/11/2019 11:06*	WG1340987
(T) Yttrium	*111*			*79.0-136*	*09/11/2019 11:06*	WG1340987

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	1.57		0.712	0.877	09/11/2019 11:06	WG1337055

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.489		0.283	0.191	08/30/2019 14:54	WG1337055
(T) Barium-133	*76.6*			*30.0-143*	*08/30/2019 14:54*	WG1337055

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	2.22		0.444	0.775	09/11/2019 11:06	WG1340987
(T) Barium	*93.0*			*62.0-143*	*09/11/2019 11:06*	WG1340987
(T) Yttrium	*109*			*79.0-136*	*09/11/2019 11:06*	WG1340987

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	3.57		0.893	1.01	09/11/2019 11:06	WG1337055

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	1.35		0.449	0.232	08/30/2019 14:54	WG1337055
(T) Barium-133	*90.4*			*30.0-143*	*08/30/2019 14:54*	WG1337055

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	1.58		0.406	0.601	09/11/2019 15:45	WG1340987
(T) Barium	*103*			*62.0-143*	*09/11/2019 15:45*	WG1340987
(T) Yttrium	*106*			*79.0-136*	*09/11/2019 15:45*	WG1340987

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	1.97		0.752	1.03	09/11/2019 15:45	WG1337055

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.390		0.346	0.429	08/30/2019 14:54	WG1337055
(T) Barium-133	*79.3*			*30.0-143*	*08/30/2019 14:54*	WG1337055

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+/-	pCi/l	date / time	
RADIUM-228	2.55		0.409	0.552	09/11/2019 15:45	WG1340987
(T) Barium	*99.4*			*62.0-143*	*09/11/2019 15:45*	WG1340987
(T) Yttrium	*113*			*79.0-136*	*09/11/2019 15:45*	WG1340987

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+/-	pCi/l	date / time	
Combined Radium	3.95		0.861	0.802	09/11/2019 15:45	WG1337055

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+/-	pCi/l	date / time	
RADIUM-226	1.39		0.452	0.25	09/04/2019 17:23	WG1337055
(T) Barium-133	*97.1*			*30.0-143*	*09/04/2019 17:23*	WG1337055

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+/-	pCi/l	date / time	
RADIUM-228	3.52		0.491	0.672	09/11/2019 15:45	WG1340987
(T) Barium	*105*			*62.0-143*	*09/11/2019 15:45*	WG1340987
(T) Yttrium	*107*			*79.0-136*	*09/11/2019 15:45*	WG1340987

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+/-	pCi/l	date / time	
Combined Radium	4.64		0.940	0.947	09/11/2019 15:45	WG1337055

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+/-	pCi/l	date / time	
RADIUM-226	1.12		0.449	0.275	08/30/2019 14:55	WG1337055
(T) Barium-133	*82.2*			*30.0-143*	*08/30/2019 14:55*	WG1337055

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+/-	pCi/l	date / time	
RADIUM-228	1.55		0.414	0.707	09/11/2019 15:45	WG1340987
(T) Barium	*96.7*			*62.0-143*	*09/11/2019 15:45*	WG1340987
(T) Yttrium	*111*			*79.0-136*	*09/11/2019 15:45*	WG1340987

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+/-	pCi/l	date / time	
Combined Radium	2.15		0.757	1.04	09/11/2019 15:45	WG1337055

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+/-	pCi/l	date / time	
RADIUM-226	0.604		0.343	0.332	09/04/2019 17:23	WG1337055
(T) Barium-133	*82.4*			*30.0-143*	*09/04/2019 17:23*	WG1337055

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3449949-1 09/11/19 11:06

Analyte	MB Result pCi/l	MB Qualifier	MB MDA pCi/l
Radium-228	0.176		0.453
(T) Barium	*92.6*		
(T) Yttrium	*114*		

L1133289-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1133289-01 09/11/19 11:06 • (DUP) R3449949-5 09/11/19 11:06

Analyte	Original Result pCi/l	DUP Result pCi/l	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-228	2.55	3.06	1	18.2	0.553		20	3
(T) Barium	*98.1*	*95.8*						
(T) Yttrium	*109*	*88.5*						

Laboratory Control Sample (LCS)

(LCS) R3449949-2 09/11/19 11:06

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	5.46	109	80.0-120	
(T) Barium			*99.0*		
(T) Yttrium			*106*		

L1133317-11 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1133317-11 09/11/19 15:45 • (MS) R3449949-3 09/11/19 11:06 • (MSD) R3449949-4 09/11/19 11:06

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	10.0	1.25	9.53	11.1	82.8	98.9	1	70.0-130			15.6		20
(T) Barium		*102*			*95.7*	*111*							
(T) Yttrium		*111*			*108*	*97.9*							

Method Blank (MB)

(MB) R3447929-1 08/30/19 14:54

Analyte	MB Result pCi/l	MB Qualifier	MB MDA pCi/l
Radium-226	0.000		0.0661
(T) Barium-133	*83.8*		

L1133289-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1133289-08 08/30/19 14:54 • (DUP) R3447929-5 08/30/19 14:54

Analyte	Original Result pCi/l	DUP Result pCi/l	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-226	1.35	1.14	1	16.5	0.296		20	3
(T) Barium-133	*90.4*	*63.2*						

Laboratory Control Sample (LCS)

(LCS) R3447929-2 08/30/19 14:54

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-226	5.02	4.81	95.8	80.0-120	
(T) Barium-133			*63.8*		

L1134015-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1134015-01 08/30/19 14:55 • (MS) R3447929-3 08/30/19 14:54 • (MSD) R3447929-4 08/30/19 14:54

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-226	20.1	0.290	21.5	20.4	105	100	1	75.0-125			5.06		20
(T) Barium-133		*25.5*			*75.8*	*66.2*							

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDA	Minimum Detectable Activity.
Rec.	Recovery.
RER	Replicate Error Ratio.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(T)	Tracer - A radioisotope of known concentration added to a solution of chemically equivalent radioisotopes at a known concentration to assist in monitoring the yield of the chemical separation.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
C2	Tracer recovery limits have been exceeded; values are outside lower control limits.

ACCREDITATIONS & LOCATIONS

ONE LAB. NATIONWIDE.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky [16]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [14]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

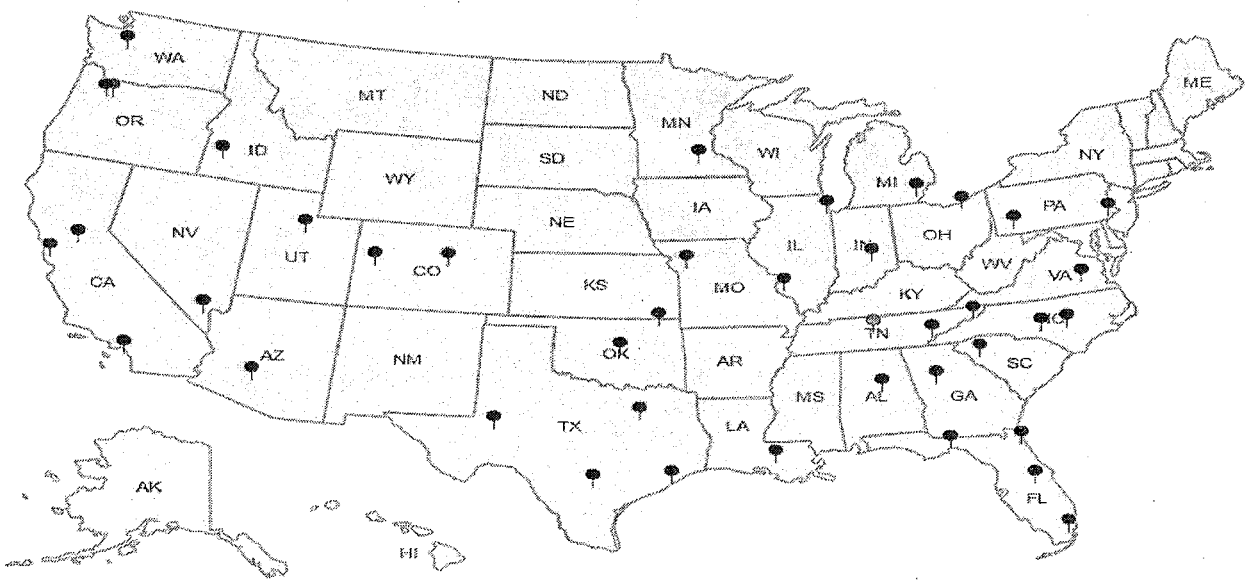
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



Pace Analytical National Center for Testing & Innovation
Cooler Receipt Form

Client: DHLRTX	SDG#:	1135289
Cooler Received/Opened On: 8/27/19	Temperature:	Am5
Received By: Lexxi Romero		
Signature:		

Receipt Check List	NP	Yes	No
COC Seal Present / Intact?	✓		
COC Signed / Accurate?		✓	
Bottles arrive intact?		✓	
Correct bottles used?		✓	
Sufficient volume sent?		✓	
If Applicable			
VOA Zero headspace?			
Preservation Correct / Checked?		✓	

DHL Analytical, Inc.
2300 Double Creek Drive
Round Rock, TX 78664
TEL: *(512) 388-8222* FAX: *(512) 388-8229*

CHAIN-OF-CUSTODY RECORD

H008

Work Order: 1908215

Subcontractor:
Pace Analytical
12065 Lebanon Rd
Mt. Juliet, TN 37122

TEL: (615) 773-5923
FAX:
Acct #: DHLRRTX

11333289

21-Aug-19

Sample Id	Matrix	DHL#	Date Collected	Bottle Type	Ra 228 E904.0	Ra 226 M7500 Ra B M	Requested Tests	
FGD-6	Aqueous	-01C	08/19/19 07:35 AM	1LHDPEHNO3	1			-01
FGD-6	Aqueous	-01D	08/19/19 07:35 AM	1LHDPEHNO3		1		
FGD-3	Aqueous	-02C	08/19/19 08:25 AM	1LHDPEHNO3	1			02
FGD-3	Aqueous	-02D	08/19/19 08:25 AM	1LHDPEHNO3		1		
FGD-2	Aqueous	-03C	08/19/19 09:15 AM	1LHDPEHNO3	1			03
FGD-2	Aqueous	-03D	08/19/19 09:15 AM	1LHDPEHNO3		1		
FGD-5	Aqueous	-04C	08/19/19 10:00 AM	1LHDPEHNO3	1			04
FGD-5	Aqueous	-04D	08/19/19 10:00 AM	1LHDPEHNO3		1		
DUP-1	Aqueous	-05C	08/19/19 10:00 AM	1LHDPEHNO3	1			05
DUP-1	Aqueous	-05D	08/19/19 10:00 AM	1LHDPEHNO3		1		
FGD-8	Aqueous	-06C	08/19/19 11:00 AM	1LHDPEHNO3	1			06
FGD-8	Aqueous	-06D	08/19/19 11:00 AM	1LHDPEHNO3		1		
FGD-1	Aqueous	-07C	08/19/19 12:05 PM	1LHDPEHNO3	1			07
FGD-1	Aqueous	-07D	08/19/19 12:05 PM	1LHDPEHNO3		1		
FGD-14	Aqueous	-08C	08/19/19 01:15 PM	1LHDPEHNO3	1			08
FGD-14	Aqueous	-08D	08/19/19 01:15 PM	1LHDPEHNO3		1		
FGD-4	Aqueous	-09C	08/19/19 02:15 PM	1LHDPEHNO3	1			09
FGD-4	Aqueous	-09D	08/19/19 02:15 PM	1LHDPEHNO3		1		

General Comments:

Please analyze these samples with Normal Turnaround Time.
Report RA-226, Ra-228 & Combined per Specs.
Quality Control Package Needed: Standard - NELAC Rad Test compliant
Email to cac@dhlanalytical.com & dupont@dhlanalytical.com

	Date/Time		Date/Time
Relinquished by:		Received by:	8-21-19 10:30
Relinquished by:		Received by:	

DHL Analytical, Inc.
2300 Double Creek Drive
Round Rock, TX 78664
TEL: *(512) 388-8222* FAX: *(512) 388-8229*

CHAIN-OF-CUSTODY RECORD

Work Order: 1908215

Subcontractor:
Pace Analytical
12065 Lebanon Rd
Mt. Juliet, TN 37122

TEL: (615) 773-5923
FAX:
Acct #: DHLRRTX

1133289

21-Aug-19

Sample Id	Matrix	DHL#	Date Collected	Bottle Type	Ra 228 E904.0	Ra 226 M7500 Ra B M	Requested Tests			
FGD-11	Aqueous	-10C	08/19/19 03:20 PM	1LHDPEHNO3	1					10
FGD-11	Aqueous	-10D	08/19/19 03:20 PM	1LHDPEHNO3		1				
FGD-12	Aqueous	-11C	08/19/19 04:25 PM	1LHDPEHNO3	1					11
FGD-12	Aqueous	-11D	08/19/19 04:25 PM	1LHDPEHNO3		1				
FGD-15	Aqueous	-12C	08/19/19 05:30 PM	1LHDPEHNO3	1					12
FGD-15	Aqueous	-12D	08/19/19 05:30 PM	1LHDPEHNO3		1				

General Comments:
Please analyze these samples with Normal Turnaround Time.
Report RA-226, Ra-228 & Combined per Specs.
Quality Control Package Needed: Standard - NELAC Rad Test compliant
Email to cac@dhlanalytical.com & dupont@dhlanalytical.com

		Date/Time			Date/Time
Relinquished by:			Received by:		8-21-19 10:00
Relinquished by:			Received by:		

June 10, 2020

Will Vienne
Golder
2201 Double Creek Dr #4004
Round Rock, Texas 78664
TEL: (512) 671-3434
FAX (512) 671-3446

Order No.: 2005040

RE: Luminant-OGSES-CCR

Dear Will Vienne:

DHL Analytical, Inc. received 2 sample(s) on 5/7/2020 for the analyses presented in the following report.

There were no problems with the analyses and all data met requirements of NELAP except where noted in the Case Narrative. All non-NELAP methods will be identified accordingly in the case narrative and all estimated uncertainties of test results are within method or EPA specifications.

If you have any questions regarding these tests results, please feel free to call. Thank you for using DHL Analytical.

Sincerely,

John DuPont
General Manager

This report was performed under the accreditation of the State of Texas Laboratory Certification Number: T104704211-20-25

Table of Contents

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DHL ANALYTICAL
2300 Double Creek Dr. ■ Round Rock, TX 78664
Phone (512) 388-8222 ■ FAX (512) 388-8229
Web: www.dhlanalytical.com
E-Mail: login@dhlanalytical.com

№ 68301

CHAIN-OF-CUSTODY

CLIENT: GOLDER ASSOCIATES
ADDRESS: 2201 DOUBLE CREEK DR ROUND ROCK, TX 78664
PHONE: 512-671-3434 FAX/E-MAIL:
DATA REPORTED TO: WILL VIENNE
ADDITIONAL REPORT COPIES TO:

DATE: 5-6-20 PAGE 1 OF 1
PO #: DHL WORK ORDER #: 2005040
PROJECT LOCATION OR NAME: LUMINANT - DGSES - CCR
CLENT PROJECT #: 19122262 COLLECTOR:

Authorize 5% surcharge for TRRP Report? ❑ Yes ❑ No

S=SOIL P=PAINT
W=WATER SL=SLUDGE
A=AIR O=OTHER
L=LIQUID SO=SOLID
SE=SEDIMENT

PRESERVATION: HCl | HNO_3 | H_2SO_4 ❑ NaOH ❑ | ICE | UNPRESERVED

ANALYSES: BTEX ❑ MTBE ❑ [METHOD 8021] | TPH 1005 ❑ TPH 1006 ❑ HOLD 1006 ❑ | GRO [METHOD 8015] ❑ DRO [METHOD 8105] ❑ | VOC 8260 ❑ VOC 624 ❑ VOC 8260/5035 ❑ | SVOC 8270 ❑ PAH 8270 ❑ HOLD PAH ❑ SVOC 625 ❑ | 8270 PEST ❑ 625 PEST/PCB ❑ 608 PCB ❑ | 8270 O-P PEST ❑ 8082 PCB ❑ 8270 PCB ❑ | 8321 HERB ❑ T PHOS, AMMONIA ❑ | METALS 6020 ❑ METALS 200.8 ❑ DISS. METALS ❑ | RCRA ❑ TX11 ❑ ❑ | PH ❑ HEX CHROM ❑ ALKALINITY ❑ COD ❑ | CHLORIDE ❑ ANIONS ❑ | TCLP-SVOC ❑ VOC ❑ PEST ❑ HERB ❑ | TCLP-METALS ❑ RCRA 8 ❑ TX-11 ❑ Pb ❑ | RCI ❑ FLASHPOINT ❑ DGAS ❑ | TDS ❑ TSS ❑ % MOISTURE ❑ CYANIDE ❑ | APPENDIX III & IV | FIELD NOTES

Field Sample I.D.	DHL Lab #	Date	Time	Matrix	Container Type	# of Containers	HCl	HNO_3	H_2SO_4 ❑ NaOH ❑	ICE	UNPRESERVED	APPENDIX III & IV	FIELD NOTES
FGD-6	01	5-6-20	1320	W		4		X		X		X	
FGD-3	02	5-6-20	1420	W		4		X		X		X	

RELINQUISHED BY: (Signature) DATE/TIME 5-7-20/900 RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature) DATE/TIME 5-7-20/1655 RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

❑ DHL DISPOSAL @ $5.00 each ❑ Return

TURN AROUND TIME
RUSH ❑ CALL FIRST
1 DAY ❑ CALL FIRST
2 DAY ❑
NORMAL ☒
OTHER ❑

LABORATORY USE ONLY:
RECEIVING TEMP: 0.9°C THERM #: 78
CUSTODY SEALS: ❑ BROKEN ☒ INTACT ❑ NOT USED
CARRIER: ❑ LONE STAR ❑ FEDEX ❑ UPS ❑ OTHER
❑ COURIER DELIVERY
☒ HAND DELIVERED

DHL COC Rev 1 | FEB 2010

Eric Lau

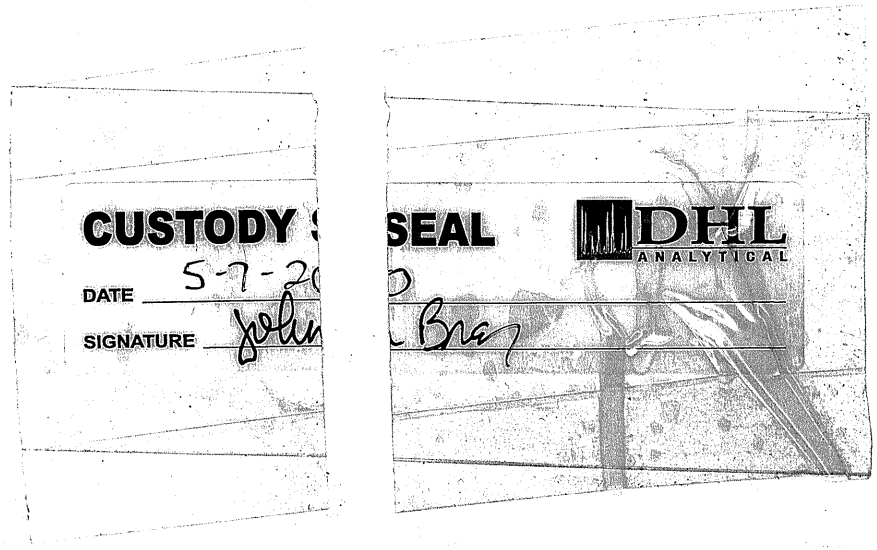
From: John DuPont
Sent: Tuesday, May 28, 2019 11:35 AM
To: Eric Lau
Subject: FW: CCR Analysis

Appendix III Parameters:
Metals (Ca and B)
Anions (Cl, F, and SO4)
TDS

Appendix IV Parameters:

Metals (As, Ba, Be, Cd, Co, Cr, Hg, Li, Mo, Pb, Sb, Se, and Tl)
Ra-226
Ra-228

From: Vienne, Will [mailto:William_Vienne@golder.com]
Sent: Tuesday, April 09, 2019 12:48 PM
To: John DuPont <dupont@dhlanalytical.com>
Subject: CCR Analysis


CUSTODY
SEAL
DHL
ANALYTICAL
DATE
5-7-2
SIGNATURE

DHL Analytical, Inc.

Sample Receipt Checklist

Client Name **Golder** Date Received: **5/7/2020**

Work Order Number **2005040** Received by: **EL**

Checklist completed by: [signature] 5/7/2020 (Signature / Date) Reviewed by (DL) 5/7/2020 (Initials / Date)

Carrier name: Hand Delivered

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shippping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	**0.9** °C
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH<2 acceptable upon receipt?	Yes ☑	No ☐	NA ☐ LOT # 13171
	Adjusted? no		Checked by EL
Water - ph>9 (S) or ph>10 (CN) acceptable upon receipt?	Yes ☐	No ☐	NA ☑ LOT #
	Adjusted?		Checked by

Any No response must be detailed in the comments section below.

Client contacted: _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments: _____

Corrective Action _____

Laboratory Name: DHL Analytical, Inc.

Laboratory Review Checklist: Reportable Data

Project Name: Luminant-OGSES-CCR	**LRC Date:** 6/10/20
Reviewer Name: Carlos Castro	**Laboratory Work Order:** 2005040
Prep Batch Number(s): See Prep Dates Report	**Run Batch:** See Analytical Dates Report

#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
		Chain-of-Custody (C-O-C)					
R1	OI	**1)** Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	**X**				**R1-01**
		2) Were all departures from standard conditions described in an exception report?			**X**		
R2	OI	**Sample and Quality Control (QC) Identification**					
		1) Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	**X**				
		2) Are all laboratory ID numbers cross-referenced to the corresponding QC data?	**X**				
R3	OI	**Test Reports**					
		1) Were all samples prepared and analyzed within holding times?	**X**				
		2) Other than those results < MQL, were all other raw values bracketed by calibration standards?	**X**				
		3) Were calculations checked by a peer or supervisor?	**X**				
		4) Were all analyte identifications checked by a peer or supervisor?	**X**				
		5) Were sample detection limits reported for all analytes not detected?	**X**				
		6) Were all results for soil and sediment samples reported on a dry weight basis?			**X**		
		7) Were % moisture (or solids) reported for all soil and sediment samples?			**X**		
		8) Were bulk soils/solids samples for volatile analysis extracted with methanol per EPA Method 5035?			**X**		
		9) If required for the project, TICs reported?			**X**		
R4	O	**Surrogate Recovery Data**					
		1) Were surrogates added prior to extraction?			**X**		
		2) Were surrogate percent recoveries in all samples within the laboratory QC limits?			**X**		
R5	OI	**Test Reports/Summary Forms for Blank Samples**					
		1) Were appropriate type(s) of blanks analyzed?	**X**				
		2) Were blanks analyzed at the appropriate frequency?	**X**				
		3) Where method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	**X**				
		4) Were blank concentrations < MDL?	**X**				
		5) For analyte(s) detected in a blank sample, was the concentration, unadjusted for sample specific factors, in all associated field samples, **greater** than 10 times the concentration in the blank sample?			**X**		
R6	OI	**Laboratory Control Samples (LCS):**					
		1) Were all COCs included in the LCS?	**X**				
		2) Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	**X**				
		3) Were LCSs analyzed at the required frequency?	**X**				
		4) Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	**X**				
		5) Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	**X**				
		6) Was the LCSD RPD within QC limits (if applicable)?	**X**				
R7	OI	**Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Data**					
		1) Were the project/method specified analytes included in the MS and MSD?	**X**				
		2) Were MS/MSD analyzed at the appropriate frequency?	**X**				
		3) Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	**X**				
		4) Were MS/MSD RPDs within laboratory QC limits?	**X**				
R8	OI	**Analytical Duplicate Data**					
		1) Were appropriate analytical duplicates analyzed for each matrix?	**X**				
		2) Were analytical duplicates analyzed at the appropriate frequency?	**X**				
		3) Were RPDs or relative standard deviations within the laboratory QC limits?	**X**				
R9	OI	**Method Quantitation Limits (MQLs):**					
		1) Are the MQLs for each method analyte included in the laboratory data package?	**X**				
		2) Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	**X**				
		3) Are unadjusted MQLs and DCSs included in the laboratory data package?	**X**				
R10	OI	**Other Problems/Anomalies**					
		1) Are all known problems/anomalies/special conditions noted in this LRC and ER?	**X**				
		2) Was applicable and available technology used to lower the SDL to minimize the matrix interference affects on the sample results?	**X**				
		3) Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	**X**				

Laboratory Name: DHL Analytical, Inc.

Laboratory Review Checklist (continued): Supporting Data

Project Name: Luminant-OGSES-CCR	**LRC Date:** 6/10/20
Reviewer Name: Carlos Castro	**Laboratory Work Order:** 2005040
Prep Batch Number(s): See Prep Dates Report	**Run Batch:** See Analytical Dates Report

#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
S1	OI	**Initial Calibration (ICAL)**					
		1) Were response factors and/or relative response factors for each analyte within QC limits?	X				
		2) Were percent RSDs or correlation coefficient criteria met?	X				
		3) Was the number of standards recommended in the method used for all analytes?	X				
		4) Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		5) Are ICAL data available for all instruments used?	X				
		6) Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and Continuing calibration Verification (ICCV and CCV) and Continuing Calibration blank (CCB):**					
		1) Was the CCV analyzed at the method-required frequency?	X				
		2) Were percent differences for each analyte within the method-required QC limits?	X				
		3) Was the ICAL curve verified for each analyte?	X				
		4) Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
S3	O	**Mass Spectral Tuning:**					
		1) Was the appropriate compound for the method used for tuning?	X				
		2) Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal Standards (IS):**					
		1) Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw Data (NELAC Section 5.5.10)**					
		1) Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		2) Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual Column Confirmation**					
		1) Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively Identified Compounds (TICs):**					
		1) If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) Results:**					
		1) Were percent recoveries within method QC limits?	X				
S9	I	**Serial Dilutions, Post Digestion Spikes, and Method of Standard Additions**					
		1) Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		X			**S9-01**
S10	OI	**Method Detection Limit (MDL) Studies**					
		1) Was a MDL study performed for each reported analyte?	X				
		2) Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency Test Reports:**					
		1) Was the lab's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards Documentation**					
		1) Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/Analyte Identification Procedures**					
		1) Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of Analyst Competency (DOC)**					
		1) Was DOC conducted consistent with NELAC Chapter 5 – Appendix C?	X				
		2) Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/Validation Documentation for Methods** (NELAC Chapter 5)					
		1) Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory Standard Operating Procedures (SOPs):**					
		1) Are laboratory SOPs current and on file for each method performed?	X				

1 Items identified by the letter "R" should be included in the laboratory data package submitted to the TCEQ in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
2 O = organic analyses; I = inorganic analyses (and general chemistry, when applicable).
3 NA = Not applicable.
4 NR = Not Reviewed.
5 ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Data Package Signature Page – RG-366/TRRP-13

This data package consists of:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;
R2 Sample identification cross-reference;
R3 Test reports (analytical data sheets) for each environmental sample that includes:
  a) Items consistent with NELAC Chapter 5,
  b) dilution factors,
  c) preparation methods,
  d) cleanup methods, and
  e) if required for the project, tentatively identified compounds (TICs).
R4 Surrogate recovery data including:
  a) Calculated recovery (%R), and
  b) The laboratory's surrogate QC limits.
R5 Test reports/summary forms for blank samples;
R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  a) LCS spiking amounts,
  b) Calculated %R for each analyte, and
  c) The laboratory's LCS QC limits.
R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  a) Samples associated with the MS/MSD clearly identified,
  b) MS/MSD spiking amounts,
  c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
  d) Calculated %Rs and relative percent differences (RPDs), and
  e) The laboratory's MS/MSD QC limits
R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  a) The amount of analyte measured in the duplicate,
  b) The calculated RPD, and
  c) The laboratory's QC limits for analytical duplicates.
R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix;
R10 Other problems or anomalies.

The Exception Report for each "No" or "Not Reviewed (NR)" item in the Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory is not accredited under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge that all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information or data affecting the quality of the data has been knowingly withheld.

This laboratory was last inspected by TCEQ on February 25-28 2019. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Name: John DuPont
Official Title: General Manager



Signature

06/10/20

Date

Name: Dr. Derhsing Luu
Official Title: Technical Director

DHL Analytical, Inc. **Date:** *10-Jun-20*

CLIENT: Golder
Project: Luminant-OGSES-CCR
Lab Order: 2005040

CASE NARRATIVE

Samples were analyzed using the methods outlined in the following references:

Method SW6020B - Metals Analysis
Method SW7470A - Mercury Analysis
Method E300 - Anions Analysis
Method M2540C - TDS Analysis

Exception Report R1-01

The samples were received and log-in performed on 5/7/20. A total of 2 samples were received. The samples arrived in good condition and were properly packaged.

Exception Report S9-01

For Metals analysis performed on 5/11/20 the RPD for the serial dilution was slightly above control limits for Boron. This is flagged accordingly in the QC summary report. The PDS was within control limits for this analyte. No further corrective actions were taken.

DHL Analytical, Inc.

Date: *10-Jun-20*

CLIENT: Golder
Project: Luminant-OGSES-CCR
Lab Order: 2005040

Work Order Sample Summary

Lab Smp ID	Client Sample ID	Tag Number	Date Collected	Date Recved
2005040-01	FGD-6		05/06/20 01:20 PM	5/7/2020
2005040-02	FGD-3		05/06/20 02:20 PM	5/7/2020

Lab Order: 2005040
Client: Golder
Project: Luminant-OGSES-CCR

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
2005040-01A	FGD-6	05/06/20 01:20 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/08/20 10:34 AM	96270
	FGD-6	05/06/20 01:20 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/08/20 10:34 AM	96270
	FGD-6	05/06/20 01:20 PM	Aqueous	SW7470A	Mercury Aq Prep	05/12/20 01:39 PM	96317
2005040-01B	FGD-6	05/06/20 01:20 PM	Aqueous	E300	Anion Preparation	05/07/20 08:41 AM	96213
	FGD-6	05/06/20 01:20 PM	Aqueous	E300	Anion Preparation	05/07/20 08:41 AM	96213
	FGD-6	05/06/20 01:20 PM	Aqueous	M2540C	TDS Preparation	05/07/20 01:32 PM	96250
2005040-02A	FGD-3	05/06/20 02:20 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/08/20 10:34 AM	96270
	FGD-3	05/06/20 02:20 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/08/20 10:34 AM	96270
	FGD-3	05/06/20 02:20 PM	Aqueous	SW7470A	Mercury Aq Prep	05/12/20 01:39 PM	96317
2005040-02B	FGD-3	05/06/20 02:20 PM	Aqueous	E300	Anion Preparation	05/07/20 08:41 AM	96213
	FGD-3	05/06/20 02:20 PM	Aqueous	E300	Anion Preparation	05/07/20 08:41 AM	96213
	FGD-3	05/06/20 02:20 PM	Aqueous	M2540C	TDS Preparation	05/07/20 01:32 PM	96250

Lab Order: 2005040
Client: Golder
Project: Luminant-OGSES-CCR

ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
2005040-01A	FGD-6	Aqueous	SW7470A	Mercury Total: Aqueous	96317	1	05/13/20 12:19 PM	CETAC2_HG_200513 A
	FGD-6	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96270	5	05/11/20 04:08 PM	ICP-MS5_200511B
	FGD-6	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96270	1	05/11/20 02:50 PM	ICP-MS5_200511B
2005040-01B	FGD-6	Aqueous	E300	Anions by IC method - Water	96213	1	05/07/20 08:25 PM	IC4_200507A
	FGD-6	Aqueous	E300	Anions by IC method - Water	96213	10	05/07/20 07:53 PM	IC4_200507A
	FGD-6	Aqueous	M2540C	Total Dissolved Solids	96250	1	05/07/20 04:50 PM	WC_200507D
2005040-02A	FGD-3	Aqueous	SW7470A	Mercury Total: Aqueous	96317	1	05/13/20 12:21 PM	CETAC2_HG_200513 A
	FGD-3	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96270	5	05/11/20 04:10 PM	ICP-MS5_200511B
	FGD-3	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96270	1	05/11/20 02:52 PM	ICP-MS5_200511B
2005040-02B	FGD-3	Aqueous	E300	Anions by IC method - Water	96213	1	05/07/20 08:41 PM	IC4_200507A
	FGD-3	Aqueous	E300	Anions by IC method - Water	96213	10	05/07/20 08:09 PM	IC4_200507A
	FGD-3	Aqueous	M2540C	Total Dissolved Solids	96250	1	05/07/20 04:50 PM	WC_200507D

DHL Analytical, Inc.

Date: *10-Jun-20*

CLIENT:	Golder	**Client Sample ID:**	FGD-6
Project:	Luminant-OGSES-CCR	**Lab ID:**	2005040-01
Project No:	19122262-F2020	**Collection Date:**	05/06/20 01:20 PM
Lab Order:	2005040	**Matrix:**	AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020B**					Analyst: **RO**
Antimony	<0.000800	0.000800	0.00250		mg/L	1	05/11/20 02:50 PM
Arsenic	0.00286	0.00200	0.00500	J	mg/L	1	05/11/20 02:50 PM
Barium	0.0814	0.00300	0.0100		mg/L	1	05/11/20 02:50 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	05/11/20 02:50 PM
Boron	0.109	0.0100	0.0300		mg/L	1	05/11/20 02:50 PM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	05/11/20 02:50 PM
Calcium	27.4	0.500	1.50		mg/L	5	05/11/20 04:08 PM
Chromium	<0.00200	0.00200	0.00500		mg/L	1	05/11/20 02:50 PM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	05/11/20 02:50 PM
Lead	<0.000300	0.000300	0.00100		mg/L	1	05/11/20 02:50 PM
Lithium	0.00877	0.00500	0.0100	J	mg/L	1	05/11/20 02:50 PM
Molybdenum	0.00205	0.00200	0.00500	J	mg/L	1	05/11/20 02:50 PM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	05/11/20 02:50 PM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	05/11/20 02:50 PM
MERCURY TOTAL: AQUEOUS		**SW7470A**					Analyst: **BM**
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	05/13/20 12:19 PM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **SNM**
Chloride	189	3.00	10.0		mg/L	10	05/07/20 07:53 PM
Fluoride	0.292	0.100	0.400	J	mg/L	1	05/07/20 08:25 PM
Sulfate	70.7	1.00	3.00		mg/L	1	05/07/20 08:25 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	746	10.0	10.0		mg/L	1	05/07/20 04:50 PM

Qualifiers:

- ND - Not Detected at the SDL
- J - Analyte detected between SDL and RL
- B - Analyte detected in the associated Method Blank
- DF- Dilution Factor
- N - Parameter not NELAP certified
- See Final Page of Report for MQLs and MDLs
- S - Spike Recovery outside control limits
- C - Sample Result or QC discussed in Case Narrative
- RL - Reporting Limit (MQL adjusted for moisture and sample size)
- SDL - Sample Detection Limit
- E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: *10-Jun-20*

CLIENT:	Golder	**Client Sample ID:**	FGD-3
Project:	Luminant-OGSES-CCR	**Lab ID:**	2005040-02
Project No:	19122262-F2020	**Collection Date:**	05/06/20 02:20 PM
Lab Order:	2005040	**Matrix:**	AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020B**					Analyst: **RO**
Antimony	<0.000800	0.000800	0.00250		mg/L	1	05/11/20 02:52 PM
Arsenic	0.00209	0.00200	0.00500	J	mg/L	1	05/11/20 02:52 PM
Barium	0.0353	0.00300	0.0100		mg/L	1	05/11/20 02:52 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	05/11/20 02:52 PM
Boron	0.152	0.0100	0.0300		mg/L	1	05/11/20 02:52 PM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	05/11/20 02:52 PM
Calcium	42.3	0.500	1.50		mg/L	5	05/11/20 04:10 PM
Chromium	0.0117	0.00200	0.00500		mg/L	1	05/11/20 02:52 PM
Cobalt	0.00332	0.00300	0.00500	J	mg/L	1	05/11/20 02:52 PM
Lead	<0.000300	0.000300	0.00100		mg/L	1	05/11/20 02:52 PM
Lithium	0.0498	0.00500	0.0100		mg/L	1	05/11/20 02:52 PM
Molybdenum	0.00284	0.00200	0.00500	J	mg/L	1	05/11/20 02:52 PM
Selenium	0.00993	0.00200	0.00500		mg/L	1	05/11/20 02:52 PM
Thallium	0.000556	0.000500	0.00150	J	mg/L	1	05/11/20 02:52 PM
MERCURY TOTAL: AQUEOUS		**SW7470A**					Analyst: **BM**
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	05/13/20 12:21 PM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **SNM**
Chloride	70.2	3.00	10.0		mg/L	10	05/07/20 08:09 PM
Fluoride	0.800	0.100	0.400		mg/L	1	05/07/20 08:41 PM
Sulfate	129	1.00	3.00		mg/L	1	05/07/20 08:41 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	777	10.0	10.0		mg/L	1	05/07/20 04:50 PM

Qualifiers:

ND - Not Detected at the SDL
J - Analyte detected between SDL and RL
B - Analyte detected in the associated Method Blank
DF- Dilution Factor
N - Parameter not NELAP certified
See Final Page of Report for MQLs and MDLs
S - Spike Recovery outside control limits
C - Sample Result or QC discussed in Case Narrative
RL - Reporting Limit (MQL adjusted for moisture and sample size)
SDL - Sample Detection Limit
E - TPH pattern not Gas or Diesel Range Pattern

CLIENT: Golder
Work Order: 2005040
Project: Luminant-OGSES-CCR

ANALYTICAL QC SUMMARY REPORT

RunID: CETAC2_HG_200304C

Sample ID: **DCS-95289** Batch ID: **95289** TestNo: **SW7470A** Units: **mg/L**
SampType: **DCS** Run ID: **CETAC2_HG_200304C** Analysis Date: **3/4/2020 12:11:09 PM** Prep Date: **3/4/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.000175	0.000200	0.000200	0	87.5	82	119	0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005040
Project: Luminant-OGSES-CCR

ANALYTICAL QC SUMMARY REPORT

RunID: CETAC2_HG_200513A

The QC data in batch 96317 applies to the following samples: 2005040-01A, 2005040-02A

Sample ID: **MB-96317**	Batch ID: **96317**	TestNo: **SW7470A**	Units: **mg/L**
SampType: **MBLK**	Run ID: **CETAC2_HG_200513A**	Analysis Date: **5/13/2020 12:09:44 PM**	Prep Date: **5/12/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	<0.0000800	0.000200								

Sample ID: **LCS-96317**	Batch ID: **96317**	TestNo: **SW7470A**	Units: **mg/L**
SampType: **LCS**	Run ID: **CETAC2_HG_200513A**	Analysis Date: **5/13/2020 12:14:44 PM**	Prep Date: **5/12/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00195	0.000200	0.00200	0	97.5	85	115			

Sample ID: **LCSD-96317**	Batch ID: **96317**	TestNo: **SW7470A**	Units: **mg/L**
SampType: **LCSD**	Run ID: **CETAC2_HG_200513A**	Analysis Date: **5/13/2020 12:17:01 PM**	Prep Date: **5/12/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00206	0.000200	0.00200	0	103	85	115	5.49	15	

Sample ID: **2005048-02A MS**	Batch ID: **96317**	TestNo: **SW7470A**	Units: **mg/L**
SampType: **MS**	Run ID: **CETAC2_HG_200513A**	Analysis Date: **5/13/2020 12:28:20 PM**	Prep Date: **5/12/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0104	0.00100	0.0100	0	104	80	120			

Sample ID: **2005048-02A MSD**	Batch ID: **96317**	TestNo: **SW7470A**	Units: **mg/L**
SampType: **MSD**	Run ID: **CETAC2_HG_200513A**	Analysis Date: **5/13/2020 12:30:36 PM**	Prep Date: **5/12/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0105	0.00100	0.0100	0	104	80	120	0.480	15	

Sample ID: **2005048-02A SD**	Batch ID: **96317**	TestNo: **SW7470A**	Units: **mg/L**
SampType: **SD**	Run ID: **CETAC2_HG_200513A**	Analysis Date: **5/13/2020 12:32:52 PM**	Prep Date: **5/12/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	<0.00200	0.00500	0	0				0	10	

Sample ID: **2005048-02A PDS**	Batch ID: **96317**	TestNo: **SW7470A**	Units: **mg/L**
SampType: **PDS**	Run ID: **CETAC2_HG_200513A**	Analysis Date: **5/13/2020 12:35:07 PM**	Prep Date: **5/12/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0124	0.00100	0.0125	0	99.2	85	115			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005040
Project: Luminant-OGSES-CCR

ANALYTICAL QC SUMMARY REPORT

RunID: CETAC2_HG_200513A

Sample ID: **ICV-200513**	Batch ID: **R110466**	TestNo: **SW7470A**	Units: **mg/L**
SampType: **ICV**	Run ID: **CETAC2_HG_200513A**	Analysis Date: **5/13/2020 10:49:14 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00383	0.000200	0.00400	0	95.8	90	110			

Sample ID: **CCV1-200513**	Batch ID: **R110466**	TestNo: **SW7470A**	Units: **mg/L**
SampType: **CCV**	Run ID: **CETAC2_HG_200513A**	Analysis Date: **5/13/2020 1:06:55 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00202	0.000200	0.00200	0	101	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005040
Project: Luminant-OGSES-CCR

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200408C

Sample ID: **DCS1-95814**	Batch ID: **95814**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **DCS**	Run ID: **ICP-MS5_200408C**	Analysis Date: **4/8/2020 11:16:00 AM**	Prep Date: **4/7/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.000932	0.00250	0.00100	0	93.2	70	130	0	0	
Beryllium	0.000472	0.00100	0.000500	0	94.4	70	130	0	0	
Cadmium	0.000492	0.00100	0.000500	0	98.4	70	130	0	0	
Lead	0.000496	0.00100	0.000500	0	99.2	70	130	0	0	
Thallium	0.000468	0.00150	0.000500	0	93.6	70	130	0	0	

Sample ID: **DCS2-95814**	Batch ID: **95814**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **DCS2**	Run ID: **ICP-MS5_200408C**	Analysis Date: **4/8/2020 11:19:00 AM**	Prep Date: **4/7/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	0.310	0.300	0.300	0	103	70	130	0	0	

Sample ID: **DCS3-95814**	Batch ID: **95814**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **DCS3**	Run ID: **ICP-MS5_200408C**	Analysis Date: **4/8/2020 11:21:00 AM**	Prep Date: **4/7/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.00466	0.00500	0.00500	0	93.2	70	130	0	0	
Barium	0.00478	0.0100	0.00500	0	95.6	70	130	0	0	
Chromium	0.00600	0.00500	0.00500	0	120	70	130	0	0	
Cobalt	0.00473	0.00500	0.00500	0	94.6	70	130	0	0	
Lithium	0.00473	0.0100	0.00500	0	94.6	70	130	0	0	
Molybdenum	0.00466	0.00500	0.00500	0	93.2	70	130	0	0	
Selenium	0.00517	0.00500	0.00500	0	103	70	130	0	0	

Sample ID: **DCS4-95814**	Batch ID: **95814**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **DCS4**	Run ID: **ICP-MS5_200408C**	Analysis Date: **4/8/2020 11:28:00 AM**	Prep Date: **4/7/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	0.0286	0.0300	0.0300	0	95.2	70	130	0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005040
Project: Luminant-OGSES-CCR

ANALYTICAL QC SUMMARY REPORT

RunID: **ICP-MS5_200511B**

The QC data in batch 96270 applies to the following samples: 2005040-01A, 2005040-02A

Sample ID: **MB-96270** Batch ID: **96270** TestNo: **SW6020B** Units: **mg/L**
SampType: **MBLK** Run ID: **ICP-MS5_200511B** Analysis Date: **5/11/2020 1:41:00 PM** Prep Date: **5/8/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	<0.000800	0.00250								
Arsenic	<0.00200	0.00500								
Barium	<0.00300	0.0100								
Beryllium	<0.000300	0.00100								
Boron	<0.0100	0.0300								
Cadmium	<0.000300	0.00100								
Calcium	<0.100	0.300								
Chromium	<0.00200	0.00500								
Cobalt	<0.00300	0.00500								
Lead	<0.000300	0.00100								
Lithium	<0.00500	0.0100								
Molybdenum	<0.00200	0.00500								
Selenium	<0.00200	0.00500								
Thallium	<0.000500	0.00150								

Sample ID: **LCS-96270** Batch ID: **96270** TestNo: **SW6020B** Units: **mg/L**
SampType: **LCS** Run ID: **ICP-MS5_200511B** Analysis Date: **5/11/2020 1:43:00 PM** Prep Date: **5/8/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.206	0.00250	0.200	0	103	80	120			
Arsenic	0.206	0.00500	0.200	0	103	80	120			
Barium	0.198	0.0100	0.200	0	99.0	80	120			
Beryllium	0.199	0.00100	0.200	0	99.5	80	120			
Boron	0.191	0.0300	0.200	0	95.7	80	120			
Cadmium	0.203	0.00100	0.200	0	101	80	120			
Calcium	5.10	0.300	5.00	0	102	80	120			
Chromium	0.199	0.00500	0.200	0	99.3	80	120			
Cobalt	0.199	0.00500	0.200	0	99.6	80	120			
Lead	0.191	0.00100	0.200	0	95.6	80	120			
Lithium	0.202	0.0100	0.200	0	101	80	120			
Molybdenum	0.202	0.00500	0.200	0	101	80	120			
Selenium	0.206	0.00500	0.200	0	103	80	120			
Thallium	0.190	0.00150	0.200	0	95.0	80	120			

Sample ID: **LCSD-96270** Batch ID: **96270** TestNo: **SW6020B** Units: **mg/L**
SampType: **LCSD** Run ID: **ICP-MS5_200511B** Analysis Date: **5/11/2020 1:45:00 PM** Prep Date: **5/8/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.204	0.00250	0.200	0	102	80	120	0.748	15	
Arsenic	0.204	0.00500	0.200	0	102	80	120	0.625	15	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005040
Project: Luminant-OGSES-CCR

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200511B

Sample ID: **LCSD-96270** Batch ID: **96270** TestNo: **SW6020B** Units: **mg/L**
SampType: **LCSD** Run ID: **ICP-MS5_200511B** Analysis Date: **5/11/2020 1:45:00 PM** Prep Date: **5/8/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.199	0.0100	0.200	0	99.3	80	120	0.306	15	
Beryllium	0.201	0.00100	0.200	0	100	80	120	0.891	15	
Boron	0.207	0.0300	0.200	0	104	80	120	7.99	15	
Cadmium	0.201	0.00100	0.200	0	101	80	120	0.817	15	
Calcium	5.05	0.300	5.00	0	101	80	120	0.928	15	
Chromium	0.200	0.00500	0.200	0	100	80	120	0.855	15	
Cobalt	0.201	0.00500	0.200	0	100	80	120	0.747	15	
Lead	0.190	0.00100	0.200	0	95.2	80	120	0.416	15	
Lithium	0.204	0.0100	0.200	0	102	80	120	1.37	15	
Molybdenum	0.200	0.00500	0.200	0	100	80	120	0.702	15	
Selenium	0.207	0.00500	0.200	0	103	80	120	0.402	15	
Thallium	0.189	0.00150	0.200	0	94.6	80	120	0.385	15	

Sample ID: **2005013-01B SD** Batch ID: **96270** TestNo: **SW6020B** Units: **mg/L**
SampType: **SD** Run ID: **ICP-MS5_200511B** Analysis Date: **5/11/2020 1:52:00 PM** Prep Date: **5/8/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	<0.00400	0.0125	0	0				0	20	
Arsenic	<0.0100	0.0250	0	0				0	20	
Barium	0.0953	0.0500	0	0.0961				0.857	20	
Beryllium	<0.00150	0.00500	0	0				0	20	
Boron	0.287	0.150	0	0.221				26.1	20	R
Cadmium	<0.00150	0.00500	0	0				0	20	
Calcium	3.98	1.50	0	4.00				0.590	20	
Chromium	<0.0100	0.0250	0	0				0	20	
Cobalt	<0.0150	0.0250	0	0				0	20	
Lead	<0.00150	0.00500	0	0				0	20	
Lithium	0.0284	0.0500	0	0.0274				3.58	20	
Molybdenum	<0.0100	0.0250	0	0				0	20	
Selenium	<0.0100	0.0250	0	0				0	20	
Thallium	<0.00250	0.00750	0	0				0	20	

Sample ID: **2005013-01B PDS** Batch ID: **96270** TestNo: **SW6020B** Units: **mg/L**
SampType: **PDS** Run ID: **ICP-MS5_200511B** Analysis Date: **5/11/2020 2:23:00 PM** Prep Date: **5/8/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.198	0.00250	0.200	0	99.1	75	125			
Arsenic	0.193	0.00500	0.200	0	96.4	75	125			
Barium	0.292	0.0100	0.200	0.0961	97.9	75	125			
Beryllium	0.200	0.00100	0.200	0	99.8	75	125			
Boron	0.409	0.0300	0.200	0.221	94.2	75	125			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005040
Project: Luminant-OGSES-CCR

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200511B

Sample ID: **2005013-01B PDS** Batch ID: **96270** TestNo: **SW6020B** Units: **mg/L**
SampType: **PDS** Run ID: **ICP-MS5_200511B** Analysis Date: **5/11/2020 2:23:00 PM** Prep Date: **5/8/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cadmium	0.203	0.00100	0.200	0	101	75	125			
Calcium	8.99	0.300	5.00	4.00	99.7	75	125			
Chromium	0.203	0.00500	0.200	0	102	75	125			
Cobalt	0.192	0.00500	0.200	0	96.2	75	125			
Lead	0.197	0.00100	0.200	0	98.3	75	125			
Lithium	0.231	0.0100	0.200	0.0274	102	75	125			
Molybdenum	0.200	0.00500	0.200	0	99.8	75	125			
Selenium	0.190	0.00500	0.200	0	95.0	75	125			
Thallium	0.192	0.00150	0.200	0	95.9	75	125			

Sample ID: **2005013-01B MS** Batch ID: **96270** TestNo: **SW6020B** Units: **mg/L**
SampType: **MS** Run ID: **ICP-MS5_200511B** Analysis Date: **5/11/2020 2:26:00 PM** Prep Date: **5/8/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.205	0.00250	0.200	0	102	75	125			
Arsenic	0.193	0.00500	0.200	0	96.6	75	125			
Barium	0.294	0.0100	0.200	0.0961	99.0	75	125			
Beryllium	0.199	0.00100	0.200	0	99.5	75	125			
Boron	0.442	0.0300	0.200	0.221	111	75	125			
Cadmium	0.198	0.00100	0.200	0	99.2	75	125			
Calcium	9.22	0.300	5.00	4.00	104	75	125			
Chromium	0.196	0.00500	0.200	0	98.0	75	125			
Cobalt	0.188	0.00500	0.200	0	94.1	75	125			
Lead	0.193	0.00100	0.200	0	96.5	75	125			
Lithium	0.235	0.0100	0.200	0.0274	104	75	125			
Molybdenum	0.203	0.00500	0.200	0	102	75	125			
Selenium	0.193	0.00500	0.200	0	96.5	75	125			
Thallium	0.191	0.00150	0.200	0	95.3	75	125			

Sample ID: **2005013-01B MSD** Batch ID: **96270** TestNo: **SW6020B** Units: **mg/L**
SampType: **MSD** Run ID: **ICP-MS5_200511B** Analysis Date: **5/11/2020 2:28:00 PM** Prep Date: **5/8/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.205	0.00250	0.200	0	102	75	125	0.105	15	
Arsenic	0.194	0.00500	0.200	0	97.2	75	125	0.685	15	
Barium	0.296	0.0100	0.200	0.0961	100	75	125	0.795	15	
Beryllium	0.197	0.00100	0.200	0	98.7	75	125	0.818	15	
Boron	0.441	0.0300	0.200	0.221	110	75	125	0.181	15	
Cadmium	0.199	0.00100	0.200	0	99.5	75	125	0.312	15	
Calcium	9.09	0.300	5.00	4.00	102	75	125	1.39	15	
Chromium	0.196	0.00500	0.200	0	97.9	75	125	0.093	15	

Qualifiers:

B	Analyte detected in the associated Method Blank
J	Analyte detected between MDL and RL
ND	Not Detected at the Method Detection Limit
RL	Reporting Limit
J	Analyte detected between SDL and RL
DF	Dilution Factor
MDL	Method Detection Limit
R	RPD outside accepted control limits
S	Spike Recovery outside control limits
N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005040
Project: Luminant-OGSES-CCR

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200511B

Sample ID: **2005013-01B MSD** Batch ID: **96270** TestNo: **SW6020B** Units: **mg/L**
SampType: **MSD** Run ID: **ICP-MS5_200511B** Analysis Date: **5/11/2020 2:28:00 PM** Prep Date: **5/8/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cobalt	0.190	0.00500	0.200	0	95.2	75	125	1.15	15	
Lead	0.195	0.00100	0.200	0	97.3	75	125	0.844	15	
Lithium	0.236	0.0100	0.200	0.0274	104	75	125	0.311	15	
Molybdenum	0.205	0.00500	0.200	0	102	75	125	0.717	15	
Selenium	0.190	0.00500	0.200	0	95.2	75	125	1.42	15	
Thallium	0.193	0.00150	0.200	0	96.3	75	125	1.03	15	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005040
Project: Luminant-OGSES-CCR

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200511B

Sample ID: **ICV-200511** Batch ID: **R110424** TestNo: **SW6020B** Units: **mg/L**
SampType: **ICV** Run ID: **ICP-MS5_200511B** Analysis Date: **5/11/2020 11:23:00 AM** Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.103	0.00250	0.100	0	103	90	110			
Arsenic	0.0999	0.00500	0.100	0	99.9	90	110			
Barium	0.0995	0.0100	0.100	0	99.5	90	110			
Beryllium	0.0992	0.00100	0.100	0	99.2	90	110			
Boron	0.0999	0.0300	0.100	0	99.9	90	110			
Cadmium	0.102	0.00100	0.100	0	102	90	110			
Calcium	2.55	0.300	2.50	0	102	90	110			
Chromium	0.103	0.00500	0.100	0	103	90	110			
Cobalt	0.101	0.00500	0.100	0	101	90	110			
Lead	0.0990	0.00100	0.100	0	99.0	90	110			
Lithium	0.0991	0.0100	0.100	0	99.1	90	110			
Molybdenum	0.0981	0.00500	0.100	0	98.1	90	110			
Selenium	0.106	0.00500	0.100	0	106	90	110			
Thallium	0.0964	0.00150	0.100	0	96.4	90	110			

Sample ID: **LCVL-200511** Batch ID: **R110424** TestNo: **SW6020B** Units: **mg/L**
SampType: **LCVL** Run ID: **ICP-MS5_200511B** Analysis Date: **5/11/2020 11:33:00 AM** Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00204	0.00250	0.00200	0	102	80	120			
Arsenic	0.00519	0.00500	0.00500	0	104	80	120			
Barium	0.00522	0.0100	0.00500	0	104	80	120			
Beryllium	0.00103	0.00100	0.00100	0	103	80	120			
Boron	0.0205	0.0300	0.0200	0	103	80	120			
Cadmium	0.000999	0.00100	0.00100	0	99.9	80	120			
Calcium	0.112	0.300	0.100	0	112	80	120			
Chromium	0.00504	0.00500	0.00500	0	101	80	120			
Cobalt	0.00505	0.00500	0.00500	0	101	80	120			
Lead	0.000980	0.00100	0.00100	0	98.0	80	120			
Lithium	0.00989	0.0100	0.0100	0	98.9	80	120			
Molybdenum	0.00502	0.00500	0.00500	0	100	80	120			
Selenium	0.00584	0.00500	0.00500	0	117	80	120			
Thallium	0.000967	0.00150	0.00100	0	96.7	80	120			

Sample ID: **CCV2-200409** Batch ID: **R110424** TestNo: **SW6020B** Units: **mg/L**
SampType: **CCV** Run ID: **ICP-MS5_200511B** Analysis Date: **5/11/2020 1:33:00 PM** Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.203	0.00250	0.200	0	102	90	110			
Arsenic	0.199	0.00500	0.200	0	99.7	90	110			
Barium	0.196	0.0100	0.200	0	97.8	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005040
Project: Luminant-OGSES-CCR

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200511B

Sample ID: **CCV2-200409** Batch ID: **R110424** TestNo: **SW6020B** Units: **mg/L**
SampType: **CCV** Run ID: **ICP-MS5_200511B** Analysis Date: **5/11/2020 1:33:00 PM** Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Beryllium	0.198	0.00100	0.200	0	99.1	90	110			
Boron	0.197	0.0300	0.200	0	98.5	90	110			
Cadmium	0.199	0.00100	0.200	0	99.7	90	110			
Calcium	5.08	0.300	5.00	0	102	90	110			
Chromium	0.196	0.00500	0.200	0	98.1	90	110			
Cobalt	0.195	0.00500	0.200	0	97.7	90	110			
Lead	0.192	0.00100	0.200	0	95.8	90	110			
Lithium	0.206	0.0100	0.200	0	103	90	110			
Molybdenum	0.199	0.00500	0.200	0	99.4	90	110			
Selenium	0.197	0.00500	0.200	0	98.5	90	110			
Thallium	0.190	0.00150	0.200	0	94.8	90	110			

Sample ID: **CCV3-200511** Batch ID: **R110424** TestNo: **SW6020B** Units: **mg/L**
SampType: **CCV** Run ID: **ICP-MS5_200511B** Analysis Date: **5/11/2020 2:39:00 PM** Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.205	0.00250	0.200	0	103	90	110			
Arsenic	0.206	0.00500	0.200	0	103	90	110			
Barium	0.199	0.0100	0.200	0	99.5	90	110			
Beryllium	0.199	0.00100	0.200	0	99.6	90	110			
Boron	0.196	0.0300	0.200	0	98.1	90	110			
Cadmium	0.202	0.00100	0.200	0	101	90	110			
Calcium	5.20	0.300	5.00	0	104	90	110			
Chromium	0.200	0.00500	0.200	0	99.9	90	110			
Cobalt	0.200	0.00500	0.200	0	99.9	90	110			
Lead	0.193	0.00100	0.200	0	96.6	90	110			
Lithium	0.205	0.0100	0.200	0	103	90	110			
Molybdenum	0.201	0.00500	0.200	0	100	90	110			
Selenium	0.204	0.00500	0.200	0	102	90	110			
Thallium	0.192	0.00150	0.200	0	95.8	90	110			

Sample ID: **CCV4-200511** Batch ID: **R110424** TestNo: **SW6020B** Units: **mg/L**
SampType: **CCV** Run ID: **ICP-MS5_200511B** Analysis Date: **5/11/2020 3:08:00 PM** Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.204	0.00250	0.200	0	102	90	110			
Arsenic	0.204	0.00500	0.200	0	102	90	110			
Barium	0.201	0.0100	0.200	0	100	90	110			
Beryllium	0.200	0.00100	0.200	0	100	90	110			
Boron	0.199	0.0300	0.200	0	99.3	90	110			
Cadmium	0.202	0.00100	0.200	0	101	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005040
Project: Luminant-OGSES-CCR

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200511B

Sample ID: **CCV4-200511**	Batch ID: **R110424**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS5_200511B**	Analysis Date: **5/11/2020 3:08:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chromium	0.199	0.00500	0.200	0	99.4	90	110			
Cobalt	0.201	0.00500	0.200	0	100	90	110			
Lead	0.192	0.00100	0.200	0	96.2	90	110			
Lithium	0.208	0.0100	0.200	0	104	90	110			
Molybdenum	0.202	0.00500	0.200	0	101	90	110			
Selenium	0.206	0.00500	0.200	0	103	90	110			
Thallium	0.190	0.00150	0.200	0	95.1	90	110			

Sample ID: **CCV5-200511**	Batch ID: **R110424**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS5_200511B**	Analysis Date: **5/11/2020 3:41:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	5.18	0.300	5.00	0	104	90	110			

Sample ID: **CCV6-200511**	Batch ID: **R110424**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS5_200511B**	Analysis Date: **5/11/2020 4:17:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	5.23	0.300	5.00	0	105	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005040
Project: Luminant-OGSES-CCR

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_200430A

Sample ID: **DCS2-96153** Batch ID: **96153** TestNo: **E300** Units: **mg/L**
SampType: **DCS2** Run ID: **IC4_200430A** Analysis Date: **4/30/2020 11:31:49 AM** Prep Date: **4/30/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	0.473	1.00	0.5000	0	94.7	70	130	0	0	
Fluoride	0.191	0.400	0.2000	0	95.6	70	130	0	0	
Sulfate	1.34	3.00	1.500	0	89.6	70	130	0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005040
Project: Luminant-OGSES-CCR

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_200507A

The QC data in batch 96213 applies to the following samples: 2005040-01B, 2005040-02B

Sample ID: **MB-96213** Batch ID: **96213** TestNo: **E300** Units: **mg/L**
SampType: **MBLK** Run ID: **IC4_200507A** Analysis Date: **5/7/2020 10:26:10 AM** Prep Date: **5/7/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	<0.300	1.00								
Fluoride	<0.100	0.400								
Sulfate	<1.00	3.00								

Sample ID: **LCS-96213** Batch ID: **96213** TestNo: **E300** Units: **mg/L**
SampType: **LCS** Run ID: **IC4_200507A** Analysis Date: **5/7/2020 10:42:10 AM** Prep Date: **5/7/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.97	1.00	10.00	0	99.7	90	110			
Fluoride	3.70	0.400	4.000	0	92.6	90	110			
Sulfate	29.2	3.00	30.00	0	97.5	90	110			

Sample ID: **LCSD-96213** Batch ID: **96213** TestNo: **E300** Units: **mg/L**
SampType: **LCSD** Run ID: **IC4_200507A** Analysis Date: **5/7/2020 10:58:10 AM** Prep Date: **5/7/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.95	1.00	10.00	0	99.5	90	110	0.142	20	
Fluoride	3.69	0.400	4.000	0	92.3	90	110	0.300	20	
Sulfate	29.3	3.00	30.00	0	97.7	90	110	0.199	20	

Sample ID: **2005032-01CMS** Batch ID: **96213** TestNo: **E300** Units: **mg/L**
SampType: **MS** Run ID: **IC4_200507A** Analysis Date: **5/7/2020 6:17:07 PM** Prep Date: **5/7/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	2090	100	2000	152.7	97.0	90	110			
Fluoride	1990	40.0	2000	0	99.4	90	110			
Sulfate	2060	300	2000	104.8	97.7	90	110			

Sample ID: **2005032-01CMSD** Batch ID: **96213** TestNo: **E300** Units: **mg/L**
SampType: **MSD** Run ID: **IC4_200507A** Analysis Date: **5/7/2020 6:33:07 PM** Prep Date: **5/7/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	2100	100	2000	152.7	97.2	90	110	0.222	20	
Fluoride	2000	40.0	2000	0	100	90	110	0.595	20	
Sulfate	2050	300	2000	104.8	97.4	90	110	0.233	20	

Sample ID: **2005022-01BMS** Batch ID: **96213** TestNo: **E300** Units: **mg/L**
SampType: **MS** Run ID: **IC4_200507A** Analysis Date: **5/7/2020 6:49:07 PM** Prep Date: **5/7/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005040
Project: Luminant-OGSES-CCR

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_200507A

Sample ID: **2005022-01BMS**	Batch ID: **96213**	TestNo: **E300**	Units: **mg/L**
SampType: **MS**	Run ID: **IC4_200507A**	Analysis Date: **5/7/2020 6:49:07 PM**	Prep Date: **5/7/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	243	10.0	200.0	46.49	98.2	90	110			
Fluoride	223	4.00	200.0	21.81	101	90	110			
Sulfate	458	30.0	200.0	267.4	95.5	90	110			

Sample ID: **2005022-01BMSD**	Batch ID: **96213**	TestNo: **E300**	Units: **mg/L**
SampType: **MSD**	Run ID: **IC4_200507A**	Analysis Date: **5/7/2020 7:05:07 PM**	Prep Date: **5/7/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	240	10.0	200.0	46.49	97.0	90	110	0.970	20	
Fluoride	223	4.00	200.0	21.81	100	90	110	0.247	20	
Sulfate	458	30.0	200.0	267.4	95.1	90	110	0.187	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005040
Project: Luminant-OGSES-CCR

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_200507A

Sample ID: **ICV-200507**	Batch ID: **R110392**	TestNo: **E300**	Units: **mg/L**
SampType: **ICV**	Run ID: **IC4_200507A**	Analysis Date: **5/7/2020 9:54:10 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	24.7	1.00	25.00	0	98.9	90	110			
Fluoride	9.55	0.400	10.00	0	95.5	90	110			
Sulfate	74.8	3.00	75.00	0	99.7	90	110			

Sample ID: **CCV1-200507**	Batch ID: **R110392**	TestNo: **E300**	Units: **mg/L**
SampType: **CCV**	Run ID: **IC4_200507A**	Analysis Date: **5/7/2020 5:29:07 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.94	1.00	10.00	0	99.4	90	110			
Fluoride	3.75	0.400	4.000	0	93.6	90	110			
Sulfate	29.3	3.00	30.00	0	97.8	90	110			

Sample ID: **CCV2-200507**	Batch ID: **R110392**	TestNo: **E300**	Units: **mg/L**
SampType: **CCV**	Run ID: **IC4_200507A**	Analysis Date: **5/7/2020 10:33:07 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.0	1.00	10.00	0	100	90	110			
Fluoride	3.81	0.400	4.000	0	95.3	90	110			
Sulfate	29.4	3.00	30.00	0	98.0	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005040
Project: Luminant-OGSES-CCR

ANALYTICAL QC SUMMARY REPORT

RunID: **WC_200507D**

The QC data in batch 96250 applies to the following samples: 2005040-01B, 2005040-02B

Sample ID: **MB-96250**	Batch ID: **96250**	TestNo: **M2540C**	Units: **mg/L**
SampType: **MBLK**	Run ID: **WC_200507D**	Analysis Date: **5/7/2020 4:50:00 PM**	Prep Date: **5/7/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	<10.0	10.0								

Sample ID: **LCS-96250**	Batch ID: **96250**	TestNo: **M2540C**	Units: **mg/L**
SampType: **LCS**	Run ID: **WC_200507D**	Analysis Date: **5/7/2020 4:50:00 PM**	Prep Date: **5/7/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	746	10.0	745.6	0	100	90	113			

Sample ID: **2005023-01A-DUP**	Batch ID: **96250**	TestNo: **M2540C**	Units: **mg/L**
SampType: **DUP**	Run ID: **WC_200507D**	Analysis Date: **5/7/2020 4:50:00 PM**	Prep Date: **5/7/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	1040	50.0	0	1055				1.43	5	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005040
Project: Luminant-OGSES-CCR

MQL SUMMARY REPORT

TestNo: E300	**MDL**	**MQL**
Analyte	**mg/L**	**mg/L**
Chloride	0.300	1.00
Fluoride	0.100	0.400
Sulfate	1.00	3.00

TestNo: SW6020B	**MDL**	**MQL**
Analyte	**mg/L**	**mg/L**
Antimony	0.000800	0.00250
Arsenic	0.00200	0.00500
Barium	0.00300	0.0100
Beryllium	0.000300	0.00100
Boron	0.0100	0.0300
Cadmium	0.000300	0.00100
Calcium	0.100	0.300
Chromium	0.00200	0.00500
Cobalt	0.00300	0.00500
Lead	0.000300	0.00100
Lithium	0.00500	0.0100
Molybdenum	0.00200	0.00500
Selenium	0.00200	0.00500
Thallium	0.000500	0.00150

TestNo: SW7470A	**MDL**	**MQL**
Analyte	**mg/L**	**mg/L**
Mercury	0.0000800	0.000200

TestNo: M2540C	**MDL**	**MQL**
Analyte	**mg/L**	**mg/L**
Total Dissolved Solids (Residue, Filt	10.0	10.0

Qualifiers: MQL -Method Quantitation Limit as defined by TRRP
MDL -Method Detection Limit as defined by TRRP

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

June 10, 2020

DHL Analytical, Inc.

Sample Delivery Group:	L1217407
Samples Received:	05/12/2020
Project Number:	2005040
Description:	

Report To: John DuPont
2300 Double Creek Drive
Round Rock, TX 78664

Entire Report Reviewed By:

Donna Eidson
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.



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FGD-6 L1217407-01 Non-Potable Water

Collected by	Collected date/time	Received date/time
	05/06/20 13:20	05/12/20 10:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1475267	1	05/18/20 12:10	05/28/20 10:30	SNR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1483326	1	05/28/20 11:33	06/04/20 13:38	SNR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1483326	1	05/28/20 11:33	06/04/20 13:38	RGT	Mt. Juliet, TN

FGD-3 L1217407-02 Non-Potable Water

Collected by	Collected date/time	Received date/time
	05/06/20 14:20	05/12/20 10:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1475267	1	05/18/20 12:10	05/28/20 10:30	SNR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1483326	1	05/28/20 11:33	05/29/20 15:55	SNR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1483326	1	05/28/20 11:33	05/29/20 15:55	RGT	Mt. Juliet, TN

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.



Donna Eidson
Project Manager

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	0.845		0.520	0.976	05/28/2020 10:30	WG1475267
(T) Barium	*87.4*			*62.0-143*	*05/28/2020 10:30*	WG1475267
(T) Yttrium	*115*			*79.0-136*	*05/28/2020 10:30*	WG1475267

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.36		0.765	1.13	06/04/2020 13:38	WG1483326

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.513		0.245	0.154	06/04/2020 13:38	WG1483326
(T) Barium-133	*120*			*30.0-143*	*06/04/2020 13:38*	WG1483326

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	0.463		0.606	1.07	05/28/2020 10:30	WG1475267
(T) Barium	*90.5*			*62.0-143*	*05/28/2020 10:30*	WG1475267
(T) Yttrium	*117*			*79.0-136*	*05/28/2020 10:30*	WG1475267

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.857		0.859	1.31	05/29/2020 15:55	WG1483326

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.394		0.253	0.237	05/29/2020 15:55	WG1483326
(T) Barium-133	*116*			*30.0-143*	*05/29/2020 15:55*	WG1483326

Method Blank (MB)

(MB) R3530968-1 05/22/20 10:30

Analyte	MB Result pCi/l	MB Qualifier	MB MDA pCi/l
Radium-228	0.194		0.455
(T) Barium	*90.0*		
(T) Yttrium	*108*		

Laboratory Control Sample (LCS)

(LCS) R3530968-2 05/22/20 10:30

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	4.86	97.2	80.0-120	
(T) Barium			*82.1*		
(T) Yttrium			*106*		

Method Blank (MB)

(MB) R3535339-1 06/03/20 14:24

Analyte	MB Result pCi/l	MB Qualifier	MB MDA pCi/l
Radium-226	0.000		0.0602
(T) Barium-133	*98.2*		

Laboratory Control Sample (LCS)

(LCS) R3535339-2 06/03/20 14:24

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-226	5.02	5.19	103	80.0-120	
(T) Barium-133			*102*		

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDA	Minimum Detectable Activity.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(T)	Tracer - A radioisotope of known concentration added to a solution of chemically equivalent radioisotopes at a known concentration to assist in monitoring the yield of the chemical separation.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
	The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

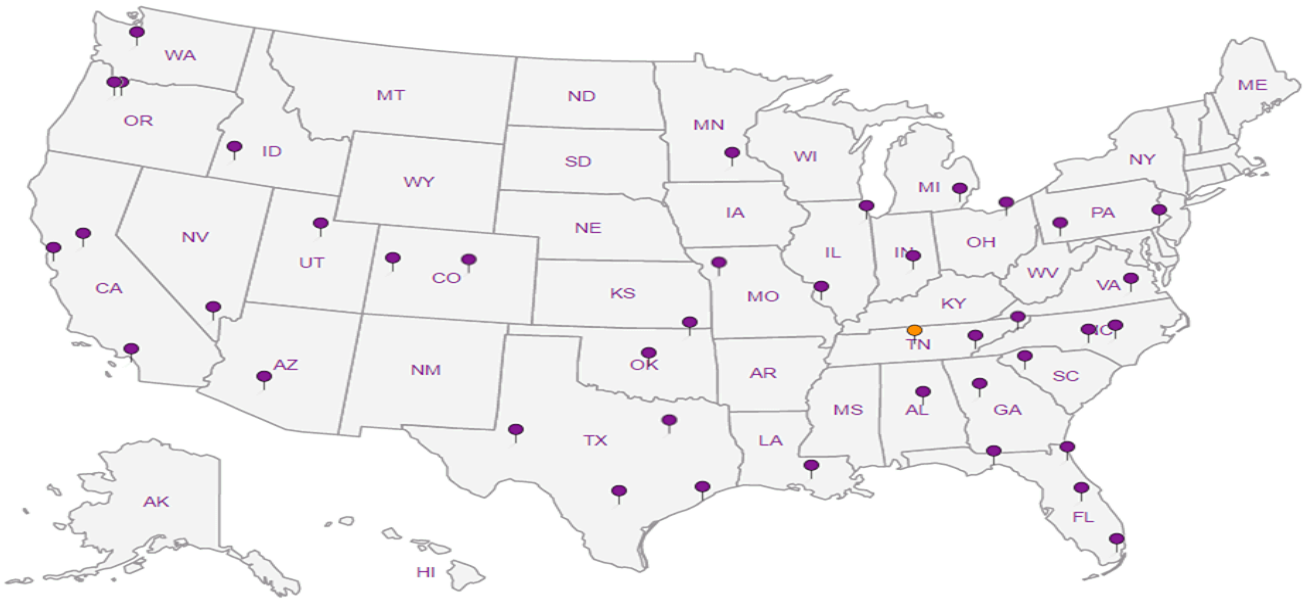
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



DHL Analytical, Inc.
2300 Double Creek Drive
Round Rock, TX 78664
TEL: *(512) 388-8222* FAX: *(512) 388-8229*

CHAIN-OF-CUSTODY RECORD

G138

Work Order: 2005040

Subcontractor:
Pace Analytical
12065 Lebanon Rd
Mt. Juliet, TN 37122

TEL: (615) 773-5923
FAX:
Acct #: DHLRRTX

1217467

07-May-20

Sample ID	Matrix	DHL#	Date Collected	Bottle Type	Requested Tests: Ra-228 E904.0	Ra-226 M7500 Ra B M				
					12	12				
FGD-6	Aqueous	01C	05/06/20 01:20 PM	1LHDPEHNO3	1					-01
FGD-6	Aqueous	01D	05/06/20 01:20 PM	1LHDPEHNO3		1				1
FGD-3	Aqueous	02C	05/06/20 02:20 PM	1LHDPEHNO3	1					02
FGD-3	Aqueous	02D	05/06/20 02:20 PM	1LHDPEHNO3		1				1

General Comments:
Please analyze these samples with Normal Turnaround Time.
Report RA-226, Ra-228 & Combined per Specs.
Quality Control Package Needed: Standard - NELAC Rad Test compliant
Email to cac@dhlanalytical.com & dupont@dhlanalytical.com

		Date/Time			Date/Time
Relinquished by:	[signature]	5/8/20 1700	Received by:	Carol Kemp	5/11/20 10:30
Relinquished by:			Received by:		

Amb

Pace Analytical National Center for Testing & Innovation
Cooler Receipt Form

Client: DHLRRTX	1217407	
Cooler Received/Opened On: 5/12/20 Temperature:	Amb	
Received By: Carol Kemp		
Signature: Carol Kemp		

Receipt Check List	NP	Yes	No
COC Seal Present / Intact?			
COC Signed / Accurate?		✓	
Bottles arrive intact?		✓	
Correct bottles used?		✓	
Sufficient volume sent?		✓	
If Applicable			
VOA Zero headspace?			
Preservation Correct / Checked?	✓		

June 12, 2020

Will Vienne
Golder
2201 Double Creek Dr #4004
Round Rock, Texas 78664
TEL: (512) 671-3434
FAX (512) 671-3446

Order No.: 2005079

RE: Luminant-OGSES FGD PONDS

Dear Will Vienne:

DHL Analytical, Inc. received 7 sample(s) on 5/12/2020 for the analyses presented in the following report.

There were no problems with the analyses and all data met requirements of NELAP except where noted in the Case Narrative. All non-NELAP methods will be identified accordingly in the case narrative and all estimated uncertainties of test results are within method or EPA specifications.

If you have any questions regarding these tests results, please feel free to call. Thank you for using DHL Analytical.

Sincerely,

John DuPont
General Manager

This report was performed under the accreditation of the State of Texas Laboratory Certification Number: T104704211-20-25

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DHL ANALYTICAL
2300 Double Creek Dr. ■ Round Rock, TX 78664
Phone (512) 388-8222 ■ FAX (512) 388-8229
Web: www.dhlanalytical.com
E-Mail: login@dhlanalytical.com

CHAIN-OF-CUSTODY

№ 68289

CLIENT: GOLDER ASSOCIATES
ADDRESS: 2201 DOUBLE CREEK DR ROUND ROCK, TX 78664
PHONE: 512-671-3434 FAX/E-MAIL:
DATA REPORTED TO: WILL VIENNE
ADDITIONAL REPORT COPIES TO:

DATE: 5-11-20 PAGE 1 OF 1
PO #: DHL WORK ORDER #: 2005079
PROJECT LOCATION OR NAME: LUMINANT - OGSES FGD PONDS
CLENT PROJECT #: 19122262 COLLECTOR: J. BEATON

Authorize 5% surcharge for TRRP Report? ❑ Yes ❑ No

S=SOIL W=WATER A=AIR L=LIQUID SE=SEDIMENT P=PAINT SL=SLUDGE O=OTHER SO=SOLID

Field Sample I.D.	DHL Lab #	Date	Time	Matrix	Container Type	# of Containers	PRESERVATION HCl	HNO_3	H_2SO_4 ❑ NaOH ❑	ICE	UNPRESERVED	ANALYSES: BTEX ❑ MTBE ❑ [METHOD 8021]	TPH 1005 ❑ TPH 1006 ❑ HOLD 1006 ❑	GRO [METHOD 8015] ❑ DRO [METHOD 8105] ❑	VOC 8260 ❑ VOC 624 ❑ VOC 8260/5035 ❑	SVOC 8270 ❑ PAH 8270 ❑ HOLD PAH ❑ SVOC 625 ❑	8270 PEST ❑ 625 PEST/PCB ❑ 608 PCB ❑ 8270 PCB ❑	8270 O-P PEST ❑ 8082 PCB ❑ 8270 PCB ❑	8321 HERB ❑ T PHOS, AMMONIA ❑	METALS 6020 ❑ METALS 200.8 ❑ DISS. METALS ❑	RCRA ❑ TX11 ❑ ❑	PH ❑ HEX CHROM ❑ ALKALINITY ❑ COD ❑	CHLORIDE ❑ ANIONS ❑	TCLP-SVOC ❑ VOC ❑ PEST ❑ HERB ❑	TCLP-METALS ❑ RCRA 8 ❑ TX-11 ❑ Pb ❑	RCI ❑ FLASHPOINT ❑ DGAS ❑	TDS ❑ TSS ❑ % MOISTURE ❑ CYANIDE ❑	APPENDIX III & IV	FIELD NOTES
FGD-4	01	5-11-20	0745	W	P	4		X		X																		X	
FGD-2	02		0835	W	P	4		X		X																		X	
FGD-5	03		0925	W	P	4		X		X																		X	
FGD-1	04		1015	W	P	4		X		X																		X	
FGD-8	05		1110	W	P	4		X		X																		X	
FGD-11	06		1245	W	P	4		X		X																		X	
FGD-12	07		1345	W	P	4		X		X																		X	

RELINQUISHED BY: (Signature) DATE/TIME 5-11-20 1730 RECEIVED BY: (Signature) FedEX
RELINQUISHED BY: (Signature) DATE/TIME 5-12-2020 0715 RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

❑ DHL DISPOSAL @ $5.00 each ❑ Return

TURN AROUND TIME
RUSH ❑ CALL FIRST
1 DAY ❑ CALL FIRST
2 DAY ❑
NORMAL ☒
OTHER ❑

LABORATORY USE ONLY:
RECEIVING TEMP: 1.5, 1.8, 3.3, 1.3 THERM #: 78
CUSTODY SEALS: ❑ BROKEN ☒ INTACT ❑ NOT USED
CARRIER: ❑ LONE STAR ☒ FEDEX ❑ UPS ❑ OTHER
❑ COURIER DELIVERY
❑ HAND DELIVERED

DHL COC Rev 1 | FEB 2010

Eric Lau

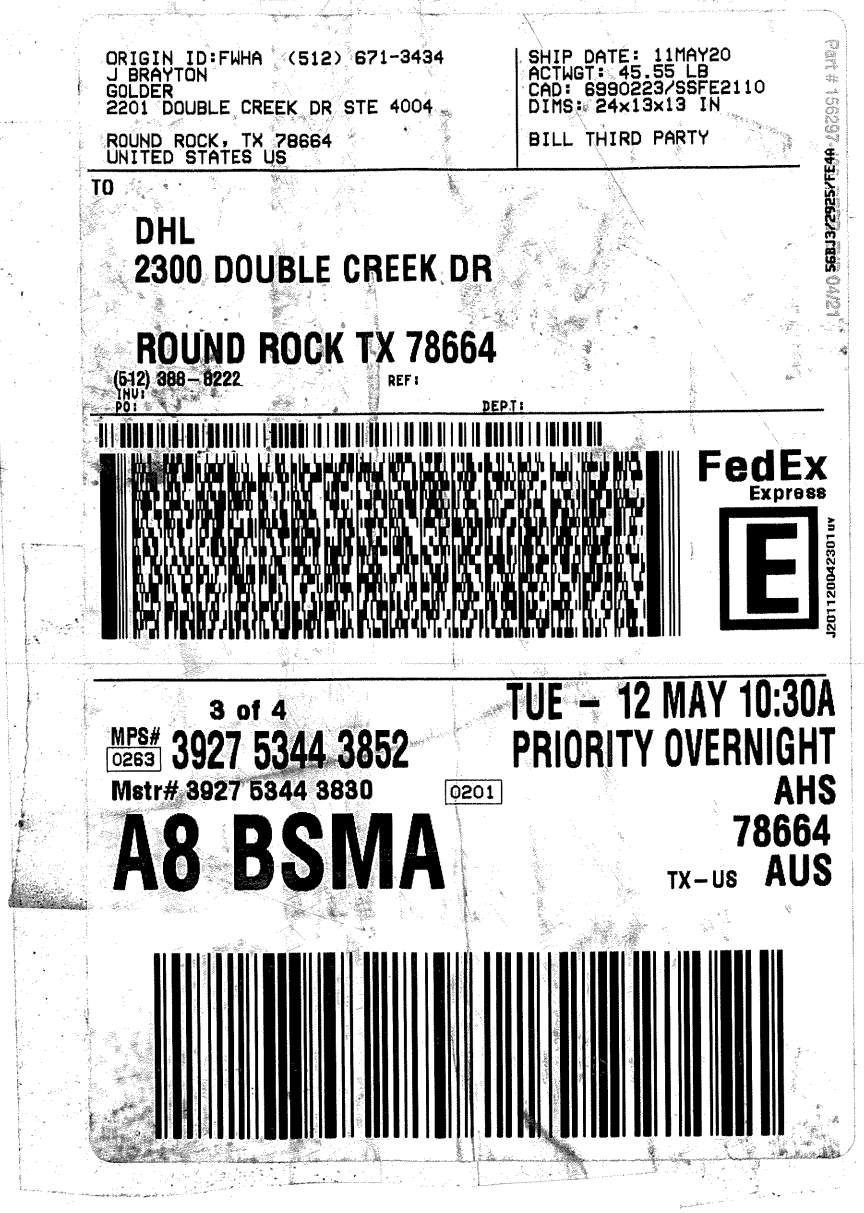
From: John DuPont
Sent: Tuesday, May 28, 2019 11:35 AM
To: Eric Lau
Subject: FW: CCR Analysis

Appendix III Parameters:
Metals (Ca and B)
Anions (Cl, F, and SO4)
TDS

Appendix IV Parameters:

Metals (As, Ba, Be, Cd, Co, Cr, Hg, Li, Mo, Pb, Sb, Se, and Tl)
Ra-226
Ra-228

From: Vienne, Will [mailto:William_Vienne@golder.com]
Sent: Tuesday, April 09, 2019 12:48 PM
To: John DuPont <dupont@dhlanalytical.com>
Subject: CCR Analysis



ORIGIN ID:FWHA (512) 671-3434
J BRAYTON
GOLDER
2201 DOUBLE CREEK DR STE 4004

ROUND ROCK, TX 78664
UNITED STATES US

SHIP DATE: 11MAY20
ACTWGT: 45.55 LB
CAD: 6990223/SSFE2110
DIMS: 24x13x13 IN

BILL THIRD PARTY

TO

DHL
2300 DOUBLE CREEK DR

ROUND ROCK TX 78664
(512) 388-8222 REF:
INV:
PO: DEPT:

FedEx Express

J2D1120042301uv

3 of 4
MPS# 0263 3927 5344 3852
Mstr# 3927 5344 3830

0201

A8 BSMA

TUE - 12 MAY 10:30A
PRIORITY OVERNIGHT
AHS
78664
TX-US AUS

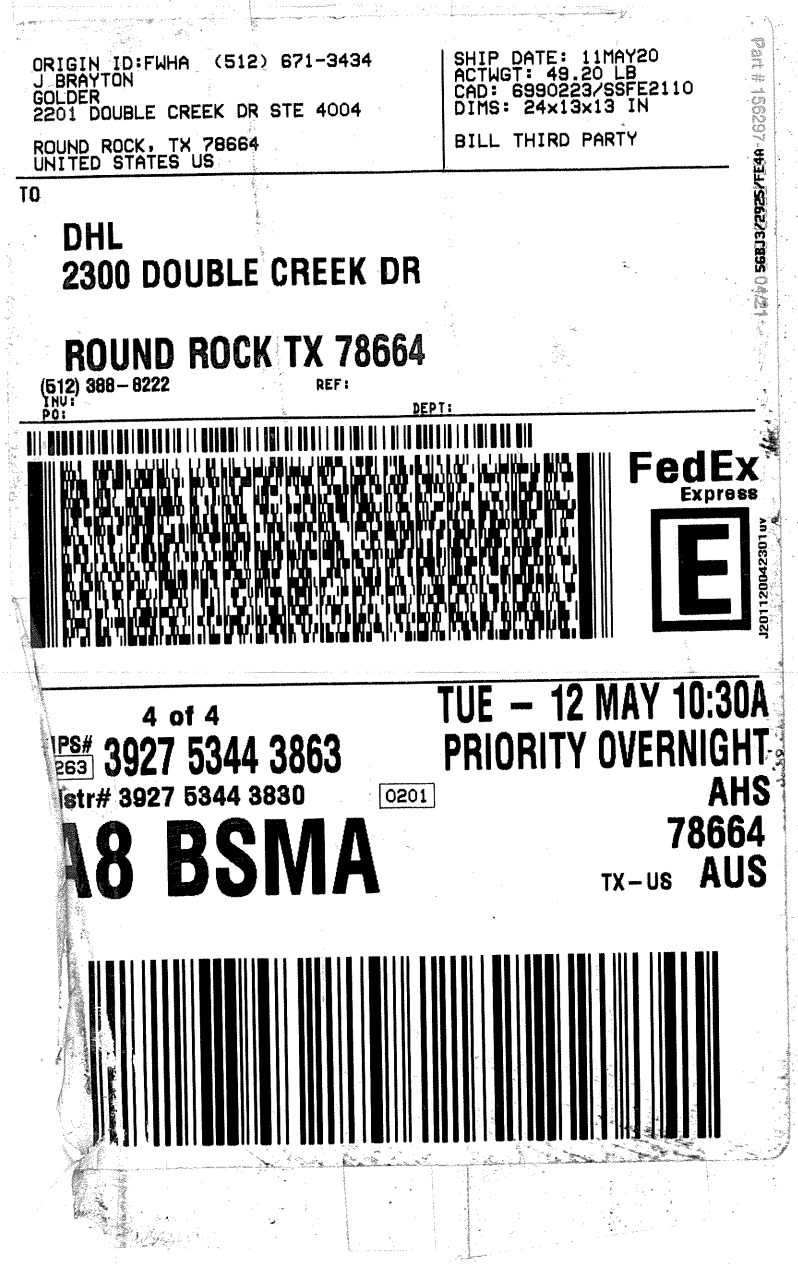
1.5
290

CUSTODY SEAL

DATE 5-11-20

SIGNATURE

DHL ANALYTICAL



ORIGIN ID:FWHA (512) 671-3434
J BRAYTON
GOLDER
2201 DOUBLE CREEK DR STE 4004

ROUND ROCK, TX 78664
UNITED STATES US

SHIP DATE: 11MAY20
ACTWGT: 49.20 LB
CAD: 6990223/SSFE2110
DIMS: 24x13x13 IN

BILL THIRD PARTY

TO

DHL
2300 DOUBLE CREEK DR

ROUND ROCK TX 78664
(512) 388-8222 REF:
INV:
PO: DEPT:

FedEx Express

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4 of 4
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Istr# 3927 5344 3830 0201

TUE - 12 MAY 10:30A
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TX-US AUS

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CUSTODY SEAL

DATE 5-11-20

SIGNATURE

DHL ANALYTICAL



ORIGIN ID:FWHA (512) 671-3434
J BRAYTON
GOLDER
2201 DOUBLE CREEK DR STE 4004

ROUND ROCK, TX 78664
UNITED STATES US

SHIP DATE: 11MAY20
ACTWGT: 45.55 LB
CAD: 5990223/SSFE2110
DIMS: 24x13x13 IN

BILL THIRD PARTY

TO

DHL
2300 DOUBLE CREEK DR

ROUND ROCK TX 78664
(512) 388-8222
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PO:
REF:
DEPT:

FedEx Express

2 of 4
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Mstr# 3927 5344 3830

0201

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CUSTODY SE AL

DATE 5-11-2020

SIGNATURE

DHL ANALYTICAL



ORIGIN ID:FWHA (512) 671-3434
J BRAYTON
GOLDER
2201 DOUBLE CREEK DR STE 4004

ROUND ROCK, TX 78664
UNITED STATES US

SHIP DATE: 11MAY20
ACTWGT: 49.20 LB
CAD: 6990223/SSFE2110
DIMS: 24x13x13 IN

BILL THIRD PARTY

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DHL
2300 DOUBLE CREEK DR

ROUND ROCK TX 78664
(512) 388-8222 REF:
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FedEx
Express

1 of 4
TRK# 0201 3927 5344 3830
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TUE - 12 MAY 10:30A
PRIORITY OVERNIGHT
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TX-US AUS

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709

CUSTODY S EAL
DATE 5-14-2
SIGNATURE

DH
ANALY

DHL Analytical, Inc.

Sample Receipt Checklist

Client Name **Golder**

Date Received: **5/12/2020**

Work Order Number **2005079**

Received by: **JH**

Checklist completed by: _____ 5/12/2020
Signature | Date

Reviewed by _____ 5/12/2020
Initials | Date

Carrier name: FedEx 1day

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shippping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	**1.5** °C
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH<2 acceptable upon receipt?	Yes ☑	No ☐	NA ☐ LOT # 13171
	Adjusted? no		Checked by Ec
Water - ph>9 (S) or ph>10 (CN) acceptable upon receipt?	Yes ☐	No ☐	NA ☑ LOT #
	Adjusted?		Checked by

Any No response must be detailed in the comments section below.

Client contacted: _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments: _____

Corrective Action _____

Laboratory Name: DHL Analytical, Inc.

Laboratory Review Checklist: Reportable Data

Project Name: Luminant-OGSES FGD PONDS	**LRC Date:** 6/12/20
Reviewer Name: Carlos Castro	**Laboratory Work Order:** 2005079
Prep Batch Number(s): See Prep Dates Report	**Run Batch:** See Analytical Dates Report

#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
		Chain-of-Custody (C-O-C)					
R1	OI	**1)** Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				**R1-01**
		2) Were all departures from standard conditions described in an exception report?			X		
R2	OI	**Sample and Quality Control (QC) Identification**					
		1) Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		2) Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test Reports**					
		1) Were all samples prepared and analyzed within holding times?	X				
		2) Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		3) Were calculations checked by a peer or supervisor?	X				
		4) Were all analyte identifications checked by a peer or supervisor?	X				
		5) Were sample detection limits reported for all analytes not detected?	X				
		6) Were all results for soil and sediment samples reported on a dry weight basis?			X		
		7) Were % moisture (or solids) reported for all soil and sediment samples?			X		
		8) Were bulk soils/solids samples for volatile analysis extracted with methanol per EPA Method 5035?			X		
		9) If required for the project, TICs reported?			X		
R4	O	**Surrogate Recovery Data**					
		1) Were surrogates added prior to extraction?			X		
		2) Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test Reports/Summary Forms for Blank Samples**					
		1) Were appropriate type(s) of blanks analyzed?	X				
		2) Were blanks analyzed at the appropriate frequency?	X				
		3) Where method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		4) Were blank concentrations < MDL?	X				
		5) For analyte(s) detected in a blank sample, was the concentration, unadjusted for sample specific factors, in all associated field samples, **greater** than 10 times the concentration in the blank sample?			X		
R6	OI	**Laboratory Control Samples (LCS):**					
		1) Were all COCs included in the LCS?	X				
		2) Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		3) Were LCSs analyzed at the required frequency?	X				
		4) Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		5) Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		6) Was the LCSD RPD within QC limits (if applicable)?	X				
R7	OI	**Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Data**					
		1) Were the project/method specified analytes included in the MS and MSD?	X				
		2) Were MS/MSD analyzed at the appropriate frequency?	X				
		3) Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			**R7-03**
		4) Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical Duplicate Data**					
		1) Were appropriate analytical duplicates analyzed for each matrix?	X				
		2) Were analytical duplicates analyzed at the appropriate frequency?	X				
		3) Were RPDs or relative standard deviations within the laboratory QC limits?	X				
R9	OI	**Method Quantitation Limits (MQLs):**					
		1) Are the MQLs for each method analyte included in the laboratory data package?	X				
		2) Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		3) Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other Problems/Anomalies**					
		1) Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		2) Was applicable and available technology used to lower the SDL to minimize the matrix interference affects on the sample results?	X				
		3) Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Name: DHL Analytical, Inc.

Laboratory Review Checklist (continued): Supporting Data

Project Name: Luminant-OGSES FGD PONDS	**LRC Date:** 6/12/20
Reviewer Name: Carlos Castro	**Laboratory Work Order:** 2005079
Prep Batch Number(s): See Prep Dates Report	**Run Batch:** See Analytical Dates Report

#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
S1	OI	**Initial Calibration (ICAL)**					
		1) Were response factors and/or relative response factors for each analyte within QC limits?	X				
		2) Were percent RSDs or correlation coefficient criteria met?	X				
		3) Was the number of standards recommended in the method used for all analytes?	X				
		4) Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		5) Are ICAL data available for all instruments used?	X				
		6) Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and Continuing calibration Verification (ICCV and CCV) and Continuing Calibration blank (CCB):**					
		1) Was the CCV analyzed at the method-required frequency?	X				
		2) Were percent differences for each analyte within the method-required QC limits?	X				
		3) Was the ICAL curve verified for each analyte?	X				
		4) Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
S3	O	**Mass Spectral Tuning:**					
		1) Was the appropriate compound for the method used for tuning?	X				
		2) Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal Standards (IS):**					
		1) Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw Data (NELAC Section 5.5.10)**					
		1) Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		2) Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual Column Confirmation**					
		1) Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively Identified Compounds (TICs):**					
		1) If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) Results:**					
		1) Were percent recoveries within method QC limits?	X				
S9	I	**Serial Dilutions, Post Digestion Spikes, and Method of Standard Additions**					
		1) Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		X			**S9-09**
S10	OI	**Method Detection Limit (MDL) Studies**					
		1) Was a MDL study performed for each reported analyte?	X				
		2) Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency Test Reports:**					
		1) Was the lab's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards Documentation**					
		1) Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/Analyte Identification Procedures**					
		1) Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of Analyst Competency (DOC)**					
		1) Was DOC conducted consistent with NELAC Chapter 5 – Appendix C?	X				
		2) Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/Validation Documentation for Methods** (NELAC Chapter 5)					
		1) Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory Standard Operating Procedures (SOPs):**					
		1) Are laboratory SOPs current and on file for each method performed?	X				

1 Items identified by the letter "R" should be included in the laboratory data package submitted to the TCEQ in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
2 O = organic analyses; I = inorganic analyses (and general chemistry, when applicable).
3 NA = Not applicable.
4 NR = Not Reviewed.
5 ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Data Package Signature Page – RG-366/TRRP-13

This data package consists of:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;
R2 Sample identification cross-reference;
R3 Test reports (analytical data sheets) for each environmental sample that includes:
  a) Items consistent with NELAC Chapter 5,
  b) dilution factors,
  c) preparation methods,
  d) cleanup methods, and
  e) if required for the project, tentatively identified compounds (TICs).
R4 Surrogate recovery data including:
  a) Calculated recovery (%R), and
  b) The laboratory's surrogate QC limits.
R5 Test reports/summary forms for blank samples;
R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  a) LCS spiking amounts,
  b) Calculated %R for each analyte, and
  c) The laboratory's LCS QC limits.
R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  a) Samples associated with the MS/MSD clearly identified,
  b) MS/MSD spiking amounts,
  c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
  d) Calculated %Rs and relative percent differences (RPDs), and
  e) The laboratory's MS/MSD QC limits
R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  a) The amount of analyte measured in the duplicate,
  b) The calculated RPD, and
  c) The laboratory's QC limits for analytical duplicates.
R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix;
R10 Other problems or anomalies.

The Exception Report for each "No" or "Not Reviewed (NR)" item in the Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory is not accredited under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge that all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information or data affecting the quality of the data has been knowingly withheld.

This laboratory was last inspected by TCEQ on February 25-28 2019. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Name: John DuPont
Official Title: General Manager



Signature

06/12/20

Date

Name: Dr. Derhsing Luu
Official Title: Technical Director

DHL Analytical, Inc. **Date:** *12-Jun-20*

CLIENT: Golder
Project: Luminant-OGSES FGD PONDS
Lab Order: 2005079

CASE NARRATIVE

Samples were analyzed using the methods outlined in the following references:

Method SW6020B - Metals Analysis
Method SW7470A - Mercury Analysis
Method E300 - Anions Analysis
Method M2540C - TDS Analysis

Exception Report R1-01

The samples were received and log-in performed on 5/12/20. A total of 7 samples were received. The samples arrived in good condition and were properly packaged.

Exception Report R7-03

For Anions analysis performed on 5/13/20 (batch 96331) the matrix spikes and matrix spike duplicates recoveries (2005007-01 MS/MSD & 2005077-02 MS/MSD) were out of control limits for Chloride and/or Sulfate. This was due to matrix effect. These are flagged accordingly in the QC summary report. The samples selected for the matrix spikes and matrix spike duplicates were not from this work order. The LCS was within control limits for these analytes. No further corrective actions were taken.

For Metals analysis performed on 5/20/20 the matrix spike and matrix spike duplicate recoveries were above control limits for Boron. These are flagged accordingly. The sample selected for the matrix spike and matrix spike duplicate was not from this work order. The LCS was within control limits for this analyte. No further corrective actions were taken.

Exception Report S9-01

For Metals analysis performed on 5/19/20 the PDS recovery was out of control limits for Calcium. This is flagged accordingly in the QC summary report. The serial dilution was within control limits for this analyte. No further corrective actions were taken.

DHL Analytical, Inc.

Date: *12-Jun-20*

CLIENT: Golder
Project: Luminant-OGSES FGD PONDS
Lab Order: 2005079

Work Order Sample Summary

Lab Smp ID	Client Sample ID	Tag Number	Date Collected	Date Recved
2005079-01	FGD-4		05/11/20 07:45 AM	5/12/2020
2005079-02	FGD-2		05/11/20 08:35 AM	5/12/2020
2005079-03	FGD-5		05/11/20 09:25 AM	5/12/2020
2005079-04	FGD-1		05/11/20 10:15 AM	5/12/2020
2005079-05	FGD-8		05/11/20 11:10 AM	5/12/2020
2005079-06	FGD-11		05/11/20 12:45 PM	5/12/2020
2005079-07	FGD-12		05/11/20 01:45 PM	5/12/2020

Lab Order: 2005079
Client: Golder
Project: Luminant-OGSES FGD PONDS

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
2005079-01A	FGD-4	05/11/20 07:45 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-4	05/11/20 07:45 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-4	05/11/20 07:45 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-4	05/11/20 07:45 AM	Aqueous	SW7470A	Mercury Aq Prep	05/17/20 12:32 PM	96370
2005079-01B	FGD-4	05/11/20 07:45 AM	Aqueous	E300	Anion Preparation	05/13/20 10:21 AM	96331
	FGD-4	05/11/20 07:45 AM	Aqueous	E300	Anion Preparation	05/13/20 10:21 AM	96331
	FGD-4	05/11/20 07:45 AM	Aqueous	M2540C	TDS Preparation	05/13/20 10:43 AM	96333
2005079-02A	FGD-2	05/11/20 08:35 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-2	05/11/20 08:35 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-2	05/11/20 08:35 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-2	05/11/20 08:35 AM	Aqueous	SW7470A	Mercury Aq Prep	05/17/20 12:32 PM	96370
2005079-02B	FGD-2	05/11/20 08:35 AM	Aqueous	E300	Anion Preparation	05/13/20 10:21 AM	96331
	FGD-2	05/11/20 08:35 AM	Aqueous	E300	Anion Preparation	05/13/20 10:21 AM	96331
	FGD-2	05/11/20 08:35 AM	Aqueous	E300	Anion Preparation	05/13/20 10:21 AM	96331
	FGD-2	05/11/20 08:35 AM	Aqueous	M2540C	TDS Preparation	05/13/20 10:43 AM	96333
2005079-03A	FGD-5	05/11/20 09:25 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-5	05/11/20 09:25 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-5	05/11/20 09:25 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-5	05/11/20 09:25 AM	Aqueous	SW7470A	Mercury Aq Prep	05/17/20 12:32 PM	96370
2005079-03B	FGD-5	05/11/20 09:25 AM	Aqueous	E300	Anion Preparation	05/13/20 10:21 AM	96331
	FGD-5	05/11/20 09:25 AM	Aqueous	E300	Anion Preparation	05/13/20 10:21 AM	96331
	FGD-5	05/11/20 09:25 AM	Aqueous	M2540C	TDS Preparation	05/13/20 10:43 AM	96333
2005079-04A	FGD-1	05/11/20 10:15 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-1	05/11/20 10:15 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-1	05/11/20 10:15 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-1	05/11/20 10:15 AM	Aqueous	SW7470A	Mercury Aq Prep	05/17/20 12:32 PM	96370
2005079-04B	FGD-1	05/11/20 10:15 AM	Aqueous	E300	Anion Preparation	05/13/20 10:21 AM	96331
	FGD-1	05/11/20 10:15 AM	Aqueous	E300	Anion Preparation	05/13/20 10:21 AM	96331

Lab Order: 2005079
Client: Golder
Project: Luminant-OGSES FGD PONDS

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
2005079-04B	FGD-1	05/11/20 10:15 AM	Aqueous	M2540C	TDS Preparation	05/13/20 10:43 AM	96333
2005079-05A	FGD-8	05/11/20 11:10 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-8	05/11/20 11:10 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-8	05/11/20 11:10 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-8	05/11/20 11:10 AM	Aqueous	SW7470A	Mercury Aq Prep	05/17/20 12:32 PM	96370
2005079-05B	FGD-8	05/11/20 11:10 AM	Aqueous	E300	Anion Preparation	05/13/20 10:21 AM	96331
	FGD-8	05/11/20 11:10 AM	Aqueous	E300	Anion Preparation	05/13/20 10:21 AM	96331
	FGD-8	05/11/20 11:10 AM	Aqueous	E300	Anion Preparation	05/13/20 10:21 AM	96331
	FGD-8	05/11/20 11:10 AM	Aqueous	M2540C	TDS Preparation	05/13/20 10:43 AM	96333
2005079-06A	FGD-11	05/11/20 12:45 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-11	05/11/20 12:45 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-11	05/11/20 12:45 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-11	05/11/20 12:45 PM	Aqueous	SW7470A	Mercury Aq Prep	05/17/20 12:32 PM	96370
2005079-06B	FGD-11	05/11/20 12:45 PM	Aqueous	E300	Anion Preparation	05/13/20 10:21 AM	96331
	FGD-11	05/11/20 12:45 PM	Aqueous	E300	Anion Preparation	05/13/20 10:21 AM	96331
	FGD-11	05/11/20 12:45 PM	Aqueous	E300	Anion Preparation	05/15/20 10:09 AM	96363
	FGD-11	05/11/20 12:45 PM	Aqueous	M2540C	TDS Preparation	05/13/20 10:43 AM	96333
2005079-07A	FGD-12	05/11/20 01:45 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-12	05/11/20 01:45 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-12	05/11/20 01:45 PM	Aqueous	SW7470A	Mercury Aq Prep	05/17/20 12:32 PM	96370
2005079-07B	FGD-12	05/11/20 01:45 PM	Aqueous	E300	Anion Preparation	05/13/20 10:21 AM	96331
	FGD-12	05/11/20 01:45 PM	Aqueous	E300	Anion Preparation	05/13/20 10:21 AM	96331
	FGD-12	05/11/20 01:45 PM	Aqueous	M2540C	TDS Preparation	05/13/20 10:43 AM	96333

Lab Order: 2005079
Client: Golder
Project: Luminant-OGSES FGD PONDS

ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
2005079-01A	FGD-4	Aqueous	SW7470A	Mercury Total: Aqueous	96370	1	05/19/20 11:59 AM	CETAC2_HG_200519B
	FGD-4	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	1	05/19/20 12:55 PM	ICP-MS5_200519B
	FGD-4	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	1	05/20/20 12:27 PM	ICP-MS5_200520B
	FGD-4	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	10	05/20/20 01:28 PM	ICP-MS5_200520B
2005079-01B	FGD-4	Aqueous	E300	Anions by IC method - Water	96331	10	05/13/20 08:08 PM	IC2_200513A
	FGD-4	Aqueous	E300	Anions by IC method - Water	96331	1	05/13/20 11:20 PM	IC2_200513A
	FGD-4	Aqueous	M2540C	Total Dissolved Solids	96333	1	05/13/20 05:00 PM	WC_200513A
2005079-02A	FGD-2	Aqueous	SW7470A	Mercury Total: Aqueous	96370	1	05/19/20 12:10 PM	CETAC2_HG_200519B
	FGD-2	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	1	05/19/20 12:57 PM	ICP-MS5_200519B
	FGD-2	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	1	05/20/20 12:30 PM	ICP-MS5_200520B
	FGD-2	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	20	05/20/20 01:30 PM	ICP-MS5_200520B
2005079-02B	FGD-2	Aqueous	E300	Anions by IC method - Water	96331	100	05/13/20 06:48 PM	IC2_200513A
	FGD-2	Aqueous	E300	Anions by IC method - Water	96331	10	05/13/20 08:24 PM	IC2_200513A
	FGD-2	Aqueous	E300	Anions by IC method - Water	96331	1	05/13/20 11:36 PM	IC2_200513A
	FGD-2	Aqueous	M2540C	Total Dissolved Solids	96333	1	05/13/20 05:00 PM	WC_200513A
2005079-03A	FGD-5	Aqueous	SW7470A	Mercury Total: Aqueous	96370	1	05/19/20 12:12 PM	CETAC2_HG_200519B
	FGD-5	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	1	05/19/20 01:00 PM	ICP-MS5_200519B
	FGD-5	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	1	05/20/20 12:32 PM	ICP-MS5_200520B
	FGD-5	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	10	05/20/20 01:33 PM	ICP-MS5_200520B
2005079-03B	FGD-5	Aqueous	E300	Anions by IC method - Water	96331	10	05/13/20 08:40 PM	IC2_200513A
	FGD-5	Aqueous	E300	Anions by IC method - Water	96331	1	05/13/20 11:52 PM	IC2_200513A
	FGD-5	Aqueous	M2540C	Total Dissolved Solids	96333	1	05/13/20 05:00 PM	WC_200513A
2005079-04A	FGD-1	Aqueous	SW7470A	Mercury Total: Aqueous	96370	1	05/19/20 12:15 PM	CETAC2_HG_200519B
	FGD-1	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	10	05/20/20 01:35 PM	ICP-MS5_200520B
	FGD-1	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	1	05/19/20 01:02 PM	ICP-MS5_200519B
	FGD-1	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	1	05/20/20 12:34 PM	ICP-MS5_200520B

Lab Order: 2005079
Client: Golder
Project: Luminant-OGSES FGD PONDS

ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
2005079-04B	FGD-1	Aqueous	E300	Anions by IC method - Water	96331	1	05/14/20 12:08 AM	IC2_200513A
	FGD-1	Aqueous	E300	Anions by IC method - Water	96331	10	05/13/20 08:56 PM	IC2_200513A
	FGD-1	Aqueous	M2540C	Total Dissolved Solids	96333	1	05/13/20 05:00 PM	WC_200513A
2005079-05A	FGD-8	Aqueous	SW7470A	Mercury Total: Aqueous	96370	1	05/19/20 12:17 PM	CETAC2_HG_200519B
	FGD-8	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	1	05/19/20 01:04 PM	ICP-MS5_200519B
	FGD-8	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	1	05/20/20 12:36 PM	ICP-MS5_200520B
	FGD-8	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	50	05/20/20 01:37 PM	ICP-MS5_200520B
2005079-05B	FGD-8	Aqueous	E300	Anions by IC method - Water	96331	100	05/13/20 07:04 PM	IC2_200513A
	FGD-8	Aqueous	E300	Anions by IC method - Water	96331	10	05/13/20 09:12 PM	IC2_200513A
	FGD-8	Aqueous	E300	Anions by IC method - Water	96331	1	05/14/20 12:24 AM	IC2_200513A
	FGD-8	Aqueous	M2540C	Total Dissolved Solids	96333	1	05/13/20 05:00 PM	WC_200513A
2005079-06A	FGD-11	Aqueous	SW7470A	Mercury Total: Aqueous	96370	1	05/19/20 12:19 PM	CETAC2_HG_200519B
	FGD-11	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	10	05/20/20 01:39 PM	ICP-MS5_200520B
	FGD-11	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	1	05/19/20 01:06 PM	ICP-MS5_200519B
	FGD-11	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	1	05/20/20 12:38 PM	ICP-MS5_200520B
2005079-06B	FGD-11	Aqueous	E300	Anions by IC method - Water	96331	10	05/13/20 10:48 PM	IC2_200513A
	FGD-11	Aqueous	E300	Anions by IC method - Water	96331	1	05/14/20 12:40 AM	IC2_200513A
	FGD-11	Aqueous	E300	Anions by IC method - Water	96363	100	05/15/20 03:28 PM	IC2_200515A
	FGD-11	Aqueous	M2540C	Total Dissolved Solids	96333	1	05/13/20 05:00 PM	WC_200513A
2005079-07A	FGD-12	Aqueous	SW7470A	Mercury Total: Aqueous	96370	1	05/19/20 12:21 PM	CETAC2_HG_200519B
	FGD-12	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	1	05/19/20 01:09 PM	ICP-MS5_200519B
	FGD-12	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	1	05/20/20 12:41 PM	ICP-MS5_200520B
2005079-07B	FGD-12	Aqueous	E300	Anions by IC method - Water	96331	10	05/13/20 11:04 PM	IC2_200513A
	FGD-12	Aqueous	E300	Anions by IC method - Water	96331	1	05/14/20 12:56 AM	IC2_200513A
	FGD-12	Aqueous	M2540C	Total Dissolved Solids	96333	1	05/13/20 05:00 PM	WC_200513A

DHL Analytical, Inc.

Date: *12-Jun-20*

CLIENT:	Golder	**Client Sample ID:**	FGD-4
Project:	Luminant-OGSES FGD PONDS	**Lab ID:**	2005079-01
Project No:	19122262-F2020	**Collection Date:**	05/11/20 07:45 AM
Lab Order:	2005079	**Matrix:**	AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020B**					Analyst: **RO**
Antimony	<0.000800	0.000800	0.00250		mg/L	1	05/19/20 12:55 PM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	05/19/20 12:55 PM
Barium	0.104	0.00300	0.0100		mg/L	1	05/19/20 12:55 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	05/19/20 12:55 PM
Boron	0.145	0.0100	0.0300		mg/L	1	05/20/20 12:27 PM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	05/19/20 12:55 PM
Calcium	40.6	1.00	3.00		mg/L	10	05/20/20 01:28 PM
Chromium	<0.00200	0.00200	0.00500		mg/L	1	05/19/20 12:55 PM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	05/19/20 12:55 PM
Lead	<0.000300	0.000300	0.00100		mg/L	1	05/19/20 12:55 PM
Lithium	0.0166	0.00500	0.0100		mg/L	1	05/19/20 12:55 PM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	05/19/20 12:55 PM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	05/19/20 12:55 PM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	05/19/20 12:55 PM
MERCURY TOTAL: AQUEOUS		**SW7470A**					Analyst: **BM**
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	05/19/20 11:59 AM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **SNM**
Chloride	198	3.00	10.0		mg/L	10	05/13/20 08:08 PM
Fluoride	0.300	0.100	0.400	J	mg/L	1	05/13/20 11:20 PM
Sulfate	52.9	1.00	3.00		mg/L	1	05/13/20 11:20 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	702	10.0	10.0		mg/L	1	05/13/20 05:00 PM

Qualifiers:

ND - Not Detected at the SDL
J - Analyte detected between SDL and RL
B - Analyte detected in the associated Method Blank
DF- Dilution Factor
N - Parameter not NELAP certified
See Final Page of Report for MQLs and MDLs
S - Spike Recovery outside control limits
C - Sample Result or QC discussed in Case Narrative
RL - Reporting Limit (MQL adjusted for moisture and sample size)
SDL - Sample Detection Limit
E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: *12-Jun-20*

CLIENT:	Golder	**Client Sample ID:**	FGD-2
Project:	Luminant-OGSES FGD PONDS	**Lab ID:**	2005079-02
Project No:	19122262-F2020	**Collection Date:**	05/11/20 08:35 AM
Lab Order:	2005079	**Matrix:**	AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020B**					Analyst: **RO**
Antimony	<0.000800	0.000800	0.00250		mg/L	1	05/19/20 12:57 PM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	05/19/20 12:57 PM
Barium	0.108	0.00300	0.0100		mg/L	1	05/19/20 12:57 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	05/19/20 12:57 PM
Boron	0.605	0.0100	0.0300		mg/L	1	05/20/20 12:30 PM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	05/19/20 12:57 PM
Calcium	217	2.00	6.00		mg/L	20	05/20/20 01:30 PM
Chromium	0.00234	0.00200	0.00500	J	mg/L	1	05/19/20 12:57 PM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	05/19/20 12:57 PM
Lead	<0.000300	0.000300	0.00100		mg/L	1	05/19/20 12:57 PM
Lithium	0.0280	0.00500	0.0100		mg/L	1	05/19/20 12:57 PM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	05/19/20 12:57 PM
Selenium	0.0208	0.00200	0.00500		mg/L	1	05/19/20 12:57 PM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	05/19/20 12:57 PM
MERCURY TOTAL: AQUEOUS		**SW7470A**					Analyst: **BM**
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	05/19/20 12:10 PM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **SNM**
Chloride	1150	30.0	100		mg/L	100	05/13/20 06:48 PM
Fluoride	<0.100	0.100	0.400		mg/L	1	05/13/20 11:36 PM
Sulfate	286	10.0	30.0		mg/L	10	05/13/20 08:24 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	2300	50.0	50.0		mg/L	1	05/13/20 05:00 PM

Qualifiers:

ND - Not Detected at the SDL
J - Analyte detected between SDL and RL
B - Analyte detected in the associated Method Blank
DF- Dilution Factor
N - Parameter not NELAP certified
See Final Page of Report for MQLs and MDLs
S - Spike Recovery outside control limits
C - Sample Result or QC discussed in Case Narrative
RL - Reporting Limit (MQL adjusted for moisture and sample size)
SDL - Sample Detection Limit
E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: *12-Jun-20*

CLIENT:	Golder	**Client Sample ID:**	FGD-5
Project:	Luminant-OGSES FGD PONDS	**Lab ID:**	2005079-03
Project No:	19122262-F2020	**Collection Date:**	05/11/20 09:25 AM
Lab Order:	2005079	**Matrix:**	AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020B**					Analyst: **RO**
Antimony	<0.000800	0.000800	0.00250		mg/L	1	05/19/20 01:00 PM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	05/19/20 01:00 PM
Barium	0.0959	0.00300	0.0100		mg/L	1	05/19/20 01:00 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	05/19/20 01:00 PM
Boron	0.165	0.0100	0.0300		mg/L	1	05/20/20 12:32 PM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	05/19/20 01:00 PM
Calcium	100	1.00	3.00		mg/L	10	05/20/20 01:33 PM
Chromium	0.0374	0.00200	0.00500		mg/L	1	05/19/20 01:00 PM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	05/19/20 01:00 PM
Lead	<0.000300	0.000300	0.00100		mg/L	1	05/19/20 01:00 PM
Lithium	0.156	0.00500	0.0100		mg/L	1	05/19/20 01:00 PM
Molybdenum	0.00561	0.00200	0.00500		mg/L	1	05/19/20 01:00 PM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	05/19/20 01:00 PM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	05/19/20 01:00 PM
MERCURY TOTAL: AQUEOUS		**SW7470A**					Analyst: **BM**
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	05/19/20 12:12 PM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **SNM**
Chloride	307	3.00	10.0		mg/L	10	05/13/20 08:40 PM
Fluoride	0.413	0.100	0.400		mg/L	1	05/13/20 11:52 PM
Sulfate	83.8	1.00	3.00		mg/L	1	05/13/20 11:52 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	836	10.0	10.0		mg/L	1	05/13/20 05:00 PM

Qualifiers:

ND - Not Detected at the SDL
J - Analyte detected between SDL and RL
B - Analyte detected in the associated Method Blank
DF- Dilution Factor
N - Parameter not NELAP certified
See Final Page of Report for MQLs and MDLs
S - Spike Recovery outside control limits
C - Sample Result or QC discussed in Case Narrative
RL - Reporting Limit (MQL adjusted for moisture and sample size)
SDL - Sample Detection Limit
E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: *12-Jun-20*

CLIENT:	Golder	**Client Sample ID:**	FGD-1
Project:	Luminant-OGSES FGD PONDS	**Lab ID:**	2005079-04
Project No:	19122262-F2020	**Collection Date:**	05/11/20 10:15 AM
Lab Order:	2005079	**Matrix:**	AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020B**					Analyst: **RO**
Antimony	<0.000800	0.000800	0.00250		mg/L	1	05/19/20 01:02 PM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	05/19/20 01:02 PM
Barium	0.131	0.00300	0.0100		mg/L	1	05/19/20 01:02 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	05/19/20 01:02 PM
Boron	0.121	0.0100	0.0300		mg/L	1	05/20/20 12:34 PM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	05/19/20 01:02 PM
Calcium	37.8	1.00	3.00		mg/L	10	05/20/20 01:35 PM
Chromium	<0.00200	0.00200	0.00500		mg/L	1	05/19/20 01:02 PM
Cobalt	0.0495	0.00300	0.00500		mg/L	1	05/19/20 01:02 PM
Lead	<0.000300	0.000300	0.00100		mg/L	1	05/19/20 01:02 PM
Lithium	0.0548	0.00500	0.0100		mg/L	1	05/19/20 01:02 PM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	05/19/20 01:02 PM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	05/19/20 01:02 PM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	05/19/20 01:02 PM
MERCURY TOTAL: AQUEOUS		**SW7470A**					Analyst: **BM**
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	05/19/20 12:15 PM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **SNM**
Chloride	146	3.00	10.0		mg/L	10	05/13/20 08:56 PM
Fluoride	0.231	0.100	0.400	J	mg/L	1	05/14/20 12:08 AM
Sulfate	79.5	1.00	3.00		mg/L	1	05/14/20 12:08 AM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	448	10.0	10.0		mg/L	1	05/13/20 05:00 PM

Qualifiers:

ND - Not Detected at the SDL
J - Analyte detected between SDL and RL
B - Analyte detected in the associated Method Blank
DF- Dilution Factor
N - Parameter not NELAP certified
See Final Page of Report for MQLs and MDLs
S - Spike Recovery outside control limits
C - Sample Result or QC discussed in Case Narrative
RL - Reporting Limit (MQL adjusted for moisture and sample size)
SDL - Sample Detection Limit
E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: *12-Jun-20*

CLIENT:	Golder	**Client Sample ID:**	FGD-8
Project:	Luminant-OGSES FGD PONDS	**Lab ID:**	2005079-05
Project No:	19122262-F2020	**Collection Date:**	05/11/20 11:10 AM
Lab Order:	2005079	**Matrix:**	AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020B**					Analyst: **RO**
Antimony	<0.000800	0.000800	0.00250		mg/L	1	05/19/20 01:04 PM
Arsenic	0.00663	0.00200	0.00500		mg/L	1	05/19/20 01:04 PM
Barium	0.732	0.00300	0.0100		mg/L	1	05/19/20 01:04 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	05/19/20 01:04 PM
Boron	0.129	0.0100	0.0300		mg/L	1	05/20/20 12:36 PM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	05/19/20 01:04 PM
Calcium	381	5.00	15.0		mg/L	50	05/20/20 01:37 PM
Chromium	<0.00200	0.00200	0.00500		mg/L	1	05/19/20 01:04 PM
Cobalt	0.00840	0.00300	0.00500		mg/L	1	05/19/20 01:04 PM
Lead	0.000415	0.000300	0.00100	J	mg/L	1	05/19/20 01:04 PM
Lithium	0.0152	0.00500	0.0100		mg/L	1	05/19/20 01:04 PM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	05/19/20 01:04 PM
Selenium	0.00210	0.00200	0.00500	J	mg/L	1	05/19/20 01:04 PM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	05/19/20 01:04 PM
MERCURY TOTAL: AQUEOUS		**SW7470A**					Analyst: **BM**
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	05/19/20 12:17 PM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **SNM**
Chloride	2240	30.0	100		mg/L	100	05/13/20 07:04 PM
Fluoride	<0.100	0.100	0.400		mg/L	1	05/14/20 12:24 AM
Sulfate	188	10.0	30.0		mg/L	10	05/13/20 09:12 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	4090	50.0	50.0		mg/L	1	05/13/20 05:00 PM

Qualifiers:

ND - Not Detected at the SDL
J - Analyte detected between SDL and RL
B - Analyte detected in the associated Method Blank
DF- Dilution Factor
N - Parameter not NELAP certified
See Final Page of Report for MQLs and MDLs
S - Spike Recovery outside control limits
C - Sample Result or QC discussed in Case Narrative
RL - Reporting Limit (MQL adjusted for moisture and sample size)
SDL - Sample Detection Limit
E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: *12-Jun-20*

CLIENT:	Golder	**Client Sample ID:**	FGD-11
Project:	Luminant-OGSES FGD PONDS	**Lab ID:**	2005079-06
Project No:	19122262-F2020	**Collection Date:**	05/11/20 12:45 PM
Lab Order:	2005079	**Matrix:**	AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020B**					Analyst: **RO**
Antimony	<0.000800	0.000800	0.00250		mg/L	1	05/19/20 01:06 PM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	05/19/20 01:06 PM
Barium	0.347	0.00300	0.0100		mg/L	1	05/19/20 01:06 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	05/19/20 01:06 PM
Boron	0.166	0.0100	0.0300		mg/L	1	05/20/20 12:38 PM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	05/19/20 01:06 PM
Calcium	103	1.00	3.00		mg/L	10	05/20/20 01:39 PM
Chromium	0.0146	0.00200	0.00500		mg/L	1	05/19/20 01:06 PM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	05/19/20 01:06 PM
Lead	0.000658	0.000300	0.00100	J	mg/L	1	05/19/20 01:06 PM
Lithium	0.0132	0.00500	0.0100		mg/L	1	05/19/20 01:06 PM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	05/19/20 01:06 PM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	05/19/20 01:06 PM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	05/19/20 01:06 PM
MERCURY TOTAL: AQUEOUS		**SW7470A**					Analyst: **BM**
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	05/19/20 12:19 PM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **SNM**
Chloride	560	30.0	100		mg/L	100	05/15/20 03:28 PM
Fluoride	0.365	0.100	0.400	J	mg/L	1	05/14/20 12:40 AM
Sulfate	43.3	1.00	3.00		mg/L	1	05/14/20 12:40 AM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	1300	50.0	50.0		mg/L	1	05/13/20 05:00 PM

Qualifiers:

ND - Not Detected at the SDL
J - Analyte detected between SDL and RL
B - Analyte detected in the associated Method Blank
DF- Dilution Factor
N - Parameter not NELAP certified
See Final Page of Report for MQLs and MDLs
S - Spike Recovery outside control limits
C - Sample Result or QC discussed in Case Narrative
RL - Reporting Limit (MQL adjusted for moisture and sample size)
SDL - Sample Detection Limit
E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: *12-Jun-20*

CLIENT:	Golder	**Client Sample ID:**	FGD-12
Project:	Luminant-OGSES FGD PONDS	**Lab ID:**	2005079-07
Project No:	19122262-F2020	**Collection Date:**	05/11/20 01:45 PM
Lab Order:	2005079	**Matrix:**	AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020B**					Analyst: **RO**
Antimony	<0.000800	0.000800	0.00250		mg/L	1	05/19/20 01:09 PM
Arsenic	0.0116	0.00200	0.00500		mg/L	1	05/19/20 01:09 PM
Barium	0.230	0.00300	0.0100		mg/L	1	05/19/20 01:09 PM
Beryllium	0.00166	0.000300	0.00100		mg/L	1	05/19/20 01:09 PM
Boron	0.149	0.0100	0.0300		mg/L	1	05/20/20 12:41 PM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	05/19/20 01:09 PM
Calcium	15.6	0.100	0.300		mg/L	1	05/20/20 12:41 PM
Chromium	0.0370	0.00200	0.00500		mg/L	1	05/19/20 01:09 PM
Cobalt	0.00883	0.00300	0.00500		mg/L	1	05/19/20 01:09 PM
Lead	0.0249	0.000300	0.00100		mg/L	1	05/19/20 01:09 PM
Lithium	0.0371	0.00500	0.0100		mg/L	1	05/19/20 01:09 PM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	05/19/20 01:09 PM
Selenium	0.00678	0.00200	0.00500		mg/L	1	05/19/20 01:09 PM
Thallium	0.000651	0.000500	0.00150	J	mg/L	1	05/19/20 01:09 PM
MERCURY TOTAL: AQUEOUS		**SW7470A**					Analyst: **BM**
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	05/19/20 12:21 PM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **SNM**
Chloride	19.3	0.300	1.00		mg/L	1	05/14/20 12:56 AM
Fluoride	<0.100	0.100	0.400		mg/L	1	05/14/20 12:56 AM
Sulfate	19.9	1.00	3.00		mg/L	1	05/14/20 12:56 AM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	198	10.0	10.0		mg/L	1	05/13/20 05:00 PM

Qualifiers:

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S - Spike Recovery outside control limits
C - Sample Result or QC discussed in Case Narrative
RL - Reporting Limit (MQL adjusted for moisture and sample size)
SDL - Sample Detection Limit
E - TPH pattern not Gas or Diesel Range Pattern

CLIENT: Golder
Work Order: 2005079
Project: Luminant-OGSES FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: CETAC2_HG_200304C

Sample ID: **DCS-95289** Batch ID: **95289** TestNo: **SW7470A** Units: **mg/L**
SampType: **DCS** Run ID: **CETAC2_HG_200304C** Analysis Date: **3/4/2020 12:11:09 PM** Prep Date: **3/4/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.000175	0.000200	0.000200	0	87.5	82	119	0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005079
Project: Luminant-OGSES FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: CETAC2_HG_200519B

The QC data in batch 96370 applies to the following samples: 2005079-01A, 2005079-02A, 2005079-03A, 2005079-04A, 2005079-05A, 2005079-06A, 2005079-07A

Sample ID: **MB-96370** Batch ID: **96370** TestNo: **SW7470A** Units: **mg/L**
SampType: **MBLK** Run ID: **CETAC2_HG_200519B** Analysis Date: **5/19/2020 11:47:54 AM** Prep Date: **5/17/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	<0.0000800	0.000200								

Sample ID: **LCS-96370** Batch ID: **96370** TestNo: **SW7470A** Units: **mg/L**
SampType: **LCS** Run ID: **CETAC2_HG_200519B** Analysis Date: **5/19/2020 11:50:10 AM** Prep Date: **5/17/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00205	0.000200	0.00200	0	103	85	115			

Sample ID: **LCSD-96370** Batch ID: **96370** TestNo: **SW7470A** Units: **mg/L**
SampType: **LCSD** Run ID: **CETAC2_HG_200519B** Analysis Date: **5/19/2020 11:52:26 AM** Prep Date: **5/17/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00194	0.000200	0.00200	0	97.0	85	115	5.51	15	

Sample ID: **2005079-01A MS** Batch ID: **96370** TestNo: **SW7470A** Units: **mg/L**
SampType: **MS** Run ID: **CETAC2_HG_200519B** Analysis Date: **5/19/2020 12:01:30 PM** Prep Date: **5/17/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00191	0.000200	0.00200	0	95.5	80	120			

Sample ID: **2005079-01A MSD** Batch ID: **96370** TestNo: **SW7470A** Units: **mg/L**
SampType: **MSD** Run ID: **CETAC2_HG_200519B** Analysis Date: **5/19/2020 12:03:46 PM** Prep Date: **5/17/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00209	0.000200	0.00200	0	104	80	120	9.00	15	

Sample ID: **2005079-01A SD** Batch ID: **96370** TestNo: **SW7470A** Units: **mg/L**
SampType: **SD** Run ID: **CETAC2_HG_200519B** Analysis Date: **5/19/2020 12:06:02 PM** Prep Date: **5/17/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	<0.000400	0.00100	0	0				0	10	

Sample ID: **2005079-01A PDS** Batch ID: **96370** TestNo: **SW7470A** Units: **mg/L**
SampType: **PDS** Run ID: **CETAC2_HG_200519B** Analysis Date: **5/19/2020 12:08:18 PM** Prep Date: **5/17/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00226	0.000200	0.00250	0	90.4	85	115			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005079
Project: Luminant-OGSES FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: CETAC2_HG_200519B

Sample ID: **ICV-200519**	Batch ID: **R110550**	TestNo: **SW7470A**	Units: **mg/L**
SampType: **ICV**	Run ID: **CETAC2_HG_200519B**	Analysis Date: **5/19/2020 10:31:55 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00391	0.000200	0.00400	0	97.8	90	110			

Sample ID: **CCV2-200519**	Batch ID: **R110550**	TestNo: **SW7470A**	Units: **mg/L**
SampType: **CCV**	Run ID: **CETAC2_HG_200519B**	Analysis Date: **5/19/2020 11:42:21 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00213	0.000200	0.00200	0	106	90	110			

Sample ID: **CCV3-200519**	Batch ID: **R110550**	TestNo: **SW7470A**	Units: **mg/L**
SampType: **CCV**	Run ID: **CETAC2_HG_200519B**	Analysis Date: **5/19/2020 12:26:27 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00214	0.000200	0.00200	0	107	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005079
Project: Luminant-OGSES FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200408C

Sample ID: **DCS1-95814**	Batch ID: **95814**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **DCS**	Run ID: **ICP-MS5_200408C**	Analysis Date: **4/8/2020 11:16:00 AM**	Prep Date: **4/7/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.000932	0.00250	0.00100	0	93.2	70	130	0	0	
Beryllium	0.000472	0.00100	0.000500	0	94.4	70	130	0	0	
Cadmium	0.000492	0.00100	0.000500	0	98.4	70	130	0	0	
Lead	0.000496	0.00100	0.000500	0	99.2	70	130	0	0	
Thallium	0.000468	0.00150	0.000500	0	93.6	70	130	0	0	

Sample ID: **DCS2-95814**	Batch ID: **95814**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **DCS2**	Run ID: **ICP-MS5_200408C**	Analysis Date: **4/8/2020 11:19:00 AM**	Prep Date: **4/7/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	0.310	0.300	0.300	0	103	70	130	0	0	

Sample ID: **DCS3-95814**	Batch ID: **95814**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **DCS3**	Run ID: **ICP-MS5_200408C**	Analysis Date: **4/8/2020 11:21:00 AM**	Prep Date: **4/7/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.00466	0.00500	0.00500	0	93.2	70	130	0	0	
Barium	0.00478	0.0100	0.00500	0	95.6	70	130	0	0	
Chromium	0.00600	0.00500	0.00500	0	120	70	130	0	0	
Cobalt	0.00473	0.00500	0.00500	0	94.6	70	130	0	0	
Lithium	0.00473	0.0100	0.00500	0	94.6	70	130	0	0	
Molybdenum	0.00466	0.00500	0.00500	0	93.2	70	130	0	0	
Selenium	0.00517	0.00500	0.00500	0	103	70	130	0	0	

Sample ID: **DCS4-95814**	Batch ID: **95814**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **DCS4**	Run ID: **ICP-MS5_200408C**	Analysis Date: **4/8/2020 11:28:00 AM**	Prep Date: **4/7/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	0.0286	0.0300	0.0300	0	95.2	70	130	0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005079
Project: Luminant-OGSES FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: **ICP-MS5_200519B**

The QC data in batch 96359 applies to the following samples: 2005079-01A, 2005079-02A, 2005079-03A, 2005079-04A, 2005079-05A, 2005079-06A, 2005079-07A

Sample ID: **MB-96359** Batch ID: **96359** TestNo: **SW6020B** Units: **mg/L**
SampType: **MBLK** Run ID: **ICP-MS5_200519B** Analysis Date: **5/19/2020 12:37:00 PM** Prep Date: **5/15/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	<0.000800	0.00250								
Arsenic	<0.00200	0.00500								
Barium	<0.00300	0.0100								
Beryllium	<0.000300	0.00100								
Cadmium	<0.000300	0.00100								
Calcium	<0.100	0.300								
Chromium	<0.00200	0.00500								
Cobalt	<0.00300	0.00500								
Lead	<0.000300	0.00100								
Lithium	<0.00500	0.0100								
Molybdenum	<0.00200	0.00500								
Selenium	<0.00200	0.00500								
Thallium	<0.000500	0.00150								

Sample ID: **LCS-96359** Batch ID: **96359** TestNo: **SW6020B** Units: **mg/L**
SampType: **LCS** Run ID: **ICP-MS5_200519B** Analysis Date: **5/19/2020 12:40:00 PM** Prep Date: **5/15/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.204	0.00250	0.200	0	102	80	120			
Arsenic	0.208	0.00500	0.200	0	104	80	120			
Barium	0.202	0.0100	0.200	0	101	80	120			
Beryllium	0.201	0.00100	0.200	0	100	80	120			
Cadmium	0.206	0.00100	0.200	0	103	80	120			
Calcium	5.42	0.300	5.00	0	108	80	120			
Chromium	0.200	0.00500	0.200	0	100	80	120			
Cobalt	0.205	0.00500	0.200	0	102	80	120			
Lead	0.201	0.00100	0.200	0	100	80	120			
Lithium	0.204	0.0100	0.200	0	102	80	120			
Molybdenum	0.205	0.00500	0.200	0	102	80	120			
Selenium	0.213	0.00500	0.200	0	107	80	120			
Thallium	0.200	0.00150	0.200	0	99.9	80	120			

Sample ID: **LCSD-96359** Batch ID: **96359** TestNo: **SW6020B** Units: **mg/L**
SampType: **LCSD** Run ID: **ICP-MS5_200519B** Analysis Date: **5/19/2020 12:42:00 PM** Prep Date: **5/15/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.204	0.00250	0.200	0	102	80	120	0.135	15	
Arsenic	0.207	0.00500	0.200	0	103	80	120	0.366	15	
Barium	0.206	0.0100	0.200	0	103	80	120	1.84	15	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005079
Project: Luminant-OGSES FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200519B

Sample ID: **LCSD-96359** Batch ID: **96359** TestNo: **SW6020B** Units: **mg/L**
SampType: **LCSD** Run ID: **ICP-MS5_200519B** Analysis Date: **5/19/2020 12:42:00 PM** Prep Date: **5/15/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Beryllium	0.202	0.00100	0.200	0	101	80	120	0.541	15	
Cadmium	0.209	0.00100	0.200	0	104	80	120	1.41	15	
Calcium	5.32	0.300	5.00	0	106	80	120	2.00	15	
Chromium	0.201	0.00500	0.200	0	100	80	120	0.209	15	
Cobalt	0.206	0.00500	0.200	0	103	80	120	0.548	15	
Lead	0.199	0.00100	0.200	0	99.6	80	120	0.766	15	
Lithium	0.201	0.0100	0.200	0	100	80	120	1.71	15	
Molybdenum	0.205	0.00500	0.200	0	103	80	120	0.262	15	
Selenium	0.212	0.00500	0.200	0	106	80	120	0.751	15	
Thallium	0.198	0.00150	0.200	0	99.2	80	120	0.704	15	

Sample ID: **2005111-01B SD** Batch ID: **96359** TestNo: **SW6020B** Units: **mg/L**
SampType: **SD** Run ID: **ICP-MS5_200519B** Analysis Date: **5/19/2020 12:53:00 PM** Prep Date: **5/15/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	<0.00400	0.0125	0	0				0	20	
Arsenic	<0.0100	0.0250	0	0.00893				0	20	
Barium	0.0171	0.0500	0	0.0170				0.492	20	
Beryllium	0.0169	0.00500	0	0.0164				3.12	20	
Cadmium	<0.00150	0.00500	0	0				0	20	
Calcium	260	1.50	0	257				0.815	20	
Chromium	<0.0100	0.0250	0	0.00205				0	20	
Cobalt	0.449	0.0250	0	0.439				2.12	20	
Lead	<0.00150	0.00500	0	0				0	20	
Lithium	0.248	0.0500	0	0.249				0.282	20	
Molybdenum	<0.0100	0.0250	0	0				0	20	
Selenium	0.0328	0.0250	0	0.0299				9.36	20	
Thallium	<0.00250	0.00750	0	0				0	20	

Sample ID: **2005111-01B PDS** Batch ID: **96359** TestNo: **SW6020B** Units: **mg/L**
SampType: **PDS** Run ID: **ICP-MS5_200519B** Analysis Date: **5/19/2020 1:20:00 PM** Prep Date: **5/15/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.204	0.00250	0.200	0	102	75	125			
Arsenic	0.200	0.00500	0.200	0.00893	95.3	75	125			
Barium	0.225	0.0100	0.200	0.0170	104	75	125			
Beryllium	0.203	0.00100	0.200	0.0164	93.4	75	125			
Cadmium	0.195	0.00100	0.200	0	97.5	75	125			
Calcium	248	0.300	5.00	257	-182	75	125			S
Chromium	0.202	0.00500	0.200	0.00205	99.7	75	125			
Cobalt	0.606	0.00500	0.200	0.439	83.3	75	125			

Qualifiers:

B	Analyte detected in the associated Method Blank
J	Analyte detected between MDL and RL
ND	Not Detected at the Method Detection Limit
RL	Reporting Limit
J	Analyte detected between SDL and RL
DF	Dilution Factor
MDL	Method Detection Limit
R	RPD outside accepted control limits
S	Spike Recovery outside control limits
N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005079
Project: Luminant-OGSES FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200519B

Sample ID: **2005111-01B PDS**	Batch ID: **96359**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **PDS**	Run ID: **ICP-MS5_200519B**	Analysis Date: **5/19/2020 1:20:00 PM**	Prep Date: **5/15/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	0.203	0.00100	0.200	0	102	75	125			
Lithium	0.417	0.0100	0.200	0.249	84.4	75	125			
Molybdenum	0.205	0.00500	0.200	0	103	75	125			
Selenium	0.217	0.00500	0.200	0.0299	93.6	75	125			
Thallium	0.201	0.00150	0.200	0	101	75	125			

Sample ID: **2005111-01B MS**	Batch ID: **96359**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **MS**	Run ID: **ICP-MS5_200519B**	Analysis Date: **5/19/2020 1:22:00 PM**	Prep Date: **5/15/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.202	0.00250	0.200	0	101	75	125			
Arsenic	0.203	0.00500	0.200	0.00893	97.3	75	125			
Barium	0.223	0.0100	0.200	0.0170	103	75	125			
Beryllium	0.206	0.00100	0.200	0.0164	94.7	75	125			
Cadmium	0.194	0.00100	0.200	0	96.8	75	125			
Calcium	263	0.300	5.00	257	118	75	125			
Chromium	0.194	0.00500	0.200	0.00205	96.1	75	125			
Cobalt	0.633	0.00500	0.200	0.439	96.8	75	125			
Lead	0.198	0.00100	0.200	0	99.1	75	125			
Lithium	0.430	0.0100	0.200	0.249	90.6	75	125			
Molybdenum	0.211	0.00500	0.200	0	106	75	125			
Selenium	0.225	0.00500	0.200	0.0299	97.4	75	125			
Thallium	0.199	0.00150	0.200	0	99.4	75	125			

Sample ID: **2005111-01B MSD**	Batch ID: **96359**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **MSD**	Run ID: **ICP-MS5_200519B**	Analysis Date: **5/19/2020 1:24:00 PM**	Prep Date: **5/15/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.200	0.00250	0.200	0	100	75	125	0.929	15	
Arsenic	0.203	0.00500	0.200	0.00893	97.0	75	125	0.261	15	
Barium	0.219	0.0100	0.200	0.0170	101	75	125	2.08	15	
Beryllium	0.206	0.00100	0.200	0.0164	95.0	75	125	0.323	15	
Cadmium	0.193	0.00100	0.200	0	96.5	75	125	0.269	15	
Calcium	262	0.300	5.00	257	92.8	75	125	0.471	15	
Chromium	0.193	0.00500	0.200	0.00205	95.7	75	125	0.411	15	
Cobalt	0.632	0.00500	0.200	0.439	96.4	75	125	0.138	15	
Lead	0.200	0.00100	0.200	0	100	75	125	1.06	15	
Lithium	0.437	0.0100	0.200	0.249	94.3	75	125	1.66	15	
Molybdenum	0.208	0.00500	0.200	0	104	75	125	1.36	15	
Selenium	0.227	0.00500	0.200	0.0299	98.3	75	125	0.785	15	
Thallium	0.201	0.00150	0.200	0	100	75	125	0.951	15	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005079
Project: Luminant-OGSES FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200519B

Sample ID: **ICV-200519** Batch ID: **R110549** TestNo: **SW6020B** Units: **mg/L**
SampType: **ICV** Run ID: **ICP-MS5_200519B** Analysis Date: **5/19/2020 10:48:00 AM** Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.101	0.00250	0.100	0	101	90	110			
Arsenic	0.0990	0.00500	0.100	0	99.0	90	110			
Barium	0.102	0.0100	0.100	0	102	90	110			
Beryllium	0.0981	0.00100	0.100	0	98.1	90	110			
Cadmium	0.102	0.00100	0.100	0	102	90	110			
Calcium	2.60	0.300	2.50	0	104	90	110			
Chromium	0.101	0.00500	0.100	0	101	90	110			
Cobalt	0.100	0.00500	0.100	0	100	90	110			
Lead	0.0993	0.00100	0.100	0	99.3	90	110			
Lithium	0.0998	0.0100	0.100	0	99.8	90	110			
Molybdenum	0.0975	0.00500	0.100	0	97.5	90	110			
Selenium	0.103	0.00500	0.100	0	103	90	110			
Thallium	0.0973	0.00150	0.100	0	97.3	90	110			

Sample ID: **LCVL-200519** Batch ID: **R110549** TestNo: **SW6020B** Units: **mg/L**
SampType: **LCVL** Run ID: **ICP-MS5_200519B** Analysis Date: **5/19/2020 11:00:00 AM** Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00203	0.00250	0.00200	0	102	80	120			
Arsenic	0.00510	0.00500	0.00500	0	102	80	120			
Barium	0.00527	0.0100	0.00500	0	105	80	120			
Beryllium	0.00109	0.00100	0.00100	0	109	80	120			
Cadmium	0.00102	0.00100	0.00100	0	102	80	120			
Calcium	0.115	0.300	0.100	0	115	80	120			
Chromium	0.00502	0.00500	0.00500	0	100	80	120			
Cobalt	0.00510	0.00500	0.00500	0	102	80	120			
Lead	0.00103	0.00100	0.00100	0	103	80	120			
Lithium	0.0100	0.0100	0.0100	0	100	80	120			
Molybdenum	0.00524	0.00500	0.00500	0	105	80	120			
Selenium	0.00565	0.00500	0.00500	0	113	80	120			
Thallium	0.000986	0.00150	0.00100	0	98.6	80	120			

Sample ID: **CCV2-200519** Batch ID: **R110549** TestNo: **SW6020B** Units: **mg/L**
SampType: **CCV** Run ID: **ICP-MS5_200519B** Analysis Date: **5/19/2020 12:26:00 PM** Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.201	0.00250	0.200	0	101	90	110			
Arsenic	0.207	0.00500	0.200	0	103	90	110			
Barium	0.200	0.0100	0.200	0	99.8	90	110			
Beryllium	0.202	0.00100	0.200	0	101	90	110			
Cadmium	0.204	0.00100	0.200	0	102	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005079
Project: Luminant-OGSES FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200519B

Sample ID: **CCV2-200519** Batch ID: **R110549** TestNo: **SW6020B** Units: **mg/L**
SampType: **CCV** Run ID: **ICP-MS5_200519B** Analysis Date: **5/19/2020 12:26:00 PM** Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	5.20	0.300	5.00	0	104	90	110			
Chromium	0.198	0.00500	0.200	0	99.1	90	110			
Cobalt	0.204	0.00500	0.200	0	102	90	110			
Lead	0.197	0.00100	0.200	0	98.3	90	110			
Lithium	0.206	0.0100	0.200	0	103	90	110			
Molybdenum	0.204	0.00500	0.200	0	102	90	110			
Selenium	0.214	0.00500	0.200	0	107	90	110			
Thallium	0.196	0.00150	0.200	0	97.8	90	110			

Sample ID: **CCV3-200519** Batch ID: **R110549** TestNo: **SW6020B** Units: **mg/L**
SampType: **CCV** Run ID: **ICP-MS5_200519B** Analysis Date: **5/19/2020 1:44:00 PM** Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.200	0.00250	0.200	0	99.8	90	110			
Arsenic	0.206	0.00500	0.200	0	103	90	110			
Barium	0.201	0.0100	0.200	0	101	90	110			
Beryllium	0.202	0.00100	0.200	0	101	90	110			
Cadmium	0.206	0.00100	0.200	0	103	90	110			
Calcium	5.19	0.300	5.00	0	104	90	110			
Chromium	0.199	0.00500	0.200	0	99.3	90	110			
Cobalt	0.206	0.00500	0.200	0	103	90	110			
Lead	0.196	0.00100	0.200	0	98.0	90	110			
Lithium	0.206	0.0100	0.200	0	103	90	110			
Molybdenum	0.205	0.00500	0.200	0	103	90	110			
Selenium	0.215	0.00500	0.200	0	107	90	110			
Thallium	0.196	0.00150	0.200	0	97.8	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005079
Project: Luminant-OGSES FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200520B

The QC data in batch 96359 applies to the following samples: 2005079-01A, 2005079-02A, 2005079-03A, 2005079-04A, 2005079-05A, 2005079-06A, 2005079-07A

Sample ID: **MB-96359** Batch ID: **96359** TestNo: **SW6020B** Units: **mg/L**
SampType: **MBLK** Run ID: **ICP-MS5_200520B** Analysis Date: **5/20/2020 1:10:00 PM** Prep Date: **5/15/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	<0.0100	0.0300								

Sample ID: **LCS-96359** Batch ID: **96359** TestNo: **SW6020B** Units: **mg/L**
SampType: **LCS** Run ID: **ICP-MS5_200520B** Analysis Date: **5/20/2020 1:13:00 PM** Prep Date: **5/15/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	0.193	0.0300	0.200	0	96.4	80	120			

Sample ID: **LCSD-96359** Batch ID: **96359** TestNo: **SW6020B** Units: **mg/L**
SampType: **LCSD** Run ID: **ICP-MS5_200520B** Analysis Date: **5/20/2020 1:15:00 PM** Prep Date: **5/15/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	0.208	0.0300	0.200	0	104	80	120	7.81	15	

Sample ID: **2005111-01B SD** Batch ID: **96359** TestNo: **SW6020B** Units: **mg/L**
SampType: **SD** Run ID: **ICP-MS5_200520B** Analysis Date: **5/20/2020 1:26:00 PM** Prep Date: **5/15/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	20.5	7.50	0	19.0				7.43	20	

Sample ID: **2005111-01B PDS** Batch ID: **96359** TestNo: **SW6020B** Units: **mg/L**
SampType: **PDS** Run ID: **ICP-MS5_200520B** Analysis Date: **5/20/2020 1:53:00 PM** Prep Date: **5/15/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	28.5	1.50	10.0	19.0	95.5	75	125			

Sample ID: **2005111-01B MS** Batch ID: **96359** TestNo: **SW6020B** Units: **mg/L**
SampType: **MS** Run ID: **ICP-MS5_200520B** Analysis Date: **5/20/2020 1:55:00 PM** Prep Date: **5/15/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	21.0	1.50	0.200	19.0	1020	75	125			S

Sample ID: **2005111-01B MSD** Batch ID: **96359** TestNo: **SW6020B** Units: **mg/L**
SampType: **MSD** Run ID: **ICP-MS5_200520B** Analysis Date: **5/20/2020 1:57:00 PM** Prep Date: **5/15/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	21.3	1.50	0.200	19.0	1160	75	125	1.40	15	S

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005079
Project: Luminant-OGSES FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200520B

Sample ID: **ICV-200520**	Batch ID: **R110581**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **ICV**	Run ID: **ICP-MS5_200520B**	Analysis Date: **5/20/2020 10:52:00 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	0.0987	0.0300	0.100	0	98.7	90	110			
Calcium	2.60	0.300	2.50	0	104	90	110			

Sample ID: **LCVL-200520**	Batch ID: **R110581**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **LCVL**	Run ID: **ICP-MS5_200520B**	Analysis Date: **5/20/2020 11:04:00 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	0.0216	0.0300	0.0200	0	108	80	120			
Calcium	0.106	0.300	0.100	0	106	80	120			

Sample ID: **CCV1-200520**	Batch ID: **R110581**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS5_200520B**	Analysis Date: **5/20/2020 12:00:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	0.200	0.0300	0.200	0	100	90	110			
Calcium	4.94	0.300	5.00	0	98.9	90	110			

Sample ID: **CCV2-200520**	Batch ID: **R110581**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS5_200520B**	Analysis Date: **5/20/2020 12:52:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	0.195	0.0300	0.200	0	97.3	90	110			
Calcium	4.98	0.300	5.00	0	99.7	90	110			

Sample ID: **CCV3-200520**	Batch ID: **R110581**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS5_200520B**	Analysis Date: **5/20/2020 2:09:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	0.198	0.0300	0.200	0	98.9	90	110			
Calcium	5.09	0.300	5.00	0	102	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005079
Project: Luminant-OGSES FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_200421A

Sample ID: **DCS2-96036** Batch ID: **96036** TestNo: **E300** Units: **mg/L**
SampType: **DCS2** Run ID: **IC2_200421A** Analysis Date: **4/21/2020 11:47:08 AM** Prep Date: **4/21/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	0.420	1.00	0.5000	0	84.1	70	130	0	0	
Fluoride	0.154	0.400	0.2000	0	77.1	70	130	0	0	
Sulfate	1.43	3.00	1.500	0	95.3	70	130	0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005079
Project: Luminant-OGSES FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_200513A

The QC data in batch 96331 applies to the following samples: 2005079-01B, 2005079-02B, 2005079-03B, 2005079-04B, 2005079-05B, 2005079-06B, 2005079-07B

Sample ID: **MB-96331** Batch ID: **96331** TestNo: **E300** Units: **mg/L**
SampType: **MBLK** Run ID: **IC2_200513A** Analysis Date: **5/13/2020 12:03:31 PM** Prep Date: **5/13/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	<0.300	1.00								
Fluoride	<0.100	0.400								
Sulfate	<1.00	3.00								

Sample ID: **LCS-96331** Batch ID: **96331** TestNo: **E300** Units: **mg/L**
SampType: **LCS** Run ID: **IC2_200513A** Analysis Date: **5/13/2020 12:19:31 PM** Prep Date: **5/13/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.2	1.00	10.00	0	102	90	110			
Fluoride	3.73	0.400	4.000	0	93.2	90	110			
Sulfate	30.2	3.00	30.00	0	101	90	110			

Sample ID: **LCSD-96331** Batch ID: **96331** TestNo: **E300** Units: **mg/L**
SampType: **LCSD** Run ID: **IC2_200513A** Analysis Date: **5/13/2020 12:35:31 PM** Prep Date: **5/13/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.2	1.00	10.00	0	102	90	110	0.114	20	
Fluoride	3.75	0.400	4.000	0	93.8	90	110	0.683	20	
Sulfate	30.2	3.00	30.00	0	101	90	110	0.039	20	

Sample ID: **2005077-02BMS** Batch ID: **96331** TestNo: **E300** Units: **mg/L**
SampType: **MS** Run ID: **IC2_200513A** Analysis Date: **5/14/2020 1:28:07 AM** Prep Date: **5/13/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	825	10.0	200.0	800.5	12.5	90	110			S
Fluoride	216	4.00	200.0	0	108	90	110			
Sulfate	494	30.0	200.0	288.5	103	90	110			

Sample ID: **2005077-02BMSD** Batch ID: **96331** TestNo: **E300** Units: **mg/L**
SampType: **MSD** Run ID: **IC2_200513A** Analysis Date: **5/14/2020 1:44:07 AM** Prep Date: **5/13/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	822	10.0	200.0	800.5	10.6	90	110	0.450	20	S
Fluoride	217	4.00	200.0	0	108	90	110	0.480	20	
Sulfate	494	30.0	200.0	288.5	103	90	110	0.008	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005079
Project: Luminant-OGSES FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_200513A

Sample ID: **2005077-01BMS**	Batch ID: **96331**	TestNo: **E300**	Units: **mg/L**
SampType: **MS**	Run ID: **IC2_200513A**	Analysis Date: **5/14/2020 2:00:07 AM**	Prep Date: **5/13/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	105	1.00	20.00	108.6	-16.4	90	110			S
Fluoride	19.4	0.400	20.00	0.2859	95.7	90	110			
Sulfate	70.1	3.00	20.00	52.44	88.2	90	110			S

Sample ID: **2005077-01BMSD**	Batch ID: **96331**	TestNo: **E300**	Units: **mg/L**
SampType: **MSD**	Run ID: **IC2_200513A**	Analysis Date: **5/14/2020 2:16:07 AM**	Prep Date: **5/13/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	<0.300	1.00	20.00	108.6	-543	90	110	0	20	S
Fluoride	19.4	0.400	20.00	0.2859	95.7	90	110	0.065	20	
Sulfate	70.1	3.00	20.00	52.44	88.5	90	110	0.074	20	S

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005079
Project: Luminant-OGSES FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_200513A

Sample ID: **ICV-200513**	Batch ID: **R110479**	TestNo: **E300**	Units: **mg/L**
SampType: **ICV**	Run ID: **IC2_200513A**	Analysis Date: **5/13/2020 11:31:31 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	26.2	1.00	25.00	0	105	90	110			
Fluoride	9.86	0.400	10.00	0	98.6	90	110			
Sulfate	78.8	3.00	75.00	0	105	90	110			

Sample ID: **CCV1-200513**	Batch ID: **R110479**	TestNo: **E300**	Units: **mg/L**
SampType: **CCV**	Run ID: **IC2_200513A**	Analysis Date: **5/13/2020 6:16:07 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.3	1.00	10.00	0	103	90	110			
Fluoride	3.88	0.400	4.000	0	97.0	90	110			
Sulfate	30.2	3.00	30.00	0	101	90	110			

Sample ID: **CCV2-200513**	Batch ID: **R110479**	TestNo: **E300**	Units: **mg/L**
SampType: **CCV**	Run ID: **IC2_200513A**	Analysis Date: **5/13/2020 10:16:07 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.2	1.00	10.00	0	102	90	110			
Fluoride	3.87	0.400	4.000	0	96.8	90	110			
Sulfate	30.1	3.00	30.00	0	100	90	110			

Sample ID: **CCV3-200513**	Batch ID: **R110479**	TestNo: **E300**	Units: **mg/L**
SampType: **CCV**	Run ID: **IC2_200513A**	Analysis Date: **5/14/2020 3:20:07 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.5	1.00	10.00	0	105	90	110			
Fluoride	3.96	0.400	4.000	0	99.0	90	110			
Sulfate	30.6	3.00	30.00	0	102	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005079
Project: Luminant-OGSES FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_200515A

The QC data in batch 96363 applies to the following samples: 2005079-06B

Sample ID: **MB-96363**	Batch ID: **96363**	TestNo: **E300**	Units: **mg/L**
SampType: **MBLK**	Run ID: **IC2_200515A**	Analysis Date: **5/15/2020 11:51:21 AM**	Prep Date: **5/15/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	<0.300	1.00								

Sample ID: **LCS-96363**	Batch ID: **96363**	TestNo: **E300**	Units: **mg/L**
SampType: **LCS**	Run ID: **IC2_200515A**	Analysis Date: **5/15/2020 12:07:21 PM**	Prep Date: **5/15/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.2	1.00	10.00	0	102	90	110			

Sample ID: **LCSD-96363**	Batch ID: **96363**	TestNo: **E300**	Units: **mg/L**
SampType: **LCSD**	Run ID: **IC2_200515A**	Analysis Date: **5/15/2020 12:23:21 PM**	Prep Date: **5/15/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.2	1.00	10.00	0	102	90	110	0.117	20	

Sample ID: **2005112-01BMS**	Batch ID: **96363**	TestNo: **E300**	Units: **mg/L**
SampType: **MS**	Run ID: **IC2_200515A**	Analysis Date: **5/15/2020 4:00:25 PM**	Prep Date: **5/15/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	2220	100	2000	206.2	101	90	110			

Sample ID: **2005112-01BMSD**	Batch ID: **96363**	TestNo: **E300**	Units: **mg/L**
SampType: **MSD**	Run ID: **IC2_200515A**	Analysis Date: **5/15/2020 4:16:25 PM**	Prep Date: **5/15/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	2230	100	2000	206.2	101	90	110	0.373	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005079
Project: Luminant-OGSES FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_200515A

Sample ID: **ICV-200515**	Batch ID: **R110519**	TestNo: **E300**	Units: **mg/L**
SampType: **ICV**	Run ID: **IC2_200515A**	Analysis Date: **5/15/2020 11:19:21 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	26.2	1.00	25.00	0	105	90	110			

Sample ID: **CCV1-200515**	Batch ID: **R110519**	TestNo: **E300**	Units: **mg/L**
SampType: **CCV**	Run ID: **IC2_200515A**	Analysis Date: **5/15/2020 7:12:25 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.3	1.00	10.00	0	103	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005079
Project: Luminant-OGSES FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: WC_200513A

The QC data in batch 96333 applies to the following samples: 2005079-01B, 2005079-02B, 2005079-03B, 2005079-04B, 2005079-05B, 2005079-06B, 2005079-07B

Sample ID: **MB-96333**	Batch ID: **96333**	TestNo: **M2540C**	Units: **mg/L**
SampType: **MBLK**	Run ID: **WC_200513A**	Analysis Date: **5/13/2020 5:00:00 PM**	Prep Date: **5/13/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	<10.0	10.0								

Sample ID: **LCS-96333**	Batch ID: **96333**	TestNo: **M2540C**	Units: **mg/L**
SampType: **LCS**	Run ID: **WC_200513A**	Analysis Date: **5/13/2020 5:00:00 PM**	Prep Date: **5/13/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	756	10.0	745.6	0	101	90	113			

Sample ID: **2005079-05B-DUP**	Batch ID: **96333**	TestNo: **M2540C**	Units: **mg/L**
SampType: **DUP**	Run ID: **WC_200513A**	Analysis Date: **5/13/2020 5:00:00 PM**	Prep Date: **5/13/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	4120	50.0	0	4090				0.609	5	

Sample ID: **2005079-06B-DUP**	Batch ID: **96333**	TestNo: **M2540C**	Units: **mg/L**
SampType: **DUP**	Run ID: **WC_200513A**	Analysis Date: **5/13/2020 5:00:00 PM**	Prep Date: **5/13/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	1250	50.0	0	1295				3.94	5	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005079
Project: Luminant-OGSES FGD PONDS

MQL SUMMARY REPORT

TestNo: E300	**MDL**	**MQL**
Analyte	**mg/L**	**mg/L**
Chloride	0.300	1.00
Fluoride	0.100	0.400
Sulfate	1.00	3.00

TestNo: SW6020B	**MDL**	**MQL**
Analyte	**mg/L**	**mg/L**
Antimony	0.000800	0.00250
Arsenic	0.00200	0.00500
Barium	0.00300	0.0100
Beryllium	0.000300	0.00100
Boron	0.0100	0.0300
Cadmium	0.000300	0.00100
Calcium	0.100	0.300
Chromium	0.00200	0.00500
Cobalt	0.00300	0.00500
Lead	0.000300	0.00100
Lithium	0.00500	0.0100
Molybdenum	0.00200	0.00500
Selenium	0.00200	0.00500
Thallium	0.000500	0.00150

TestNo: SW7470A	**MDL**	**MQL**
Analyte	**mg/L**	**mg/L**
Mercury	0.0000800	0.000200

TestNo: M2540C	**MDL**	**MQL**
Analyte	**mg/L**	**mg/L**
Total Dissolved Solids (Residue, Filt	10.0	10.0

Qualifiers: MQL -Method Quantitation Limit as defined by TRRP
MDL -Method Detection Limit as defined by TRRP

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

June 10, 2020

DHL Analytical, Inc.

Sample Delivery Group:	L1219695
Samples Received:	05/18/2020
Project Number:	2005079
Description:	

Report To: John DuPont
2300 Double Creek Drive
Round Rock, TX 78664

Entire Report Reviewed By:

Donna Eidson
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.



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FGD-4 L1219695-01 Non-Potable Water

Collected by | Collected date/time 05/11/20 07:45 | Received date/time 05/18/20 09:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1479430	1	05/21/20 14:37	06/05/20 13:30	SNR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1480228	1	05/26/20 11:14	06/05/20 13:30	RRE	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1480228	1	05/26/20 11:14	05/27/20 16:43	RGT	Mt. Juliet, TN

FGD-2 L1219695-02 Non-Potable Water

Collected by | Collected date/time 05/11/20 08:35 | Received date/time 05/18/20 09:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1479430	1	05/21/20 14:37	06/04/20 10:10	SNR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1480228	1	05/26/20 11:14	06/04/20 10:10	RRE	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1480228	1	05/26/20 11:14	05/27/20 16:43	RGT	Mt. Juliet, TN

FGD-5 L1219695-03 Non-Potable Water

Collected by | Collected date/time 05/11/20 09:25 | Received date/time 05/18/20 09:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1479430	1	05/21/20 14:37	06/05/20 13:30	SNR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1480228	1	05/26/20 11:14	06/05/20 13:30	RRE	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1480228	1	05/26/20 11:14	05/27/20 16:43	RGT	Mt. Juliet, TN

FGD-1 L1219695-04 Non-Potable Water

Collected by | Collected date/time 05/11/20 10:15 | Received date/time 05/18/20 09:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1479430	1	05/21/20 14:37	06/05/20 13:30	SNR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1480228	1	05/26/20 11:14	06/05/20 13:30	RRE	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1480228	1	05/26/20 11:14	05/28/20 13:43	RGT	Mt. Juliet, TN

FGD-8 L1219695-05 Non-Potable Water

Collected by | Collected date/time 05/11/20 11:10 | Received date/time 05/18/20 09:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1479430	1	05/21/20 14:37	06/05/20 13:30	SNR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1480228	1	05/26/20 11:14	06/05/20 13:30	RRE	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1480228	1	05/26/20 11:14	05/28/20 13:43	RGT	Mt. Juliet, TN

FGD-11 L1219695-06 Non-Potable Water

Collected by | Collected date/time 05/11/20 12:45 | Received date/time 05/18/20 09:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1479430	1	05/21/20 14:37	06/05/20 13:30	SNR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1480228	1	05/26/20 11:14	06/05/20 13:30	RRE	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1480228	1	05/26/20 11:14	05/28/20 13:43	RGT	Mt. Juliet, TN

	Collected by	Collected date/time	Received date/time
FGD-12 L1219695-07 Non-Potable Water		05/11/20 13:45	05/18/20 09:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1479430	1	05/21/20 14:37	06/05/20 13:30	SNR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1480228	1	05/26/20 11:14	06/05/20 13:30	RRE	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1480228	1	05/26/20 11:14	05/28/20 13:43	RGT	Mt. Juliet, TN

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.



Donna Eidson
Project Manager

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	1.20		0.681	1.49	06/05/2020 13:30	WG1479430
(T) Barium	*70.1*			*62.0-143*	*06/05/2020 13:30*	WG1479430
(T) Yttrium	*104*			*79.0-136*	*06/05/2020 13:30*	WG1479430

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.35		1.14	2.17	06/05/2020 13:30	WG1480228

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.150		0.462	0.679	05/27/2020 16:43	WG1480228
(T) Barium-133	*91.9*			*30.0-143*	*05/27/2020 16:43*	WG1480228

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	2.08		0.643	1.34	06/04/2020 10:10	WG1479430
(T) Barium	*78.1*			*62.0-143*	*06/04/2020 10:10*	WG1479430
(T) Yttrium	*112*			*79.0-136*	*06/04/2020 10:10*	WG1479430

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	2.76		0.993	1.55	06/04/2020 10:10	WG1480228

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.677		0.350	0.211	05/27/2020 16:43	WG1480228
(T) Barium-133	*89.7*			*30.0-143*	*05/27/2020 16:43*	WG1480228

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	5.18		0.667	1.35	06/05/2020 13:30	WG1479430
(T) Barium	*73.7*			*62.0-143*	*06/05/2020 13:30*	WG1479430
(T) Yttrium	*110*			*79.0-136*	*06/05/2020 13:30*	WG1479430

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	5.28		0.860	1.67	06/05/2020 13:30	WG1480228

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.0983		0.193	0.324	05/27/2020 16:43	WG1480228
(T) Barium-133	*83.4*			*30.0-143*	*05/27/2020 16:43*	WG1480228

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	0.808		0.616	1.03	06/05/2020 13:30	WG1479430
(T) Barium	*83.8*			*62.0-143*	*06/05/2020 13:30*	WG1479430
(T) Yttrium	*107*			*79.0-136*	*06/05/2020 13:30*	WG1479430

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.89		1.03	1.29	06/05/2020 13:30	WG1480228

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	1.08		0.415	0.256	05/28/2020 13:43	WG1480228
(T) Barium-133	*91.4*			*30.0-143*	*05/28/2020 13:43*	WG1480228

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	6.58		0.683	1.25	06/05/2020 13:30	WG1479430
(T) Barium	*68.3*			*62.0-143*	*06/05/2020 13:30*	WG1479430
(T) Yttrium	*105*			*79.0-136*	*06/05/2020 13:30*	WG1479430

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	8.65		1.18	1.57	06/05/2020 13:30	WG1480228

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	2.07		0.499	0.323	05/28/2020 13:43	WG1480228
(T) Barium-133	*96.8*			*30.0-143*	*05/28/2020 13:43*	WG1480228

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	4.00		0.583	0.835	06/05/2020 13:30	WG1479430
(T) Barium	*87.2*			*62.0-143*	*06/05/2020 13:30*	WG1479430
(T) Yttrium	*107*			*79.0-136*	*06/05/2020 13:30*	WG1479430

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	6.40		1.17	1.08	06/05/2020 13:30	WG1480228

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	2.39		0.591	0.243	05/28/2020 13:43	WG1480228
(T) Barium-133	*89.3*			*30.0-143*	*05/28/2020 13:43*	WG1480228

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	10.7		0.708	1.03	06/05/2020 13:30	WG1479430
(T) Barium	*81.0*			*62.0-143*	*06/05/2020 13:30*	WG1479430
(T) Yttrium	*110*			*79.0-136*	*06/05/2020 13:30*	WG1479430

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	16.6		1.65	1.27	06/05/2020 13:30	WG1480228

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	5.96		0.946	0.241	05/28/2020 13:43	WG1480228
(T) Barium-133	*84.7*			*30.0-143*	*05/28/2020 13:43*	WG1480228

Method Blank (MB)

(MB) R3534480-6 06/04/20 10:10

Analyte	MB Result pCi/l	MB Qualifier	MB MDA pCi/l
Radium-228	-0.637		0.528
(T) Barium	*89.8*		
(T) Yttrium	*105*		

L1219695-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1219695-02 06/04/20 10:10 • (DUP) R3534480-10 06/04/20 10:10

Analyte	Original Result pCi/l	DUP Result pCi/l	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-228	2.08	1.67	1	22.0	0.453		20	3
(T) Barium	*78.1*	*83.8*						
(T) Yttrium	*112*	*110*						

Laboratory Control Sample (LCS)

(LCS) R3534480-7 06/04/20 10:10

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	5.60	112	80.0-120	
(T) Barium			*84.5*		
(T) Yttrium			*110*		

Method Blank (MB)

(MB) R3533718-5 05/28/20 17:55

Analyte	MB Result pCi/l	MB Qualifier	MB MDA pCi/l
Radium-226	0.0282		0.0620
(T) Barium-133	*95.4*		

L1219695-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1219695-01 05/27/20 16:43 • (DUP) R3533718-1 05/27/20 16:45

Analyte	Original Result pCi/l	DUP Result pCi/l	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-226	0.150	0.477	1	104	0.622		20	3
(T) Barium-133	*91.9*	*89.3*						

Laboratory Control Sample (LCS)

(LCS) R3533718-2 05/28/20 13:53

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-226	5.02	5.42	108	80.0-120	
(T) Barium-133			*92.9*		

L1219695-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1219695-04 05/28/20 13:43 • (MS) R3533718-3 05/28/20 13:53 • (MSD) R3533718-4 05/28/20 13:53

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-226	20.1	1.08	22.8	23.6	108	112	1	75.0-125			3.32		20
(T) Barium-133		*91.4*			*84.6*	*87.2*							

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDA	Minimum Detectable Activity.
Rec.	Recovery.
RER	Replicate Error Ratio.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(T)	Tracer - A radioisotope of known concentration added to a solution of chemically equivalent radioisotopes at a known concentration to assist in monitoring the yield of the chemical separation.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description

The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

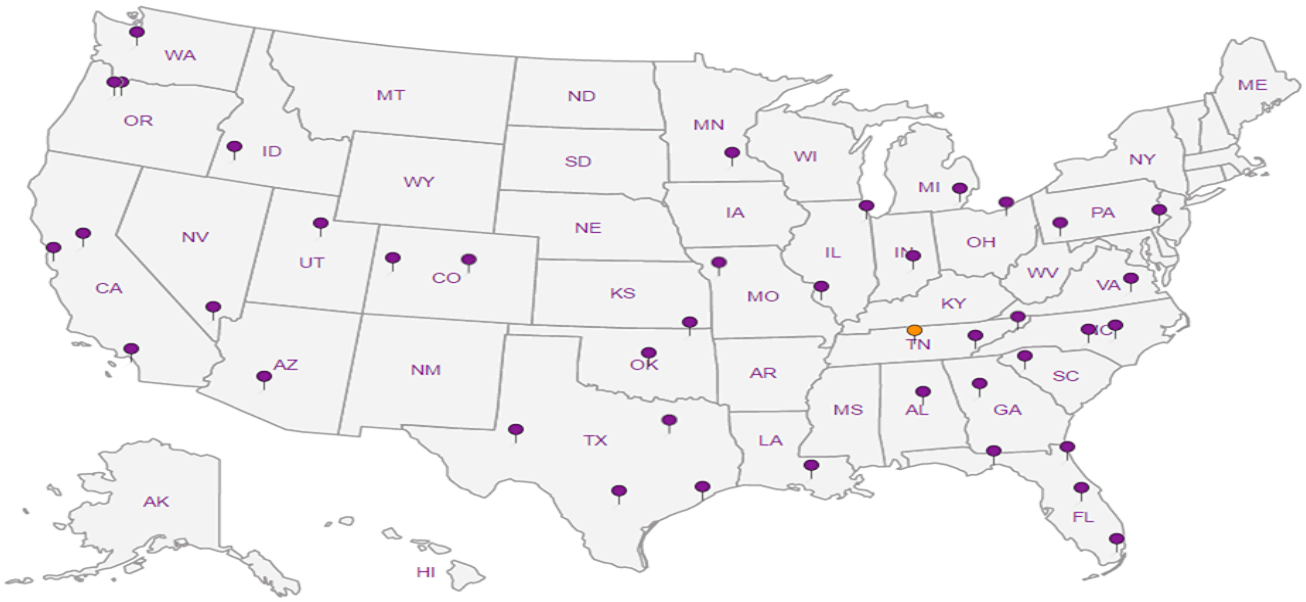
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



DHL Analytical, Inc.
2300 Double Creek Drive
Round Rock, TX 78664
TEL: *(512) 388-8222* FAX: *(512) 388-8229*

CHAIN-OF-CUSTODY RECORD

G108

Work Order: 2005079

Subcontractor:

Pace Analytical
12065 Lebanon Rd
Mt. Juliet, TN 37122

TEL: (615) 773-5923
FAX:
Acct #: DHLRRTX

12/1968

12-May-20

Sample ID	Matrix	DHL#	Date Collected	Bottle Type	Requested Tests					
					22 Ra-228 E904.0	22 Ra-226 M7500 Ra B M				
FGD-4	Aqueous	01C	05/11/20 07:45 AM	1LHDPEHNO3	1					01
FGD-4	Aqueous	01D	05/11/20 07:45 AM	1LHDPEHNO3		1				01
FGD-2	Aqueous	02C	05/11/20 08:35 AM	1LHDPEHNO3	1					02
FGD-2	Aqueous	02D	05/11/20 08:35 AM	1LHDPEHNO3		1				02
FGD-5	Aqueous	03C	05/11/20 09:25 AM	1LHDPEHNO3	1					03
FGD-5	Aqueous	03D	05/11/20 09:25 AM	1LHDPEHNO3		1				03
FGD-1	Aqueous	04C	05/11/20 10:15 AM	1LHDPEHNO3	1					04
FGD-1	Aqueous	04D	05/11/20 10:15 AM	1LHDPEHNO3		1				04
FGD-8	Aqueous	05C	05/11/20 11:10 AM	1LHDPEHNO3	1					05
FGD-8	Aqueous	05D	05/11/20 11:10 AM	1LHDPEHNO3		1				05
FGD-11	Aqueous	06C	05/11/20 12:45 PM	1LHDPEHNO3	1					06
FGD-11	Aqueous	06D	05/11/20 12:45 PM	1LHDPEHNO3		1				06
FGD-12	Aqueous	07C	05/11/20 01:45 PM	1LHDPEHNO3	1					07
FGD-12	Aqueous	07D	05/11/20 01:45 PM	1LHDPEHNO3		1				07

General Comments:

Please analyze these samples with Normal Turnaround Time.
Report RA-226, Ra-228 & Combined per Specs.
Quality Control Package Needed: Standard - NELAC Rad Test compliant
Email to cac@dhlanalytical.com & dupont@dhlanalytical.com

		Date/Time			Date/Time
Relinquished by:	[signature]	5/14/20 1700	**Received by:**	Carol Kemp	5/18/20 9:45
Relinquished by:			**Received by:**		

Amb

Pace Analytical National Center for Testing & Innovation
Cooler Receipt Form

Client: PHLRRZ	1219695	
Cooler Received/Opened On: 5 / 18 / 20 Temperature:	Amb	
Received By: Carol Kemp		
Signature: Carol Kemp		

Receipt Check List	NP	Yes	No
COC Seal Present / Intact?	/		
COC Signed / Accurate?		/	
Bottles arrive intact?		/	
Correct bottles used?		/	
Sufficient volume sent?		/	
If Applicable			
VOA Zero headspace?			
Preservation Correct / Checked?		/	

October 09, 2020

Will Vienne
Golder
2201 Double Creek Dr #4004
Round Rock, Texas 78664
TEL: (512) 671-3434
FAX (512) 671-3446

Order No.: 2009086

RE: LUMINANT-OGSES FGD PONDS (CCR)

Dear Will Vienne:

DHL Analytical, Inc. received 4 sample(s) on 9/11/2020 for the analyses presented in the following report.

There were no problems with the analyses and all data met requirements of NELAP except where noted in the Case Narrative. All non-NELAP methods will be identified accordingly in the case narrative and all estimated uncertainties of test results are within method or EPA specifications.

If you have any questions regarding these tests results, please feel free to call. Thank you for using DHL Analytical.

Sincerely,

John DuPont
General Manager

This report was performed under the accreditation of the State of Texas Laboratory Certification Number: T104704211-20-25

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DHL ANALYTICAL
2300 Double Creek Dr. ■ Round Rock, TX 78664
Phone (512) 388-8222 ■ FAX (512) 388-8229
Web: www.dhlanalytical.com
E-Mail: login@dhlanalytical.com

№ 71138

CHAIN-OF-CUSTODY

CLIENT: GOLDER
ADDRESS: 2201 DOUBLE CREEK DR ROUND ROCK, TX 78664
PHONE: 512-671-3434 FAX/E-MAIL:
DATA REPORTED TO: WILL VIENAU
ADDITIONAL REPORT COPIES TO:

DATE: 9-10-20 PAGE 1 OF 1
PO #: 19122262 DHL WORK ORDER #: 2009086
PROJECT LOCATION OR NAME: LUMINANT - OGSES FGD PONDS (CCR)
CLENT PROJECT #: 19122262 COLLECTOR: JOHN BRAYTON

Authorize 5% surcharge for TRRP Report? ❑ Yes ❑ No

S=SOIL W=WATER A=AIR L=LIQUID SE=SEDIMENT P=PAINT SL=SLUDGE O=OTHER SO=SOLID

PRESERVATION: HCl | HNO_3 | H_2SO_4 ❑ NaOH ❑ | ICE | UNPRESERVED

ANALYSES: BTEX ❑ MTBE ❑ [METHOD 8021] | TPH 1005 ❑ TPH 1006 ❑ HOLD 1006 ❑ | GRO [METHOD 8015] ❑ DRO [METHOD 8105] ❑ | VOC 8260 ❑ VOC 624 ❑ VOC 8260/5035 ❑ | SVOC 8270 ❑ PAH 8270 ❑ HOLD PAH ❑ SVOC 625 ❑ | 8270 PEST ❑ 625 PEST/PCB ❑ 608 PCB ❑ | 8270 O-P PEST ❑ 8082 PCB ❑ 8270 PCB ❑ | 8321 HERB ❑ T PHOS, AMMONIA ❑ | METALS 6020 ❑ METALS 200.8 ❑ DISS. METALS ❑ | RCRA ❑ TX11 ❑ | PH ❑ HEX CHROM ❑ ALKALINITY ❑ COD ❑ | CHLORIDE ❑ ANIONS ❑ | TCLP-SVOC ❑ VOC ❑ PEST ❑ HERB ❑ | TCLP-METALS ❑ RCRA 8 ❑ TX-11 ❑ Pb ❑ | RCI ❑ FLASHPOINT ❑ DGAS ❑ | TDS ❑ TSS ❑ % MOISTURE ❑ CYANIDE ❑ | APPENDIX III | APPENDIX IV

Field Sample I.D.	DHL Lab #	Date	Time	Matrix	Container Type	# of Containers	HCl	HNO_3	H_2SO_4 ❑ NaOH ❑	ICE	UNPRESERVED	ANALYSES	FIELD NOTES
FGD-5	01	9-10-20	0750	W	P	4		X		X	X	APPENDIX III X, APPENDIX IV X	
FGD-2	02	↓	0845	W	P	4		X		X	X	APPENDIX III X, APPENDIX IV X	
FGD-11	03		0940	W	P	4		X		X	X	APPENDIX III X, APPENDIX IV X	
FGD-12	04	↓	1040	W	P	4		X		X	X	APPENDIX III X, APPENDIX IV X	

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
[signature]	9-10-20 1630	FedEx
FedEx	9/11/20 0927	[signature]
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)

❑ DHL DISPOSAL @ $5.00 each ❑ Return

TURN AROUND TIME
RUSH ❑ CALL FIRST
1 DAY ❑ CALL FIRST
2 DAY ❑
NORMAL ☒
OTHER ❑

LABORATORY USE ONLY:
RECEIVING TEMP: 0.9°C THERM #: 78
CUSTODY SEALS: ❑ BROKEN ❑ INTACT ☒ NOT USED
CARRIER: ❑ LONE STAR ☒ FEDEX ❑ UPS ❑ OTHER
❑ COURIER DELIVERY
❑ HAND DELIVERED

DHL COC Rev 1 | FEB 2010

Eric Lau

From: John DuPont
Sent: Tuesday, May 28, 2019 11:35 AM
To: Eric Lau
Subject: FW: CCR Analysis

Appendix III Parameters:
Metals (Ca and B)
Anions (Cl, F, and SO4)
TDS

Exclude Sb, Cd, & Hg
Per Will V. 9/17/20

Appendix IV Parameters:

Metals (As, Ba, Be, Cd, Co, Cr, Hg, Li, Mo, Pb, Sb, Se, and Tl)
Ra-226
Ra-228

From: Vienne, Will [mailto:William_Vienne@golder.com]
Sent: Tuesday, April 09, 2019 12:48 PM
To: John DuPont <dupont@dhlanalytical.com>
Subject: CCR Analysis


ORIGIN ID:FWHA (512) 671-3434
JOHN BRAYTON
19122262
2201 DOUBLE CREEK DR STE 4004
ROUND ROCK, TX 78664
UNITED STATES US
SHIP DATE: 10SEP20
ACTWGT: 56.25 LB
CAD: 6995323/SSF02110
DIMS: 26x14x14 IN
BILL THIRD PARTY
TO DHL ANALYTICAL
DHL ANALYTICAL
2300 DOUBLE CREEK DR
ROUND ROCK TX 78664
(512) 388-8222
INV:
PO:
REF:
DEPT:
FedEx
Express
1 of 3
TRK# 0201 3967 0595 5522
MASTER
A8 BSMA
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PRIORITY OVERNIGHT
AHS
78664
TX-US AUS

DHL Analytical, Inc.

Sample Receipt Checklist

Client Name **Golder** Date Received: **9/11/2020**

Work Order Number **2009086** Received by: **RA**

Checklist completed by: _____ 9/11/2020 Reviewed by _____ 9/11/2020
Signature | Date | Initials | Date

Carrier name: FedEx 1day

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shippping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	**0.9** °C
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH<2 acceptable upon receipt?	Yes ☑	No ☐	NA ☐ LOT # 13171
	Adjusted? no		Checked by EC
Water - ph>9 (S) or ph>10 (CN) acceptable upon receipt?	Yes ☐	No ☐	NA ☑ LOT #
	Adjusted?		Checked by

Any No response must be detailed in the comments section below.

Client contacted: _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments: _____

Corrective Action: _____

Laboratory Name: DHL Analytical, Inc.

Laboratory Review Checklist: Reportable Data

Project Name: LUMINANT-OGSES FGD PONDS (CCR)	**LRC Date:** 10/9/20
Reviewer Name: Carlos Castro	**Laboratory Work Order:** 2009086
Prep Batch Number(s): See Prep Dates Report	**Run Batch:** See Analytical Dates Report

#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
		Chain-of-Custody (C-O-C)					
R1	OI	**1)** Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				**R1-01**
		2) Were all departures from standard conditions described in an exception report?			X		
R2	OI	**Sample and Quality Control (QC) Identification**					
		1) Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		2) Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test Reports**					
		1) Were all samples prepared and analyzed within holding times?	X				
		2) Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		3) Were calculations checked by a peer or supervisor?	X				
		4) Were all analyte identifications checked by a peer or supervisor?	X				
		5) Were sample detection limits reported for all analytes not detected?	X				
		6) Were all results for soil and sediment samples reported on a dry weight basis?			X		
		7) Were % moisture (or solids) reported for all soil and sediment samples?			X		
		8) Were bulk soils/solids samples for volatile analysis extracted with methanol per EPA Method 5035?			X		
		9) If required for the project, TICs reported?			X		
R4	O	**Surrogate Recovery Data**					
		1) Were surrogates added prior to extraction?			X		
		2) Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test Reports/Summary Forms for Blank Samples**					
		1) Were appropriate type(s) of blanks analyzed?	X				
		2) Were blanks analyzed at the appropriate frequency?	X				
		3) Where method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		4) Were blank concentrations < MDL?	X				
		5) For analyte(s) detected in a blank sample, was the concentration, unadjusted for sample specific factors, in all associated field samples, **greater** than 10 times the concentration in the blank sample?			X		
R6	OI	**Laboratory Control Samples (LCS):**					
		1) Were all COCs included in the LCS?	X				
		2) Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		3) Were LCSs analyzed at the required frequency?	X				
		4) Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		5) Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		6) Was the LCSD RPD within QC limits (if applicable)?	X				
R7	OI	**Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Data**					
		1) Were the project/method specified analytes included in the MS and MSD?	X				
		2) Were MS/MSD analyzed at the appropriate frequency?	X				
		3) Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			**R7-03**
		4) Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical Duplicate Data**					
		1) Were appropriate analytical duplicates analyzed for each matrix?	X				
		2) Were analytical duplicates analyzed at the appropriate frequency?	X				
		3) Were RPDs or relative standard deviations within the laboratory QC limits?	X				
R9	OI	**Method Quantitation Limits (MQLs):**					
		1) Are the MQLs for each method analyte included in the laboratory data package?	X				
		2) Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		3) Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other Problems/Anomalies**					
		1) Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		2) Was applicable and available technology used to lower the SDL to minimize the matrix interference affects on the sample results?	X				
		3) Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Name: DHL Analytical, Inc.

Laboratory Review Checklist (continued): Supporting Data

Project Name: LUMINANT-OGSES FGD PONDS (CCR)	**LRC Date:** 10/9/20
Reviewer Name: Carlos Castro	**Laboratory Work Order:** 2009086
Prep Batch Number(s): See Prep Dates Report	**Run Batch:** See Analytical Dates Report

#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
S1	OI	**Initial Calibration (ICAL)**					
		1) Were response factors and/or relative response factors for each analyte within QC limits?	X				
		2) Were percent RSDs or correlation coefficient criteria met?	X				
		3) Was the number of standards recommended in the method used for all analytes?	X				
		4) Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		5) Are ICAL data available for all instruments used?	X				
		6) Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and Continuing calibration Verification (ICCV and CCV) and Continuing Calibration blank (CCB):**					
		1) Was the CCV analyzed at the method-required frequency?	X				
		2) Were percent differences for each analyte within the method-required QC limits?	X				
		3) Was the ICAL curve verified for each analyte?	X				
		4) Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
S3	O	**Mass Spectral Tuning:**					
		1) Was the appropriate compound for the method used for tuning?	X				
		2) Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal Standards (IS):**					
		1) Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw Data (NELAC Section 5.5.10)**					
		1) Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		2) Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual Column Confirmation**					
		1) Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively Identified Compounds (TICs):**					
		1) If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) Results:**					
		1) Were percent recoveries within method QC limits?	X				
S9	I	**Serial Dilutions, Post Digestion Spikes, and Method of Standard Additions**					
		1) Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	**Method Detection Limit (MDL) Studies**					
		1) Was a MDL study performed for each reported analyte?	X				
		2) Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency Test Reports:**					
		1) Was the lab's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards Documentation**					
		1) Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/Analyte Identification Procedures**					
		1) Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of Analyst Competency (DOC)**					
		1) Was DOC conducted consistent with NELAC Chapter 5 – Appendix C?	X				
		2) Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/Validation Documentation for Methods** (NELAC Chapter 5)					
		1) Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory Standard Operating Procedures (SOPs):**					
		1) Are laboratory SOPs current and on file for each method performed?	X				

1 Items identified by the letter "R" should be included in the laboratory data package submitted to the TCEQ in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
2 O = organic analyses; I = inorganic analyses (and general chemistry, when applicable).
3 NA = Not applicable.
4 NR = Not Reviewed.
5 ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Data Package Signature Page – RG-366/TRRP-13

This data package consists of:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;
R2 Sample identification cross-reference;
R3 Test reports (analytical data sheets) for each environmental sample that includes:
  a) Items consistent with NELAC Chapter 5,
  b) dilution factors,
  c) preparation methods,
  d) cleanup methods, and
  e) if required for the project, tentatively identified compounds (TICs).
R4 Surrogate recovery data including:
  a) Calculated recovery (%R), and
  b) The laboratory's surrogate QC limits.
R5 Test reports/summary forms for blank samples;
R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  a) LCS spiking amounts,
  b) Calculated %R for each analyte, and
  c) The laboratory's LCS QC limits.
R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  a) Samples associated with the MS/MSD clearly identified,
  b) MS/MSD spiking amounts,
  c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
  d) Calculated %Rs and relative percent differences (RPDs), and
  e) The laboratory's MS/MSD QC limits
R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  a) The amount of analyte measured in the duplicate,
  b) The calculated RPD, and
  c) The laboratory's QC limits for analytical duplicates.
R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix;
R10 Other problems or anomalies.

The Exception Report for each "No" or "Not Reviewed (NR)" item in the Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory is not accredited under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge that all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information or data affecting the quality of the data has been knowingly withheld.

This laboratory was last inspected by TCEQ on February 25-28 2019. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Name: John DuPont
Official Title: General Manager



Signature

10/09/20
Date

Name: Dr. Derhsing Luu
Official Title: Technical Director

DHL Analytical, Inc. **Date:** *09-Oct-20*

CLIENT: Golder
Project: LUMINANT-OGSES FGD PONDS (CCR)
Lab Order: 2009086

CASE NARRATIVE

Samples were analyzed using the methods outlined in the following references:

Method SW6020B - Metals Analysis
Method E300 - Anions Analysis
Method M2540C - TDS Analysis
Sub-contract - Radium-228 and Radium-226 analyses by methods E904 and SM 7500 Ra B M. Analyzed at Pace Analytical.

Exception Report R1-01

The samples were received and log-in performed on 9/11/20. A total of 4 samples were received. The samples arrived in good condition and were properly packaged.

Exception Report R7-03

For Anions analysis performed on 9/14/20 the matrix spike recovery (2009093-01 MS) was slightly below control limits for Sulfate. This is flagged accordingly in the QC summary report. The sample selected for the matrix spike and matrix spike duplicate was not from this work order. The LCS was within control limits for this analyte. No further corrective actions were taken.

DHL Analytical, Inc.

Date: *09-Oct-20*

CLIENT: Golder
Project: LUMINANT-OGSES FGD PONDS (CCR)
Lab Order: 2009086

Work Order Sample Summary

Lab Smp ID	Client Sample ID	Tag Number	Date Collected	Date Recved
2009086-01	FGD-5		09/10/20 07:50 AM	9/11/2020
2009086-02	FGD-2		09/10/20 08:45 AM	9/11/2020
2009086-03	FGD-11		09/10/20 09:40 AM	9/11/2020
2009086-04	FGD-12		09/10/20 10:40 AM	9/11/2020

Lab Order: 2009086
Client: Golder
Project: LUMINANT-OGSES FGD POND

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
2009086-01A	FGD-5	09/10/20 07:50 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	09/14/20 08:52 AM	97889
	FGD-5	09/10/20 07:50 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	09/14/20 08:52 AM	97889
2009086-01B	FGD-5	09/10/20 07:50 AM	Aqueous	E300	Anion Preparation	09/14/20 09:39 AM	97893
	FGD-5	09/10/20 07:50 AM	Aqueous	E300	Anion Preparation	09/14/20 09:39 AM	97893
	FGD-5	09/10/20 07:50 AM	Aqueous	M2540C	TDS Preparation	09/11/20 10:35 AM	97882
2009086-02A	FGD-2	09/10/20 08:45 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	09/14/20 08:52 AM	97889
	FGD-2	09/10/20 08:45 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	09/14/20 08:52 AM	97889
2009086-02B	FGD-2	09/10/20 08:45 AM	Aqueous	E300	Anion Preparation	09/14/20 09:39 AM	97893
	FGD-2	09/10/20 08:45 AM	Aqueous	E300	Anion Preparation	09/14/20 09:39 AM	97893
	FGD-2	09/10/20 08:45 AM	Aqueous	E300	Anion Preparation	09/14/20 09:39 AM	97893
	FGD-2	09/10/20 08:45 AM	Aqueous	M2540C	TDS Preparation	09/11/20 10:35 AM	97882
2009086-03A	FGD-11	09/10/20 09:40 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	09/14/20 08:52 AM	97889
	FGD-11	09/10/20 09:40 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	09/14/20 08:52 AM	97889
2009086-03B	FGD-11	09/10/20 09:40 AM	Aqueous	E300	Anion Preparation	09/14/20 09:39 AM	97893
	FGD-11	09/10/20 09:40 AM	Aqueous	E300	Anion Preparation	09/14/20 09:39 AM	97893
	FGD-11	09/10/20 09:40 AM	Aqueous	E300	Anion Preparation	09/14/20 09:39 AM	97893
	FGD-11	09/10/20 09:40 AM	Aqueous	M2540C	TDS Preparation	09/11/20 10:35 AM	97882
2009086-04A	FGD-12	09/10/20 10:40 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	09/14/20 08:52 AM	97889
2009086-04B	FGD-12	09/10/20 10:40 AM	Aqueous	E300	Anion Preparation	09/14/20 09:39 AM	97893
	FGD-12	09/10/20 10:40 AM	Aqueous	M2540C	TDS Preparation	09/11/20 10:35 AM	97882

Lab Order: 2009086
Client: Golder
Project: LUMINANT-OGSES FGD POND

ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
2009086-01A	FGD-5	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	97889	10	09/15/20 02:19 PM	ICP-MS4_200915A
	FGD-5	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	97889	1	09/15/20 12:16 PM	ICP-MS4_200915A
2009086-01B	FGD-5	Aqueous	E300	Anions by IC method - Water	97893	10	09/14/20 02:13 PM	IC2_200914A
	FGD-5	Aqueous	E300	Anions by IC method - Water	97893	1	09/14/20 10:53 PM	IC2_200914A
	FGD-5	Aqueous	M2540C	Total Dissolved Solids	97882	1	09/11/20 04:45 PM	WC_200911D
2009086-02A	FGD-2	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	97889	1	09/15/20 12:18 PM	ICP-MS4_200915A
	FGD-2	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	97889	10	09/15/20 02:21 PM	ICP-MS4_200915A
2009086-02B	FGD-2	Aqueous	E300	Anions by IC method - Water	97893	1	09/14/20 11:09 PM	IC2_200914A
	FGD-2	Aqueous	E300	Anions by IC method - Water	97893	10	09/14/20 02:29 PM	IC2_200914A
	FGD-2	Aqueous	E300	Anions by IC method - Water	97893	100	09/14/20 05:33 PM	IC2_200914A
	FGD-2	Aqueous	M2540C	Total Dissolved Solids	97882	1	09/11/20 04:45 PM	WC_200911D
2009086-03A	FGD-11	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	97889	1	09/15/20 12:20 PM	ICP-MS4_200915A
	FGD-11	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	97889	10	09/15/20 02:23 PM	ICP-MS4_200915A
2009086-03B	FGD-11	Aqueous	E300	Anions by IC method - Water	97893	10	09/14/20 02:45 PM	IC2_200914A
	FGD-11	Aqueous	E300	Anions by IC method - Water	97893	100	09/14/20 05:49 PM	IC2_200914A
	FGD-11	Aqueous	E300	Anions by IC method - Water	97893	1	09/14/20 11:25 PM	IC2_200914A
	FGD-11	Aqueous	M2540C	Total Dissolved Solids	97882	1	09/11/20 04:45 PM	WC_200911D
2009086-04A	FGD-12	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	97889	1	09/15/20 12:22 PM	ICP-MS4_200915A
2009086-04B	FGD-12	Aqueous	E300	Anions by IC method - Water	97893	1	09/14/20 11:41 PM	IC2_200914A
	FGD-12	Aqueous	M2540C	Total Dissolved Solids	97882	1	09/11/20 04:45 PM	WC_200911D

DHL Analytical, Inc.

Date: *09-Oct-20*

CLIENT:	Golder	**Client Sample ID:**	FGD-5
Project:	LUMINANT-OGSES FGD PONDS (CCR)	**Lab ID:**	2009086-01
Project No:	19122262	**Collection Date:**	09/10/20 07:50 AM
Lab Order:	2009086	**Matrix:**	AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020B**					Analyst: **RO**
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	09/15/20 12:16 PM
Barium	0.0929	0.00300	0.0100		mg/L	1	09/15/20 12:16 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	09/15/20 12:16 PM
Boron	0.154	0.0100	0.0300		mg/L	1	09/15/20 12:16 PM
Calcium	96.6	1.00	3.00		mg/L	10	09/15/20 02:19 PM
Chromium	0.0307	0.00200	0.00500		mg/L	1	09/15/20 12:16 PM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	09/15/20 12:16 PM
Lead	<0.000300	0.000300	0.00100		mg/L	1	09/15/20 12:16 PM
Lithium	0.150	0.00500	0.0100		mg/L	1	09/15/20 12:16 PM
Molybdenum	0.00362	0.00200	0.00500	J	mg/L	1	09/15/20 12:16 PM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	09/15/20 12:16 PM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	09/15/20 12:16 PM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **SNM**
Chloride	310	3.00	10.0		mg/L	10	09/14/20 02:13 PM
Fluoride	0.617	0.100	0.400		mg/L	1	09/14/20 10:53 PM
Sulfate	95.9	1.00	3.00		mg/L	1	09/14/20 10:53 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	845	10.0	10.0		mg/L	1	09/11/20 04:45 PM

Qualifiers:

ND - Not Detected at the SDL
J - Analyte detected between SDL and RL
B - Analyte detected in the associated Method Blank
DF- Dilution Factor
N - Parameter not NELAP certified
See Final Page of Report for MQLs and MDLs
S - Spike Recovery outside control limits
C - Sample Result or QC discussed in Case Narrative
RL - Reporting Limit (MQL adjusted for moisture and sample size)
SDL - Sample Detection Limit
E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: *09-Oct-20*

CLIENT:	Golder	**Client Sample ID:**	FGD-2
Project:	LUMINANT-OGSES FGD PONDS (CCR)	**Lab ID:**	2009086-02
Project No:	19122262	**Collection Date:**	09/10/20 08:45 AM
Lab Order:	2009086	**Matrix:**	AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020B**					Analyst: **RO**
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	09/15/20 12:18 PM
Barium	0.104	0.00300	0.0100		mg/L	1	09/15/20 12:18 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	09/15/20 12:18 PM
Boron	0.567	0.0100	0.0300		mg/L	1	09/15/20 12:18 PM
Calcium	193	1.00	3.00		mg/L	10	09/15/20 02:21 PM
Chromium	0.00239	0.00200	0.00500	J	mg/L	1	09/15/20 12:18 PM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	09/15/20 12:18 PM
Lead	<0.000300	0.000300	0.00100		mg/L	1	09/15/20 12:18 PM
Lithium	0.0250	0.00500	0.0100		mg/L	1	09/15/20 12:18 PM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	09/15/20 12:18 PM
Selenium	0.0217	0.00200	0.00500		mg/L	1	09/15/20 12:18 PM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	09/15/20 12:18 PM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **SNM**
Chloride	1030	30.0	100		mg/L	100	09/14/20 05:33 PM
Fluoride	<0.100	0.100	0.400		mg/L	1	09/14/20 11:09 PM
Sulfate	301	10.0	30.0		mg/L	10	09/14/20 02:29 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	2150	50.0	50.0		mg/L	1	09/11/20 04:45 PM

Qualifiers:

- ND - Not Detected at the SDL
- J - Analyte detected between SDL and RL
- B - Analyte detected in the associated Method Blank
- DF- Dilution Factor
- N - Parameter not NELAP certified
- See Final Page of Report for MQLs and MDLs
- S - Spike Recovery outside control limits
- C - Sample Result or QC discussed in Case Narrative
- RL - Reporting Limit (MQL adjusted for moisture and sample size)
- SDL - Sample Detection Limit
- E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: *09-Oct-20*

CLIENT:	Golder	**Client Sample ID:**	FGD-11
Project:	LUMINANT-OGSES FGD PONDS (CCR)	**Lab ID:**	2009086-03
Project No:	19122262	**Collection Date:**	09/10/20 09:40 AM
Lab Order:	2009086	**Matrix:**	AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020B**					Analyst: **RO**
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	09/15/20 12:20 PM
Barium	0.330	0.00300	0.0100		mg/L	1	09/15/20 12:20 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	09/15/20 12:20 PM
Boron	0.242	0.0100	0.0300		mg/L	1	09/15/20 12:20 PM
Calcium	101	1.00	3.00		mg/L	10	09/15/20 02:23 PM
Chromium	0.0158	0.00200	0.00500		mg/L	1	09/15/20 12:20 PM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	09/15/20 12:20 PM
Lead	0.000706	0.000300	0.00100	J	mg/L	1	09/15/20 12:20 PM
Lithium	0.0121	0.00500	0.0100		mg/L	1	09/15/20 12:20 PM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	09/15/20 12:20 PM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	09/15/20 12:20 PM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	09/15/20 12:20 PM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **SNM**
Chloride	573	30.0	100		mg/L	100	09/14/20 05:49 PM
Fluoride	0.575	0.100	0.400		mg/L	1	09/14/20 11:25 PM
Sulfate	44.0	1.00	3.00		mg/L	1	09/14/20 11:25 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	1320	50.0	50.0		mg/L	1	09/11/20 04:45 PM

Qualifiers:

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- See Final Page of Report for MQLs and MDLs
- S - Spike Recovery outside control limits
- C - Sample Result or QC discussed in Case Narrative
- RL - Reporting Limit (MQL adjusted for moisture and sample size)
- SDL - Sample Detection Limit
- E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: *09-Oct-20*

CLIENT:	Golder	**Client Sample ID:**	FGD-12
Project:	LUMINANT-OGSES FGD PONDS (CCR)	**Lab ID:**	2009086-04
Project No:	19122262	**Collection Date:**	09/10/20 10:40 AM
Lab Order:	2009086	**Matrix:**	AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020B**					Analyst: **RO**
Arsenic	0.00252	0.00200	0.00500	J	mg/L	1	09/15/20 12:22 PM
Barium	0.0922	0.00300	0.0100		mg/L	1	09/15/20 12:22 PM
Beryllium	0.000375	0.000300	0.00100	J	mg/L	1	09/15/20 12:22 PM
Boron	0.120	0.0100	0.0300		mg/L	1	09/15/20 12:22 PM
Calcium	9.34	0.100	0.300		mg/L	1	09/15/20 12:22 PM
Chromium	0.00723	0.00200	0.00500		mg/L	1	09/15/20 12:22 PM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	09/15/20 12:22 PM
Lead	0.00402	0.000300	0.00100		mg/L	1	09/15/20 12:22 PM
Lithium	0.0235	0.00500	0.0100		mg/L	1	09/15/20 12:22 PM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	09/15/20 12:22 PM
Selenium	0.00254	0.00200	0.00500	J	mg/L	1	09/15/20 12:22 PM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	09/15/20 12:22 PM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **SNM**
Chloride	13.0	0.300	1.00		mg/L	1	09/14/20 11:41 PM
Fluoride	<0.100	0.100	0.400		mg/L	1	09/14/20 11:41 PM
Sulfate	14.1	1.00	3.00		mg/L	1	09/14/20 11:41 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	166	10.0	10.0		mg/L	1	09/11/20 04:45 PM

Qualifiers:

- ND - Not Detected at the SDL
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- B - Analyte detected in the associated Method Blank
- DF- Dilution Factor
- N - Parameter not NELAP certified
- See Final Page of Report for MQLs and MDLs
- S - Spike Recovery outside control limits
- C - Sample Result or QC discussed in Case Narrative
- RL - Reporting Limit (MQL adjusted for moisture and sample size)
- SDL - Sample Detection Limit
- E - TPH pattern not Gas or Diesel Range Pattern

CLIENT: Golder
Work Order: 2009086
Project: LUMINANT-OGSES FGD PONDS (CCR)

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_200803A

Sample ID: **DCS1-97152**	Batch ID: **97152**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **DCS**	Run ID: **ICP-MS4_200803A**	Analysis Date: **8/3/2020 12:35:00 PM**	Prep Date: **7/16/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Beryllium	0.000428	0.00100	0.000500	0	85.6	70	130	0	0	
Lead	0.000490	0.00100	0.000500	0	98.0	70	130	0	0	
Thallium	0.000482	0.00150	0.000500	0	96.4	70	130	0	0	

Sample ID: **DCS2-97152**	Batch ID: **97152**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **DCS2**	Run ID: **ICP-MS4_200803A**	Analysis Date: **8/3/2020 12:37:00 PM**	Prep Date: **7/16/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	0.342	0.300	0.300	0	114	70	130	0	0	

Sample ID: **DCS3-97152**	Batch ID: **97152**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **DCS3**	Run ID: **ICP-MS4_200803A**	Analysis Date: **8/3/2020 12:40:00 PM**	Prep Date: **7/16/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.00503	0.00500	0.00500	0	101	70	130	0	0	
Barium	0.00508	0.0100	0.00500	0	102	70	130	0	0	
Chromium	0.00524	0.00500	0.00500	0	105	70	130	0	0	
Cobalt	0.00532	0.00500	0.00500	0	106	70	130	0	0	
Lithium	0.00427	0.0100	0.00500	0	85.4	70	130	0	0	
Molybdenum	0.00506	0.00500	0.00500	0	101	70	130	0	0	
Selenium	0.00597	0.00500	0.00500	0	119	70	130	0	0	

Sample ID: **DCS4-97152**	Batch ID: **97152**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **DCS4**	Run ID: **ICP-MS4_200803A**	Analysis Date: **8/3/2020 12:43:00 PM**	Prep Date: **7/16/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	0.0277	0.0300	0.0300	0	92.4	70	130	0	0	

Qualifiers:			
B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2009086
Project: LUMINANT-OGSES FGD PONDS (CCR)

ANALYTICAL QC SUMMARY REPORT

RunID: **ICP-MS4_200915A**

The QC data in batch 97889 applies to the following samples: 2009086-01A, 2009086-02A, 2009086-03A, 2009086-04A

Sample ID: **MB-97889** Batch ID: **97889** TestNo: **SW6020B** Units: **mg/L**
SampType: **MBLK** Run ID: **ICP-MS4_200915A** Analysis Date: **9/15/2020 11:09:00 AM** Prep Date: **9/14/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	<0.00200	0.00500								
Barium	<0.00300	0.0100								
Beryllium	<0.000300	0.00100								
Boron	<0.0100	0.0300								
Calcium	<0.100	0.300								
Chromium	<0.00200	0.00500								
Cobalt	<0.00300	0.00500								
Lead	<0.000300	0.00100								
Lithium	<0.00500	0.0100								
Molybdenum	<0.00200	0.00500								
Selenium	<0.00200	0.00500								
Thallium	<0.000500	0.00150								

Sample ID: **LCS-97889** Batch ID: **97889** TestNo: **SW6020B** Units: **mg/L**
SampType: **LCS** Run ID: **ICP-MS4_200915A** Analysis Date: **9/15/2020 11:11:00 AM** Prep Date: **9/14/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.203	0.00500	0.200	0	102	80	120			
Barium	0.203	0.0100	0.200	0	101	80	120			
Beryllium	0.209	0.00100	0.200	0	105	80	120			
Boron	0.203	0.0300	0.200	0	101	80	120			
Calcium	5.01	0.300	5.00	0	100	80	120			
Chromium	0.207	0.00500	0.200	0	104	80	120			
Cobalt	0.204	0.00500	0.200	0	102	80	120			
Lead	0.200	0.00100	0.200	0	100	80	120			
Lithium	0.215	0.0100	0.200	0	108	80	120			
Molybdenum	0.206	0.00500	0.200	0	103	80	120			
Selenium	0.200	0.00500	0.200	0	100	80	120			
Thallium	0.204	0.00150	0.200	0	102	80	120			

Sample ID: **LCSD-97889** Batch ID: **97889** TestNo: **SW6020B** Units: **mg/L**
SampType: **LCSD** Run ID: **ICP-MS4_200915A** Analysis Date: **9/15/2020 11:13:00 AM** Prep Date: **9/14/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.201	0.00500	0.200	0	101	80	120	0.897	15	
Barium	0.200	0.0100	0.200	0	100	80	120	1.15	15	
Beryllium	0.210	0.00100	0.200	0	105	80	120	0.296	15	
Boron	0.215	0.0300	0.200	0	108	80	120	5.93	15	
Calcium	5.03	0.300	5.00	0	101	80	120	0.264	15	
Chromium	0.208	0.00500	0.200	0	104	80	120	0.474	15	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2009086
Project: LUMINANT-OGSES FGD PONDS (CCR)

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_200915A

Sample ID: **LCSD-97889** Batch ID: **97889** TestNo: **SW6020B** Units: **mg/L**
SampType: **LCSD** Run ID: **ICP-MS4_200915A** Analysis Date: **9/15/2020 11:13:00 AM** Prep Date: **9/14/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cobalt	0.205	0.00500	0.200	0	102	80	120	0.141	15	
Lead	0.201	0.00100	0.200	0	101	80	120	0.512	15	
Lithium	0.217	0.0100	0.200	0	108	80	120	0.555	15	
Molybdenum	0.204	0.00500	0.200	0	102	80	120	0.955	15	
Selenium	0.197	0.00500	0.200	0	98.4	80	120	1.72	15	
Thallium	0.204	0.00150	0.200	0	102	80	120	0.247	15	

Sample ID: **2009082-02A SD** Batch ID: **97889** TestNo: **SW6020B** Units: **mg/L**
SampType: **SD** Run ID: **ICP-MS4_200915A** Analysis Date: **9/15/2020 11:23:00 AM** Prep Date: **9/14/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	<0.0100	0.0250	0	0				0	20	
Barium	0.0455	0.0500	0	0.0444				2.55	20	
Beryllium	<0.00150	0.00500	0	0				0	20	
Boron	0.0878	0.150	0	0.0847				3.60	20	
Calcium	14.7	1.50	0	14.5				1.60	20	
Chromium	<0.0100	0.0250	0	0				0	20	
Cobalt	<0.0150	0.0250	0	0				0	20	
Lead	<0.00150	0.00500	0	0				0	20	
Lithium	<0.0250	0.0500	0	0.00839				0	20	
Molybdenum	<0.0100	0.0250	0	0				0	20	
Selenium	<0.0100	0.0250	0	0				0	20	
Thallium	<0.00250	0.00750	0	0				0	20	

Sample ID: **2009082-02A PDS** Batch ID: **97889** TestNo: **SW6020B** Units: **mg/L**
SampType: **PDS** Run ID: **ICP-MS4_200915A** Analysis Date: **9/15/2020 11:47:00 AM** Prep Date: **9/14/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.197	0.00500	0.200	0	98.3	75	125			
Barium	0.248	0.0100	0.200	0.0444	102	75	125			
Beryllium	0.206	0.00100	0.200	0	103	75	125			
Boron	0.294	0.0300	0.200	0.0847	105	75	125			
Calcium	18.7	0.300	5.00	14.5	84.4	75	125			
Chromium	0.211	0.00500	0.200	0	105	75	125			
Cobalt	0.202	0.00500	0.200	0	101	75	125			
Lead	0.208	0.00100	0.200	0	104	75	125			
Lithium	0.223	0.0100	0.200	0.00839	107	75	125			
Molybdenum	0.198	0.00500	0.200	0	98.8	75	125			
Selenium	0.194	0.00500	0.200	0	96.9	75	125			
Thallium	0.207	0.00150	0.200	0	104	75	125			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2009086
Project: LUMINANT-OGSES FGD PONDS (CCR)

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_200915A

Sample ID: **2009082-02A MS** Batch ID: **97889** TestNo: **SW6020B** Units: **mg/L**
SampType: **MS** Run ID: **ICP-MS4_200915A** Analysis Date: **9/15/2020 11:48:00 AM** Prep Date: **9/14/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.202	0.00500	0.200	0	101	75	125			
Barium	0.245	0.0100	0.200	0.0444	100	75	125			
Beryllium	0.208	0.00100	0.200	0	104	75	125			
Boron	0.295	0.0300	0.200	0.0847	105	75	125			
Calcium	19.5	0.300	5.00	14.5	100	75	125			
Chromium	0.204	0.00500	0.200	0	102	75	125			
Cobalt	0.203	0.00500	0.200	0	102	75	125			
Lead	0.205	0.00100	0.200	0	102	75	125			
Lithium	0.220	0.0100	0.200	0.00839	106	75	125			
Molybdenum	0.202	0.00500	0.200	0	101	75	125			
Selenium	0.201	0.00500	0.200	0	100	75	125			
Thallium	0.203	0.00150	0.200	0	102	75	125			

Sample ID: **2009082-02A MSD** Batch ID: **97889** TestNo: **SW6020B** Units: **mg/L**
SampType: **MSD** Run ID: **ICP-MS4_200915A** Analysis Date: **9/15/2020 11:50:00 AM** Prep Date: **9/14/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.205	0.00500	0.200	0	102	75	125	1.51	15	
Barium	0.247	0.0100	0.200	0.0444	101	75	125	0.847	15	
Beryllium	0.208	0.00100	0.200	0	104	75	125	0.007	15	
Boron	0.307	0.0300	0.200	0.0847	111	75	125	3.97	15	
Calcium	19.3	0.300	5.00	14.5	97.0	75	125	0.864	15	
Chromium	0.205	0.00500	0.200	0	102	75	125	0.231	15	
Cobalt	0.204	0.00500	0.200	0	102	75	125	0.153	15	
Lead	0.208	0.00100	0.200	0	104	75	125	1.43	15	
Lithium	0.222	0.0100	0.200	0.00839	107	75	125	0.737	15	
Molybdenum	0.205	0.00500	0.200	0	102	75	125	1.02	15	
Selenium	0.198	0.00500	0.200	0	98.8	75	125	1.66	15	
Thallium	0.205	0.00150	0.200	0	102	75	125	0.784	15	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2009086
Project: LUMINANT-OGSES FGD PONDS (CCR)

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_200915A

Sample ID: **ICV-200915** Batch ID: **R112294** TestNo: **SW6020B** Units: **mg/L**
SampType: **ICV** Run ID: **ICP-MS4_200915A** Analysis Date: **9/15/2020 10:55:00 AM** Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.0978	0.00500	0.100	0	97.8	90	110			
Barium	0.0978	0.0100	0.100	0	97.8	90	110			
Beryllium	0.103	0.00100	0.100	0	103	90	110			
Boron	0.106	0.0300	0.100	0	106	90	110			
Calcium	2.39	0.300	2.50	0	95.7	90	110			
Chromium	0.104	0.00500	0.100	0	104	90	110			
Cobalt	0.101	0.00500	0.100	0	101	90	110			
Lead	0.103	0.00100	0.100	0	103	90	110			
Lithium	0.107	0.0100	0.100	0	107	90	110			
Molybdenum	0.0966	0.00500	0.100	0	96.6	90	110			
Selenium	0.0949	0.00500	0.100	0	94.9	90	110			
Thallium	0.102	0.00150	0.100	0	102	90	110			

Sample ID: **LCVL-200915** Batch ID: **R112294** TestNo: **SW6020B** Units: **mg/L**
SampType: **LCVL** Run ID: **ICP-MS4_200915A** Analysis Date: **9/15/2020 11:02:00 AM** Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.00505	0.00500	0.00500	0	101	80	120			
Barium	0.00535	0.0100	0.00500	0	107	80	120			
Beryllium	0.00105	0.00100	0.00100	0	105	80	120			
Boron	0.0226	0.0300	0.0200	0	113	80	120			
Calcium	0.109	0.300	0.100	0	109	80	120			
Chromium	0.00538	0.00500	0.00500	0	108	80	120			
Cobalt	0.00541	0.00500	0.00500	0	108	80	120			
Lead	0.00106	0.00100	0.00100	0	106	80	120			
Lithium	0.0104	0.0100	0.0100	0	104	80	120			
Molybdenum	0.00526	0.00500	0.00500	0	105	80	120			
Selenium	0.00518	0.00500	0.00500	0	104	80	120			
Thallium	0.00105	0.00150	0.00100	0	105	80	120			

Sample ID: **CCV1-200915** Batch ID: **R112294** TestNo: **SW6020B** Units: **mg/L**
SampType: **CCV** Run ID: **ICP-MS4_200915A** Analysis Date: **9/15/2020 12:00:00 PM** Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.200	0.00500	0.200	0	99.9	90	110			
Barium	0.198	0.0100	0.200	0	99.2	90	110			
Beryllium	0.202	0.00100	0.200	0	101	90	110			
Boron	0.204	0.0300	0.200	0	102	90	110			
Calcium	4.83	0.300	5.00	0	96.6	90	110			
Chromium	0.201	0.00500	0.200	0	100	90	110			
Cobalt	0.200	0.00500	0.200	0	99.9	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2009086
Project: LUMINANT-OGSES FGD PONDS (CCR)

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_200915A

Sample ID: **CCV1-200915**	Batch ID: **R112294**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS4_200915A**	Analysis Date: **9/15/2020 12:00:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	0.201	0.00100	0.200	0	101	90	110			
Lithium	0.208	0.0100	0.200	0	104	90	110			
Molybdenum	0.197	0.00500	0.200	0	98.3	90	110			
Selenium	0.194	0.00500	0.200	0	97.1	90	110			
Thallium	0.199	0.00150	0.200	0	99.3	90	110			

Sample ID: **CCV2-200915**	Batch ID: **R112294**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS4_200915A**	Analysis Date: **9/15/2020 12:32:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.197	0.00500	0.200	0	98.6	90	110			
Barium	0.194	0.0100	0.200	0	97.2	90	110			
Beryllium	0.201	0.00100	0.200	0	101	90	110			
Boron	0.202	0.0300	0.200	0	101	90	110			
Calcium	4.77	0.300	5.00	0	95.4	90	110			
Chromium	0.199	0.00500	0.200	0	99.7	90	110			
Cobalt	0.198	0.00500	0.200	0	99.0	90	110			
Lead	0.199	0.00100	0.200	0	99.7	90	110			
Lithium	0.210	0.0100	0.200	0	105	90	110			
Molybdenum	0.193	0.00500	0.200	0	96.7	90	110			
Selenium	0.195	0.00500	0.200	0	97.7	90	110			
Thallium	0.200	0.00150	0.200	0	100	90	110			

Sample ID: **CCV4-200915**	Batch ID: **R112294**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS4_200915A**	Analysis Date: **9/15/2020 2:14:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	4.73	0.300	5.00	0	94.5	90	110			

Sample ID: **CCV5-200915**	Batch ID: **R112294**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS4_200915A**	Analysis Date: **9/15/2020 2:39:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	4.66	0.300	5.00	0	93.1	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2009086
Project: LUMINANT-OGSES FGD PONDS (CCR)

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_200729A

Sample ID: **DCS2-97333** Batch ID: **97333** TestNo: **E300** Units: **mg/L**
SampType: **DCS2** Run ID: **IC2_200729A** Analysis Date: **7/29/2020 12:57:41 PM** Prep Date: **7/29/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	0.468	1.00	0.5000	0	93.7	70	130	0	0	
Fluoride	0.214	0.400	0.2000	0	107	70	130	0	0	
Sulfate	1.51	3.00	1.500	0	101	70	130	0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2009086
Project: LUMINANT-OGSES FGD PONDS (CCR)

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_200914A

The QC data in batch 97893 applies to the following samples: 2009086-01B, 2009086-02B, 2009086-03B, 2009086-04B

Sample ID: **MB-97893** Batch ID: **97893** TestNo: **E300** Units: **mg/L**
SampType: **MBLK** Run ID: **IC2_200914A** Analysis Date: **9/14/2020 11:03:37 AM** Prep Date: **9/14/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	<0.300	1.00								
Fluoride	<0.100	0.400								
Sulfate	<1.00	3.00								

Sample ID: **LCS-97893** Batch ID: **97893** TestNo: **E300** Units: **mg/L**
SampType: **LCS** Run ID: **IC2_200914A** Analysis Date: **9/14/2020 11:19:37 AM** Prep Date: **9/14/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.6	1.00	10.00	0	106	90	110			
Fluoride	3.97	0.400	4.000	0	99.2	90	110			
Sulfate	30.4	3.00	30.00	0	101	90	110			

Sample ID: **LCSD-97893** Batch ID: **97893** TestNo: **E300** Units: **mg/L**
SampType: **LCSD** Run ID: **IC2_200914A** Analysis Date: **9/14/2020 11:35:37 AM** Prep Date: **9/14/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.6	1.00	10.00	0	106	90	110	0.503	20	
Fluoride	3.90	0.400	4.000	0	97.5	90	110	1.69	20	
Sulfate	30.2	3.00	30.00	0	101	90	110	0.804	20	

Sample ID: **2009093-01AMS** Batch ID: **97893** TestNo: **E300** Units: **mg/L**
SampType: **MS** Run ID: **IC2_200914A** Analysis Date: **9/14/2020 6:21:33 PM** Prep Date: **9/14/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	347	10.0	200.0	158.7	94.4	90	110			
Fluoride	193	4.00	200.0	0	96.6	90	110			
Sulfate	228	30.0	200.0	51.68	88.3	90	110			S

Sample ID: **2009093-01AMSD** Batch ID: **97893** TestNo: **E300** Units: **mg/L**
SampType: **MSD** Run ID: **IC2_200914A** Analysis Date: **9/14/2020 6:37:33 PM** Prep Date: **9/14/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	370	10.0	200.0	158.7	105	90	110	6.16	20	
Fluoride	217	4.00	200.0	0	108	90	110	11.4	20	
Sulfate	254	30.0	200.0	51.68	101	90	110	10.7	20	

Sample ID: **2009084-01BMS** Batch ID: **97893** TestNo: **E300** Units: **mg/L**
SampType: **MS** Run ID: **IC2_200914A** Analysis Date: **9/14/2020 6:53:33 PM** Prep Date: **9/14/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2009086
Project: LUMINANT-OGSES FGD PONDS (CCR)

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_200914A

Sample ID: **2009084-01BMS**	Batch ID: **97893**	TestNo: **E300**	Units: **mg/L**
SampType: **MS**	Run ID: **IC2_200914A**	Analysis Date: **9/14/2020 6:53:33 PM**	Prep Date: **9/14/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	403	10.0	200.0	210.3	96.3	90	110			
Fluoride	210	4.00	200.0	0	105	90	110			
Sulfate	293	30.0	200.0	96.62	98.1	90	110			

Sample ID: **2009084-01BMSD**	Batch ID: **97893**	TestNo: **E300**	Units: **mg/L**
SampType: **MSD**	Run ID: **IC2_200914A**	Analysis Date: **9/14/2020 7:09:33 PM**	Prep Date: **9/14/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	404	10.0	200.0	210.3	96.6	90	110	0.174	20	
Fluoride	210	4.00	200.0	0	105	90	110	0.153	20	
Sulfate	289	30.0	200.0	96.62	96.4	90	110	1.22	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2009086
Project: LUMINANT-OGSES FGD PONDS (CCR)

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_200914A

Sample ID: **ICV-200914**	Batch ID: **R112286**	TestNo: **E300**	Units: **mg/L**
SampType: **ICV**	Run ID: **IC2_200914A**	Analysis Date: **9/14/2020 10:31:37 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	27.2	1.00	25.00	0	109	90	110			
Fluoride	10.4	0.400	10.00	0	104	90	110			
Sulfate	79.7	3.00	75.00	0	106	90	110			

Sample ID: **CCV1-200914**	Batch ID: **R112286**	TestNo: **E300**	Units: **mg/L**
SampType: **CCV**	Run ID: **IC2_200914A**	Analysis Date: **9/14/2020 5:01:33 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.6	1.00	10.00	0	106	90	110			
Fluoride	4.07	0.400	4.000	0	102	90	110			
Sulfate	30.7	3.00	30.00	0	102	90	110			

Sample ID: **CCV2-200914**	Batch ID: **R112286**	TestNo: **E300**	Units: **mg/L**
SampType: **CCV**	Run ID: **IC2_200914A**	Analysis Date: **9/14/2020 10:05:33 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.6	1.00	10.00	0	106	90	110			
Fluoride	4.09	0.400	4.000	0	102	90	110			
Sulfate	30.2	3.00	30.00	0	101	90	110			

Sample ID: **CCV3-200914**	Batch ID: **R112286**	TestNo: **E300**	Units: **mg/L**
SampType: **CCV**	Run ID: **IC2_200914A**	Analysis Date: **9/15/2020 12:45:33 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.6	1.00	10.00	0	106	90	110			
Fluoride	4.12	0.400	4.000	0	103	90	110			
Sulfate	30.5	3.00	30.00	0	102	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2009086
Project: LUMINANT-OGSES FGD PONDS (CCR)

ANALYTICAL QC SUMMARY REPORT

RunID: WC_200911D

The QC data in batch 97882 applies to the following samples: 2009086-01B, 2009086-02B, 2009086-03B, 2009086-04B

Sample ID: **MB-97882**	Batch ID: **97882**	TestNo: **M2540C**	Units: **mg/L**
SampType: **MBLK**	Run ID: **WC_200911D**	Analysis Date: **9/11/2020 4:45:00 PM**	Prep Date: **9/11/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	<10.0	10.0								

Sample ID: **LCS-97882**	Batch ID: **97882**	TestNo: **M2540C**	Units: **mg/L**
SampType: **LCS**	Run ID: **WC_200911D**	Analysis Date: **9/11/2020 4:45:00 PM**	Prep Date: **9/11/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	749	10.0	745.6	0	100	90	113			

Sample ID: **2009053-01A-DUP**	Batch ID: **97882**	TestNo: **M2540C**	Units: **mg/L**
SampType: **DUP**	Run ID: **WC_200911D**	Analysis Date: **9/11/2020 4:45:00 PM**	Prep Date: **9/11/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	1180	50.0	0	1160				1.28	5	

Sample ID: **2009053-02A-DUP**	Batch ID: **97882**	TestNo: **M2540C**	Units: **mg/L**
SampType: **DUP**	Run ID: **WC_200911D**	Analysis Date: **9/11/2020 4:45:00 PM**	Prep Date: **9/11/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	1230	50.0	0	1225				0.407	5	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

DHL Analytical, Inc.

Date: *09-Oct-20*

CLIENT: Golder
Work Order: 2009086
Project: LUMINANT-OGSES FGD PONDS (CCR)

MQL SUMMARY REPORT

TestNo: E300	**MDL**	**MQL**
Analyte	**mg/L**	**mg/L**
Chloride	0.300	1.00
Fluoride	0.100	0.400
Sulfate	1.00	3.00

TestNo: SW6020B	**MDL**	**MQL**
Analyte	**mg/L**	**mg/L**
Arsenic	0.00200	0.00500
Barium	0.00300	0.0100
Beryllium	0.000300	0.00100
Boron	0.0100	0.0300
Calcium	0.100	0.300
Chromium	0.00200	0.00500
Cobalt	0.00300	0.00500
Lead	0.000300	0.00100
Lithium	0.00500	0.0100
Molybdenum	0.00200	0.00500
Selenium	0.00200	0.00500
Thallium	0.000500	0.00150

TestNo: M2540C	**MDL**	**MQL**
Analyte	**mg/L**	**mg/L**
Total Dissolved Solids (Residue, Filt	10.0	10.0

Qualifiers: MQL -Method Quantitation Limit as defined by TRRP
MDL -Method Detection Limit as defined by TRRP

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

October 08, 2020

DHL Analytical, Inc.

Sample Delivery Group:	L1263069
Samples Received:	09/17/2020
Project Number:	2009086
Description:	

Report To: John DuPont
2300 Double Creek Drive
Round Rock, TX 78664

Entire Report Reviewed By:

Donna Eidson
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.



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FGD-5 L1263069-01 Non-Potable Water

			Collected by	Collected date/time	Received date/time	
				09/10/20 07:50	09/17/20 10:30	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1546570	1	09/21/20 14:49	10/01/20 09:50	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1548584	1	09/25/20 15:57	10/01/20 09:50	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1548584	1	09/25/20 15:57	09/28/20 16:08	RGT	Mt. Juliet, TN

FGD-2 L1263069-02 Non-Potable Water

			Collected by	Collected date/time	Received date/time	
				09/10/20 08:45	09/17/20 10:30	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1546570	1	09/21/20 14:49	10/01/20 09:50	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1548584	1	09/25/20 15:57	10/01/20 09:50	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1548584	1	09/25/20 15:57	09/28/20 16:08	RGT	Mt. Juliet, TN

FGD-11 L1263069-03 Non-Potable Water

			Collected by	Collected date/time	Received date/time	
				09/10/20 09:40	09/17/20 10:30	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1546570	1	09/21/20 14:49	10/02/20 09:55	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1548584	1	09/25/20 15:57	10/02/20 09:55	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1548584	1	09/25/20 15:57	09/28/20 16:08	RGT	Mt. Juliet, TN

FGD-12 L1263069-04 Non-Potable Water

			Collected by	Collected date/time	Received date/time	
				09/10/20 10:40	09/17/20 10:30	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1546570	1	09/21/20 14:49	10/02/20 09:55	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1548584	1	09/25/20 15:57	10/02/20 09:55	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1548584	1	09/25/20 15:57	09/29/20 08:57	RGT	Mt. Juliet, TN

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.



Donna Eidson
Project Manager

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	-0.0787		0.595	1.11	10/01/2020 09:50	WG1546570
(T) Barium	*83.4*			*62.0-143*	*10/01/2020 09:50*	WG1546570
(T) Yttrium	*93.8*			*79.0-136*	*10/01/2020 09:50*	WG1546570

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.132		0.754	1.33	10/01/2020 09:50	WG1548584

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.132		0.159	0.219	09/28/2020 16:08	WG1548584
(T) Barium-133	*90.7*			*30.0-143*	*09/28/2020 16:08*	WG1548584

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	0.290		0.675	1.25	10/01/2020 09:50	WG1546570
(T) Barium	*85.5*			*62.0-143*	*10/01/2020 09:50*	WG1546570
(T) Yttrium	*91.3*			*79.0-136*	*10/01/2020 09:50*	WG1546570

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.03		1.03	1.6	10/01/2020 09:50	WG1548584

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.744		0.359	0.351	09/28/2020 16:08	WG1548584
(T) Barium-133	*90.1*			*30.0-143*	*09/28/2020 16:08*	WG1548584

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	4.69		0.594	0.99	10/02/2020 09:55	WG1546570
(T) Barium	*84.1*			*62.0-143*	*10/02/2020 09:55*	WG1546570
(T) Yttrium	*107*			*79.0-136*	*10/02/2020 09:55*	WG1546570

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	8.04		1.30	1.24	10/02/2020 09:55	WG1548584

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	3.35		0.707	0.251	09/28/2020 16:08	WG1548584
(T) Barium-133	*96.3*			*30.0-143*	*09/28/2020 16:08*	WG1548584

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	6.72		0.600	0.956	10/02/2020 09:55	WG1546570
(T) Barium	*89.6*			*62.0-143*	*10/02/2020 09:55*	WG1546570
(T) Yttrium	*111*			*79.0-136*	*10/02/2020 09:55*	WG1546570

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	9.31		1.25	1.17	10/02/2020 09:55	WG1548584

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	2.59		0.646	0.218	09/29/2020 08:57	WG1548584
(T) Barium-133	*89.9*			*30.0-143*	*09/29/2020 08:57*	WG1548584

Method Blank (MB)

(MB) R3578670-1 10/01/20 09:50

Analyte	MB Result pCi/l	MB Qualifier	MB MDA pCi/l
Radium-228	0.0699		0.519
(T) Barium	*88.4*		
(T) Yttrium	*91.9*		

L1262467-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1262467-01 10/01/20 09:50 • (DUP) R3578670-5 10/01/20 09:50

Analyte	Original Result pCi/l	DUP Result pCi/l	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-228	0.000	0.159	1	200	0.193		20	3
(T) Barium	*86.3*	*88.9*						
(T) Yttrium	*93.3*	*95.4*						

Laboratory Control Sample (LCS)

(LCS) R3578670-2 10/01/20 09:50

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	5.80	116	80.0-120	
(T) Barium			*83.7*		
(T) Yttrium			*91.3*		

L1262469-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1262469-01 10/01/20 09:50 • (MS) R3578670-3 10/01/20 09:50 • (MSD) R3578670-4 10/01/20 09:50

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	10.0	0.898	12.5	11.7	116	108	1	70.0-130			7.19		20
(T) Barium		*89.9*			*90.3*	*87.8*							
(T) Yttrium		*93.7*			*91.5*	*96.7*							

Method Blank (MB)

(MB) R3576636-1 09/28/20 16:08

Analyte	MB Result pCi/l	MB Qualifier	MB MDA pCi/l
Radium-226	0.0203		0.0669
(T) Barium-133	*96.7*		

L1263701-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1263701-04 09/28/20 16:08 • (DUP) R3576636-5 09/28/20 16:08

Analyte	Original Result pCi/l	DUP Result pCi/l	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-226	0.0953	0.179	1	61.0	0.309		20	3
(T) Barium-133	*88.1*	*95.7*						

Laboratory Control Sample (LCS)

(LCS) R3576636-2 09/28/20 16:08

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-226	5.02	5.37	107	80.0-120	
(T) Barium-133			*96.3*		

L1263682-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1263682-05 09/28/20 16:08 • (MS) R3576636-3 09/28/20 16:08 • (MSD) R3576636-4 09/28/20 16:08

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-226	20.1	0.0611	23.2	20.5	115	102	1	75.0-125			12.2		20
(T) Barium-133		*90.3*			*89.2*	*95.7*							

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDA	Minimum Detectable Activity.
Rec.	Recovery.
RER	Replicate Error Ratio.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(T)	Tracer - A radioisotope of known concentration added to a solution of chemically equivalent radioisotopes at a known concentration to assist in monitoring the yield of the chemical separation.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description

The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

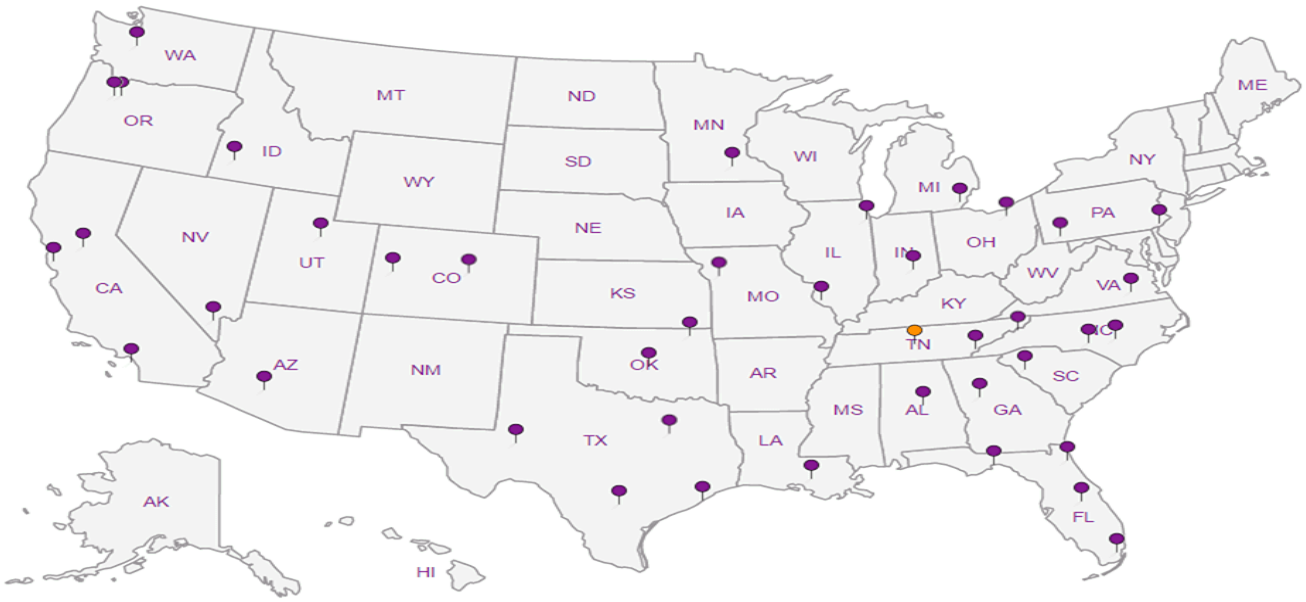
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



DHL Analytical, Inc.
2300 Double Creek Drive
Round Rock, TX 78664
TEL: *(512) 388-8222* FAX: *(512) 388-8229*

CHAIN-OF-CUSTODY RECORD

G160

Work Order: 2009086

Subcontractor:

Pace Analytical
12065 Lebanon Rd
Mt. Juliet, TN 37122

TEL: (615) 773-5923
FAX:
Acct #: DHLRRTX

pg 3 of 9

11-Sep-20

Sample ID	Matrix	DHL#	Date Collected	Bottle Type	Requested Tests					
					Ra-228	Ra-226				
					E904.0	M7500 Ra B M				
FGD-5	Aqueous	01C	09/10/20 07:50 AM	1LHDPEHNO3	1					01
FGD-5	Aqueous	01D	09/10/20 07:50 AM	1LHDPEHNO3		1				
FGD-2	Aqueous	02C	09/10/20 08:45 AM	1LHDPEHNO3	1					02
FGD-2	Aqueous	02D	09/10/20 08:45 AM	1LHDPEHNO3		1				
FGD-11	Aqueous	03C	09/10/20 09:40 AM	1LHDPEHNO3	1					03
FGD-11	Aqueous	03D	09/10/20 09:40 AM	1LHDPEHNO3		1				
FGD-12	Aqueous	04C	09/10/20 10:40 AM	1LHDPEHNO3	1					04
FGD-12	Aqueous	04D	09/10/20 10:40 AM	1LHDPEHNO3		1				

Sample Receipt Checklist

COC Seal Present/Intact:	Y ✓N	If Applicable	
COC Signed/Accurate:	✓Y N	VOA Zero Headspace:	Y N
Bottles arrive intact:	✓Y N	Pres.Correct/Check:	✓Y N
Correct bottles used:	✓Y N		
Sufficient volume sent:	✓Y N		
RAD Screen <0.5 mR/hr:	✓Y N		

General Comments:

Please analyze these samples with Normal Turnaround Time.
Report RA-226, Ra-228 & Combined per Specs.
Quality Control Package Needed: Standard - NELAC Rad Test compliant
Email to cac@dhlanalytical.com & dupont@dhlanalytical.com

		Date/Time			Date/Time
Relinquished by:	[signature]	9/14/20 1700	**Received by:**	Carol Kemp	9/17/20 10:30
Relinquished by:			**Received by:**		

October 12, 2020

Will Vienne
Golder
2201 Double Creek Dr #4004
Round Rock, Texas 78664
TEL: (512) 671-3434
FAX (512) 671-3446

Order No.: 2009111

RE: LUMINANT-OGSES-FGD PONDS (CCR)

Dear Will Vienne:

DHL Analytical, Inc. received 6 sample(s) on 9/16/2020 for the analyses presented in the following report.

There were no problems with the analyses and all data met requirements of NELAP except where noted in the Case Narrative. All non-NELAP methods will be identified accordingly in the case narrative and all estimated uncertainties of test results are within method or EPA specifications.

If you have any questions regarding these tests results, please feel free to call. Thank you for using DHL Analytical.

Sincerely,

John DuPont
General Manager

This report was performed under the accreditation of the State of Texas Laboratory Certification Number: T104704211-20-25

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DHL ANALYTICAL
2300 Double Creek Dr. ■ Round Rock, TX 78664
Phone (512) 388-8222 ■ FAX (512) 388-8229
Web: www.dhlanalytical.com
E-Mail: login@dhlanalytical.com

№ 71136

CHAIN-OF-CUSTODY

CLIENT: GOLDER
ADDRESS: 2201 DOUBLE CREEK DR ROUND ROCK TX 78664
PHONE: 512-671-3434 FAX/E-MAIL:
DATA REPORTED TO: WILL VIENNE
ADDITIONAL REPORT COPIES TO:

DATE: 9-15-20 19122262-F2020 PAGE 1 OF 1
PO #: ~~19116549~~ Per Will V. EL 9/17/20 DHL WORK ORDER #: 2009111
PROJECT LOCATION OR NAME: LUMINANT - OGSES - FGD PONDS (CCR) 19122262-F2020
CLENT PROJECT #: ~~19116549~~ Per Will V. EL 9/17/20 COLLECTOR: J. BRAYTON

Authorize 5% surcharge for TRRP Report? ❑ Yes ❑ No

S=SOIL W=WATER A=AIR L=LIQUID SE=SEDIMENT P=PAINT SL=SLUDGE O=OTHER SO=SOLID

PRESERVATION: HCl | HNO_3 | H_2SO_4 ❑ NaOH ❑ | ICE | UNPRESERVED

ANALYSES: BTEX ❑ MTBE ❑ IMETHOD 8021] | TPH 1005 ❑ TPH 1006 ❑ HOLD 1006 ❑ | GRO IMETHOD 8015] ❑ DRO IMETHOD 8015] ❑ | VOC 8260 ❑ VOC 624 ❑ VOC 8260/5035 ❑ | SVOC 8270 ❑ PAH 8270 ❑ HOLD PAH ❑ SVOC 625 ❑ | 8270 PEST ❑ 625 PEST/PCB ❑ 608 PCB ❑ | 8270 O-P PEST ❑ 8082 PCB ❑ 8270 PCB ❑ | 8321 HERB ❑ T PHOS, AMMONIA ❑ | METALS 6020 ❑ METALS 200.8 ❑ DISS. METALS ❑ | RCRA ❑ TX11 ❑ | PH ❑ HEX CHROM ❑ ALKALINITY ❑ COD ❑ | CHLORIDE ❑ ANIONS | TCLP-SVOC ❑ VOC ❑ PEST ❑ HERB ❑ | TCLP-METALS ❑ RCRA 8 ❑ TX-11 ❑ Pb ❑ | RCI ❑ FLASHPOINT ❑ DGAS ❑ | TDS ❑ TSS ❑ % MOISTURE ❑ CYANIDE ❑ | APPENDIX III AND IV | FIELD NOTES

Field Sample I.D.	DHL Lab #	Date	Time	Matrix	Container Type	# of Containers	HCl	HNO_3	H_2SO_4 ❑ NaOH ❑	ICE	UNPRESERVED	ANALYSES	FIELD NOTES
FGD-6	01	9-15-20	0805	W	P	4		X		X	X	X	
FGD-4	02	↓	0855	W	P	4		X		X	X	X	
FGD-3	03		0945	W	P	4		X		X	X	X	
FGD-8	04		1045	W	P	4		X		X	X	X	
FGD-1	05		1235	W	P	4		X		X	X	X	
DUP-01	06	↓	1235	W	P	4		X		X	X	X	

RELINQUISHED BY: (Signature) DATE/TIME 9-15-20 1630 RECEIVED BY: (Signature) FedEx
RELINQUISHED BY: (Signature) FedEx DATE/TIME 9/16/20 0948 RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

❑ DHL DISPOSAL @ $5.00 each ❑ Return

TURN AROUND TIME
RUSH ❑ CALL FIRST
1 DAY ❑ CALL FIRST
2 DAY ❑
NORMAL ☒
OTHER ❑

LABORATORY USE ONLY:
RECEIVING TEMP: 3.0°C/0.7°C THERM #: 78
CUSTODY SEALS: ❑ BROKEN ❑ INTACT ☒ NOT USED
CARRIER: ❑ LONE STAR ☒ FEDEX ❑ UPS ❑ OTHER
❑ COURIER DELIVERY
❑ HAND DELIVERED

DHL COC Rev 1 | FEB 2010

Eric Lau

From: John DuPont
Sent: Tuesday, May 28, 2019 11:35 AM
To: Eric Lau
Subject: FW: CCR Analysis

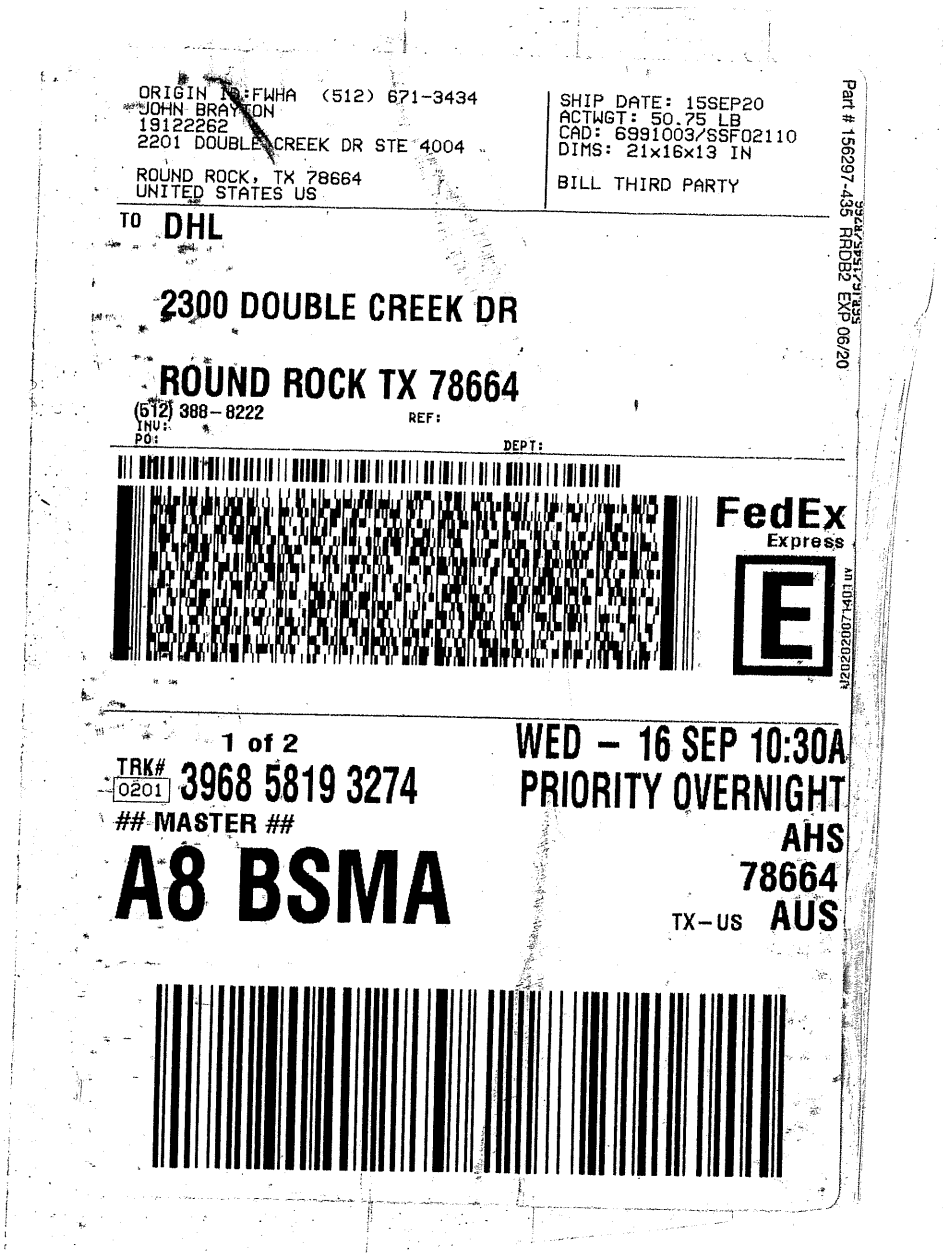
Appendix III Parameters:
Metals (Ca and B)
Anions (Cl, F, and SO4)
TDS

Exclude Sb, Cd, & Hg
Per Will V. 9/17/20

Appendix IV Parameters:

Metals (As, Ba, Be, Cd, Co, Cr, Hg, Li, Mo, Pb, Sb, Se, and Tl)
Ra-226
Ra-228

From: Vienne, Will [mailto:William_Vienne@golder.com]
Sent: Tuesday, April 09, 2019 12:48 PM
To: John DuPont <dupont@dhlanalytical.com>
Subject: CCR Analysis



ORIGIN ID:FWHA (512) 671-3434
JOHN BRAYTON
19122262
2201 DOUBLE CREEK DR STE 4004

ROUND ROCK, TX 78664
UNITED STATES US

SHIP DATE: 15SEP20
ACTWGT: 50.75 LB
CAD: 6991003/SSF02110
DIMS: 21x16x13 IN

BILL THIRD PARTY

Part # 156297-435 RRDB2 EXP 06/20

TO DHL

2300 DOUBLE CREEK DR

ROUND ROCK TX 78664

(512) 388-8222 REF:

INV:

PO: DEPT:

FedEx Express

1 of 2

TRK# 0201 3968 5819 3274

MASTER

A8 BSMA

WED - 16 SEP 10:30A
PRIORITY OVERNIGHT
AHS
78664
TX-US AUS


ORIGIN ID:FWHA (512) 671-3434
JOHN BRAYTON
19122262
2201 DOUBLE CREEK DR STE 4004
ROUND ROCK, TX 78664
UNITED STATES US
SHIP DAT
ACTWGT:
CAD:
DIMS: 24x14x14 IN
BILL THIRD PARTY
TO DHL
2300 DOUBLE CREEK DR
ROUND ROCK TX 78664
(512) 388-8222
INV:
PO:
REF:
DEPT:
FedEx
Express
2 of 2
MPS# 0263 3968 5819 3285
Mstr# 3968 5819 3274
0201
A8 BSMA
WED - 16 SEP 10:30A
PRIORITY OVERNIGHT
AHS
78664
TX-US AUS

DHL Analytical, Inc.

Sample Receipt Checklist

Client Name **Golder** Date Received: **9/16/2020**

Work Order Number **2009111** Received by: **RA**

Checklist completed by: _____ 9/16/2020 Reviewed by _____ 9/16/2020
Signature | Date | Initials | Date

Carrier name: FedEx 1day

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shippping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	**3.0** °C
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH<2 acceptable upon receipt?	Yes ☑	No ☐	NA ☐ LOT # 13171
	Adjusted? no		Checked by EL
Water - ph>9 (S) or ph>10 (CN) acceptable upon receipt?	Yes ☐	No ☐	NA ☑ LOT #
	Adjusted?		Checked by

Any No response must be detailed in the comments section below.

Client contacted: _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments: _____

Corrective Action: _____

Laboratory Name: DHL Analytical, Inc.

Laboratory Review Checklist: Reportable Data

Project Name: LUMINANT-OGSES-FGD PONDS (CCR)	**LRC Date:** 10/12/20
Reviewer Name: Carlos Castro	**Laboratory Work Order:** 2009111
Prep Batch Number(s): See Prep Dates Report	**Run Batch:** See Analytical Dates Report

#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
		Chain-of-Custody (C-O-C)					
R1	OI	**1)** Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				**R1-01**
		2) Were all departures from standard conditions described in an exception report?			X		
R2	OI	**Sample and Quality Control (QC) Identification**					
		1) Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		2) Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test Reports**					
		1) Were all samples prepared and analyzed within holding times?	X				
		2) Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		3) Were calculations checked by a peer or supervisor?	X				
		4) Were all analyte identifications checked by a peer or supervisor?	X				
		5) Were sample detection limits reported for all analytes not detected?	X				
		6) Were all results for soil and sediment samples reported on a dry weight basis?			X		
		7) Were % moisture (or solids) reported for all soil and sediment samples?			X		
		8) Were bulk soils/solids samples for volatile analysis extracted with methanol per EPA Method 5035?			X		
		9) If required for the project, TICs reported?			X		
R4	O	**Surrogate Recovery Data**					
		1) Were surrogates added prior to extraction?			X		
		2) Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	**Test Reports/Summary Forms for Blank Samples**					
		1) Were appropriate type(s) of blanks analyzed?	X				
		2) Were blanks analyzed at the appropriate frequency?	X				
		3) Where method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		4) Were blank concentrations < MDL?		X			**R5-04**
		5) For analyte(s) detected in a blank sample, was the concentration, unadjusted for sample specific factors, in all associated field samples, **greater** than 10 times the concentration in the blank sample?		X			**R5-05**
R6	OI	**Laboratory Control Samples (LCS):**					
		1) Were all COCs included in the LCS?	X				
		2) Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		3) Were LCSs analyzed at the required frequency?	X				
		4) Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		5) Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		6) Was the LCSD RPD within QC limits (if applicable)?	X				
R7	OI	**Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Data**					
		1) Were the project/method specified analytes included in the MS and MSD?	X				
		2) Were MS/MSD analyzed at the appropriate frequency?	X				
		3) Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			**R7-03**
		4) Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical Duplicate Data**					
		1) Were appropriate analytical duplicates analyzed for each matrix?	X				
		2) Were analytical duplicates analyzed at the appropriate frequency?	X				
		3) Were RPDs or relative standard deviations within the laboratory QC limits?	X				
R9	OI	**Method Quantitation Limits (MQLs):**					
		1) Are the MQLs for each method analyte included in the laboratory data package?	X				
		2) Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		3) Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other Problems/Anomalies**					
		1) Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		2) Was applicable and available technology used to lower the SDL to minimize the matrix interference affects on the sample results?	X				
		3) Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Name: DHL Analytical, Inc.

Laboratory Review Checklist (continued): Supporting Data

Project Name: LUMINANT-OGSES-FGD PONDS (CCR)	**LRC Date:** 10/12/20
Reviewer Name: Carlos Castro	**Laboratory Work Order:** 2009111
Prep Batch Number(s): See Prep Dates Report	**Run Batch:** See Analytical Dates Report

#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
S1	OI	**Initial Calibration (ICAL)**					
		1) Were response factors and/or relative response factors for each analyte within QC limits?	X				
		2) Were percent RSDs or correlation coefficient criteria met?	X				
		3) Was the number of standards recommended in the method used for all analytes?	X				
		4) Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		5) Are ICAL data available for all instruments used?	X				
		6) Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and Continuing calibration Verification (ICCV and CCV) and Continuing Calibration blank (CCB):**					
		1) Was the CCV analyzed at the method-required frequency?	X				
		2) Were percent differences for each analyte within the method-required QC limits?	X				
		3) Was the ICAL curve verified for each analyte?	X				
		4) Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			**S2-04**
S3	O	**Mass Spectral Tuning:**					
		1) Was the appropriate compound for the method used for tuning?	X				
		2) Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal Standards (IS):**					
		1) Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw Data (NELAC Section 5.5.10)**					
		1) Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		2) Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual Column Confirmation**					
		1) Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively Identified Compounds (TICs):**					
		1) If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) Results:**					
		1) Were percent recoveries within method QC limits?	X				
S9	I	**Serial Dilutions, Post Digestion Spikes, and Method of Standard Additions**					
		1) Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		X			**S9-01**
S10	OI	**Method Detection Limit (MDL) Studies**					
		1) Was a MDL study performed for each reported analyte?	X				
		2) Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency Test Reports:**					
		1) Was the lab's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards Documentation**					
		1) Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/Analyte Identification Procedures**					
		1) Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of Analyst Competency (DOC)**					
		1) Was DOC conducted consistent with NELAC Chapter 5 – Appendix C?	X				
		2) Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/Validation Documentation for Methods** (NELAC Chapter 5)					
		1) Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory Standard Operating Procedures (SOPs):**					
		1) Are laboratory SOPs current and on file for each method performed?	X				

1 Items identified by the letter "R" should be included in the laboratory data package submitted to the TCEQ in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
2 O = organic analyses; I = inorganic analyses (and general chemistry, when applicable).
3 NA = Not applicable.
4 NR = Not Reviewed.
5 ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Data Package Signature Page – RG-366/TRRP-13

This data package consists of:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;
R2 Sample identification cross-reference;
R3 Test reports (analytical data sheets) for each environmental sample that includes:
  a) Items consistent with NELAC Chapter 5,
  b) dilution factors,
  c) preparation methods,
  d) cleanup methods, and
  e) if required for the project, tentatively identified compounds (TICs).
R4 Surrogate recovery data including:
  a) Calculated recovery (%R), and
  b) The laboratory's surrogate QC limits.
R5 Test reports/summary forms for blank samples;
R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  a) LCS spiking amounts,
  b) Calculated %R for each analyte, and
  c) The laboratory's LCS QC limits.
R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  a) Samples associated with the MS/MSD clearly identified,
  b) MS/MSD spiking amounts,
  c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
  d) Calculated %Rs and relative percent differences (RPDs), and
  e) The laboratory's MS/MSD QC limits
R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  a) The amount of analyte measured in the duplicate,
  b) The calculated RPD, and
  c) The laboratory's QC limits for analytical duplicates.
R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix;
R10 Other problems or anomalies.

The Exception Report for each "No" or "Not Reviewed (NR)" item in the Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory is not accredited under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge that all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information or data affecting the quality of the data has been knowingly withheld.

This laboratory was last inspected by TCEQ on February 25-28 2019. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Name: John DuPont
Official Title: General Manager



Signature

10/12/20

Date

Name: Dr. Derhsing Luu
Official Title: Technical Director

DHL Analytical, Inc. **Date:** *12-Oct-20*

CLIENT: Golder
Project: LUMINANT-OGSES-FGD PONDS (CCR)
Lab Order: 2009111

CASE NARRATIVE

Samples were analyzed using the methods outlined in the following references:

Method SW6020B - Metals Analysis
Method E300 - Anions Analysis
Method M2540C - TDS Analysis

Exception Report R1-01

The samples were received and log-in performed on 9/16/20. A total of 6 samples were received. The samples arrived in good condition and were properly packaged.

Exception Report R5-04

For Metals analysis performed on 9/21/20 Boron was detected below the reporting limit in the method blank (MB-97920).

Exception Report R5-05

For Metals analysis performed on 9/21/20 all samples may be biased high for Boron. No further corrective actions were taken.

Exception Report R7-03

For Metals analysis performed on 9/21/20 the matrix spike and matrix spike duplicate recoveries were out of control limits for Calcium. These are flagged accordingly in the QC summary report. The sample selected for the matrix spike and matrix spike duplicate was not from this work order. The LCS was within control limits for this analyte. No further corrective actions were taken.

Exception Report S2-04

For Metals analysis performed on 9/21/20 Boron was detected below the reporting limit in CCB4-200921. This was due to carryover from the previous samples. The associated samples may be biased high for this analyte. No further corrective actions were taken.

Exception Report S9-01

For Metals analysis performed on 9/21/20 the RPD for the serial dilution was slightly above control limits for Boron. This is flagged accordingly in the QC summary report. The PDS was within control limits for this analyte. No further corrective actions were taken.

DHL Analytical, Inc.

Date: *12-Oct-20*

CLIENT: Golder
Project: LUMINANT-OGSES-FGD PONDS (CCR)
Lab Order: 2009111

Work Order Sample Summary

Lab Smp ID	Client Sample ID	Tag Number	Date Collected	Date Recved
2009111-01	FGD-6		09/15/20 08:05 AM	9/16/2020
2009111-02	FGD-4		09/15/20 08:55 AM	9/16/2020
2009111-03	FGD-3		09/15/20 09:45 AM	9/16/2020
2009111-04	FGD-8		09/15/20 10:45 AM	9/16/2020
2009111-05	FGD-1		09/15/20 12:35 PM	9/16/2020
2009111-06	DUP-01		09/15/20 12:35 PM	9/16/2020

Lab Order: 2009111
Client: Golder
Project: LUMINANT-OGSES-FGD POND

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
2009111-01A	FGD-6	09/15/20 08:05 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	09/17/20 08:04 AM	97920
2009111-01B	FGD-6	09/15/20 08:05 AM	Aqueous	E300	Anion Preparation	09/17/20 09:43 AM	97928
	FGD-6	09/15/20 08:05 AM	Aqueous	E300	Anion Preparation	09/17/20 09:43 AM	97928
	FGD-6	09/15/20 08:05 AM	Aqueous	M2540C	TDS Preparation	09/16/20 11:25 AM	97914
2009111-02A	FGD-4	09/15/20 08:55 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	09/17/20 08:04 AM	97920
	FGD-4	09/15/20 08:55 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	09/17/20 08:04 AM	97920
2009111-02B	FGD-4	09/15/20 08:55 AM	Aqueous	E300	Anion Preparation	09/17/20 09:43 AM	97928
	FGD-4	09/15/20 08:55 AM	Aqueous	E300	Anion Preparation	09/17/20 09:43 AM	97928
	FGD-4	09/15/20 08:55 AM	Aqueous	M2540C	TDS Preparation	09/16/20 11:25 AM	97914
2009111-03A	FGD-3	09/15/20 09:45 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	09/17/20 08:04 AM	97920
	FGD-3	09/15/20 09:45 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	09/17/20 08:04 AM	97920
2009111-03B	FGD-3	09/15/20 09:45 AM	Aqueous	E300	Anion Preparation	09/17/20 09:43 AM	97928
	FGD-3	09/15/20 09:45 AM	Aqueous	E300	Anion Preparation	09/17/20 09:43 AM	97928
	FGD-3	09/15/20 09:45 AM	Aqueous	M2540C	TDS Preparation	09/16/20 11:25 AM	97914
2009111-04A	FGD-8	09/15/20 10:45 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	09/17/20 08:04 AM	97920
	FGD-8	09/15/20 10:45 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	09/17/20 08:04 AM	97920
2009111-04B	FGD-8	09/15/20 10:45 AM	Aqueous	E300	Anion Preparation	09/17/20 09:43 AM	97928
	FGD-8	09/15/20 10:45 AM	Aqueous	E300	Anion Preparation	09/17/20 09:43 AM	97928
	FGD-8	09/15/20 10:45 AM	Aqueous	E300	Anion Preparation	09/18/20 11:27 AM	97950
	FGD-8	09/15/20 10:45 AM	Aqueous	M2540C	TDS Preparation	09/16/20 11:25 AM	97914
2009111-05A	FGD-1	09/15/20 12:35 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	09/17/20 08:04 AM	97920
	FGD-1	09/15/20 12:35 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	09/17/20 08:04 AM	97920
2009111-05B	FGD-1	09/15/20 12:35 PM	Aqueous	E300	Anion Preparation	09/17/20 09:43 AM	97928
	FGD-1	09/15/20 12:35 PM	Aqueous	E300	Anion Preparation	09/17/20 09:43 AM	97928
	FGD-1	09/15/20 12:35 PM	Aqueous	M2540C	TDS Preparation	09/16/20 11:25 AM	97914
2009111-06A	DUP-01	09/15/20 12:35 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	09/17/20 08:04 AM	97920
	DUP-01	09/15/20 12:35 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	09/17/20 08:04 AM	97920
2009111-06B	DUP-01	09/15/20 12:35 PM	Aqueous	E300	Anion Preparation	09/17/20 09:43 AM	97928

Lab Order: 2009111
Client: Golder
Project: LUMINANT-OGSES-FGD POND

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
2009111-06B	DUP-01	09/15/20 12:35 PM	Aqueous	E300	Anion Preparation	09/17/20 09:43 AM	97928
	DUP-01	09/15/20 12:35 PM	Aqueous	M2540C	TDS Preparation	09/16/20 11:25 AM	97914

Lab Order: 2009111
Client: Golder
Project: LUMINANT-OGSES-FGD POND

ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
2009111-01A	FGD-6	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	97920	1	09/21/20 02:47 PM	ICP-MS4_200921C
2009111-01B	FGD-6	Aqueous	E300	Anions by IC method - Water	97928	10	09/17/20 04:06 PM	IC4_200917A
	FGD-6	Aqueous	E300	Anions by IC method - Water	97928	1	09/17/20 09:16 PM	IC4_200917A
	FGD-6	Aqueous	M2540C	Total Dissolved Solids	97914	1	09/16/20 04:45 PM	WC_200916D
2009111-02A	FGD-4	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	97920	1	09/21/20 02:49 PM	ICP-MS4_200921C
	FGD-4	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	97920	10	09/22/20 11:05 AM	ICP-MS4_200922A
2009111-02B	FGD-4	Aqueous	E300	Anions by IC method - Water	97928	10	09/17/20 05:16 PM	IC4_200917A
	FGD-4	Aqueous	E300	Anions by IC method - Water	97928	1	09/17/20 09:32 PM	IC4_200917A
	FGD-4	Aqueous	M2540C	Total Dissolved Solids	97914	1	09/16/20 04:45 PM	WC_200916D
2009111-03A	FGD-3	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	97920	1	09/21/20 02:51 PM	ICP-MS4_200921C
	FGD-3	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	97920	10	09/22/20 11:07 AM	ICP-MS4_200922A
2009111-03B	FGD-3	Aqueous	E300	Anions by IC method - Water	97928	10	09/17/20 05:32 PM	IC4_200917A
	FGD-3	Aqueous	E300	Anions by IC method - Water	97928	1	09/17/20 09:48 PM	IC4_200917A
	FGD-3	Aqueous	M2540C	Total Dissolved Solids	97914	1	09/16/20 04:45 PM	WC_200916D
2009111-04A	FGD-8	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	97920	50	09/22/20 11:09 AM	ICP-MS4_200922A
	FGD-8	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	97920	1	09/21/20 02:53 PM	ICP-MS4_200921C
2009111-04B	FGD-8	Aqueous	E300	Anions by IC method - Water	97928	10	09/17/20 05:48 PM	IC4_200917A
	FGD-8	Aqueous	E300	Anions by IC method - Water	97928	1	09/17/20 10:04 PM	IC4_200917A
	FGD-8	Aqueous	E300	Anions by IC method - Water	97950	100	09/18/20 05:53 PM	IC4_200918A
	FGD-8	Aqueous	M2540C	Total Dissolved Solids	97914	1	09/16/20 04:45 PM	WC_200916D
2009111-05A	FGD-1	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	97920	1	09/21/20 02:55 PM	ICP-MS4_200921C
	FGD-1	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	97920	10	09/22/20 11:11 AM	ICP-MS4_200922A
2009111-05B	FGD-1	Aqueous	E300	Anions by IC method - Water	97928	10	09/17/20 06:04 PM	IC4_200917A
	FGD-1	Aqueous	E300	Anions by IC method - Water	97928	1	09/17/20 10:20 PM	IC4_200917A
	FGD-1	Aqueous	M2540C	Total Dissolved Solids	97914	1	09/16/20 04:45 PM	WC_200916D
2009111-06A	DUP-01	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	97920	1	09/21/20 02:57 PM	ICP-MS4_200921C
	DUP-01	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	97920	10	09/22/20 11:13 AM	ICP-MS4_200922A
2009111-06B	DUP-01	Aqueous	E300	Anions by IC method - Water	97928	10	09/17/20 06:20 PM	IC4_200917A

Lab Order: 2009111
Client: Golder
Project: LUMINANT-OGSES-FGD POND

ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
2009111-06B	DUP-01	Aqueous	E300	Anions by IC method - Water	97928	1	09/17/20 10:36 PM	IC4_200917A
	DUP-01	Aqueous	M2540C	Total Dissolved Solids	97914	1	09/16/20 04:45 PM	WC_200916D

DHL Analytical, Inc.

Date: *12-Oct-20*

CLIENT:	Golder	**Client Sample ID:**	FGD-6
Project:	LUMINANT-OGSES-FGD PONDS (CCR)	**Lab ID:**	2009111-01
Project No:	19122262-F2020	**Collection Date:**	09/15/20 08:05 AM
Lab Order:	2009111	**Matrix:**	AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020B**					Analyst: **RO**
Arsenic	0.00651	0.00200	0.00500		mg/L	1	09/21/20 02:47 PM
Barium	0.0695	0.00300	0.0100		mg/L	1	09/21/20 02:47 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	09/21/20 02:47 PM
Boron	0.112	0.0100	0.0300		mg/L	1	09/21/20 02:47 PM
Calcium	20.2	0.100	0.300		mg/L	1	09/21/20 02:47 PM
Chromium	<0.00200	0.00200	0.00500		mg/L	1	09/21/20 02:47 PM
Cobalt	0.00615	0.00300	0.00500		mg/L	1	09/21/20 02:47 PM
Lead	<0.000300	0.000300	0.00100		mg/L	1	09/21/20 02:47 PM
Lithium	0.00669	0.00500	0.0100	J	mg/L	1	09/21/20 02:47 PM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	09/21/20 02:47 PM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	09/21/20 02:47 PM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	09/21/20 02:47 PM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **SNM**
Chloride	144	3.00	10.0		mg/L	10	09/17/20 04:06 PM
Fluoride	0.354	0.100	0.400	J	mg/L	1	09/17/20 09:16 PM
Sulfate	89.6	1.00	3.00		mg/L	1	09/17/20 09:16 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	688	10.0	10.0		mg/L	1	09/16/20 04:45 PM

Qualifiers:

- ND - Not Detected at the SDL
- J - Analyte detected between SDL and RL
- B - Analyte detected in the associated Method Blank
- DF- Dilution Factor
- N - Parameter not NELAP certified
- See Final Page of Report for MQLs and MDLs
- S - Spike Recovery outside control limits
- C - Sample Result or QC discussed in Case Narrative
- RL - Reporting Limit (MQL adjusted for moisture and sample size)
- SDL - Sample Detection Limit
- E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: *12-Oct-20*

CLIENT:	Golder	**Client Sample ID:**	FGD-4
Project:	LUMINANT-OGSES-FGD PONDS (CCR)	**Lab ID:**	2009111-02
Project No:	19122262-F2020	**Collection Date:**	09/15/20 08:55 AM
Lab Order:	2009111	**Matrix:**	AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020B**					Analyst: **RO**
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	09/21/20 02:49 PM
Barium	0.0899	0.00300	0.0100		mg/L	1	09/21/20 02:49 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	09/21/20 02:49 PM
Boron	0.109	0.0100	0.0300		mg/L	1	09/21/20 02:49 PM
Calcium	33.6	1.00	3.00		mg/L	10	09/22/20 11:05 AM
Chromium	<0.00200	0.00200	0.00500		mg/L	1	09/21/20 02:49 PM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	09/21/20 02:49 PM
Lead	<0.000300	0.000300	0.00100		mg/L	1	09/21/20 02:49 PM
Lithium	0.0140	0.00500	0.0100		mg/L	1	09/21/20 02:49 PM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	09/21/20 02:49 PM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	09/21/20 02:49 PM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	09/21/20 02:49 PM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **SNM**
Chloride	197	3.00	10.0		mg/L	10	09/17/20 05:16 PM
Fluoride	<0.100	0.100	0.400		mg/L	1	09/17/20 09:32 PM
Sulfate	50.1	1.00	3.00		mg/L	1	09/17/20 09:32 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	674	10.0	10.0		mg/L	1	09/16/20 04:45 PM

Qualifiers:

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DF- Dilution Factor
N - Parameter not NELAP certified
See Final Page of Report for MQLs and MDLs
S - Spike Recovery outside control limits
C - Sample Result or QC discussed in Case Narrative
RL - Reporting Limit (MQL adjusted for moisture and sample size)
SDL - Sample Detection Limit
E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: *12-Oct-20*

CLIENT:	Golder	**Client Sample ID:**	FGD-3
Project:	LUMINANT-OGSES-FGD PONDS (CCR)	**Lab ID:**	2009111-03
Project No:	19122262-F2020	**Collection Date:**	09/15/20 09:45 AM
Lab Order:	2009111	**Matrix:**	AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020B**					Analyst: **RO**
Arsenic	0.00225	0.00200	0.00500	J	mg/L	1	09/21/20 02:51 PM
Barium	0.0326	0.00300	0.0100		mg/L	1	09/21/20 02:51 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	09/21/20 02:51 PM
Boron	0.130	0.0100	0.0300		mg/L	1	09/21/20 02:51 PM
Calcium	36.8	1.00	3.00		mg/L	10	09/22/20 11:07 AM
Chromium	<0.00200	0.00200	0.00500		mg/L	1	09/21/20 02:51 PM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	09/21/20 02:51 PM
Lead	<0.000300	0.000300	0.00100		mg/L	1	09/21/20 02:51 PM
Lithium	0.0416	0.00500	0.0100		mg/L	1	09/21/20 02:51 PM
Molybdenum	0.00245	0.00200	0.00500	J	mg/L	1	09/21/20 02:51 PM
Selenium	0.00646	0.00200	0.00500		mg/L	1	09/21/20 02:51 PM
Thallium	0.000534	0.000500	0.00150	J	mg/L	1	09/21/20 02:51 PM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **SNM**
Chloride	58.5	3.00	10.0		mg/L	10	09/17/20 05:32 PM
Fluoride	0.772	0.100	0.400		mg/L	1	09/17/20 09:48 PM
Sulfate	122	1.00	3.00		mg/L	1	09/17/20 09:48 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	709	10.0	10.0		mg/L	1	09/16/20 04:45 PM

Qualifiers:

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DF- Dilution Factor
N - Parameter not NELAP certified
See Final Page of Report for MQLs and MDLs
S - Spike Recovery outside control limits
C - Sample Result or QC discussed in Case Narrative
RL - Reporting Limit (MQL adjusted for moisture and sample size)
SDL - Sample Detection Limit
E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: *12-Oct-20*

CLIENT:	Golder	**Client Sample ID:**	FGD-8
Project:	LUMINANT-OGSES-FGD PONDS (CCR)	**Lab ID:**	2009111-04
Project No:	19122262-F2020	**Collection Date:**	09/15/20 10:45 AM
Lab Order:	2009111	**Matrix:**	AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020B**					Analyst: **RO**
Arsenic	0.00796	0.00200	0.00500		mg/L	1	09/21/20 02:53 PM
Barium	0.777	0.00300	0.0100		mg/L	1	09/21/20 02:53 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	09/21/20 02:53 PM
Boron	0.101	0.0100	0.0300		mg/L	1	09/21/20 02:53 PM
Calcium	329	5.00	15.0		mg/L	50	09/22/20 11:09 AM
Chromium	0.00287	0.00200	0.00500	J	mg/L	1	09/21/20 02:53 PM
Cobalt	0.00379	0.00300	0.00500	J	mg/L	1	09/21/20 02:53 PM
Lead	0.00107	0.000300	0.00100		mg/L	1	09/21/20 02:53 PM
Lithium	0.00864	0.00500	0.0100	J	mg/L	1	09/21/20 02:53 PM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	09/21/20 02:53 PM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	09/21/20 02:53 PM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	09/21/20 02:53 PM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **SNM**
Chloride	2220	30.0	100		mg/L	100	09/18/20 05:53 PM
Fluoride	<0.100	0.100	0.400		mg/L	1	09/17/20 10:04 PM
Sulfate	58.9	1.00	3.00		mg/L	1	09/17/20 10:04 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	3890	50.0	50.0		mg/L	1	09/16/20 04:45 PM

Qualifiers:

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- DF- Dilution Factor
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- See Final Page of Report for MQLs and MDLs
- S - Spike Recovery outside control limits
- C - Sample Result or QC discussed in Case Narrative
- RL - Reporting Limit (MQL adjusted for moisture and sample size)
- SDL - Sample Detection Limit
- E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: *12-Oct-20*

CLIENT:	Golder	**Client Sample ID:**	FGD-1
Project:	LUMINANT-OGSES-FGD PONDS (CCR)	**Lab ID:**	2009111-05
Project No:	19122262-F2020	**Collection Date:**	09/15/20 12:35 PM
Lab Order:	2009111	**Matrix:**	AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020B**					Analyst: **RO**
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	09/21/20 02:55 PM
Barium	0.162	0.00300	0.0100		mg/L	1	09/21/20 02:55 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	09/21/20 02:55 PM
Boron	0.0871	0.0100	0.0300		mg/L	1	09/21/20 02:55 PM
Calcium	36.0	1.00	3.00		mg/L	10	09/22/20 11:11 AM
Chromium	<0.00200	0.00200	0.00500		mg/L	1	09/21/20 02:55 PM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	09/21/20 02:55 PM
Lead	0.000342	0.000300	0.00100	J	mg/L	1	09/21/20 02:55 PM
Lithium	0.0233	0.00500	0.0100		mg/L	1	09/21/20 02:55 PM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	09/21/20 02:55 PM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	09/21/20 02:55 PM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	09/21/20 02:55 PM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **SNM**
Chloride	320	3.00	10.0		mg/L	10	09/17/20 06:04 PM
Fluoride	0.215	0.100	0.400	J	mg/L	1	09/17/20 10:20 PM
Sulfate	158	10.0	30.0		mg/L	10	09/17/20 06:04 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	875	50.0	50.0		mg/L	1	09/16/20 04:45 PM

Qualifiers:

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- DF- Dilution Factor
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- See Final Page of Report for MQLs and MDLs
- S - Spike Recovery outside control limits
- C - Sample Result or QC discussed in Case Narrative
- RL - Reporting Limit (MQL adjusted for moisture and sample size)
- SDL - Sample Detection Limit
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DHL Analytical, Inc.

Date: *12-Oct-20*

CLIENT:	Golder	**Client Sample ID:**	DUP-01
Project:	LUMINANT-OGSES-FGD PONDS (CCR)	**Lab ID:**	2009111-06
Project No:	19122262-F2020	**Collection Date:**	09/15/20 12:35 PM
Lab Order:	2009111	**Matrix:**	AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020B**					Analyst: **RO**
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	09/21/20 02:57 PM
Barium	0.161	0.00300	0.0100		mg/L	1	09/21/20 02:57 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	09/21/20 02:57 PM
Boron	0.0981	0.0100	0.0300		mg/L	1	09/21/20 02:57 PM
Calcium	36.3	1.00	3.00		mg/L	10	09/22/20 11:13 AM
Chromium	<0.00200	0.00200	0.00500		mg/L	1	09/21/20 02:57 PM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	09/21/20 02:57 PM
Lead	0.000388	0.000300	0.00100	J	mg/L	1	09/21/20 02:57 PM
Lithium	0.0252	0.00500	0.0100		mg/L	1	09/21/20 02:57 PM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	09/21/20 02:57 PM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	09/21/20 02:57 PM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	09/21/20 02:57 PM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **SNM**
Chloride	316	3.00	10.0		mg/L	10	09/17/20 06:20 PM
Fluoride	0.239	0.100	0.400	J	mg/L	1	09/17/20 10:36 PM
Sulfate	156	10.0	30.0		mg/L	10	09/17/20 06:20 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	940	50.0	50.0		mg/L	1	09/16/20 04:45 PM

Qualifiers:

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- DF- Dilution Factor
- N - Parameter not NELAP certified
- See Final Page of Report for MQLs and MDLs
- S - Spike Recovery outside control limits
- C - Sample Result or QC discussed in Case Narrative
- RL - Reporting Limit (MQL adjusted for moisture and sample size)
- SDL - Sample Detection Limit
- E - TPH pattern not Gas or Diesel Range Pattern

CLIENT: Golder
Work Order: 2009111
Project: LUMINANT-OGSES-FGD PONDS (CCR)

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_200803A

Sample ID: **DCS1-97152**	Batch ID: **97152**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **DCS**	Run ID: **ICP-MS4_200803A**	Analysis Date: **8/3/2020 12:35:00 PM**	Prep Date: **7/16/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Beryllium	0.000428	0.00100	0.000500	0	85.6	70	130	0	0	
Lead	0.000490	0.00100	0.000500	0	98.0	70	130	0	0	
Thallium	0.000482	0.00150	0.000500	0	96.4	70	130	0	0	

Sample ID: **DCS2-97152**	Batch ID: **97152**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **DCS2**	Run ID: **ICP-MS4_200803A**	Analysis Date: **8/3/2020 12:37:00 PM**	Prep Date: **7/16/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	0.342	0.300	0.300	0	114	70	130	0	0	

Sample ID: **DCS3-97152**	Batch ID: **97152**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **DCS3**	Run ID: **ICP-MS4_200803A**	Analysis Date: **8/3/2020 12:40:00 PM**	Prep Date: **7/16/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.00503	0.00500	0.00500	0	101	70	130	0	0	
Barium	0.00508	0.0100	0.00500	0	102	70	130	0	0	
Chromium	0.00524	0.00500	0.00500	0	105	70	130	0	0	
Cobalt	0.00532	0.00500	0.00500	0	106	70	130	0	0	
Lithium	0.00427	0.0100	0.00500	0	85.4	70	130	0	0	
Molybdenum	0.00506	0.00500	0.00500	0	101	70	130	0	0	
Selenium	0.00597	0.00500	0.00500	0	119	70	130	0	0	

Sample ID: **DCS4-97152**	Batch ID: **97152**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **DCS4**	Run ID: **ICP-MS4_200803A**	Analysis Date: **8/3/2020 12:43:00 PM**	Prep Date: **7/16/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	0.0277	0.0300	0.0300	0	92.4	70	130	0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2009111
Project: LUMINANT-OGSES-FGD PONDS (CCR)

ANALYTICAL QC SUMMARY REPORT

RunID: **ICP-MS4_200921C**

The QC data in batch 97920 applies to the following samples: 2009111-01A, 2009111-02A, 2009111-03A, 2009111-04A, 2009111-05A, 2009111-06A

Sample ID: **MB-97920** Batch ID: **97920** TestNo: **SW6020B** Units: **mg/L**
SampType: **MBLK** Run ID: **ICP-MS4_200921C** Analysis Date: **9/21/2020 2:31:00 PM** Prep Date: **9/17/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	<0.00200	0.00500								
Barium	<0.00300	0.0100								
Beryllium	<0.000300	0.00100								
Boron	0.0102	0.0300								
Calcium	<0.100	0.300								
Chromium	<0.00200	0.00500								
Cobalt	<0.00300	0.00500								
Lead	<0.000300	0.00100								
Lithium	<0.00500	0.0100								
Molybdenum	<0.00200	0.00500								
Selenium	<0.00200	0.00500								
Thallium	<0.000500	0.00150								

Sample ID: **LCS-97920** Batch ID: **97920** TestNo: **SW6020B** Units: **mg/L**
SampType: **LCS** Run ID: **ICP-MS4_200921C** Analysis Date: **9/21/2020 2:33:00 PM** Prep Date: **9/17/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.198	0.00500	0.200	0	99.2	80	120			
Barium	0.196	0.0100	0.200	0	97.9	80	120			
Beryllium	0.201	0.00100	0.200	0	101	80	120			
Boron	0.199	0.0300	0.200	0	99.7	80	120			
Calcium	4.75	0.300	5.00	0	95.0	80	120			
Chromium	0.206	0.00500	0.200	0	103	80	120			
Cobalt	0.201	0.00500	0.200	0	100	80	120			
Lead	0.197	0.00100	0.200	0	98.7	80	120			
Lithium	0.199	0.0100	0.200	0	99.4	80	120			
Molybdenum	0.201	0.00500	0.200	0	101	80	120			
Selenium	0.196	0.00500	0.200	0	97.8	80	120			
Thallium	0.200	0.00150	0.200	0	100	80	120			

Sample ID: **LCSD-97920** Batch ID: **97920** TestNo: **SW6020B** Units: **mg/L**
SampType: **LCSD** Run ID: **ICP-MS4_200921C** Analysis Date: **9/21/2020 2:35:00 PM** Prep Date: **9/17/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.200	0.00500	0.200	0	99.8	80	120	0.597	15	
Barium	0.199	0.0100	0.200	0	99.7	80	120	1.79	15	
Beryllium	0.201	0.00100	0.200	0	101	80	120	0.171	15	
Boron	0.208	0.0300	0.200	0	104	80	120	4.40	15	
Calcium	4.75	0.300	5.00	0	95.1	80	120	0.127	15	
Chromium	0.208	0.00500	0.200	0	104	80	120	0.743	15	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2009111
Project: LUMINANT-OGSES-FGD PONDS (CCR)

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_200921C

Sample ID: **LCSD-97920** Batch ID: **97920** TestNo: **SW6020B** Units: **mg/L**
SampType: **LCSD** Run ID: **ICP-MS4_200921C** Analysis Date: **9/21/2020 2:35:00 PM** Prep Date: **9/17/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cobalt	0.201	0.00500	0.200	0	100	80	120	0.005	15	
Lead	0.200	0.00100	0.200	0	99.9	80	120	1.17	15	
Lithium	0.206	0.0100	0.200	0	103	80	120	3.63	15	
Molybdenum	0.204	0.00500	0.200	0	102	80	120	1.42	15	
Selenium	0.193	0.00500	0.200	0	96.5	80	120	1.39	15	
Thallium	0.199	0.00150	0.200	0	99.4	80	120	0.579	15	

Sample ID: **2009097-05B SD** Batch ID: **97920** TestNo: **SW6020B** Units: **mg/L**
SampType: **SD** Run ID: **ICP-MS4_200921C** Analysis Date: **9/21/2020 2:45:00 PM** Prep Date: **9/17/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	<0.0100	0.0250	0	0				0	20	
Barium	<0.0150	0.0500	0	0.0115				0	20	
Beryllium	<0.00150	0.00500	0	0				0	20	
Boron	0.105	0.150	0	0.0818				24.8	20	R
Chromium	<0.0100	0.0250	0	0				0	20	
Cobalt	<0.0150	0.0250	0	0				0	20	
Lead	<0.00150	0.00500	0	0.000311				0	20	
Lithium	0.0687	0.0500	0	0.0662				3.66	20	
Molybdenum	<0.0100	0.0250	0	0				0	20	
Selenium	<0.0100	0.0250	0	0				0	20	
Thallium	<0.00250	0.00750	0	0				0	20	

Sample ID: **2009097-05B PDS** Batch ID: **97920** TestNo: **SW6020B** Units: **mg/L**
SampType: **PDS** Run ID: **ICP-MS4_200921C** Analysis Date: **9/21/2020 3:09:00 PM** Prep Date: **9/17/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.210	0.00500	0.200	0	105	75	125			
Barium	0.220	0.0100	0.200	0.0115	104	75	125			
Beryllium	0.190	0.00100	0.200	0	95.0	75	125			
Boron	0.260	0.0300	0.200	0.0818	88.9	75	125			
Chromium	0.211	0.00500	0.200	0	105	75	125			
Cobalt	0.204	0.00500	0.200	0	102	75	125			
Lead	0.211	0.00100	0.200	0.000311	105	75	125			
Lithium	0.258	0.0100	0.200	0.0662	95.8	75	125			
Molybdenum	0.206	0.00500	0.200	0	103	75	125			
Selenium	0.218	0.00500	0.200	0	109	75	125			
Thallium	0.214	0.00150	0.200	0	107	75	125			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2009111
Project: LUMINANT-OGSES-FGD PONDS (CCR)

ANALYTICAL QC SUMMARY REPORT

RunID: **ICP-MS4_200921C**

Sample ID: **2009097-05B MS**	Batch ID: **97920**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **MS**	Run ID: **ICP-MS4_200921C**	Analysis Date: **9/21/2020 3:11:00 PM**	Prep Date: **9/17/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.215	0.00500	0.200	0	107	75	125			
Barium	0.215	0.0100	0.200	0.0115	102	75	125			
Beryllium	0.189	0.00100	0.200	0	94.7	75	125			
Boron	0.265	0.0300	0.200	0.0818	91.8	75	125			
Calcium	499	0.300	5.00	495	73.7	75	125			S
Chromium	0.205	0.00500	0.200	0	102	75	125			
Cobalt	0.203	0.00500	0.200	0	101	75	125			
Lead	0.205	0.00100	0.200	0.000311	102	75	125			
Lithium	0.265	0.0100	0.200	0.0662	99.6	75	125			
Molybdenum	0.213	0.00500	0.200	0	107	75	125			
Selenium	0.215	0.00500	0.200	0	108	75	125			
Thallium	0.208	0.00150	0.200	0	104	75	125			

Sample ID: **2009097-05B MSD**	Batch ID: **97920**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **MSD**	Run ID: **ICP-MS4_200921C**	Analysis Date: **9/21/2020 3:13:00 PM**	Prep Date: **9/17/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.210	0.00500	0.200	0	105	75	125	2.09	15	
Barium	0.214	0.0100	0.200	0.0115	101	75	125	0.392	15	
Beryllium	0.186	0.00100	0.200	0	93.0	75	125	1.88	15	
Boron	0.263	0.0300	0.200	0.0818	90.6	75	125	0.842	15	
Calcium	495	0.300	5.00	495	-11.6	75	125	0.859	15	S
Chromium	0.204	0.00500	0.200	0	102	75	125	0.245	15	
Cobalt	0.199	0.00500	0.200	0	99.7	75	125	1.60	15	
Lead	0.203	0.00100	0.200	0.000311	102	75	125	0.724	15	
Lithium	0.260	0.0100	0.200	0.0662	96.8	75	125	2.17	15	
Molybdenum	0.212	0.00500	0.200	0	106	75	125	0.575	15	
Selenium	0.211	0.00500	0.200	0	105	75	125	1.99	15	
Thallium	0.209	0.00150	0.200	0	104	75	125	0.285	15	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2009111
Project: LUMINANT-OGSES-FGD PONDS (CCR)

ANALYTICAL QC SUMMARY REPORT

RunID: **ICP-MS4_200921C**

Sample ID: **ICV-200921** Batch ID: **R112367** TestNo: **SW6020B** Units: **mg/L**
SampType: **ICV** Run ID: **ICP-MS4_200921C** Analysis Date: **9/21/2020 10:51:00 AM** Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.0951	0.00500	0.100	0	95.1	90	110			
Barium	0.0994	0.0100	0.100	0	99.4	90	110			
Beryllium	0.0998	0.00100	0.100	0	99.8	90	110			
Boron	0.102	0.0300	0.100	0	102	90	110			
Calcium	2.46	0.300	2.50	0	98.6	90	110			
Chromium	0.104	0.00500	0.100	0	104	90	110			
Cobalt	0.0992	0.00500	0.100	0	99.2	90	110			
Lead	0.0985	0.00100	0.100	0	98.5	90	110			
Lithium	0.0995	0.0100	0.100	0	99.5	90	110			
Molybdenum	0.0949	0.00500	0.100	0	94.9	90	110			
Selenium	0.0940	0.00500	0.100	0	94.0	90	110			
Thallium	0.0976	0.00150	0.100	0	97.6	90	110			

Sample ID: **LCVL-200921** Batch ID: **R112367** TestNo: **SW6020B** Units: **mg/L**
SampType: **LCVL** Run ID: **ICP-MS4_200921C** Analysis Date: **9/21/2020 10:58:00 AM** Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.00517	0.00500	0.00500	0	103	80	120			
Barium	0.00513	0.0100	0.00500	0	103	80	120			
Beryllium	0.00117	0.00100	0.00100	0	117	80	120			
Boron	0.0204	0.0300	0.0200	0	102	80	120			
Calcium	0.106	0.300	0.100	0	106	80	120			
Chromium	0.00534	0.00500	0.00500	0	107	80	120			
Cobalt	0.00521	0.00500	0.00500	0	104	80	120			
Lead	0.00107	0.00100	0.00100	0	107	80	120			
Lithium	0.0106	0.0100	0.0100	0	106	80	120			
Molybdenum	0.00530	0.00500	0.00500	0	106	80	120			
Selenium	0.00472	0.00500	0.00500	0	94.5	80	120			
Thallium	0.00104	0.00150	0.00100	0	104	80	120			

Sample ID: **CCV4-200921** Batch ID: **R112367** TestNo: **SW6020B** Units: **mg/L**
SampType: **CCV** Run ID: **ICP-MS4_200921C** Analysis Date: **9/21/2020 2:20:00 PM** Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.198	0.00500	0.200	0	99.0	90	110			
Barium	0.196	0.0100	0.200	0	98.0	90	110			
Beryllium	0.198	0.00100	0.200	0	99.2	90	110			
Boron	0.193	0.0300	0.200	0	96.4	90	110			
Calcium	4.78	0.300	5.00	0	95.5	90	110			
Chromium	0.205	0.00500	0.200	0	102	90	110			
Cobalt	0.200	0.00500	0.200	0	100	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2009111
Project: LUMINANT-OGSES-FGD PONDS (CCR)

ANALYTICAL QC SUMMARY REPORT

RunID: **ICP-MS4_200921C**

Sample ID: **CCV4-200921**	Batch ID: **R112367**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS4_200921C**	Analysis Date: **9/21/2020 2:20:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	0.197	0.00100	0.200	0	98.4	90	110			
Lithium	0.202	0.0100	0.200	0	101	90	110			
Molybdenum	0.199	0.00500	0.200	0	99.4	90	110			
Selenium	0.192	0.00500	0.200	0	96.1	90	110			
Thallium	0.201	0.00150	0.200	0	100	90	110			

Sample ID: **CCV5-200921**	Batch ID: **R112367**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS4_200921C**	Analysis Date: **9/21/2020 3:19:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.196	0.00500	0.200	0	97.8	90	110			
Barium	0.198	0.0100	0.200	0	99.0	90	110			
Beryllium	0.204	0.00100	0.200	0	102	90	110			
Boron	0.199	0.0300	0.200	0	99.4	90	110			
Calcium	4.71	0.300	5.00	0	94.3	90	110			
Chromium	0.207	0.00500	0.200	0	103	90	110			
Cobalt	0.202	0.00500	0.200	0	101	90	110			
Lead	0.195	0.00100	0.200	0	97.6	90	110			
Lithium	0.212	0.0100	0.200	0	106	90	110			
Molybdenum	0.203	0.00500	0.200	0	101	90	110			
Selenium	0.193	0.00500	0.200	0	96.5	90	110			
Thallium	0.205	0.00150	0.200	0	102	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2009111
Project: LUMINANT-OGSES-FGD PONDS (CCR)

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_200922A

The QC data in batch 97920 applies to the following samples: 2009111-01A, 2009111-02A, 2009111-03A, 2009111-04A, 2009111-05A, 2009111-06A

Sample ID: **2009097-05B SD** Batch ID: **97920** TestNo: **SW6020B** Units: **mg/L**
SampType: **SD** Run ID: **ICP-MS4_200922A** Analysis Date: **9/22/2020 11:03:00 AM** Prep Date: **9/17/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	524	75.0	0	523				0.145	20	

Sample ID: **2009097-05B PDS** Batch ID: **97920** TestNo: **SW6020B** Units: **mg/L**
SampType: **PDS** Run ID: **ICP-MS4_200922A** Analysis Date: **9/22/2020 11:23:00 AM** Prep Date: **9/17/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	782	15.0	250	523	103	75	125			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2009111
Project: LUMINANT-OGSES-FGD PONDS (CCR)

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_200922A

Sample ID: **ICV-200922**	Batch ID: **R112373**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **ICV**	Run ID: **ICP-MS4_200922A**	Analysis Date: **9/22/2020 10:30:00 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	2.48	0.300	2.50	0	99.1	90	110			

Sample ID: **LCVL-200922**	Batch ID: **R112373**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **LCVL**	Run ID: **ICP-MS4_200922A**	Analysis Date: **9/22/2020 10:36:00 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	0.106	0.300	0.100	0	106	80	120			

Sample ID: **CCV1-200922**	Batch ID: **R112373**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS4_200922A**	Analysis Date: **9/22/2020 10:56:00 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	4.91	0.300	5.00	0	98.2	90	110			

Sample ID: **CCV2-200922**	Batch ID: **R112373**	TestNo: **SW6020B**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS4_200922A**	Analysis Date: **9/22/2020 11:24:00 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	5.04	0.300	5.00	0	101	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2009111
Project: LUMINANT-OGSES-FGD PONDS (CCR)

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_200826A

Sample ID: **DCS2-97742** Batch ID: **97742** TestNo: **E300** Units: **mg/L**
SampType: **DCS2** Run ID: **IC4_200826A** Analysis Date: **8/26/2020 1:19:59 PM** Prep Date: **8/26/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	0.477	1.00	0.5000	0	95.3	70	130	0	0	
Fluoride	0.216	0.400	0.2000	0	108	70	130	0	0	
Sulfate	1.47	3.00	1.500	0	98.1	70	130	0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2009111
Project: LUMINANT-OGSES-FGD PONDS (CCR)

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_200917A

The QC data in batch 97928 applies to the following samples: 2009111-01B, 2009111-02B, 2009111-03B, 2009111-04B, 2009111-05B, 2009111-06B

Sample ID: **MB-97928** Batch ID: **97928** TestNo: **E300** Units: **mg/L**
SampType: **MBLK** Run ID: **IC4_200917A** Analysis Date: **9/17/2020 11:46:53 AM** Prep Date: **9/17/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	<0.300	1.00								
Fluoride	<0.100	0.400								
Sulfate	<1.00	3.00								

Sample ID: **LCS-97928** Batch ID: **97928** TestNo: **E300** Units: **mg/L**
SampType: **LCS** Run ID: **IC4_200917A** Analysis Date: **9/17/2020 12:02:53 PM** Prep Date: **9/17/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.81	1.00	10.00	0	98.1	90	110			
Fluoride	3.84	0.400	4.000	0	96.0	90	110			
Sulfate	30.5	3.00	30.00	0	102	90	110			

Sample ID: **LCSD-97928** Batch ID: **97928** TestNo: **E300** Units: **mg/L**
SampType: **LCSD** Run ID: **IC4_200917A** Analysis Date: **9/17/2020 12:18:53 PM** Prep Date: **9/17/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.77	1.00	10.00	0	97.7	90	110	0.428	20	
Fluoride	3.82	0.400	4.000	0	95.6	90	110	0.430	20	
Sulfate	30.4	3.00	30.00	0	101	90	110	0.404	20	

Sample ID: **2009111-01BMS** Batch ID: **97928** TestNo: **E300** Units: **mg/L**
SampType: **MS** Run ID: **IC4_200917A** Analysis Date: **9/17/2020 4:44:31 PM** Prep Date: **9/17/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	328	10.0	200.0	144.0	92.0	90	110			
Fluoride	209	4.00	200.0	0	104	90	110			
Sulfate	297	30.0	200.0	84.03	107	90	110			

Sample ID: **2009111-01BMSD** Batch ID: **97928** TestNo: **E300** Units: **mg/L**
SampType: **MSD** Run ID: **IC4_200917A** Analysis Date: **9/17/2020 5:00:31 PM** Prep Date: **9/17/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	325	10.0	200.0	144.0	90.4	90	110	0.935	20	
Fluoride	207	4.00	200.0	0	103	90	110	0.995	20	
Sulfate	297	30.0	200.0	84.03	107	90	110	0.083	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2009111
Project: LUMINANT-OGSES-FGD PONDS (CCR)

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_200917A

Sample ID: **ICV-200917**	Batch ID: **R112331**	TestNo: **E300**	Units: **mg/L**
SampType: **ICV**	Run ID: **IC4_200917A**	Analysis Date: **9/17/2020 11:14:53 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	24.4	1.00	25.00	0	97.5	90	110			
Fluoride	9.78	0.400	10.00	0	97.8	90	110			
Sulfate	77.8	3.00	75.00	0	104	90	110			

Sample ID: **CCV1-200917**	Batch ID: **R112331**	TestNo: **E300**	Units: **mg/L**
SampType: **CCV**	Run ID: **IC4_200917A**	Analysis Date: **9/17/2020 8:28:31 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.70	1.00	10.00	0	97.0	90	110			
Fluoride	3.91	0.400	4.000	0	97.7	90	110			
Sulfate	30.2	3.00	30.00	0	101	90	110			

Sample ID: **CCV2-200917**	Batch ID: **R112331**	TestNo: **E300**	Units: **mg/L**
SampType: **CCV**	Run ID: **IC4_200917A**	Analysis Date: **9/17/2020 11:40:31 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	4.01	0.400	4.000	0	100	90	110			
Sulfate	30.4	3.00	30.00	0	101	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2009111
Project: LUMINANT-OGSES-FGD PONDS (CCR)

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_200918A

The QC data in batch 97950 applies to the following samples: 2009111-04B

Sample ID: **MB-97950**	Batch ID: **97950**	TestNo: **E300**	Units: **mg/L**
SampType: **MBLK**	Run ID: **IC4_200918A**	Analysis Date: **9/18/2020 12:52:56 PM**	Prep Date: **9/18/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	<0.300	1.00								

Sample ID: **LCS-97950**	Batch ID: **97950**	TestNo: **E300**	Units: **mg/L**
SampType: **LCS**	Run ID: **IC4_200918A**	Analysis Date: **9/18/2020 1:08:56 PM**	Prep Date: **9/18/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.73	1.00	10.00	0	97.3	90	110			

Sample ID: **LCSD-97950**	Batch ID: **97950**	TestNo: **E300**	Units: **mg/L**
SampType: **LCSD**	Run ID: **IC4_200918A**	Analysis Date: **9/18/2020 1:24:56 PM**	Prep Date: **9/18/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.85	1.00	10.00	0	98.5	90	110	1.23	20	

Sample ID: **2009138-01BMS**	Batch ID: **97950**	TestNo: **E300**	Units: **mg/L**
SampType: **MS**	Run ID: **IC4_200918A**	Analysis Date: **9/18/2020 3:29:16 PM**	Prep Date: **9/18/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	302	10.0	200.0	113.8	94.0	90	110			

Sample ID: **2009138-01BMSD**	Batch ID: **97950**	TestNo: **E300**	Units: **mg/L**
SampType: **MSD**	Run ID: **IC4_200918A**	Analysis Date: **9/18/2020 3:45:16 PM**	Prep Date: **9/18/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	297	10.0	200.0	113.8	91.6	90	110	1.61	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2009111
Project: LUMINANT-OGSES-FGD PONDS (CCR)

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_200918A

Sample ID: **ICV-200918**	Batch ID: **R112344**	TestNo: **E300**	Units: **mg/L**
SampType: **ICV**	Run ID: **IC4_200918A**	Analysis Date: **9/18/2020 12:20:56 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	24.0	1.00	25.00	0	96.1	90	110			

Sample ID: **CCV1-200918**	Batch ID: **R112344**	TestNo: **E300**	Units: **mg/L**
SampType: **CCV**	Run ID: **IC4_200918A**	Analysis Date: **9/18/2020 6:57:16 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.1	1.00	10.00	0	101	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2009111
Project: LUMINANT-OGSES-FGD PONDS (CCR)

ANALYTICAL QC SUMMARY REPORT

RunID: WC_200916D

The QC data in batch 97914 applies to the following samples: 2009111-01B, 2009111-02B, 2009111-03B, 2009111-04B, 2009111-05B, 2009111-06B

Sample ID: **MB-97914**	Batch ID: **97914**	TestNo: **M2540C**	Units: **mg/L**
SampType: **MBLK**	Run ID: **WC_200916D**	Analysis Date: **9/16/2020 4:45:00 PM**	Prep Date: **9/16/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	<10.0	10.0								

Sample ID: **LCS-97914**	Batch ID: **97914**	TestNo: **M2540C**	Units: **mg/L**
SampType: **LCS**	Run ID: **WC_200916D**	Analysis Date: **9/16/2020 4:45:00 PM**	Prep Date: **9/16/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	774	10.0	745.6	0	104	90	113			

Sample ID: **2009097-01E-DUP**	Batch ID: **97914**	TestNo: **M2540C**	Units: **mg/L**
SampType: **DUP**	Run ID: **WC_200916D**	Analysis Date: **9/16/2020 4:45:00 PM**	Prep Date: **9/16/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	2860	50.0	0	2860				0.175	5	

Sample ID: **2009097-02E-DUP**	Batch ID: **97914**	TestNo: **M2540C**	Units: **mg/L**
SampType: **DUP**	Run ID: **WC_200916D**	Analysis Date: **9/16/2020 4:45:00 PM**	Prep Date: **9/16/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	3990	50.0	0	3980				0.126	5	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

DHL Analytical, Inc.

Date: *12-Oct-20*

CLIENT: Golder
Work Order: 2009111
Project: LUMINANT-OGSES-FGD PONDS (CCR)

MQL SUMMARY REPORT

TestNo: E300	**MDL**	**MQL**
Analyte	**mg/L**	**mg/L**
Chloride	0.300	1.00
Fluoride	0.100	0.400
Sulfate	1.00	3.00

TestNo: SW6020B	**MDL**	**MQL**
Analyte	**mg/L**	**mg/L**
Arsenic	0.00200	0.00500
Barium	0.00300	0.0100
Beryllium	0.000300	0.00100
Boron	0.0100	0.0300
Calcium	0.100	0.300
Chromium	0.00200	0.00500
Cobalt	0.00300	0.00500
Lead	0.000300	0.00100
Lithium	0.00500	0.0100
Molybdenum	0.00200	0.00500
Selenium	0.00200	0.00500
Thallium	0.000500	0.00150

TestNo: M2540C	**MDL**	**MQL**
Analyte	**mg/L**	**mg/L**
Total Dissolved Solids (Residue, Filt	10.0	10.0

Qualifiers: MQL -Method Quantitation Limit as defined by TRRP
MDL -Method Detection Limit as defined by TRRP

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

October 08, 2020

DHL Analytical, Inc.

Sample Delivery Group:	L1263680
Samples Received:	09/18/2020
Project Number:	2009111
Description:	

Report To: John DuPont
2300 Double Creek Drive
Round Rock, TX 78664

Entire Report Reviewed By:

Donna Eidson
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.



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FGD-6 L1263680-01 Non-Potable Water

			Collected by	Collected date/time	Received date/time
				09/15/20 08:05	09/18/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1546570	1	09/21/20 14:49	10/02/20 09:55	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1548584	1	09/25/20 15:57	10/02/20 09:55	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1548584	1	09/25/20 15:57	09/29/20 08:57	RGT	Mt. Juliet, TN

FGD-4 L1263680-02 Non-Potable Water

			Collected by	Collected date/time	Received date/time
				09/15/20 08:05	09/18/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1546570	1	09/21/20 14:49	10/02/20 09:55	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1548584	1	09/25/20 15:57	10/02/20 09:55	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1548584	1	09/25/20 15:57	09/29/20 08:57	RGT	Mt. Juliet, TN

FGD-3 L1263680-03 Non-Potable Water

			Collected by	Collected date/time	Received date/time
				09/15/20 08:05	09/18/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1546570	1	09/21/20 14:49	10/02/20 09:55	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1548584	1	09/25/20 15:57	10/02/20 09:55	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1548584	1	09/25/20 15:57	09/29/20 08:57	RGT	Mt. Juliet, TN

FGD-8 L1263680-04 Non-Potable Water

			Collected by	Collected date/time	Received date/time
				09/15/20 08:05	09/18/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1546570	1	09/21/20 14:49	10/02/20 09:55	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1548584	1	09/25/20 15:57	10/02/20 09:55	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1548584	1	09/25/20 15:57	09/29/20 08:57	RGT	Mt. Juliet, TN

FGD-1 L1263680-05 Non-Potable Water

			Collected by	Collected date/time	Received date/time
				09/15/20 08:05	09/18/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1546570	1	09/21/20 14:49	10/02/20 09:55	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1548584	1	09/25/20 15:57	10/02/20 09:55	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1548584	1	09/25/20 15:57	09/29/20 08:57	RGT	Mt. Juliet, TN

DUP-01 L1263680-06 Non-Potable Water

			Collected by	Collected date/time	Received date/time
				09/15/20 08:05	09/18/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1546570	1	09/21/20 14:49	10/02/20 09:55	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1548584	1	09/25/20 15:57	10/02/20 09:55	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1548584	1	09/25/20 15:57	09/28/20 16:08	RGT	Mt. Juliet, TN

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.



Donna Eidson
Project Manager

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	1.08		0.630	1.16	10/02/2020 09:55	WG1546570
(T) Barium	*92.1*			*62.0-143*	*10/02/2020 09:55*	WG1546570
(T) Yttrium	*113*			*79.0-136*	*10/02/2020 09:55*	WG1546570

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	1.57		0.938	1.5	10/02/2020 09:55	WG1548584

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.485		0.308	0.344	09/29/2020 08:57	WG1548584
(T) Barium-133	*91.8*			*30.0-143*	*09/29/2020 08:57*	WG1548584

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	-0.0258		0.672	1.27	10/02/2020 09:55	WG1546570
(T) Barium	*86.0*			*62.0-143*	*10/02/2020 09:55*	WG1546570
(T) Yttrium	*109*			*79.0-136*	*10/02/2020 09:55*	WG1546570

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.498		0.977	1.54	10/02/2020 09:55	WG1548584

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.498		0.305	0.274	09/29/2020 08:57	WG1548584
(T) Barium-133	*88.2*			*30.0-143*	*09/29/2020 08:57*	WG1548584

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	0.454		0.770	1.44	10/02/2020 09:55	WG1546570
(T) Barium	*80.4*			*62.0-143*	*10/02/2020 09:55*	WG1546570
(T) Yttrium	*102*			*79.0-136*	*10/02/2020 09:55*	WG1546570

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.711		0.978	1.65	10/02/2020 09:55	WG1548584

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.257		0.208	0.206	09/29/2020 08:57	WG1548584
(T) Barium-133	*88.5*			*30.0-143*	*09/29/2020 08:57*	WG1548584

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	6.20		0.766	1.28	10/02/2020 09:55	WG1546570
(T) Barium	*82.2*			*62.0-143*	*10/02/2020 09:55*	WG1546570
(T) Yttrium	*112*			*79.0-136*	*10/02/2020 09:55*	WG1546570

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	8.70		1.39	1.53	10/02/2020 09:55	WG1548584

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	2.50		0.624	0.246	09/29/2020 08:57	WG1548584
(T) Barium-133	*84.9*			*30.0-143*	*09/29/2020 08:57*	WG1548584

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	1.66		0.563	1.01	10/02/2020 09:55	WG1546570
(T) Barium	*84.4*			*62.0-143*	*10/02/2020 09:55*	WG1546570
(T) Yttrium	*111*			*79.0-136*	*10/02/2020 09:55*	WG1546570

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	2.32		0.890	1.22	10/02/2020 09:55	WG1548584

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.664		0.327	0.211	09/29/2020 08:57	WG1548584
(T) Barium-133	*88.6*			*30.0-143*	*09/29/2020 08:57*	WG1548584

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.984		0.697	1.29	10/02/2020 09:55	WG1546570
(T) Barium	*86.5*			*62.0-143*	*10/02/2020 09:55*	WG1546570
(T) Yttrium	*111*			*79.0-136*	*10/02/2020 09:55*	WG1546570

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	1.89		1.11	1.51	10/02/2020 09:55	WG1548584

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.901		0.412	0.221	09/28/2020 16:08	WG1548584
(T) Barium-133	*74.3*			*30.0-143*	*09/28/2020 16:08*	WG1548584

Method Blank (MB)

(MB) R3578670-1 10/01/20 09:50

Analyte	MB Result pCi/l	MB Qualifier	MB MDA pCi/l
Radium-228	0.0699		0.519
(T) Barium	*88.4*		
(T) Yttrium	*91.9*		

L1262467-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1262467-01 10/01/20 09:50 • (DUP) R3578670-5 10/01/20 09:50

Analyte	Original Result pCi/l	DUP Result pCi/l	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-228	0.000	0.159	1	200	0.193		20	3
(T) Barium	*86.3*	*88.9*						
(T) Yttrium	*93.3*	*95.4*						

Laboratory Control Sample (LCS)

(LCS) R3578670-2 10/01/20 09:50

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	5.80	116	80.0-120	
(T) Barium			*83.7*		
(T) Yttrium			*91.3*		

L1262469-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1262469-01 10/01/20 09:50 • (MS) R3578670-3 10/01/20 09:50 • (MSD) R3578670-4 10/01/20 09:50

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	10.0	0.898	12.5	11.7	116	108	1	70.0-130			7.19		20
(T) Barium		*89.9*			*90.3*	*87.8*							
(T) Yttrium		*93.7*			*91.5*	*96.7*							

Method Blank (MB)

(MB) R3576636-1 09/28/20 16:08

Analyte	MB Result	MB Qualifier	MB MDA
	pCi/l		pCi/l
Radium-226	0.0203		0.0669
(T) Barium-133	*96.7*		

L1263701-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1263701-04 09/28/20 16:08 • (DUP) R3576636-5 09/28/20 16:08

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP RER	DUP Qualifier	DUP RPD Limits	DUP RER Limit
	pCi/l	pCi/l		%			%	
Radium-226	0.0953	0.179	1	61.0	0.309		20	3
(T) Barium-133	*88.1*	*95.7*						

Laboratory Control Sample (LCS)

(LCS) R3576636-2 09/28/20 16:08

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	pCi/l	pCi/l	%	%	
Radium-226	5.02	5.37	107	80.0-120	
(T) Barium-133			*96.3*		

L1263682-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1263682-05 09/28/20 16:08 • (MS) R3576636-3 09/28/20 16:08 • (MSD) R3576636-4 09/28/20 16:08

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	MS RER	RPD Limits
	pCi/l	pCi/l	pCi/l	pCi/l	%	%		%			%		%
Radium-226	20.1	0.0611	23.2	20.5	115	102	1	75.0-125			12.2		20
(T) Barium-133		*90.3*			*89.2*	*95.7*							

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDA	Minimum Detectable Activity.
Rec.	Recovery.
RER	Replicate Error Ratio.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(T)	Tracer - A radioisotope of known concentration added to a solution of chemically equivalent radioisotopes at a known concentration to assist in monitoring the yield of the chemical separation.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description

The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

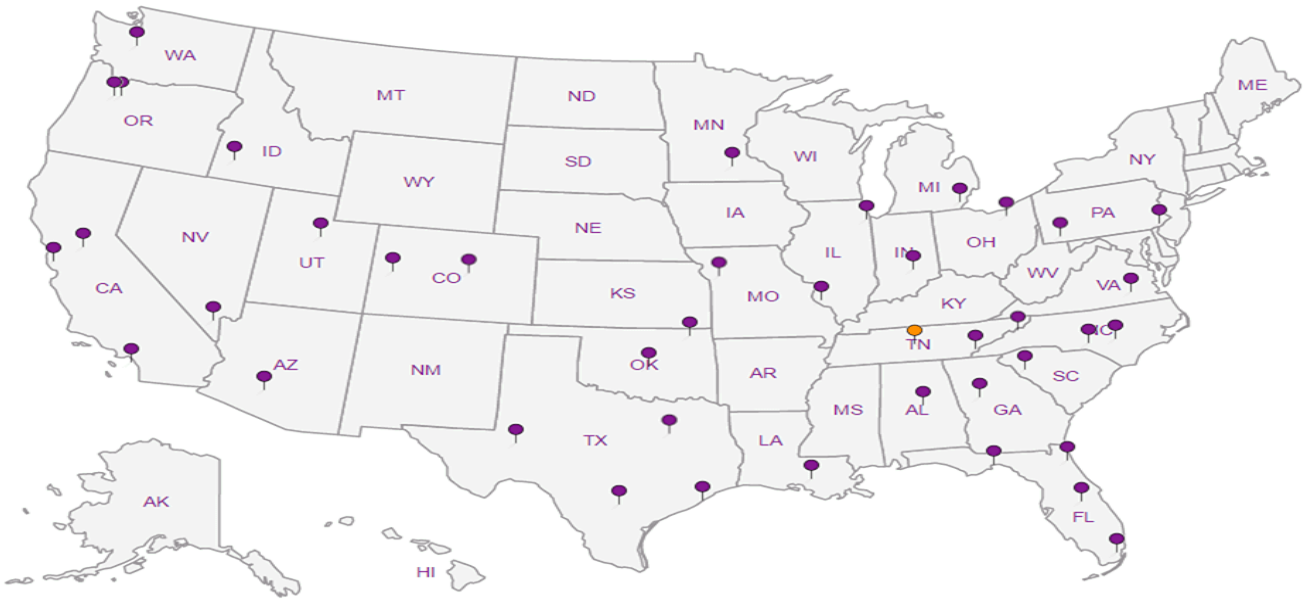
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



DHL Analytical, Inc.
2300 Double Creek Drive
Round Rock, TX 78664
TEL: *(512) 388-8222* FAX: *(512) 388-8229*

CHAIN-OF-CUSTODY RECORD

G193

Work Order: 2009111

L1263680

Subcontractor:
Pace Analytical
12065 Lebanon Rd
Mt. Juliet, TN 37122

TEL: (615) 773-5923
FAX:
Acct #: DHLRRTX

16-Sep-20

Sample ID	Matrix	DHL#	Date Collected	Bottle Type	Requested Tests					
					Ra-228	Ra-226				
					E904.0	M7500 Ra B M				
FGD-6	Aqueous	01C	09/15/20 08:05 AM	1LHDPEHNO3	1					-01
FGD-6	Aqueous	01D	09/15/20 08:05 AM	1LHDPEHNO3		1				-01
FGD-4	Aqueous	02C	09/15/20 08:55 AM	1LHDPEHNO3	1					-02
FGD-4	Aqueous	02D	09/15/20 08:55 AM	1LHDPEHNO3		1				-02
FGD-3	Aqueous	03C	09/15/20 09:45 AM	1LHDPEHNO3	1					-03
FGD-3	Aqueous	03D	09/15/20 09:45 AM	1LHDPEHNO3		1				-03
FGD-8	Aqueous	04C	09/15/20 10:45 AM	1LHDPEHNO3	1					-04
FGD-8	Aqueous	04D	09/15/20 10:45 AM	1LHDPEHNO3		1				-04
FGD-1	Aqueous	05C	09/15/20 12:35 PM	1LHDPEHNO3	1					-05
FGD-1	Aqueous	05D	09/15/20 12:35 PM	1LHDPEHNO3		1				-05
DUP-01	Aqueous	06C	09/15/20 12:35 PM	1LHDPEHNO3	1					-06
DUP-01	Aqueous	06D	09/15/20 12:35 PM	1LHDPEHNO3		1				-06

General Comments:

Please analyze these samples with Normal Turnaround Time.
Report RA-226, Ra-228 & Combined per Specs.
Quality Control Package Needed: Standard - NELAC Rad Test compliant
Email to cac@dhlanalytical.com & dupont@dhlanalytical.com

OK

		Date/Time			Date/Time
Relinquished by:	E	9/16/20 1700	**Received by:**	Mark Kemp	9/18/20 10:00
Relinquished by:			**Received by:**		

Pace Analytical National Center for Testing & Innovation
Cooler Receipt Form

Client: DHLRRTX	L1263680	
Cooler Received/Opened On: 9/18/20 Temperature:	Amb	
Received By: Carol Kemp		
Signature: Carol Kemp		

Receipt Check List	NP	Yes	No
COC Seal Present / Intact?	✓		
COC Signed / Accurate?		✓	
Bottles arrive intact?		✓	
Correct bottles used?		✓	
Sufficient volume sent?		✓	
If Applicable			
VOA Zero headspace?			
Preservation Correct / Checked?		✓	

Quantitative X-Ray Diffraction by Rietveld Refinement

Report Prepared for:	*Golder Associates*
Project Number/ LIMS No.	*17431-01 / MI7024-MAY19*
Batch:	*Oak Grove FDG Ponds*
Sample Receipt:	*May 30, 2019*
Sample Analysis:	*June 12, 2019*
Reporting Date:	*June 14, 2019*
Instrument:	Panalytical X'pert Pro Diffractometer
Test Conditions:	Co radiation, 40 kV, 45 mA Regular Scanning: Step: 0.033°, Step time:0.15s, 2θ range: 6-70°
Interpretations :	HighScore Plus software using Crystallography Open Database (COD) and Joint Committee on Powder Diffraction Standards -International Center for Diffraction Data (JCPDS-ICDD).
Detection Limit :	0.5-2%. Strongly dependent on crystallinity.

Contents:

1) Method Summary
2) Summary of Mineral Assemblages
3) Quantitative XRD Results
4) XRD Pattern(s)

Lain Glossop H.B.Sc / Ben Eaton
Senior Mineralogist / Junior Mineralogist

Sarah Prout, Ph.D.,
Manager: Metallurgy

Method Summary

Mineral Identification and Interpretation:

Mineral identification and interpretation involve matching the diffraction pattern of a test sample material to patterns of single-phase reference materials. The reference patterns from the Crystallography Open Database (COD) and the Joint Committee on Powder Diffraction Standards - International Center for Diffraction Data (JCPDS-ICDD).

Interpretations do not reflect the presence of non-crystalline and/or amorphous compounds, except when internal standards have been added by request. Mineral proportions may be strongly influenced by crystallinity, crystal structure and preferred orientations. Mineral or compound identification and quantitative analysis results should be accompanied by supporting chemical assay data or other additional tests.

Quantitative Rietveld Analysis:

Panalytcal Highscore Plus software was used to perform the quantitative Rietveld Analysis. This software uses a graphics based profile analysis program built around a non-linear least squares fitting system, to quantitatively determine the amount of different phases present in a multicomponent sample. Whole pattern analyses are predicated by the fact that the X-ray diffraction pattern is a total sum of both instrumental and specimen factors. Unlike other peak intensity-based methods, the Rietveld method uses a least squares approach to refine a theoretical line profile (shown as a blue pattern in the analyses plots) until it matches the obtained experimental patterns (shown as the coloured pattern in the analyses plots).

Rietveld refinement is completed with a set of minerals specifically identified for the sample. Zero values indicate that the mineral was included in the refinement calculations, but the calculated concentration was less than 0.5 wt%. Minerals not identified by the analyst are not included in refinement calculations for specific samples and are indicated with a dash.

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WARNING: The sample(s) to which the findings recorded herein (the "Findings") relate was(were) drawn and / or provided by the Client or by a third party acting at the Client's direction. The Findings constitute no warranty of the sample's representativeness of any goods and strictly relate to the sample(s). The Company accepts no liability with regard to the origin or source from which the sample(s) is/are said to be extracted.

Summary of Rietveld Quantitative Analysis X-ray Diffraction Results

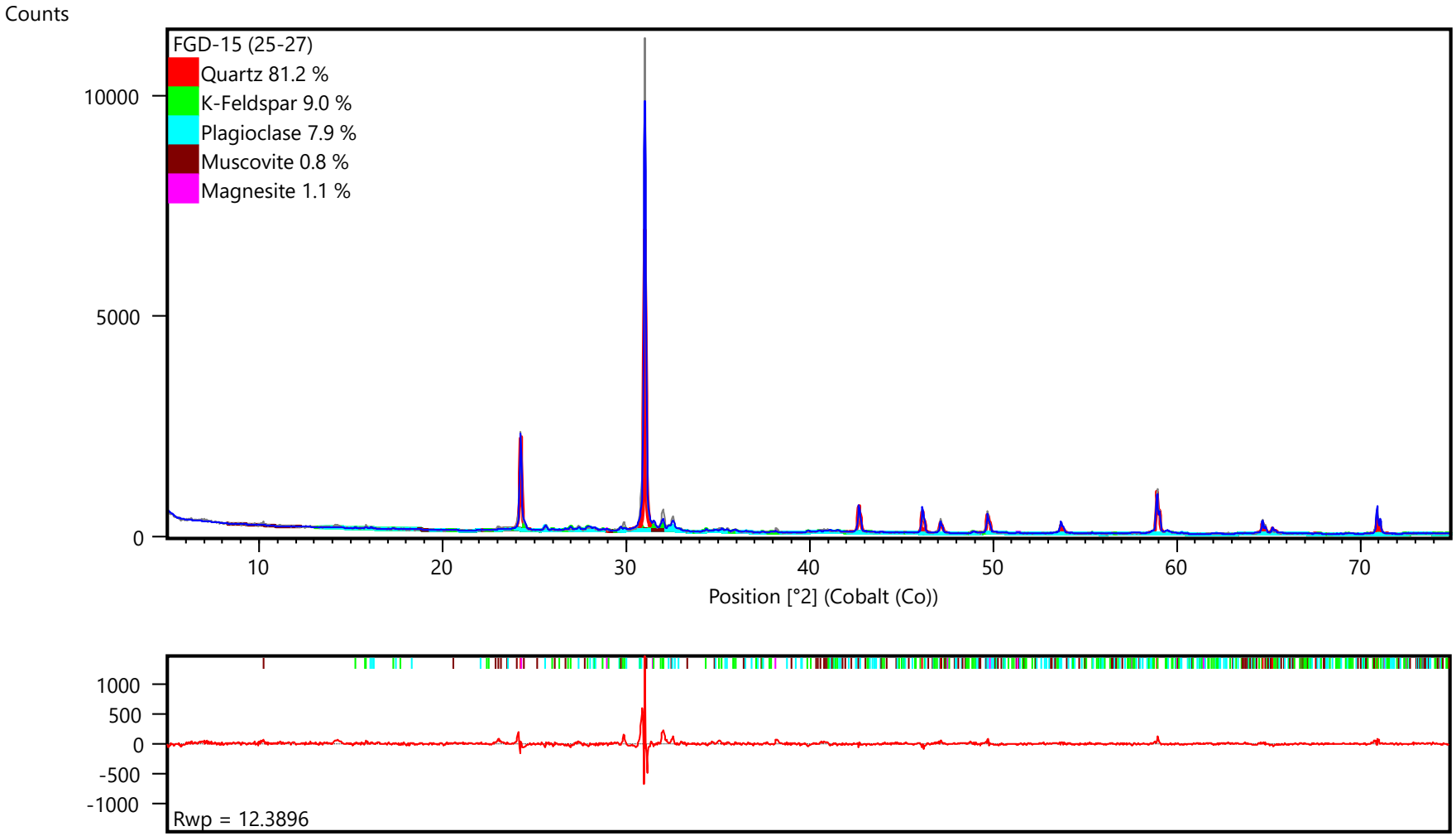
Quantitative X-ray Diffraction Results

Mineral/Compound	1 FGD-15 (25-27)	2 FGD-16 (30-32)	3 FGD-2019-1 (23-25)
	(wt %)	(wt %)	(wt %)
Quartz	81.2	80.5	84.9
K-feldspar	9.0	10.4	6.8
Plagioclase	7.9	9.0	7.3
Muscovite	0.8	0.1	1.0
Magnesite	1.1	--	--
TOTAL	100	100	100

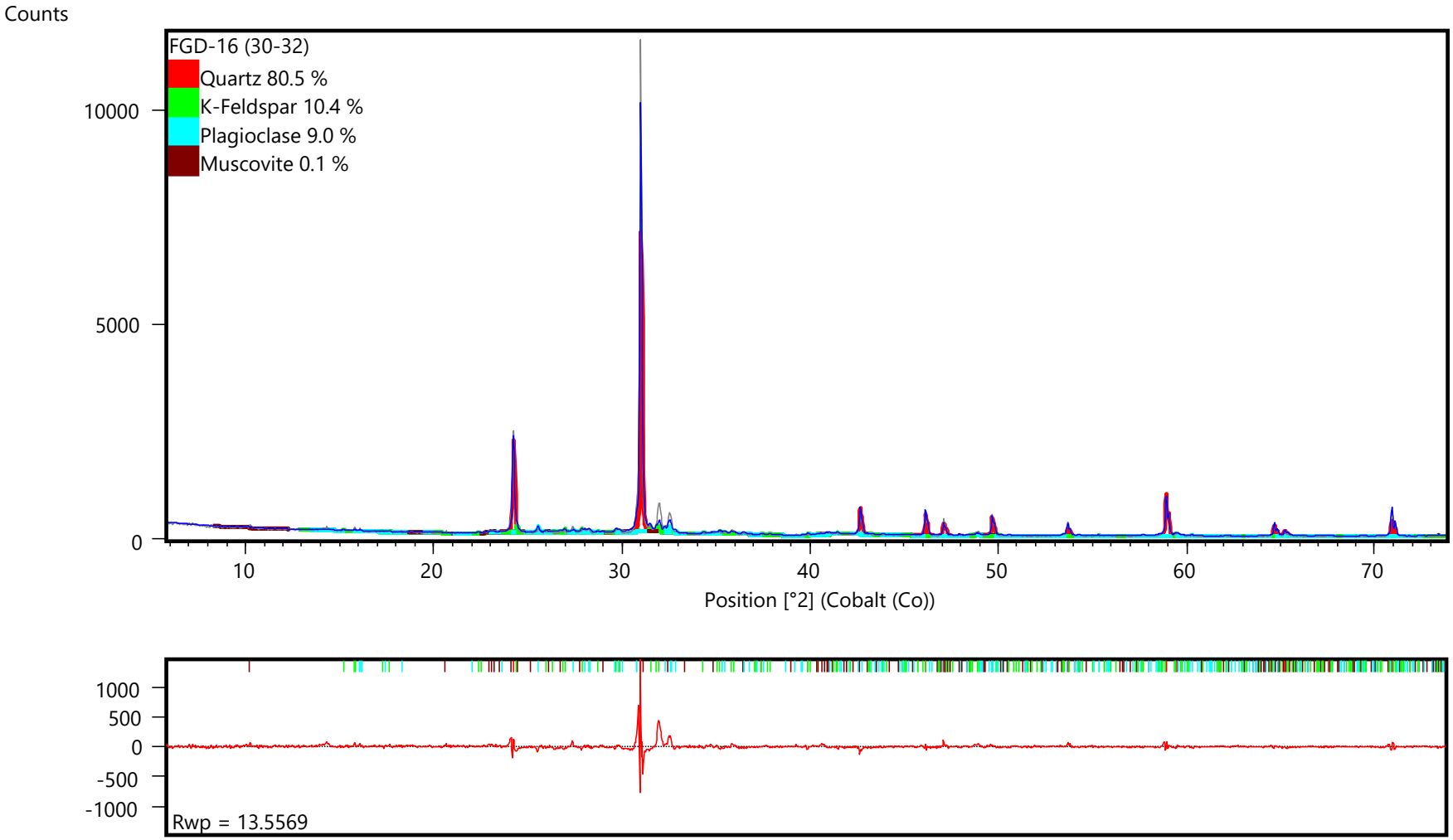
Zero values indicate that the mineral was included in the refinement, but the calculated concentration is below a measurable value.

Dashes indicate that the mineral was not identified by the analyst and not included in the refinement calculation for the sample.

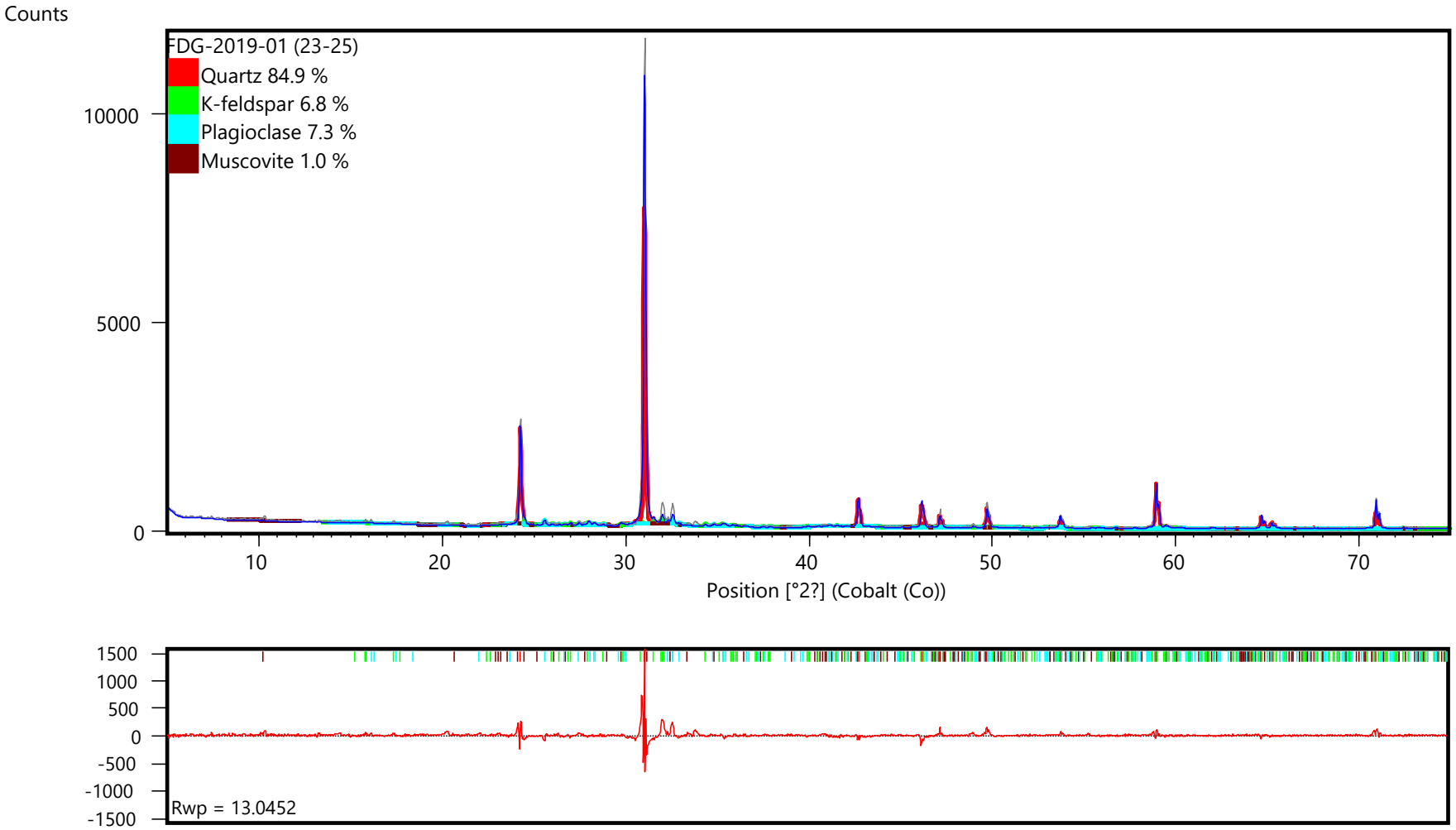
Mineral/Compound	Formula
Quartz	SiO_2
K-feldspar	$KAlSi_3O_8$
Plagioclase	$(Na,Ca)[Al(Si,Al)Si_2O_8]$
Muscovite	$KAl_2(AlSi_3O_{10})(OH)_2$
Magnesite	$MgCO_3$



X-ray diffractogram. The upper pattern is the measured diffractogram, the blue curve is the calculated pattern from the Rietveld Refinement and the lower red curve is the difference plot.



X-ray diffractogram. The upper pattern is the measured diffractogram, the blue curve is the calculated pattern from the Rietveld Refinement and the lower red curve is the difference plot.



X-ray diffractogram. The upper pattern is the measured diffractogram, the blue curve is the calculated pattern from the Rietveld Refinement and the lower red curve is the difference plot.

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ANALYTICAL REPORT

Eurofins TestAmerica, Knoxville
5815 Middlebrook Pike
Knoxville, TN 37921
Tel: (865)291-3000

Laboratory Job ID: 140-15376-1
Client Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

For:
Golder Associates Inc.
2201 Double Creek Dr
Suite 4004
Round Rock, Texas 78664

Attn: Will Vienne

Terry Walker Wasmund

Authorized for release by:
7/30/2019 3:12:58 PM

Terry Walker Wasmund, Project Manager II
(865)291-3000
terry.wasmund@testamericainc.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: Golder Associates Inc. Job ID: 140-15376-1
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Qualifiers

Metals

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
*	RPD of the LCS and LCSD exceeds the control limits
B	Compound was found in the blank and sample.
F3	Duplicate RPD exceeds the control limit
F5	Duplicate RPD exceeds limit, and one or both sample results are less than 5 times RL. The data are considered valid because the absolute difference is less than the RL.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 140-15376-1

Laboratory: Eurofins TestAmerica, Knoxville

Narrative

Job Narrative
140-15376-1

Receipt
The samples were received on 5/24/2019 at 9:40 AM. The samples arrived in good condition, properly preserved, and on ice. The temperature of the cooler at receipt was 0.8º C.

Metals - 7 Step Sequential Extraction Procedure
These soil samples were prepared and analyzed using Eurofins TestAmerica Knoxville standard operating procedure KNOX-MT-0008, "7 Step Sequential Extraction Procedure". SW-846 Method 6010B as incorporated in Eurofins TestAmerica Knoxville standard operating procedure KNOX-MT-0007 was used to perform the final instrument analyses.

An aliquot of each sample was sequentially extracted using the steps listed below:

- ***Step 1 - Exchangeable Fraction***: A 5 gram aliquot of sample was extracted with 25 mL of 1M magnesium sulfate (MgSO4), centrifuged and filtered. 5 mL of the resulting leachate was digested using method 3010A and analyzed by method 6010B. Results are reported in mg/kg on a dry weight basis.
- ***Step 2 - Carbonate Fraction:*** The sample residue from step 1 was extracted with 25 mL of 1M sodium acetate/acetic acid (NaOAc/HOAc) at pH 5, centrifuged and filtered. 5 mL of the resulting leachate was digested using method 3010A and analyzed by method 6010B. Results are reported in mg/kg on a dry weight basis.
- ***Step 3 - Non-crystalline Materials Fraction:*** The sample residue from step 2 was extracted with 25 mL of 0.2M ammonium oxalate (pH 3), centrifuged and filtered. 5 mL of the resulting leachate was digested using method 3010A and analyzed by method 6010B. Results are reported in mg/kg on a dry weight basis.
- ***Step 4 - Metal Hydroxide Fraction:*** The sample residue from step 3 was extracted with 25 mL of 1M hydroxylamine hydrochloride solution in 25% v/v acetic acid, centrifuged and filtered. 5 mL of the resulting leachate was digested using method 3010A and analyzed by method 6010B. Results are reported in mg/kg on a dry weight basis.
- ***Step 5 - Organic-bound Fraction:*** The sample residue from step 4 was extracted three times with 25 mL of 5% sodium hypochlorite (NaClO) at pH 9.5, centrifuged and filtered. The resulting leachates were combined and 5 mL were digested using method 3010A and analyzed by method 6010B. Results are reported in mg/kg on a dry weight basis.
- ***Step 6 - Acid/Sulfide Fraction***: The sample residue from step 5 was extracted with 25 mL of a 3:1:2 v/v solution of HCl-HNO3-H2O, centrifuged and filtered. 5 mL of the resulting leachate was diluted to 50 mL with reagent water and analyzed by method 6010B. Results are reported in mg/kg on a dry weight basis.
- ***Step 7 - Residual Fraction:*** A 1.0 g aliquot of the sample residue from step 6 was digested using HF, HNO3, HCl and H3BO3. The digestate was analyzed by ICP using method 6010B. Results are reported in mg/kg on a dry weight basis.

In addition, a 1.0 g aliquot of the original sample was digested using HF, HNO3, HCl and H3BO3. The digestate was analyzed by ICP using method 6010B. Total metal results are reported in mg/kg on a dry weight basis.

Results were calculated using the following equation:

Result, µg/g or mg/Kg, dry weight = (C × V × V1 × D) / (W × S × V2)

Where:
C = Concentration from instrument readout, µg/mL
V = Final volume of digestate, mL
D = Instrument dilution factor
V1 = Total volume of leachate, mL
V2 = Volume of leachate digested, mL
W = Wet weight of sample, g
S = Percent solids/100

A method blank, laboratory control sample and laboratory control sample duplicate were prepared and analyzed with each SEP step in order to provide information about both the presence of elements of interest in the extraction solutions, and the recovery of elements of interest from the extraction solutions. Results outside of laboratory QC limits do not reflect out of control performance, but rather the effect of the extraction solution upon the analyte.

Job ID: 140-15376-1 (Continued)

Laboratory: Eurofins TestAmerica, Knoxville (Continued)

A laboratory sample duplicate was prepared and analyzed with each batch of samples in order to provide information regarding the reproducibility of the procedure.

SEP Report Notes:
The final report lists the results for each step, the result for the total digestion of the sample, and a sum of the results of steps 1 through 7 by element.

Magnesium was not reported for step 1 because the extraction solution for this step (magnesium sulfate) contains high levels of magnesium. Sodium was not reported for steps 2 and 5 since the extraction solutions for these steps contain high levels of sodium. The sum of steps 1 through 7 is much higher than the total result for sodium and magnesium due to the magnesium and sodium introduced by the extraction solutions.

The step 1 digestates were reanalyzed for vanadium at a 1/10 dilution due to positive interelement interferences resulting from the high magnesium results. The reporting limits were adjusted accordingly.

The digestates for steps 1, 2 and 5 were analyzed at a dilution due to instrument problems caused by the high solids content of the digestates. The reporting limits were adjusted accordingly.

The serial dilution performed for the following samples associated with batch 140-31255 was outside control limits: (140-15376-A-1-A SD ^5), (140-15376-A-1-A SD ^50) and (140-15376-A-1-AA SD ^50)

Samples FGO-15 (25-27) (140-15376-1), FGO-14 (30-32) (140-15376-2), FGO-2019-1 (23-25) (140-15376-3), (140-15376-A-1-AB DU) and (140-15376-A-1-B DU) were diluted due to the presence of silicon or titanium which interferes with Arsenic, Cobalt, Selenium and Thallium. Elevated reporting limits (RLs) are provided.

Sample FGO-2019-1 (23-25) (140-15376-3) was diluted due to the presence of titanium which interferes with Cobalt. Elevated reporting limits (RLs) are provided.

There was a difference between the Total Metals results for cobalt and the Total SEP result for cobalt. At the client's request, the cobalt results for SEP 3 and SEP 4 were confirmed by reanalysis, and the total analysis for metals was reanalyzed with a separate aliquot. The original results for SEP 3 and SEP 4 were confirmed, but the reanalysis of the totals was much higher than the original test result. This suggests that the sample is heterogeneous, as different total cobalt results are obtained by the three tests. The affected sample is FGO-2019-1 (23-25) (140-15376-3).

The sample duplicate (DUP) precision for preparation batch 140-30453, 140-30480, 140-30481, 140-31696 and 140-31697 and analytical batch 140-31197 was outside control limits. Sample non-homogeneity is suspected.

The sample duplicate (DUP) precision for preparation batch 140-30852 and analytical batch 140-31255 was outside control limits. Sample non-homogeneity is suspected.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry - % Moisture
The samples were analyzed for percent moisture using SOP number KNOX-WC-0012 (based on Modified MCAWW 160.3 and SM2540B and on the percent moisture determinations described in methods 3540C and 3550B).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Comments
No additional comments.

Detection Summary

Client: Golder Associates Inc.
Job ID: 140-15376-1
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Client Sample ID: FGO-15 (25-27)
Lab Sample ID: 140-15376-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Manganese	0.47	J	3.9	0.16	mg/Kg	4	☼	6010B SEP	Step 1
Manganese	1.4	J	2.9	1.1	mg/Kg	3	☼	6010B SEP	Step 2
Aluminum	23		13	2.7	mg/Kg	1	☼	6010B SEP	Step 3
Barium	1.4	J B	3.3	0.16	mg/Kg	1	☼	6010B SEP	Step 3
Beryllium	0.020	J	0.33	0.020	mg/Kg	1	☼	6010B SEP	Step 3
Cobalt	0.63	J	3.3	0.059	mg/Kg	1	☼	6010B SEP	Step 3
Iron	58		6.5	3.8	mg/Kg	1	☼	6010B SEP	Step 3
Manganese	14	B	0.98	0.035	mg/Kg	1	☼	6010B SEP	Step 3
Aluminum	600		13	2.1	mg/Kg	1	☼	6010B SEP	Step 4
Arsenic	0.64	J B	0.65	0.29	mg/Kg	1	☼	6010B SEP	Step 4
Barium	9.6		3.3	0.16	mg/Kg	1	☼	6010B SEP	Step 4
Beryllium	0.12	J	0.33	0.021	mg/Kg	1	☼	6010B SEP	Step 4
Cobalt	0.41	J	3.3	0.069	mg/Kg	1	☼	6010B SEP	Step 4
Iron	1400		6.5	3.8	mg/Kg	1	☼	6010B SEP	Step 4
Li	0.93	J	3.3	0.20	mg/Kg	1	☼	6010B SEP	Step 4
Manganese	6.9		0.98	0.17	mg/Kg	1	☼	6010B SEP	Step 4
Selenium	0.65	* B	0.65	0.61	mg/Kg	1	☼	6010B SEP	Step 4
Aluminum	67	J *	200	31	mg/Kg	5	☼	6010B SEP	Step 5
Aluminum	1200		13	2.1	mg/Kg	1	☼	6010B SEP	Step 6
Arsenic	0.62	J	0.65	0.20	mg/Kg	1	☼	6010B SEP	Step 6
Barium	6.0		3.3	0.16	mg/Kg	1	☼	6010B SEP	Step 6
Beryllium	0.053	J	0.33	0.016	mg/Kg	1	☼	6010B SEP	Step 6
Cobalt	0.27	J	3.3	0.060	mg/Kg	1	☼	6010B SEP	Step 6
Iron	1100		6.5	3.8	mg/Kg	1	☼	6010B SEP	Step 6
Li	0.93	J	3.3	0.20	mg/Kg	1	☼	6010B SEP	Step 6
Manganese	10		0.98	0.33	mg/Kg	1	☼	6010B SEP	Step 6
Aluminum	28000		130	21	mg/Kg	10	☼	6010B SEP	Step 7
Arsenic	0.90	J	1.3	0.34	mg/Kg	2	☼	6010B SEP	Step 7
Barium	510		33	1.6	mg/Kg	10	☼	6010B SEP	Step 7
Beryllium	0.48		0.33	0.0098	mg/Kg	1	☼	6010B SEP	Step 7
Cobalt	0.48	J	6.5	0.39	mg/Kg	2	☼	6010B SEP	Step 7
Iron	2900		6.5	5.4	mg/Kg	1	☼	6010B SEP	Step 7
Li	7.0		3.3	0.20	mg/Kg	1	☼	6010B SEP	Step 7
Manganese	54	B	0.98	0.068	mg/Kg	1	☼	6010B SEP	Step 7
Mo	0.11	J	2.6	0.11	mg/Kg	1	☼	6010B SEP	Step 7
Thallium	0.59	J	4.6	0.47	mg/Kg	2	☼	6010B SEP	Step 7
Aluminum	30000		10	1.6	mg/Kg	1		6010B SEP	Sum of Steps 1-7
Arsenic	2.2		0.50	0.13	mg/Kg	1		6010B SEP	Sum of Steps 1-7
Barium	530		2.5	0.12	mg/Kg	1		6010B SEP	Sum of Steps 1-7
Beryllium	0.67		0.25	0.0075	mg/Kg	1		6010B SEP	Sum of Steps 1-7
Cobalt	1.8	J	2.5	0.023	mg/Kg	1		6010B SEP	Sum of Steps 1-7
Iron	5400		5.0	4.1	mg/Kg	1		6010B SEP	Sum of Steps 1-7
Li	8.9		2.5	0.15	mg/Kg	1		6010B SEP	Sum of Steps 1-7
Manganese	88		0.75	0.052	mg/Kg	1		6010B SEP	Sum of Steps 1-7

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Knoxville

Detection Summary

Client: Golder Associates Inc.
Job ID: 140-15376-1
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Client Sample ID: FGO-15 (25-27) (Continued)
Lab Sample ID: 140-15376-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Mo	0.11	J	2.0	0.082	mg/Kg	1		6010B SEP	Sum of Steps 1-7
Selenium	0.65		0.50	0.17	mg/Kg	1		6010B SEP	Sum of Steps 1-7
Thallium	0.59	J	1.8	0.18	mg/Kg	1		6010B SEP	Sum of Steps 1-7
Chromium	4.2		1.8	0.27	mg/Kg	1	☼	6010B	Total/NA
Lead	3.2		1.8	0.34	mg/Kg	1	☼	6010B	Total/NA
Phosphorus	69		36	2.9	mg/Kg	1	☼	6010B	Total/NA
Aluminum	46000		130	21	mg/Kg	10	☼	6010B	Total/NA
Arsenic	1.6		0.65	0.17	mg/Kg	1	☼	6010B	Total/NA
Barium	670		33	1.6	mg/Kg	10	☼	6010B	Total/NA
Beryllium	0.71		0.33	0.0098	mg/Kg	1	☼	6010B	Total/NA
Cobalt	1.8	J	6.5	0.39	mg/Kg	2	☼	6010B	Total/NA
Iron	5700		6.5	5.4	mg/Kg	1	☼	6010B	Total/NA
Lithium	10		3.3	0.20	mg/Kg	1	☼	6010B	Total/NA
Manganese	93		0.98	0.068	mg/Kg	1	☼	6010B	Total/NA
Molybdenum	0.21	J	2.6	0.11	mg/Kg	1	☼	6010B	Total/NA

Client Sample ID: FGO-14 (30-32)
Lab Sample ID: 140-15376-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.67	J	13	0.61	mg/Kg	4	☼	6010B SEP	Step 1
Manganese	0.20	J	3.8	0.16	mg/Kg	4	☼	6010B SEP	Step 1
Barium	0.55	J *	9.5	0.45	mg/Kg	3	☼	6010B SEP	Step 2
Aluminum	40		13	2.7	mg/Kg	1	☼	6010B SEP	Step 3
Arsenic	0.28	J	0.63	0.16	mg/Kg	1	☼	6010B SEP	Step 3
Barium	6.4	B	3.2	0.15	mg/Kg	1	☼	6010B SEP	Step 3
Beryllium	0.036	J	0.32	0.019	mg/Kg	1	☼	6010B SEP	Step 3
Cobalt	0.63	J	3.2	0.057	mg/Kg	1	☼	6010B SEP	Step 3
Iron	31		6.3	3.7	mg/Kg	1	☼	6010B SEP	Step 3
Manganese	4.4	B	0.95	0.034	mg/Kg	1	☼	6010B SEP	Step 3
Aluminum	990		13	2.0	mg/Kg	1	☼	6010B SEP	Step 4
Arsenic	1.1	B	0.63	0.28	mg/Kg	1	☼	6010B SEP	Step 4
Barium	12		3.2	0.15	mg/Kg	1	☼	6010B SEP	Step 4
Beryllium	0.18	J	0.32	0.020	mg/Kg	1	☼	6010B SEP	Step 4
Cobalt	0.63	J	3.2	0.067	mg/Kg	1	☼	6010B SEP	Step 4
Iron	2100		6.3	3.7	mg/Kg	1	☼	6010B SEP	Step 4
Li	0.27	J	3.2	0.19	mg/Kg	1	☼	6010B SEP	Step 4
Manganese	4.8		0.95	0.16	mg/Kg	1	☼	6010B SEP	Step 4
Aluminum	90	J *	190	30	mg/Kg	5	☼	6010B SEP	Step 5
Aluminum	1600		13	2.0	mg/Kg	1	☼	6010B SEP	Step 6
Arsenic	0.69		0.63	0.19	mg/Kg	1	☼	6010B SEP	Step 6
Barium	4.2		3.2	0.15	mg/Kg	1	☼	6010B SEP	Step 6
Beryllium	0.056	J	0.32	0.015	mg/Kg	1	☼	6010B SEP	Step 6
Cobalt	0.32	J	3.2	0.058	mg/Kg	1	☼	6010B SEP	Step 6
Iron	1300		6.3	3.7	mg/Kg	1	☼	6010B SEP	Step 6
Li	0.57	J	3.2	0.19	mg/Kg	1	☼	6010B SEP	Step 6
Manganese	6.4		0.95	0.32	mg/Kg	1	☼	6010B SEP	Step 6
Aluminum	39000		130	20	mg/Kg	10	☼	6010B SEP	Step 7
Arsenic	0.47	J	1.3	0.33	mg/Kg	2	☼	6010B SEP	Step 7
Barium	520		32	1.5	mg/Kg	10	☼	6010B SEP	Step 7

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Golder Associates Inc.
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Client Sample ID: FGO-14 (30-32) (Continued)

Lab Sample ID: 140-15376-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Beryllium	0.59		0.32	0.0095	mg/Kg	1	☼	6010B SEP	Step 7
Cobalt	0.62	J	6.3	0.38	mg/Kg	2	☼	6010B SEP	Step 7
Iron	3100		6.3	5.2	mg/Kg	1	☼	6010B SEP	Step 7
Li	7.9		3.2	0.19	mg/Kg	1	☼	6010B SEP	Step 7
Manganese	18	B	0.95	0.066	mg/Kg	1	☼	6010B SEP	Step 7
Thallium	0.95	J	4.4	0.45	mg/Kg	2	☼	6010B SEP	Step 7
Aluminum	42000		10	1.6	mg/Kg	1		6010B SEP	Sum of Steps 1-7
Arsenic	2.5		0.50	0.13	mg/Kg	1		6010B SEP	Sum of Steps 1-7
Barium	540		2.5	0.12	mg/Kg	1		6010B SEP	Sum of Steps 1-7
Beryllium	0.86		0.25	0.0075	mg/Kg	1		6010B SEP	Sum of Steps 1-7
Cobalt	2.2	J	2.5	0.023	mg/Kg	1		6010B SEP	Sum of Steps 1-7
Iron	6600		5.0	4.1	mg/Kg	1		6010B SEP	Sum of Steps 1-7
Li	8.7		2.5	0.15	mg/Kg	1		6010B SEP	Sum of Steps 1-7
Manganese	34		0.75	0.052	mg/Kg	1		6010B SEP	Sum of Steps 1-7
Thallium	0.95	J	1.8	0.18	mg/Kg	1		6010B SEP	Sum of Steps 1-7
Chromium	3.3		1.8	0.26	mg/Kg	1	☼	6010B	Total/NA
Lead	3.4		1.8	0.33	mg/Kg	1	☼	6010B	Total/NA
Phosphorus	43		35	2.8	mg/Kg	1	☼	6010B	Total/NA
Aluminum	44000		130	20	mg/Kg	10	☼	6010B	Total/NA
Arsenic	2.5		1.3	0.33	mg/Kg	2	☼	6010B	Total/NA
Barium	760		32	1.5	mg/Kg	10	☼	6010B	Total/NA
Beryllium	0.85		0.32	0.0095	mg/Kg	1	☼	6010B	Total/NA
Cobalt	1.7	J	6.3	0.38	mg/Kg	2	☼	6010B	Total/NA
Iron	5900		6.3	5.2	mg/Kg	1	☼	6010B	Total/NA
Lithium	7.6		3.2	0.19	mg/Kg	1	☼	6010B	Total/NA
Manganese	34		0.95	0.066	mg/Kg	1	☼	6010B	Total/NA
Molybdenum	0.16	J	2.5	0.10	mg/Kg	1	☼	6010B	Total/NA
Thallium	0.68	J	4.4	0.45	mg/Kg	2	☼	6010B	Total/NA

Client Sample ID: FGO-2019-1 (23-25)

Lab Sample ID: 140-15376-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.86	J	13	0.62	mg/Kg	4	☼	6010B SEP	Step 1
Manganese	0.99	J	3.9	0.16	mg/Kg	4	☼	6010B SEP	Step 1
Barium	1.9	J *	9.7	0.47	mg/Kg	3	☼	6010B SEP	Step 2
Selenium	0.88	J B	1.9	0.66	mg/Kg	3	☼	6010B SEP	Step 2
Aluminum	62		13	2.7	mg/Kg	1	☼	6010B SEP	Step 3
Arsenic	0.30	J	0.65	0.17	mg/Kg	1	☼	6010B SEP	Step 3
Barium	4.0	B	3.2	0.16	mg/Kg	1	☼	6010B SEP	Step 3
Beryllium	0.10	J	0.32	0.019	mg/Kg	1	☼	6010B SEP	Step 3
Cobalt	29		3.2	0.058	mg/Kg	1	☼	6010B SEP	Step 3
Cobalt	29		3.2	0.058	mg/Kg	1	☼	6010B SEP	Step 3
Iron	61		6.5	3.8	mg/Kg	1	☼	6010B SEP	Step 3
Li	0.80	J	3.2	0.19	mg/Kg	1	☼	6010B SEP	Step 3
Manganese	110	B	0.97	0.035	mg/Kg	1	☼	6010B SEP	Step 3

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Knoxville

Client Sample ID: FGO-2019-1 (23-25) (Continued) Lab Sample ID: 140-15376-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Aluminum	1800		13	2.1	mg/Kg	1	☼	6010B SEP	Step 4
Arsenic	1.9	B	0.65	0.29	mg/Kg	1	☼	6010B SEP	Step 4
Barium	14		3.2	0.16	mg/Kg	1	☼	6010B SEP	Step 4
Beryllium	0.25	J	0.32	0.021	mg/Kg	1	☼	6010B SEP	Step 4
Cobalt	36		3.2	0.069	mg/Kg	1	☼	6010B SEP	Step 4
Cobalt	35		3.2	0.069	mg/Kg	1	☼	6010B SEP	Step 4
Iron	3400		6.5	3.8	mg/Kg	1	☼	6010B SEP	Step 4
Li	3.9		3.2	0.19	mg/Kg	1	☼	6010B SEP	Step 4
Manganese	98		0.97	0.17	mg/Kg	1	☼	6010B SEP	Step 4
Mo	0.18	J	2.6	0.11	mg/Kg	1	☼	6010B SEP	Step 4
Aluminum	65	J *	190	30	mg/Kg	5	☼	6010B SEP	Step 5
Barium	27	J *	49	2.3	mg/Kg	5	☼	6010B SEP	Step 5
Cobalt	2.6	J *	49	0.78	mg/Kg	5	☼	6010B SEP	Step 5
Aluminum	2600		13	2.1	mg/Kg	1	☼	6010B SEP	Step 6
Arsenic	1.6		0.65	0.19	mg/Kg	1	☼	6010B SEP	Step 6
Barium	35		3.2	0.16	mg/Kg	1	☼	6010B SEP	Step 6
Beryllium	0.074	J	0.32	0.016	mg/Kg	1	☼	6010B SEP	Step 6
Cobalt	1.6	J	3.2	0.060	mg/Kg	1	☼	6010B SEP	Step 6
Iron	1100		6.5	3.8	mg/Kg	1	☼	6010B SEP	Step 6
Li	1.2	J	3.2	0.19	mg/Kg	1	☼	6010B SEP	Step 6
Manganese	10		0.97	0.32	mg/Kg	1	☼	6010B SEP	Step 6
Mo	0.21	J	2.6	0.13	mg/Kg	1	☼	6010B SEP	Step 6
Aluminum	33000		130	21	mg/Kg	10	☼	6010B SEP	Step 7
Arsenic	1.2		0.65	0.17	mg/Kg	1	☼	6010B SEP	Step 7
Barium	410		32	1.6	mg/Kg	10	☼	6010B SEP	Step 7
Beryllium	0.39		0.32	0.0097	mg/Kg	1	☼	6010B SEP	Step 7
Cobalt	0.70	J	6.5	0.39	mg/Kg	2	☼	6010B SEP	Step 7
Iron	4400		6.5	5.3	mg/Kg	1	☼	6010B SEP	Step 7
Li	14		3.2	0.19	mg/Kg	1	☼	6010B SEP	Step 7
Manganese	19	B	0.97	0.067	mg/Kg	1	☼	6010B SEP	Step 7
Mo	0.80	J	2.6	0.11	mg/Kg	1	☼	6010B SEP	Step 7
Aluminum	38000		10	1.6	mg/Kg	1		6010B SEP	Sum of Steps 1-7
Arsenic	5.0		0.50	0.13	mg/Kg	1		6010B SEP	Sum of Steps 1-7
Barium	490		2.5	0.12	mg/Kg	1		6010B SEP	Sum of Steps 1-7
Beryllium	0.81		0.25	0.0075	mg/Kg	1		6010B SEP	Sum of Steps 1-7
Cobalt	69		2.5	0.023	mg/Kg	1		6010B SEP	Sum of Steps 1-7
Iron	9100		5.0	4.1	mg/Kg	1		6010B SEP	Sum of Steps 1-7
Li	20		2.5	0.15	mg/Kg	1		6010B SEP	Sum of Steps 1-7
Manganese	230		0.75	0.052	mg/Kg	1		6010B SEP	Sum of Steps 1-7
Mo	1.2	J	2.0	0.082	mg/Kg	1		6010B SEP	Sum of Steps 1-7
Selenium	0.88		0.50	0.17	mg/Kg	1		6010B SEP	Sum of Steps 1-7
Chromium	4.8		1.8	0.27	mg/Kg	1	☼	6010B	Total/NA
Lead	6.0		1.8	0.34	mg/Kg	1	☼	6010B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: FGO-2019-1 (23-25) (Continued)
Lab Sample ID: 140-15376-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Phosphorus	65		36	2.9	mg/Kg	1	☼	6010B	Total/NA
Aluminum	43000		130	21	mg/Kg	10	☼	6010B	Total/NA
Arsenic	7.6		0.65	0.17	mg/Kg	1	☼	6010B	Total/NA
Barium	730		32	1.6	mg/Kg	10	☼	6010B	Total/NA
Beryllium	0.76		0.32	0.0097	mg/Kg	1	☼	6010B	Total/NA
Cobalt	6.9		3.2	0.19	mg/Kg	1	☼	6010B	Total/NA
Cobalt	17		6.5	0.39	mg/Kg	2	☼	6010B	Total/NA
Iron	8400		6.5	5.3	mg/Kg	1	☼	6010B	Total/NA
Lithium	14		3.2	0.19	mg/Kg	1	☼	6010B	Total/NA
Manganese	61		0.97	0.067	mg/Kg	1	☼	6010B	Total/NA
Molybdenum	1.1	J	2.6	0.11	mg/Kg	1	☼	6010B	Total/NA
Thallium	0.85	J	2.3	0.23	mg/Kg	1	☼	6010B	Total/NA
Hg	0.15		0.13	0.052	mg/Kg	1	☼	7470A	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: FGO-15 (25-27)
Date Collected: 05/22/19 19:15
Date Received: 05/24/19 09:40

Lab Sample ID: 140-15376-1
Matrix: Solid
Percent Solids: 76.6

Method: 6010B SEP - SEP Metals (ICP) - Step 1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		52	8.4	mg/Kg	☼	05/31/19 08:00	06/17/19 14:14	4
Antimony	ND		16	1.5	mg/Kg	☼	05/31/19 08:00	06/17/19 14:14	4
Arsenic	ND		2.6	0.68	mg/Kg	☼	05/31/19 08:00	06/17/19 14:14	4
Barium	ND		13	0.63	mg/Kg	☼	05/31/19 08:00	06/17/19 14:14	4
Beryllium	ND		1.3	0.40	mg/Kg	☼	05/31/19 08:00	06/17/19 14:14	4
Cobalt	ND		13	0.24	mg/Kg	☼	05/31/19 08:00	06/17/19 14:14	4
Iron	ND		26	15	mg/Kg	☼	05/31/19 08:00	06/17/19 14:14	4
Li	ND		13	0.78	mg/Kg	☼	05/31/19 08:00	06/17/19 14:14	4
Manganese	**0.47**	**J**	3.9	0.16	mg/Kg	☼	05/31/19 08:00	06/17/19 14:14	4
Mo	ND		10	0.43	mg/Kg	☼	05/31/19 08:00	06/17/19 14:14	4
Selenium	ND		2.6	0.89	mg/Kg	☼	05/31/19 08:00	06/17/19 14:14	4
Thallium	ND		9.1	1.1	mg/Kg	☼	05/31/19 08:00	06/17/19 14:14	4

Method: 6010B SEP - SEP Metals (ICP) - Step 2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND	*	39	6.3	mg/Kg	☼	06/03/19 08:00	06/17/19 15:37	3
Antimony	ND		12	1.1	mg/Kg	☼	06/03/19 08:00	06/17/19 15:37	3
Arsenic	ND		2.0	0.51	mg/Kg	☼	06/03/19 08:00	06/17/19 15:37	3
Barium	ND	*	9.8	0.47	mg/Kg	☼	06/03/19 08:00	06/17/19 15:37	3
Beryllium	ND	*	0.98	0.063	mg/Kg	☼	06/03/19 08:00	06/17/19 15:37	3
Cobalt	ND		9.8	0.25	mg/Kg	☼	06/03/19 08:00	06/17/19 15:37	3
Iron	ND	*	20	11	mg/Kg	☼	06/03/19 08:00	06/17/19 15:37	3
Li	ND		9.8	0.59	mg/Kg	☼	06/03/19 08:00	06/17/19 15:37	3
Manganese	**1.4**	**J**	2.9	1.1	mg/Kg	☼	06/03/19 08:00	06/17/19 15:37	3
Mo	ND		7.8	0.32	mg/Kg	☼	06/03/19 08:00	06/17/19 15:37	3
Selenium	ND		2.0	0.67	mg/Kg	☼	06/03/19 08:00	06/17/19 15:37	3
Thallium	ND		6.9	0.82	mg/Kg	☼	06/03/19 08:00	06/17/19 15:37	3

Method: 6010B SEP - SEP Metals (ICP) - Step 3

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**23**		13	2.7	mg/Kg	☼	06/04/19 08:00	06/26/19 17:30	1
Antimony	ND		3.9	0.37	mg/Kg	☼	06/04/19 08:00	06/26/19 17:30	1
Arsenic	ND		0.65	0.17	mg/Kg	☼	06/04/19 08:00	06/26/19 17:30	1
Barium	**1.4**	**J B**	3.3	0.16	mg/Kg	☼	06/04/19 08:00	06/26/19 17:30	1
Beryllium	**0.020**	**J**	0.33	0.020	mg/Kg	☼	06/04/19 08:00	06/26/19 17:30	1
Cobalt	**0.63**	**J**	3.3	0.059	mg/Kg	☼	06/04/19 08:00	06/26/19 17:30	1
Iron	**58**		6.5	3.8	mg/Kg	☼	06/04/19 08:00	06/26/19 17:30	1
Li	ND		3.3	0.20	mg/Kg	☼	06/04/19 08:00	06/26/19 17:30	1
Manganese	**14**	**B**	0.98	0.035	mg/Kg	☼	06/04/19 08:00	06/26/19 17:30	1
Mo	ND		2.6	0.11	mg/Kg	☼	06/04/19 08:00	06/26/19 17:30	1
Selenium	ND		0.65	0.22	mg/Kg	☼	06/04/19 08:00	06/26/19 17:30	1
Thallium	ND		2.3	0.27	mg/Kg	☼	06/04/19 08:00	06/26/19 17:30	1

Method: 6010B SEP - SEP Metals (ICP) - Step 4

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**600**		13	2.1	mg/Kg	☼	06/10/19 08:00	06/26/19 18:52	1
Antimony	ND		3.9	0.59	mg/Kg	☼	06/10/19 08:00	06/26/19 18:52	1
Arsenic	**0.64**	**J B**	0.65	0.29	mg/Kg	☼	06/10/19 08:00	06/26/19 18:52	1
Barium	**9.6**		3.3	0.16	mg/Kg	☼	06/10/19 08:00	06/26/19 18:52	1
Beryllium	**0.12**	**J**	0.33	0.021	mg/Kg	☼	06/10/19 08:00	06/26/19 18:52	1

Client Sample ID: FGO-15 (25-27) **Lab Sample ID: 140-15376-1**
Date Collected: 05/22/19 19:15 **Matrix: Solid**
Date Received: 05/24/19 09:40 **Percent Solids: 76.6**

Method: 6010B SEP - SEP Metals (ICP) - Step 4 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	0.41	J	3.3	0.069	mg/Kg	☼	06/10/19 08:00	06/26/19 18:52	1
Iron	1400		6.5	3.8	mg/Kg	☼	06/10/19 08:00	06/26/19 18:52	1
Li	0.93	J	3.3	0.20	mg/Kg	☼	06/10/19 08:00	06/26/19 18:52	1
Manganese	6.9		0.98	0.17	mg/Kg	☼	06/10/19 08:00	06/26/19 18:52	1
Mo	ND		2.6	0.11	mg/Kg	☼	06/10/19 08:00	06/26/19 18:52	1
Selenium	0.65	* B	0.65	0.61	mg/Kg	☼	06/10/19 08:00	06/26/19 18:52	1
Thallium	ND		2.3	0.38	mg/Kg	☼	06/10/19 08:00	06/26/19 18:52	1

Method: 6010B SEP - SEP Metals (ICP) - Step 5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	67	J *	200	31	mg/Kg	☼	06/12/19 08:00	06/26/19 20:25	5
Antimony	ND		59	5.5	mg/Kg	☼	06/12/19 08:00	06/26/19 20:25	5
Arsenic	ND		9.8	2.5	mg/Kg	☼	06/12/19 08:00	06/26/19 20:25	5
Barium	ND	*	49	2.4	mg/Kg	☼	06/12/19 08:00	06/26/19 20:25	5
Beryllium	ND	*	4.9	0.41	mg/Kg	☼	06/12/19 08:00	06/26/19 20:25	5
Cobalt	ND	*	49	0.78	mg/Kg	☼	06/12/19 08:00	06/26/19 20:25	5
Iron	ND	*	98	57	mg/Kg	☼	06/12/19 08:00	06/26/19 20:25	5
Li	ND		49	2.9	mg/Kg	☼	06/12/19 08:00	06/26/19 20:25	5
Manganese	ND	*	15	2.4	mg/Kg	☼	06/12/19 08:00	06/26/19 20:25	5
Mo	ND		39	1.6	mg/Kg	☼	06/12/19 08:00	06/26/19 20:25	5
Selenium	ND		9.8	3.4	mg/Kg	☼	06/12/19 08:00	06/26/19 20:25	5
Thallium	ND	*	34	4.6	mg/Kg	☼	06/12/19 08:00	06/26/19 20:25	5

Method: 6010B SEP - SEP Metals (ICP) - Step 6

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	1200		13	2.1	mg/Kg	☼	06/15/19 08:00	06/26/19 21:48	1
Antimony	ND		3.9	0.37	mg/Kg	☼	06/15/19 08:00	06/26/19 21:48	1
Arsenic	0.62	J	0.65	0.20	mg/Kg	☼	06/15/19 08:00	06/26/19 21:48	1
Barium	6.0		3.3	0.16	mg/Kg	☼	06/15/19 08:00	06/26/19 21:48	1
Beryllium	0.053	J	0.33	0.016	mg/Kg	☼	06/15/19 08:00	06/26/19 21:48	1
Cobalt	0.27	J	3.3	0.060	mg/Kg	☼	06/15/19 08:00	06/26/19 21:48	1
Iron	1100		6.5	3.8	mg/Kg	☼	06/15/19 08:00	06/26/19 21:48	1
Li	0.93	J	3.3	0.20	mg/Kg	☼	06/15/19 08:00	06/26/19 21:48	1
Manganese	10		0.98	0.33	mg/Kg	☼	06/15/19 08:00	06/26/19 21:48	1
Mo	ND		2.6	0.13	mg/Kg	☼	06/15/19 08:00	06/26/19 21:48	1
Selenium	ND		0.65	0.22	mg/Kg	☼	06/15/19 08:00	06/26/19 21:48	1
Thallium	ND		2.3	0.27	mg/Kg	☼	06/15/19 08:00	06/26/19 21:48	1

Method: 6010B SEP - SEP Metals (ICP) - Step 7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	28000		130	21	mg/Kg	☼	06/16/19 08:00	06/28/19 14:17	10
Antimony	ND		3.9	0.18	mg/Kg	☼	06/16/19 08:00	06/28/19 12:53	1
Arsenic	0.90	J	1.3	0.34	mg/Kg	☼	06/16/19 08:00	06/28/19 17:43	2
Barium	510		33	1.6	mg/Kg	☼	06/16/19 08:00	06/28/19 14:17	10
Beryllium	0.48		0.33	0.0098	mg/Kg	☼	06/16/19 08:00	06/28/19 12:53	1
Cobalt	0.48	J	6.5	0.39	mg/Kg	☼	06/16/19 08:00	06/28/19 17:43	2
Iron	2900		6.5	5.4	mg/Kg	☼	06/16/19 08:00	06/28/19 12:53	1
Li	7.0		3.3	0.20	mg/Kg	☼	06/16/19 08:00	06/28/19 12:53	1
Manganese	54	B	0.98	0.068	mg/Kg	☼	06/16/19 08:00	06/28/19 12:53	1
Mo	0.11	J	2.6	0.11	mg/Kg	☼	06/16/19 08:00	06/28/19 12:53	1

Client Sample ID: FGO-15 (25-27) **Lab Sample ID: 140-15376-1**
Date Collected: 05/22/19 19:15 **Matrix: Solid**
Date Received: 05/24/19 09:40 **Percent Solids: 76.6**

Method: 6010B SEP - SEP Metals (ICP) - Step 7 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Selenium	ND		1.3	0.44	mg/Kg	☼	06/16/19 08:00	06/28/19 17:43	2
Thallium	**0.59**	**J**	4.6	0.47	mg/Kg	☼	06/16/19 08:00	06/28/19 17:43	2

Method: 6010B SEP - SEP Metals (ICP) - Sum of Steps 1-7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**30000**		10	1.6	mg/Kg			07/11/19 10:59	1
Antimony	ND		3.0	0.14	mg/Kg			07/11/19 10:59	1
Arsenic	**2.2**		0.50	0.13	mg/Kg			07/11/19 10:59	1
Barium	**530**		2.5	0.12	mg/Kg			07/11/19 10:59	1
Beryllium	**0.67**		0.25	0.0075	mg/Kg			07/11/19 10:59	1
Cobalt	**1.8**	**J**	2.5	0.023	mg/Kg			07/11/19 10:59	1
Iron	**5400**		5.0	4.1	mg/Kg			07/11/19 10:59	1
Li	**8.9**		2.5	0.15	mg/Kg			07/11/19 10:59	1
Manganese	**88**		0.75	0.052	mg/Kg			07/11/19 10:59	1
Mo	**0.11**	**J**	2.0	0.082	mg/Kg			07/11/19 10:59	1
Selenium	**0.65**		0.50	0.17	mg/Kg			07/11/19 10:59	1
Thallium	**0.59**	**J**	1.8	0.18	mg/Kg			07/11/19 10:59	1

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		24	12	mg/Kg	☼	06/16/19 08:00	06/17/19 11:27	1
Chromium	**4.2**		1.8	0.27	mg/Kg	☼	06/16/19 08:00	06/17/19 11:27	1
Lead	**3.2**		1.8	0.34	mg/Kg	☼	06/16/19 08:00	06/17/19 11:27	1
Phosphorus	**69**		36	2.9	mg/Kg	☼	06/16/19 08:00	06/17/19 11:27	1

Method: 6010B - SEP Metals (ICP) - Total

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**46000**		130	21	mg/Kg	☼	05/30/19 08:00	06/28/19 16:37	10
Antimony	ND		3.9	0.18	mg/Kg	☼	05/30/19 08:00	06/28/19 15:23	1
Arsenic	**1.6**		0.65	0.17	mg/Kg	☼	05/30/19 08:00	06/28/19 15:23	1
Barium	**670**		33	1.6	mg/Kg	☼	05/30/19 08:00	06/28/19 16:37	10
Beryllium	**0.71**		0.33	0.0098	mg/Kg	☼	05/30/19 08:00	06/28/19 15:23	1
Cobalt	**1.8**	**J**	6.5	0.39	mg/Kg	☼	05/30/19 08:00	06/28/19 18:40	2
Iron	**5700**		6.5	5.4	mg/Kg	☼	05/30/19 08:00	06/28/19 15:23	1
Lithium	**10**		3.3	0.20	mg/Kg	☼	05/30/19 08:00	06/28/19 15:23	1
Manganese	**93**		0.98	0.068	mg/Kg	☼	05/30/19 08:00	06/28/19 15:23	1
Molybdenum	**0.21**	**J**	2.6	0.11	mg/Kg	☼	05/30/19 08:00	06/28/19 15:23	1
Selenium	ND		0.65	0.22	mg/Kg	☼	05/30/19 08:00	06/28/19 15:23	1
Thallium	ND		4.6	0.47	mg/Kg	☼	05/30/19 08:00	06/28/19 18:40	2

Client Sample ID: FGO-14 (30-32)
Date Collected: 05/23/19 10:40
Date Received: 05/24/19 09:40

Lab Sample ID: 140-15376-2
Matrix: Solid
Percent Solids: 79.2

Method: 6010B SEP - SEP Metals (ICP) - Step 1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		51	8.1	mg/Kg	☼	05/31/19 08:00	06/17/19 14:24	4
Antimony	ND		15	1.4	mg/Kg	☼	05/31/19 08:00	06/17/19 14:24	4
Arsenic	ND		2.5	0.66	mg/Kg	☼	05/31/19 08:00	06/17/19 14:24	4
Barium	**0.67**	**J**	13	0.61	mg/Kg	☼	05/31/19 08:00	06/17/19 14:24	4
Beryllium	ND		1.3	0.39	mg/Kg	☼	05/31/19 08:00	06/17/19 14:24	4
Cobalt	ND		13	0.23	mg/Kg	☼	05/31/19 08:00	06/17/19 14:24	4
Iron	ND		25	15	mg/Kg	☼	05/31/19 08:00	06/17/19 14:24	4
Li	ND		13	0.76	mg/Kg	☼	05/31/19 08:00	06/17/19 14:24	4
Manganese	**0.20**	**J**	3.8	0.16	mg/Kg	☼	05/31/19 08:00	06/17/19 14:24	4
Mo	ND		10	0.41	mg/Kg	☼	05/31/19 08:00	06/17/19 14:24	4
Selenium	ND		2.5	0.86	mg/Kg	☼	05/31/19 08:00	06/17/19 14:24	4
Thallium	ND		8.8	1.1	mg/Kg	☼	05/31/19 08:00	06/17/19 14:24	4

Method: 6010B SEP - SEP Metals (ICP) - Step 2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND	*	38	6.1	mg/Kg	☼	06/03/19 08:00	06/17/19 15:58	3
Antimony	ND		11	1.1	mg/Kg	☼	06/03/19 08:00	06/17/19 15:58	3
Arsenic	ND		1.9	0.49	mg/Kg	☼	06/03/19 08:00	06/17/19 15:58	3
Barium	**0.55**	**J ***	9.5	0.45	mg/Kg	☼	06/03/19 08:00	06/17/19 15:58	3
Beryllium	ND	*	0.95	0.061	mg/Kg	☼	06/03/19 08:00	06/17/19 15:58	3
Cobalt	ND		9.5	0.24	mg/Kg	☼	06/03/19 08:00	06/17/19 15:58	3
Iron	ND	*	19	11	mg/Kg	☼	06/03/19 08:00	06/17/19 15:58	3
Li	ND		9.5	0.57	mg/Kg	☼	06/03/19 08:00	06/17/19 15:58	3
Manganese	ND		2.8	1.1	mg/Kg	☼	06/03/19 08:00	06/17/19 15:58	3
Mo	ND		7.6	0.31	mg/Kg	☼	06/03/19 08:00	06/17/19 15:58	3
Selenium	ND		1.9	0.64	mg/Kg	☼	06/03/19 08:00	06/17/19 15:58	3
Thallium	ND		6.6	0.80	mg/Kg	☼	06/03/19 08:00	06/17/19 15:58	3

Method: 6010B SEP - SEP Metals (ICP) - Step 3

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**40**		13	2.7	mg/Kg	☼	06/04/19 08:00	06/26/19 17:40	1
Antimony	ND		3.8	0.35	mg/Kg	☼	06/04/19 08:00	06/26/19 17:40	1
Arsenic	**0.28**	**J**	0.63	0.16	mg/Kg	☼	06/04/19 08:00	06/26/19 17:40	1
Barium	**6.4**	**B**	3.2	0.15	mg/Kg	☼	06/04/19 08:00	06/26/19 17:40	1
Beryllium	**0.036**	**J**	0.32	0.019	mg/Kg	☼	06/04/19 08:00	06/26/19 17:40	1
Cobalt	**0.63**	**J**	3.2	0.057	mg/Kg	☼	06/04/19 08:00	06/26/19 17:40	1
Iron	**31**		6.3	3.7	mg/Kg	☼	06/04/19 08:00	06/26/19 17:40	1
Li	ND		3.2	0.19	mg/Kg	☼	06/04/19 08:00	06/26/19 17:40	1
Manganese	**4.4**	**B**	0.95	0.034	mg/Kg	☼	06/04/19 08:00	06/26/19 17:40	1
Mo	ND		2.5	0.10	mg/Kg	☼	06/04/19 08:00	06/26/19 17:40	1
Selenium	ND		0.63	0.21	mg/Kg	☼	06/04/19 08:00	06/26/19 17:40	1
Thallium	ND		2.2	0.27	mg/Kg	☼	06/04/19 08:00	06/26/19 17:40	1

Method: 6010B SEP - SEP Metals (ICP) - Step 4

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**990**		13	2.0	mg/Kg	☼	06/10/19 08:00	06/26/19 19:13	1
Antimony	ND		3.8	0.57	mg/Kg	☼	06/10/19 08:00	06/26/19 19:13	1
Arsenic	**1.1**	**B**	0.63	0.28	mg/Kg	☼	06/10/19 08:00	06/26/19 19:13	1
Barium	**12**		3.2	0.15	mg/Kg	☼	06/10/19 08:00	06/26/19 19:13	1
Beryllium	**0.18**	**J**	0.32	0.020	mg/Kg	☼	06/10/19 08:00	06/26/19 19:13	1

Client Sample ID: FGO-14 (30-32) **Lab Sample ID: 140-15376-2**
Date Collected: 05/23/19 10:40 **Matrix: Solid**
Date Received: 05/24/19 09:40 **Percent Solids: 79.2**

Method: 6010B SEP - SEP Metals (ICP) - Step 4 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	**0.63**	**J**	3.2	0.067	mg/Kg	☼	06/10/19 08:00	06/26/19 19:13	1
Iron	**2100**		6.3	3.7	mg/Kg	☼	06/10/19 08:00	06/26/19 19:13	1
Li	**0.27**	**J**	3.2	0.19	mg/Kg	☼	06/10/19 08:00	06/26/19 19:13	1
Manganese	**4.8**		0.95	0.16	mg/Kg	☼	06/10/19 08:00	06/26/19 19:13	1
Mo	ND		2.5	0.10	mg/Kg	☼	06/10/19 08:00	06/26/19 19:13	1
Selenium	ND	*	0.63	0.59	mg/Kg	☼	06/10/19 08:00	06/26/19 19:13	1
Thallium	ND		2.2	0.37	mg/Kg	☼	06/10/19 08:00	06/26/19 19:13	1

Method: 6010B SEP - SEP Metals (ICP) - Step 5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**90**	**J ***	190	30	mg/Kg	☼	06/12/19 08:00	06/26/19 20:35	5
Antimony	ND		57	5.3	mg/Kg	☼	06/12/19 08:00	06/26/19 20:35	5
Arsenic	ND		9.5	2.4	mg/Kg	☼	06/12/19 08:00	06/26/19 20:35	5
Barium	ND	*	47	2.3	mg/Kg	☼	06/12/19 08:00	06/26/19 20:35	5
Beryllium	ND	*	4.7	0.40	mg/Kg	☼	06/12/19 08:00	06/26/19 20:35	5
Cobalt	ND	*	47	0.76	mg/Kg	☼	06/12/19 08:00	06/26/19 20:35	5
Iron	ND	*	95	56	mg/Kg	☼	06/12/19 08:00	06/26/19 20:35	5
Li	ND		47	2.8	mg/Kg	☼	06/12/19 08:00	06/26/19 20:35	5
Manganese	ND	*	14	2.3	mg/Kg	☼	06/12/19 08:00	06/26/19 20:35	5
Mo	ND		38	1.6	mg/Kg	☼	06/12/19 08:00	06/26/19 20:35	5
Selenium	ND		9.5	3.3	mg/Kg	☼	06/12/19 08:00	06/26/19 20:35	5
Thallium	ND	*	33	4.4	mg/Kg	☼	06/12/19 08:00	06/26/19 20:35	5

Method: 6010B SEP - SEP Metals (ICP) - Step 6

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**1600**		13	2.0	mg/Kg	☼	06/15/19 08:00	06/26/19 22:14	1
Antimony	ND		3.8	0.35	mg/Kg	☼	06/15/19 08:00	06/26/19 22:14	1
Arsenic	**0.69**		0.63	0.19	mg/Kg	☼	06/15/19 08:00	06/26/19 22:14	1
Barium	**4.2**		3.2	0.15	mg/Kg	☼	06/15/19 08:00	06/26/19 22:14	1
Beryllium	**0.056**	**J**	0.32	0.015	mg/Kg	☼	06/15/19 08:00	06/26/19 22:14	1
Cobalt	**0.32**	**J**	3.2	0.058	mg/Kg	☼	06/15/19 08:00	06/26/19 22:14	1
Iron	**1300**		6.3	3.7	mg/Kg	☼	06/15/19 08:00	06/26/19 22:14	1
Li	**0.57**	**J**	3.2	0.19	mg/Kg	☼	06/15/19 08:00	06/26/19 22:14	1
Manganese	**6.4**		0.95	0.32	mg/Kg	☼	06/15/19 08:00	06/26/19 22:14	1
Mo	ND		2.5	0.13	mg/Kg	☼	06/15/19 08:00	06/26/19 22:14	1
Selenium	ND		0.63	0.21	mg/Kg	☼	06/15/19 08:00	06/26/19 22:14	1
Thallium	ND		2.2	0.27	mg/Kg	☼	06/15/19 08:00	06/26/19 22:14	1

Method: 6010B SEP - SEP Metals (ICP) - Step 7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**39000**		130	20	mg/Kg	☼	06/16/19 08:00	06/28/19 14:27	10
Antimony	ND		3.8	0.18	mg/Kg	☼	06/16/19 08:00	06/28/19 13:19	1
Arsenic	**0.47**	**J**	1.3	0.33	mg/Kg	☼	06/16/19 08:00	06/28/19 17:53	2
Barium	**520**		32	1.5	mg/Kg	☼	06/16/19 08:00	06/28/19 14:27	10
Beryllium	**0.59**		0.32	0.0095	mg/Kg	☼	06/16/19 08:00	06/28/19 13:19	1
Cobalt	**0.62**	**J**	6.3	0.38	mg/Kg	☼	06/16/19 08:00	06/28/19 17:53	2
Iron	**3100**		6.3	5.2	mg/Kg	☼	06/16/19 08:00	06/28/19 13:19	1
Li	**7.9**		3.2	0.19	mg/Kg	☼	06/16/19 08:00	06/28/19 13:19	1
Manganese	**18**	**B**	0.95	0.066	mg/Kg	☼	06/16/19 08:00	06/28/19 13:19	1
Mo	ND		2.5	0.10	mg/Kg	☼	06/16/19 08:00	06/28/19 13:19	1

Client Sample ID: FGO-14 (30-32) **Lab Sample ID: 140-15376-2**
Date Collected: 05/23/19 10:40 **Matrix: Solid**
Date Received: 05/24/19 09:40 **Percent Solids: 79.2**

Method: 6010B SEP - SEP Metals (ICP) - Step 7 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Selenium	ND		1.3	0.43	mg/Kg	☼	06/16/19 08:00	06/28/19 17:53	2
Thallium	**0.95**	**J**	4.4	0.45	mg/Kg	☼	06/16/19 08:00	06/28/19 17:53	2

Method: 6010B SEP - SEP Metals (ICP) - Sum of Steps 1-7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**42000**		10	1.6	mg/Kg			07/11/19 10:59	1
Antimony	ND		3.0	0.14	mg/Kg			07/11/19 10:59	1
Arsenic	**2.5**		0.50	0.13	mg/Kg			07/11/19 10:59	1
Barium	**540**		2.5	0.12	mg/Kg			07/11/19 10:59	1
Beryllium	**0.86**		0.25	0.0075	mg/Kg			07/11/19 10:59	1
Cobalt	**2.2**	**J**	2.5	0.023	mg/Kg			07/11/19 10:59	1
Iron	**6600**		5.0	4.1	mg/Kg			07/11/19 10:59	1
Li	**8.7**		2.5	0.15	mg/Kg			07/11/19 10:59	1
Manganese	**34**		0.75	0.052	mg/Kg			07/11/19 10:59	1
Mo	ND		2.0	0.082	mg/Kg			07/11/19 10:59	1
Selenium	ND		0.50	0.17	mg/Kg			07/11/19 10:59	1
Thallium	**0.95**	**J**	1.8	0.18	mg/Kg			07/11/19 10:59	1

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		24	12	mg/Kg	☼	06/16/19 08:00	06/17/19 11:41	1
Chromium	**3.3**		1.8	0.26	mg/Kg	☼	06/16/19 08:00	06/17/19 11:41	1
Lead	**3.4**		1.8	0.33	mg/Kg	☼	06/16/19 08:00	06/17/19 11:41	1
Phosphorus	**43**		35	2.8	mg/Kg	☼	06/16/19 08:00	06/17/19 11:41	1

Method: 6010B - SEP Metals (ICP) - Total

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**44000**		130	20	mg/Kg	☼	05/30/19 08:00	06/28/19 16:47	10
Antimony	ND		3.8	0.18	mg/Kg	☼	05/30/19 08:00	06/28/19 15:34	1
Arsenic	**2.5**		1.3	0.33	mg/Kg	☼	05/30/19 08:00	06/28/19 18:50	2
Barium	**760**		32	1.5	mg/Kg	☼	05/30/19 08:00	06/28/19 16:47	10
Beryllium	**0.85**		0.32	0.0095	mg/Kg	☼	05/30/19 08:00	06/28/19 15:34	1
Cobalt	**1.7**	**J**	6.3	0.38	mg/Kg	☼	05/30/19 08:00	06/28/19 18:50	2
Iron	**5900**		6.3	5.2	mg/Kg	☼	05/30/19 08:00	06/28/19 15:34	1
Lithium	**7.6**		3.2	0.19	mg/Kg	☼	05/30/19 08:00	06/28/19 15:34	1
Manganese	**34**		0.95	0.066	mg/Kg	☼	05/30/19 08:00	06/28/19 15:34	1
Molybdenum	**0.16**	**J**	2.5	0.10	mg/Kg	☼	05/30/19 08:00	06/28/19 15:34	1
Selenium	ND		1.3	0.43	mg/Kg	☼	05/30/19 08:00	06/28/19 18:50	2
Thallium	**0.68**	**J**	4.4	0.45	mg/Kg	☼	05/30/19 08:00	06/28/19 18:50	2

Method: 7470A - SEP Mercury (CVAA) - Total

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.13	0.051	mg/Kg	☼	05/30/19 08:00	06/03/19 14:52	1

Client Sample ID: FGO-2019-1 (23-25) **Lab Sample ID: 140-15376-3**
Date Collected: 05/23/19 15:20 **Matrix: Solid**
Date Received: 05/24/19 09:40 **Percent Solids: 77.2**

Method: 6010B SEP - SEP Metals (ICP) - Step 1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		52	8.3	mg/Kg	☼	05/31/19 08:00	06/17/19 14:29	4
Antimony	ND		16	1.5	mg/Kg	☼	05/31/19 08:00	06/17/19 14:29	4
Arsenic	ND		2.6	0.67	mg/Kg	☼	05/31/19 08:00	06/17/19 14:29	4
Barium	**0.86**	**J**	13	0.62	mg/Kg	☼	05/31/19 08:00	06/17/19 14:29	4
Beryllium	ND		1.3	0.40	mg/Kg	☼	05/31/19 08:00	06/17/19 14:29	4
Cobalt	ND		13	0.23	mg/Kg	☼	05/31/19 08:00	06/17/19 14:29	4
Iron	ND		26	15	mg/Kg	☼	05/31/19 08:00	06/17/19 14:29	4
Li	ND		13	0.78	mg/Kg	☼	05/31/19 08:00	06/17/19 14:29	4
Manganese	**0.99**	**J**	3.9	0.16	mg/Kg	☼	05/31/19 08:00	06/17/19 14:29	4
Mo	ND		10	0.43	mg/Kg	☼	05/31/19 08:00	06/17/19 14:29	4
Selenium	ND		2.6	0.88	mg/Kg	☼	05/31/19 08:00	06/17/19 14:29	4
Thallium	ND		9.1	1.1	mg/Kg	☼	05/31/19 08:00	06/17/19 14:29	4

Method: 6010B SEP - SEP Metals (ICP) - Step 2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND	*	39	6.2	mg/Kg	☼	06/03/19 08:00	06/17/19 16:03	3
Antimony	ND		12	1.1	mg/Kg	☼	06/03/19 08:00	06/17/19 16:03	3
Arsenic	ND		1.9	0.51	mg/Kg	☼	06/03/19 08:00	06/17/19 16:03	3
Barium	**1.9**	**J ***	9.7	0.47	mg/Kg	☼	06/03/19 08:00	06/17/19 16:03	3
Beryllium	ND	*	0.97	0.062	mg/Kg	☼	06/03/19 08:00	06/17/19 16:03	3
Cobalt	ND		9.7	0.24	mg/Kg	☼	06/03/19 08:00	06/17/19 16:03	3
Iron	ND	*	19	11	mg/Kg	☼	06/03/19 08:00	06/17/19 16:03	3
Li	ND		9.7	0.58	mg/Kg	☼	06/03/19 08:00	06/17/19 16:03	3
Manganese	ND		2.9	1.1	mg/Kg	☼	06/03/19 08:00	06/17/19 16:03	3
Mo	ND		7.8	0.32	mg/Kg	☼	06/03/19 08:00	06/17/19 16:03	3
Selenium	**0.88**	**J B**	1.9	0.66	mg/Kg	☼	06/03/19 08:00	06/17/19 16:03	3
Thallium	ND		6.8	0.82	mg/Kg	☼	06/03/19 08:00	06/17/19 16:03	3

Method: 6010B SEP - SEP Metals (ICP) - Step 3

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**62**		13	2.7	mg/Kg	☼	06/04/19 08:00	06/26/19 17:45	1
Antimony	ND		3.9	0.36	mg/Kg	☼	06/04/19 08:00	06/26/19 17:45	1
Arsenic	**0.30**	**J**	0.65	0.17	mg/Kg	☼	06/04/19 08:00	06/26/19 17:45	1
Barium	**4.0**	**B**	3.2	0.16	mg/Kg	☼	06/04/19 08:00	06/26/19 17:45	1
Beryllium	**0.10**	**J**	0.32	0.019	mg/Kg	☼	06/04/19 08:00	06/26/19 17:45	1
Cobalt	**29**		3.2	0.058	mg/Kg	☼	06/04/19 08:00	06/26/19 17:45	1
Cobalt	**29**		3.2	0.058	mg/Kg	☼	07/16/19 08:00	07/17/19 11:32	1
Iron	**61**		6.5	3.8	mg/Kg	☼	06/04/19 08:00	06/26/19 17:45	1
Li	**0.80**	**J**	3.2	0.19	mg/Kg	☼	06/04/19 08:00	06/26/19 17:45	1
Manganese	**110**	**B**	0.97	0.035	mg/Kg	☼	06/04/19 08:00	06/26/19 17:45	1
Mo	ND		2.6	0.11	mg/Kg	☼	06/04/19 08:00	06/26/19 17:45	1
Selenium	ND		0.65	0.22	mg/Kg	☼	06/04/19 08:00	06/26/19 17:45	1
Thallium	ND		2.3	0.27	mg/Kg	☼	06/04/19 08:00	06/26/19 17:45	1

Method: 6010B SEP - SEP Metals (ICP) - Step 4

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**1800**		13	2.1	mg/Kg	☼	06/10/19 08:00	06/26/19 19:18	1
Antimony	ND		3.9	0.58	mg/Kg	☼	06/10/19 08:00	06/26/19 19:18	1
Arsenic	**1.9**	**B**	0.65	0.29	mg/Kg	☼	06/10/19 08:00	06/26/19 19:18	1
Barium	**14**		3.2	0.16	mg/Kg	☼	06/10/19 08:00	06/26/19 19:18	1

Client Sample ID: FGO-2019-1 (23-25) **Lab Sample ID: 140-15376-3**
Date Collected: 05/23/19 15:20 **Matrix: Solid**
Date Received: 05/24/19 09:40 **Percent Solids: 77.2**

Method: 6010B SEP - SEP Metals (ICP) - Step 4 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	**0.25**	**J**	0.32	0.021	mg/Kg	☼	06/10/19 08:00	06/26/19 19:18	1
Cobalt	**36**		3.2	0.069	mg/Kg	☼	06/10/19 08:00	06/26/19 19:18	1
Cobalt	**35**		3.2	0.069	mg/Kg	☼	07/16/19 08:00	07/17/19 11:53	1
Iron	**3400**		6.5	3.8	mg/Kg	☼	06/10/19 08:00	06/26/19 19:18	1
Li	**3.9**		3.2	0.19	mg/Kg	☼	06/10/19 08:00	06/26/19 19:18	1
Manganese	**98**		0.97	0.17	mg/Kg	☼	06/10/19 08:00	06/26/19 19:18	1
Mo	**0.18**	**J**	2.6	0.11	mg/Kg	☼	06/10/19 08:00	06/26/19 19:18	1
Selenium	ND	*	0.65	0.61	mg/Kg	☼	06/10/19 08:00	06/26/19 19:18	1
Thallium	ND		2.3	0.38	mg/Kg	☼	06/10/19 08:00	06/26/19 19:18	1

Method: 6010B SEP - SEP Metals (ICP) - Step 5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**65**	**J ***	190	30	mg/Kg	☼	06/12/19 08:00	06/26/19 20:41	5
Antimony	ND		58	5.4	mg/Kg	☼	06/12/19 08:00	06/26/19 20:41	5
Arsenic	ND		9.7	2.5	mg/Kg	☼	06/12/19 08:00	06/26/19 20:41	5
Barium	**27**	**J ***	49	2.3	mg/Kg	☼	06/12/19 08:00	06/26/19 20:41	5
Beryllium	ND	*	4.9	0.41	mg/Kg	☼	06/12/19 08:00	06/26/19 20:41	5
Cobalt	**2.6**	**J ***	49	0.78	mg/Kg	☼	06/12/19 08:00	06/26/19 20:41	5
Iron	ND	*	97	57	mg/Kg	☼	06/12/19 08:00	06/26/19 20:41	5
Li	ND		49	2.9	mg/Kg	☼	06/12/19 08:00	06/26/19 20:41	5
Manganese	ND	*	15	2.4	mg/Kg	☼	06/12/19 08:00	06/26/19 20:41	5
Mo	ND		39	1.6	mg/Kg	☼	06/12/19 08:00	06/26/19 20:41	5
Selenium	ND		9.7	3.4	mg/Kg	☼	06/12/19 08:00	06/26/19 20:41	5
Thallium	ND	*	34	4.5	mg/Kg	☼	06/12/19 08:00	06/26/19 20:41	5

Method: 6010B SEP - SEP Metals (ICP) - Step 6

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**2600**		13	2.1	mg/Kg	☼	06/15/19 08:00	06/26/19 22:20	1
Antimony	ND		3.9	0.36	mg/Kg	☼	06/15/19 08:00	06/26/19 22:20	1
Arsenic	**1.6**		0.65	0.19	mg/Kg	☼	06/15/19 08:00	06/26/19 22:20	1
Barium	**35**		3.2	0.16	mg/Kg	☼	06/15/19 08:00	06/26/19 22:20	1
Beryllium	**0.074**	**J**	0.32	0.016	mg/Kg	☼	06/15/19 08:00	06/26/19 22:20	1
Cobalt	**1.6**	**J**	3.2	0.060	mg/Kg	☼	06/15/19 08:00	06/26/19 22:20	1
Iron	**1100**		6.5	3.8	mg/Kg	☼	06/15/19 08:00	06/26/19 22:20	1
Li	**1.2**	**J**	3.2	0.19	mg/Kg	☼	06/15/19 08:00	06/26/19 22:20	1
Manganese	**10**		0.97	0.32	mg/Kg	☼	06/15/19 08:00	06/26/19 22:20	1
Mo	**0.21**	**J**	2.6	0.13	mg/Kg	☼	06/15/19 08:00	06/26/19 22:20	1
Selenium	ND		0.65	0.22	mg/Kg	☼	06/15/19 08:00	06/26/19 22:20	1
Thallium	ND		2.3	0.27	mg/Kg	☼	06/15/19 08:00	06/26/19 22:20	1

Method: 6010B SEP - SEP Metals (ICP) - Step 7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**33000**		130	21	mg/Kg	☼	06/16/19 08:00	06/28/19 14:32	10
Antimony	ND		3.9	0.18	mg/Kg	☼	06/16/19 08:00	06/28/19 13:24	1
Arsenic	**1.2**		0.65	0.17	mg/Kg	☼	06/16/19 08:00	06/28/19 13:24	1
Barium	**410**		32	1.6	mg/Kg	☼	06/16/19 08:00	06/28/19 14:32	10
Beryllium	**0.39**		0.32	0.0097	mg/Kg	☼	06/16/19 08:00	06/28/19 13:24	1
Cobalt	**0.70**	**J**	6.5	0.39	mg/Kg	☼	06/16/19 08:00	06/28/19 17:58	2
Iron	**4400**		6.5	5.3	mg/Kg	☼	06/16/19 08:00	06/28/19 13:24	1
Li	**14**		3.2	0.19	mg/Kg	☼	06/16/19 08:00	06/28/19 13:24	1

Client Sample ID: FGO-2019-1 (23-25) **Lab Sample ID: 140-15376-3**
Date Collected: 05/23/19 15:20 **Matrix: Solid**
Date Received: 05/24/19 09:40 **Percent Solids: 77.2**

Method: 6010B SEP - SEP Metals (ICP) - Step 7 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	19	B	0.97	0.067	mg/Kg	☼	06/16/19 08:00	06/28/19 13:24	1
Mo	0.80	J	2.6	0.11	mg/Kg	☼	06/16/19 08:00	06/28/19 13:24	1
Selenium	ND		0.65	0.22	mg/Kg	☼	06/16/19 08:00	06/28/19 13:24	1
Thallium	ND		4.5	0.47	mg/Kg	☼	06/16/19 08:00	06/28/19 17:58	2

Method: 6010B SEP - SEP Metals (ICP) - Sum of Steps 1-7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	38000		10	1.6	mg/Kg			07/11/19 10:59	1
Antimony	ND		3.0	0.14	mg/Kg			07/11/19 10:59	1
Arsenic	5.0		0.50	0.13	mg/Kg			07/11/19 10:59	1
Barium	490		2.5	0.12	mg/Kg			07/11/19 10:59	1
Beryllium	0.81		0.25	0.0075	mg/Kg			07/11/19 10:59	1
Cobalt	69		2.5	0.023	mg/Kg			07/11/19 10:59	1
Iron	9100		5.0	4.1	mg/Kg			07/11/19 10:59	1
Li	20		2.5	0.15	mg/Kg			07/11/19 10:59	1
Manganese	230		0.75	0.052	mg/Kg			07/11/19 10:59	1
Mo	1.2	J	2.0	0.082	mg/Kg			07/11/19 10:59	1
Selenium	0.88		0.50	0.17	mg/Kg			07/11/19 10:59	1
Thallium	ND		1.8	0.18	mg/Kg			07/11/19 10:59	1

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		24	12	mg/Kg	☼	06/16/19 08:00	06/17/19 11:47	1
Chromium	4.8		1.8	0.27	mg/Kg	☼	06/16/19 08:00	06/17/19 11:47	1
Lead	6.0		1.8	0.34	mg/Kg	☼	06/16/19 08:00	06/17/19 11:47	1
Phosphorus	65		36	2.9	mg/Kg	☼	06/16/19 08:00	06/17/19 11:47	1

Method: 6010B - SEP Metals (ICP) - Total

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	43000		130	21	mg/Kg	☼	05/30/19 08:00	06/28/19 16:52	10
Antimony	ND		3.9	0.18	mg/Kg	☼	05/30/19 08:00	06/28/19 15:40	1
Arsenic	7.6		0.65	0.17	mg/Kg	☼	05/30/19 08:00	06/28/19 15:40	1
Barium	730		32	1.6	mg/Kg	☼	05/30/19 08:00	06/28/19 16:52	10
Beryllium	0.76		0.32	0.0097	mg/Kg	☼	05/30/19 08:00	06/28/19 15:40	1
Cobalt	6.9		3.2	0.19	mg/Kg	☼	05/30/19 08:00	06/28/19 15:40	1
Cobalt	17		6.5	0.39	mg/Kg	☼	07/16/19 08:00	07/17/19 12:03	2
Iron	8400		6.5	5.3	mg/Kg	☼	05/30/19 08:00	06/28/19 15:40	1
Lithium	14		3.2	0.19	mg/Kg	☼	05/30/19 08:00	06/28/19 15:40	1
Manganese	61		0.97	0.067	mg/Kg	☼	05/30/19 08:00	06/28/19 15:40	1
Molybdenum	1.1	J	2.6	0.11	mg/Kg	☼	05/30/19 08:00	06/28/19 15:40	1
Selenium	ND		0.65	0.22	mg/Kg	☼	05/30/19 08:00	06/28/19 15:40	1
Thallium	0.85	J	2.3	0.23	mg/Kg	☼	05/30/19 08:00	06/28/19 15:40	1

Method: 7470A - SEP Mercury (CVAA) - Total

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.15		0.13	0.052	mg/Kg	☼	05/30/19 08:00	06/03/19 14:54	1

Default Detection Limits

Client: Golder Associates Inc.
Job ID: 140-15376-1
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Method: 6010B SEP - SEP Metals (ICP) - Step 1

Prep: 3010A

SEP: Exchangeable

Analyte	RL	MDL	Units
Aluminum	10	1.6	mg/Kg
Antimony	3.0	0.28	mg/Kg
Arsenic	0.50	0.13	mg/Kg
Barium	2.5	0.12	mg/Kg
Beryllium	0.25	0.077	mg/Kg
Cobalt	2.5	0.045	mg/Kg
Iron	5.0	2.9	mg/Kg
Li	2.5	0.15	mg/Kg
Manganese	0.75	0.031	mg/Kg
Mo	2.0	0.082	mg/Kg
Selenium	0.50	0.17	mg/Kg
Thallium	1.8	0.21	mg/Kg

Method: 6010B SEP - SEP Metals (ICP) - Step 2

Prep: 3010A

SEP: Carbonate

Analyte	RL	MDL	Units
Aluminum	10	1.6	mg/Kg
Antimony	3.0	0.28	mg/Kg
Arsenic	0.50	0.13	mg/Kg
Barium	2.5	0.12	mg/Kg
Beryllium	0.25	0.016	mg/Kg
Cobalt	2.5	0.063	mg/Kg
Iron	5.0	2.9	mg/Kg
Li	2.5	0.15	mg/Kg
Manganese	0.75	0.28	mg/Kg
Mo	2.0	0.082	mg/Kg
Selenium	0.50	0.17	mg/Kg
Thallium	1.8	0.21	mg/Kg

Method: 6010B SEP - SEP Metals (ICP) - Step 3

Prep: 3010A

SEP: Non-Crystalline

Analyte	RL	MDL	Units
Aluminum	10	2.1	mg/Kg
Antimony	3.0	0.28	mg/Kg
Arsenic	0.50	0.13	mg/Kg
Barium	2.5	0.12	mg/Kg
Beryllium	0.25	0.015	mg/Kg
Cobalt	2.5	0.045	mg/Kg
Iron	5.0	2.9	mg/Kg
Li	2.5	0.15	mg/Kg
Manganese	0.75	0.027	mg/Kg
Mo	2.0	0.082	mg/Kg
Selenium	0.50	0.17	mg/Kg
Thallium	1.8	0.21	mg/Kg

Method: 6010B SEP - SEP Metals (ICP) - Step 4

Prep: 3010A

SEP: Metal Hydroxide

Default Detection Limits

Client: Golder Associates Inc.
Job ID: 140-15376-1
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Method: 6010B SEP - SEP Metals (ICP) - Step 4

Prep: 3010A

SEP: Metal Hydroxide

Analyte	RL	MDL	Units
Aluminum	10	1.6	mg/Kg
Antimony	3.0	0.45	mg/Kg
Arsenic	0.50	0.22	mg/Kg
Barium	2.5	0.12	mg/Kg
Beryllium	0.25	0.016	mg/Kg
Cobalt	2.5	0.053	mg/Kg
Iron	5.0	2.9	mg/Kg
Li	2.5	0.15	mg/Kg
Manganese	0.75	0.13	mg/Kg
Mo	2.0	0.082	mg/Kg
Selenium	0.50	0.47	mg/Kg
Thallium	1.8	0.29	mg/Kg

Method: 6010B SEP - SEP Metals (ICP) - Step 5

Prep: 3010A

SEP: Organic-Bound

Analyte	RL	MDL	Units
Aluminum	30	4.7	mg/Kg
Antimony	9.0	0.84	mg/Kg
Arsenic	1.5	0.38	mg/Kg
Barium	7.5	0.36	mg/Kg
Beryllium	0.75	0.063	mg/Kg
Cobalt	7.5	0.12	mg/Kg
Iron	15	8.8	mg/Kg
Li	7.5	0.44	mg/Kg
Manganese	2.3	0.37	mg/Kg
Mo	6.0	0.25	mg/Kg
Selenium	1.5	0.52	mg/Kg
Thallium	5.3	0.70	mg/Kg

Method: 6010B SEP - SEP Metals (ICP) - Step 6

SEP: Acid/Sulfide

Analyte	RL	MDL	Units
Aluminum	10	1.6	mg/Kg
Antimony	3.0	0.28	mg/Kg
Arsenic	0.50	0.15	mg/Kg
Barium	2.5	0.12	mg/Kg
Beryllium	0.25	0.012	mg/Kg
Cobalt	2.5	0.046	mg/Kg
Iron	5.0	2.9	mg/Kg
Li	2.5	0.15	mg/Kg
Manganese	0.75	0.25	mg/Kg
Mo	2.0	0.099	mg/Kg
Selenium	0.50	0.17	mg/Kg
Thallium	1.8	0.21	mg/Kg

Method: 6010B SEP - SEP Metals (ICP) - Step 7

Prep: Residual

Analyte	RL	MDL	Units
Aluminum	10	1.6	mg/Kg

Default Detection Limits

Client: Golder Associates Inc.
Job ID: 140-15376-1
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Method: 6010B SEP - SEP Metals (ICP) - Step 7 (Continued)

Prep: Residual

Analyte	RL	MDL	Units
Antimony	3.0	0.14	mg/Kg
Arsenic	0.50	0.13	mg/Kg
Barium	2.5	0.12	mg/Kg
Beryllium	0.25	0.0075	mg/Kg
Cobalt	2.5	0.15	mg/Kg
Iron	5.0	4.1	mg/Kg
Li	2.5	0.15	mg/Kg
Manganese	0.75	0.052	mg/Kg
Mo	2.0	0.082	mg/Kg
Selenium	0.50	0.17	mg/Kg
Thallium	1.8	0.18	mg/Kg

Method: 6010B SEP - SEP Metals (ICP) - Sum of Steps 1-7

Analyte	RL	MDL	Units
Aluminum	10	1.6	mg/Kg
Antimony	3.0	0.14	mg/Kg
Arsenic	0.50	0.13	mg/Kg
Barium	2.5	0.12	mg/Kg
Beryllium	0.25	0.0075	mg/Kg
Cobalt	2.5	0.023	mg/Kg
Iron	5.0	4.1	mg/Kg
Li	2.5	0.15	mg/Kg
Manganese	0.75	0.052	mg/Kg
Mo	2.0	0.082	mg/Kg
Selenium	0.50	0.17	mg/Kg
Thallium	1.8	0.18	mg/Kg

Method: 6010B - Metals (ICP)

Prep: 3050B

Analyte	RL	MDL	Units
Boron	20	10	mg/Kg
Chromium	1.5	0.22	mg/Kg
Lead	1.5	0.28	mg/Kg
Phosphorus	30	2.4	mg/Kg

Method: 6010B - SEP Metals (ICP) - Total

Prep: Total

Analyte	RL	MDL	Units
Aluminum	10	1.6	mg/Kg
Antimony	3.0	0.14	mg/Kg
Arsenic	0.50	0.13	mg/Kg
Barium	2.5	0.12	mg/Kg
Beryllium	0.25	0.0075	mg/Kg
Cobalt	2.5	0.15	mg/Kg
Iron	5.0	4.1	mg/Kg
Lithium	2.5	0.15	mg/Kg
Manganese	0.75	0.052	mg/Kg
Molybdenum	2.0	0.082	mg/Kg
Selenium	0.50	0.17	mg/Kg
Thallium	1.8	0.18	mg/Kg

Default Detection Limits

Client: Golder Associates Inc.
Job ID: 140-15376-1
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Method: 7470A - SEP Mercury (CVAA) - Total

Prep: Total

Analyte	RL	MDL	Units
Hg	0.10	0.040	mg/Kg

Method: 6010B - Metals (ICP)

Lab Sample ID: MB 140-30853/8-A
Matrix: Solid
Analysis Batch: 30900

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 30853

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		20	10	mg/Kg		06/16/19 08:00	06/17/19 11:06	1
Chromium	ND		1.5	0.22	mg/Kg		06/16/19 08:00	06/17/19 11:06	1
Lead	ND		1.5	0.28	mg/Kg		06/16/19 08:00	06/17/19 11:06	1
Phosphorus	ND		30	2.4	mg/Kg		06/16/19 08:00	06/17/19 11:06	1

Lab Sample ID: LCS 140-30853/9-A
Matrix: Solid
Analysis Batch: 30900

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 30853

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	100	99.1		mg/Kg		99	80 - 120
Chromium	20.0	20.5		mg/Kg		102	90 - 110
Lead	10.0	10.2		mg/Kg		102	90 - 110
Phosphorus	500	507		mg/Kg		101	80 - 120

Lab Sample ID: 140-15376-1 MS
Matrix: Solid
Analysis Batch: 30900

Client Sample ID: FGO-15 (25-27)
Prep Type: Total/NA
Prep Batch: 30853

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	ND		128	121		mg/Kg	☼	95	75 - 125
Chromium	4.2		25.5	33.9		mg/Kg	☼	117	75 - 125
Lead	3.2		12.8	15.4		mg/Kg	☼	96	75 - 125
Phosphorus	69		638	680		mg/Kg	☼	96	75 - 125

Lab Sample ID: 140-15376-1 MSD
Matrix: Solid
Analysis Batch: 30900

Client Sample ID: FGO-15 (25-27)
Prep Type: Total/NA
Prep Batch: 30853

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron	ND		127	122		mg/Kg	☼	96	75 - 125	1	20
Chromium	4.2		25.4	33.5		mg/Kg	☼	116	75 - 125	1	20
Lead	3.2		12.7	15.4		mg/Kg	☼	96	75 - 125	1	20
Phosphorus	69		635	672		mg/Kg	☼	95	75 - 125	1	20

Method: 6010B - SEP Metals (ICP) - Total

Lab Sample ID: MB 140-30373/11-A
Matrix: Solid
Analysis Batch: 31255

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 30373

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		10	1.6	mg/Kg		05/30/19 08:00	06/28/19 12:27	1
Antimony	ND		3.0	0.14	mg/Kg		05/30/19 08:00	06/28/19 12:27	1
Arsenic	ND		0.50	0.13	mg/Kg		05/30/19 08:00	06/28/19 12:27	1
Barium	ND		2.5	0.12	mg/Kg		05/30/19 08:00	06/28/19 12:27	1
Beryllium	ND		0.25	0.0075	mg/Kg		05/30/19 08:00	06/28/19 12:27	1
Cobalt	ND		2.5	0.15	mg/Kg		05/30/19 08:00	06/28/19 12:27	1
Iron	ND		5.0	4.1	mg/Kg		05/30/19 08:00	06/28/19 12:27	1
Lithium	ND		2.5	0.15	mg/Kg		05/30/19 08:00	06/28/19 12:27	1

Method: 6010B - SEP Metals (ICP) - Total (Continued)

Lab Sample ID: MB 140-30373/11-A
Matrix: Solid
Analysis Batch: 31255

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 30373

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	ND		0.75	0.052	mg/Kg		05/30/19 08:00	06/28/19 12:27	1
Molybdenum	ND		2.0	0.082	mg/Kg		05/30/19 08:00	06/28/19 12:27	1
Selenium	ND		0.50	0.17	mg/Kg		05/30/19 08:00	06/28/19 12:27	1
Thallium	ND		1.8	0.18	mg/Kg		05/30/19 08:00	06/28/19 12:27	1

Lab Sample ID: LCS 140-30373/12-A
Matrix: Solid
Analysis Batch: 31255

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 30373

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	100	96.4		mg/Kg		96	75 - 125
Antimony	25.0	25.3		mg/Kg		101	75 - 125
Arsenic	5.00	5.23		mg/Kg		105	75 - 125
Barium	5.00	5.07		mg/Kg		101	75 - 125
Beryllium	2.50	2.47		mg/Kg		99	75 - 125
Cobalt	5.00	5.25		mg/Kg		105	75 - 125
Iron	50.0	50.6		mg/Kg		101	75 - 125
Lithium	5.00	5.37		mg/Kg		107	75 - 125
Manganese	5.00	5.27		mg/Kg		105	75 - 125
Molybdenum	25.0	26.5		mg/Kg		106	75 - 125
Selenium	7.50	7.36		mg/Kg		98	75 - 125
Thallium	20.0	21.6		mg/Kg		108	75 - 125

Lab Sample ID: LCSD 140-30373/13-A
Matrix: Solid
Analysis Batch: 31255

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 30373

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Aluminum	100	95.8		mg/Kg		96	75 - 125	1	30
Antimony	25.0	25.3		mg/Kg		101	75 - 125	0	30
Arsenic	5.00	5.23		mg/Kg		105	75 - 125	0	30
Barium	5.00	5.06		mg/Kg		101	75 - 125	0	30
Beryllium	2.50	2.47		mg/Kg		99	75 - 125	0	30
Cobalt	5.00	5.22		mg/Kg		104	75 - 125	0	30
Iron	50.0	50.6		mg/Kg		101	75 - 125	0	30
Lithium	5.00	5.35		mg/Kg		107	75 - 125	0	30
Manganese	5.00	5.25		mg/Kg		105	75 - 125	0	30
Molybdenum	25.0	26.4		mg/Kg		106	75 - 125	0	30
Selenium	7.50	7.37		mg/Kg		98	75 - 125	0	30
Thallium	20.0	21.4		mg/Kg		107	75 - 125	1	30

Lab Sample ID: 140-15376-1 DU
Matrix: Solid
Analysis Batch: 31255

Client Sample ID: FGO-15 (25-27)
Prep Type: Total/NA
Prep Batch: 30373

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Antimony	ND		ND		mg/Kg	☼	NC	30
Arsenic	1.6		1.73		mg/Kg	☼	10	30
Beryllium	0.71		0.709		mg/Kg	☼	0.6	30

Method: 6010B - SEP Metals (ICP) - Total (Continued)

Lab Sample ID: 140-15376-1 DU
Matrix: Solid
Analysis Batch: 31255

Client Sample ID: FGO-15 (25-27)
Prep Type: Total/NA
Prep Batch: 30373

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Iron	5700		5780		mg/Kg	☼	2	30
Lithium	10		10.4		mg/Kg	☼	0.9	30
Manganese	93		86.6		mg/Kg	☼	7	30
Molybdenum	0.21	J	0.176	J	mg/Kg	☼	17	30
Selenium	ND		ND		mg/Kg	☼	NC	30

Lab Sample ID: 140-15376-1 DU
Matrix: Solid
Analysis Batch: 31255

Client Sample ID: FGO-15 (25-27)
Prep Type: Total/NA
Prep Batch: 30373

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Aluminum	46000		46400		mg/Kg	☼	1	30
Barium	670		697		mg/Kg	☼	3	30

Lab Sample ID: 140-15376-1 DU
Matrix: Solid
Analysis Batch: 31255

Client Sample ID: FGO-15 (25-27)
Prep Type: Total/NA
Prep Batch: 30373

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Cobalt	1.8	J	1.74	J	mg/Kg	☼	5	30
Thallium	ND		ND		mg/Kg	☼	NC	30

Lab Sample ID: MB 140-31695/2-A
Matrix: Solid
Analysis Batch: 31812

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 31695

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	ND		2.5	0.15	mg/Kg		07/16/19 08:00	07/17/19 11:17	1

Lab Sample ID: LCS 140-31695/3-A
Matrix: Solid
Analysis Batch: 31812

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 31695

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cobalt	5.00	5.28		mg/Kg		106	75 - 125

Lab Sample ID: LCSD 140-31695/4-A
Matrix: Solid
Analysis Batch: 31812

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 31695

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Cobalt	5.00	5.29		mg/Kg		106	75 - 125	0	30

Method: 6010B SEP - SEP Metals (ICP)

Lab Sample ID: MB 140-30374/11-B ^4
Matrix: Solid
Analysis Batch: 30900

Client Sample ID: Method Blank
Prep Type: Step 1
Prep Batch: 30422

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		40	6.4	mg/Kg		05/31/19 08:00	06/17/19 13:48	4
Antimony	ND		12	1.1	mg/Kg		05/31/19 08:00	06/17/19 13:48	4
Arsenic	ND		2.0	0.52	mg/Kg		05/31/19 08:00	06/17/19 13:48	4
Barium	ND		10	0.48	mg/Kg		05/31/19 08:00	06/17/19 13:48	4
Beryllium	ND		1.0	0.31	mg/Kg		05/31/19 08:00	06/17/19 13:48	4
Cobalt	ND		10	0.18	mg/Kg		05/31/19 08:00	06/17/19 13:48	4
Iron	ND		20	12	mg/Kg		05/31/19 08:00	06/17/19 13:48	4
Li	ND		10	0.60	mg/Kg		05/31/19 08:00	06/17/19 13:48	4
Manganese	ND		3.0	0.12	mg/Kg		05/31/19 08:00	06/17/19 13:48	4
Mo	ND		8.0	0.33	mg/Kg		05/31/19 08:00	06/17/19 13:48	4
Selenium	ND		2.0	0.68	mg/Kg		05/31/19 08:00	06/17/19 13:48	4
Thallium	ND		7.0	0.84	mg/Kg		05/31/19 08:00	06/17/19 13:48	4

Lab Sample ID: LCS 140-30374/12-B ^5
Matrix: Solid
Analysis Batch: 30900

Client Sample ID: Lab Control Sample
Prep Type: Step 1
Prep Batch: 30422

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	100	94.0		mg/Kg		94	75 - 125
Antimony	25.0	24.7		mg/Kg		99	75 - 125
Arsenic	5.00	4.79		mg/Kg		96	75 - 125
Barium	5.00	5.16	J	mg/Kg		103	75 - 125
Beryllium	2.50	2.57		mg/Kg		103	75 - 125
Cobalt	5.00	5.06	J	mg/Kg		101	75 - 125
Iron	50.0	51.3		mg/Kg		103	75 - 125
Li	5.00	5.37	J	mg/Kg		107	75 - 125
Manganese	5.00	4.96		mg/Kg		99	75 - 125
Mo	25.0	25.8		mg/Kg		103	75 - 125
Selenium	7.50	7.86		mg/Kg		105	75 - 125
Thallium	20.0	19.6		mg/Kg		98	75 - 125

Lab Sample ID: LCSD 140-30374/13-B ^5
Matrix: Solid
Analysis Batch: 30900

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 1
Prep Batch: 30422

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Aluminum	100	96.4		mg/Kg		96	75 - 125	3	30
Antimony	25.0	23.9		mg/Kg		95	75 - 125	4	30
Arsenic	5.00	4.66		mg/Kg		93	75 - 125	3	30
Barium	5.00	5.00	J	mg/Kg		100	75 - 125	3	30
Beryllium	2.50	2.55		mg/Kg		102	75 - 125	1	30
Cobalt	5.00	4.97	J	mg/Kg		99	75 - 125	2	30
Iron	50.0	50.4		mg/Kg		101	75 - 125	2	30
Li	5.00	5.04	J	mg/Kg		101	75 - 125	6	30
Manganese	5.00	4.92		mg/Kg		98	75 - 125	1	30
Mo	25.0	25.3		mg/Kg		101	75 - 125	2	30
Selenium	7.50	7.98		mg/Kg		106	75 - 125	2	30
Thallium	20.0	19.4		mg/Kg		97	75 - 125	1	30

Method: 6010B SEP - SEP Metals (ICP) (Continued)

Lab Sample ID: 140-15376-1 DU
Matrix: Solid
Analysis Batch: 30900

Client Sample ID: FGO-15 (25-27)
Prep Type: Step 1
Prep Batch: 30422

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Aluminum	ND			ND		mg/Kg	☼			NC	30
Antimony	ND			ND		mg/Kg	☼			NC	30
Arsenic	ND			ND		mg/Kg	☼			NC	30
Barium	ND			ND		mg/Kg	☼			NC	30
Beryllium	ND			ND		mg/Kg	☼			NC	30
Cobalt	ND			ND		mg/Kg	☼			NC	30
Iron	ND			ND		mg/Kg	☼			NC	30
Li	ND			ND		mg/Kg	☼			NC	30
Manganese	0.47	J		1.04	J F5	mg/Kg	☼			76	30
Mo	ND			ND		mg/Kg	☼			NC	30
Selenium	ND			ND		mg/Kg	☼			NC	30
Thallium	ND			ND		mg/Kg	☼			NC	30

Lab Sample ID: MB 140-30423/11-B ^3
Matrix: Solid
Analysis Batch: 30900

Client Sample ID: Method Blank
Prep Type: Step 2
Prep Batch: 30452

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		30	4.8	mg/Kg		06/03/19 08:00	06/17/19 15:11	3
Antimony	ND		9.0	0.84	mg/Kg		06/03/19 08:00	06/17/19 15:11	3
Arsenic	ND		1.5	0.39	mg/Kg		06/03/19 08:00	06/17/19 15:11	3
Barium	ND		7.5	0.36	mg/Kg		06/03/19 08:00	06/17/19 15:11	3
Beryllium	ND		0.75	0.048	mg/Kg		06/03/19 08:00	06/17/19 15:11	3
Cobalt	ND		7.5	0.19	mg/Kg		06/03/19 08:00	06/17/19 15:11	3
Iron	ND		15	8.7	mg/Kg		06/03/19 08:00	06/17/19 15:11	3
Li	ND		7.5	0.45	mg/Kg		06/03/19 08:00	06/17/19 15:11	3
Manganese	ND		2.3	0.84	mg/Kg		06/03/19 08:00	06/17/19 15:11	3
Mo	ND		6.0	0.25	mg/Kg		06/03/19 08:00	06/17/19 15:11	3
Selenium	0.644	J	1.5	0.51	mg/Kg		06/03/19 08:00	06/17/19 15:11	3
Thallium	ND		5.3	0.63	mg/Kg		06/03/19 08:00	06/17/19 15:11	3

Lab Sample ID: LCS 140-30423/12-B ^5
Matrix: Solid
Analysis Batch: 30900

Client Sample ID: Lab Control Sample
Prep Type: Step 2
Prep Batch: 30452

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Aluminum			100	ND	*	mg/Kg		-4	75 - 125		
Antimony			25.0	21.2		mg/Kg		85	75 - 125		
Arsenic			5.00	3.93		mg/Kg		79	75 - 125		
Barium			5.00	2.38	J *	mg/Kg		48	75 - 125		
Beryllium			2.50	1.28	J *	mg/Kg		51	75 - 125		
Cobalt			5.00	4.75	J	mg/Kg		95	75 - 125		
Iron			50.0	ND	*	mg/Kg		2	75 - 125		
Li			5.00	4.71	J	mg/Kg		94	75 - 125		
Manganese			5.00	4.63		mg/Kg		93	75 - 125		
Mo			25.0	21.1		mg/Kg		84	75 - 125		
Selenium			7.50	6.91		mg/Kg		92	75 - 125		
Thallium			20.0	18.1		mg/Kg		90	75 - 125		

Method: 6010B SEP - SEP Metals (ICP) (Continued)

Lab Sample ID: LCSD 140-30423/13-B ^5
Matrix: Solid
Analysis Batch: 30900

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 2
Prep Batch: 30452

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Aluminum			100	ND	*	mg/Kg		-0.3	75 - 125	167	30
Antimony			25.0	21.3		mg/Kg		85	75 - 125	0	30
Arsenic			5.00	4.07		mg/Kg		81	75 - 125	4	30
Barium			5.00	2.40	J *	mg/Kg		48	75 - 125	1	30
Beryllium			2.50	1.27	J *	mg/Kg		51	75 - 125	0	30
Cobalt			5.00	4.76	J	mg/Kg		95	75 - 125	0	30
Iron			50.0	ND	*	mg/Kg		4	75 - 125	57	30
Li			5.00	5.06	J	mg/Kg		101	75 - 125	7	30
Manganese			5.00	4.64		mg/Kg		93	75 - 125	0	30
Mo			25.0	21.2		mg/Kg		85	75 - 125	0	30
Selenium			7.50	6.76		mg/Kg		90	75 - 125	2	30
Thallium			20.0	18.8		mg/Kg		94	75 - 125	4	30

Lab Sample ID: 140-15376-1 DU
Matrix: Solid
Analysis Batch: 30900

Client Sample ID: FGO-15 (25-27)
Prep Type: Step 2
Prep Batch: 30452

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Aluminum	ND	*		ND	*	mg/Kg	☼			NC	30
Antimony	ND			ND		mg/Kg	☼			NC	30
Arsenic	ND			ND		mg/Kg	☼			NC	30
Barium	ND	*		ND	*	mg/Kg	☼			NC	30
Beryllium	ND	*		ND	*	mg/Kg	☼			NC	30
Cobalt	ND			ND		mg/Kg	☼			NC	30
Iron	ND	*		ND	*	mg/Kg	☼			NC	30
Li	ND			ND		mg/Kg	☼			NC	30
Manganese	1.4	J		1.49	J	mg/Kg	☼			8	30
Mo	ND			ND		mg/Kg	☼			NC	30
Selenium	ND			ND		mg/Kg	☼			NC	30
Thallium	ND			ND		mg/Kg	☼			NC	30

Lab Sample ID: MB 140-30453/11-B
Matrix: Solid
Analysis Batch: 31197

Client Sample ID: Method Blank
Prep Type: Step 3
Prep Batch: 30480

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		10	2.1	mg/Kg		06/04/19 08:00	06/26/19 17:04	1
Antimony	ND		3.0	0.28	mg/Kg		06/04/19 08:00	06/26/19 17:04	1
Arsenic	ND		0.50	0.13	mg/Kg		06/04/19 08:00	06/26/19 17:04	1
Barium	0.487	J	2.5	0.12	mg/Kg		06/04/19 08:00	06/26/19 17:04	1
Beryllium	ND		0.25	0.015	mg/Kg		06/04/19 08:00	06/26/19 17:04	1
Cobalt	ND		2.5	0.045	mg/Kg		06/04/19 08:00	06/26/19 17:04	1
Iron	ND		5.0	2.9	mg/Kg		06/04/19 08:00	06/26/19 17:04	1
Li	ND		2.5	0.15	mg/Kg		06/04/19 08:00	06/26/19 17:04	1
Manganese	0.0625	J	0.75	0.027	mg/Kg		06/04/19 08:00	06/26/19 17:04	1
Mo	ND		2.0	0.082	mg/Kg		06/04/19 08:00	06/26/19 17:04	1
Selenium	ND		0.50	0.17	mg/Kg		06/04/19 08:00	06/26/19 17:04	1
Thallium	ND		1.8	0.21	mg/Kg		06/04/19 08:00	06/26/19 17:04	1

Method: 6010B SEP - SEP Metals (ICP) (Continued)

Lab Sample ID: LCS 140-30453/12-B
Matrix: Solid
Analysis Batch: 31197

Client Sample ID: Lab Control Sample
Prep Type: Step 3
Prep Batch: 30480

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Aluminum			100	95.1		mg/Kg		95	75 - 125		
Antimony			25.0	24.2		mg/Kg		97	75 - 125		
Arsenic			5.00	5.01		mg/Kg		100	75 - 125		
Barium			5.00	4.36		mg/Kg		87	75 - 125		
Beryllium			2.50	2.53		mg/Kg		101	75 - 125		
Cobalt			5.00	4.87		mg/Kg		97	75 - 125		
Iron			50.0	49.3		mg/Kg		99	75 - 125		
Li			5.00	4.84		mg/Kg		97	75 - 125		
Manganese			5.00	4.86		mg/Kg		97	75 - 125		
Mo			25.0	24.5		mg/Kg		98	75 - 125		
Selenium			7.50	7.45		mg/Kg		99	75 - 125		
Thallium			20.0	20.0		mg/Kg		100	75 - 125		

Lab Sample ID: LCSD 140-30453/13-B
Matrix: Solid
Analysis Batch: 31197

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 3
Prep Batch: 30480

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Aluminum			100	98.4		mg/Kg		98	75 - 125	3	30
Antimony			25.0	25.0		mg/Kg		100	75 - 125	3	30
Arsenic			5.00	5.11		mg/Kg		102	75 - 125	2	30
Barium			5.00	4.42		mg/Kg		88	75 - 125	2	30
Beryllium			2.50	2.64		mg/Kg		106	75 - 125	4	30
Cobalt			5.00	4.99		mg/Kg		100	75 - 125	2	30
Iron			50.0	50.9		mg/Kg		102	75 - 125	3	30
Li			5.00	4.97		mg/Kg		99	75 - 125	3	30
Manganese			5.00	5.00		mg/Kg		100	75 - 125	3	30
Mo			25.0	25.2		mg/Kg		101	75 - 125	3	30
Selenium			7.50	7.80		mg/Kg		104	75 - 125	5	30
Thallium			20.0	20.7		mg/Kg		104	75 - 125	3	30

Lab Sample ID: 140-15376-1 DU
Matrix: Solid
Analysis Batch: 31197

Client Sample ID: FGO-15 (25-27)
Prep Type: Step 3
Prep Batch: 30480

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Aluminum	23			21.4		mg/Kg	☼			7	30
Antimony	ND			ND		mg/Kg	☼			NC	30
Arsenic	ND			ND		mg/Kg	☼			NC	30
Barium	1.4	J B		1.37	J	mg/Kg	☼			5	30
Beryllium	0.020	J		0.0202	J	mg/Kg	☼			3	30
Cobalt	0.63	J		0.599	J	mg/Kg	☼			4	30
Iron	58			54.6		mg/Kg	☼			6	30
Li	ND			ND		mg/Kg	☼			NC	30
Manganese	14	B		7.32	F3	mg/Kg	☼			63	30
Mo	ND			ND		mg/Kg	☼			NC	30
Selenium	ND			ND		mg/Kg	☼			NC	30
Thallium	ND			ND		mg/Kg	☼			NC	30

Method: 6010B SEP - SEP Metals (ICP) (Continued)

Lab Sample ID: MB 140-30453/11-C
Matrix: Solid
Analysis Batch: 31812

Client Sample ID: Method Blank
Prep Type: Step 3
Prep Batch: 31696

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	ND		2.5	0.045	mg/Kg		07/16/19 08:00	07/17/19 10:47	1

Lab Sample ID: LCS 140-30453/12-C
Matrix: Solid
Analysis Batch: 31812

Client Sample ID: Lab Control Sample
Prep Type: Step 3
Prep Batch: 31696

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cobalt	5.00	4.88		mg/Kg		98	75 - 125

Lab Sample ID: LCSD 140-30453/13-C
Matrix: Solid
Analysis Batch: 31812

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 3
Prep Batch: 31696

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Cobalt	5.00	5.04		mg/Kg		101	75 - 125	3	30

Lab Sample ID: MB 140-30481/11-B
Matrix: Solid
Analysis Batch: 31197

Client Sample ID: Method Blank
Prep Type: Step 4
Prep Batch: 30528

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		10	1.6	mg/Kg		06/10/19 08:00	06/26/19 18:27	1
Antimony	ND		3.0	0.45	mg/Kg		06/10/19 08:00	06/26/19 18:27	1
Arsenic	0.220	J	0.50	0.22	mg/Kg		06/10/19 08:00	06/26/19 18:27	1
Barium	ND		2.5	0.12	mg/Kg		06/10/19 08:00	06/26/19 18:27	1
Beryllium	ND		0.25	0.016	mg/Kg		06/10/19 08:00	06/26/19 18:27	1
Cobalt	ND		2.5	0.053	mg/Kg		06/10/19 08:00	06/26/19 18:27	1
Iron	ND		5.0	2.9	mg/Kg		06/10/19 08:00	06/26/19 18:27	1
Li	ND		2.5	0.15	mg/Kg		06/10/19 08:00	06/26/19 18:27	1
Manganese	ND		0.75	0.13	mg/Kg		06/10/19 08:00	06/26/19 18:27	1
Mo	ND		2.0	0.082	mg/Kg		06/10/19 08:00	06/26/19 18:27	1
Selenium	0.473	J	0.50	0.47	mg/Kg		06/10/19 08:00	06/26/19 18:27	1
Thallium	ND		1.8	0.29	mg/Kg		06/10/19 08:00	06/26/19 18:27	1

Lab Sample ID: LCS 140-30481/12-B
Matrix: Solid
Analysis Batch: 31197

Client Sample ID: Lab Control Sample
Prep Type: Step 4
Prep Batch: 30528

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	100	96.7		mg/Kg		97	75 - 125
Antimony	25.0	24.7		mg/Kg		99	75 - 125
Arsenic	5.00	5.37		mg/Kg		107	75 - 125
Barium	5.00	4.86		mg/Kg		97	75 - 125
Beryllium	2.50	2.61		mg/Kg		104	75 - 125
Cobalt	5.00	4.98		mg/Kg		100	75 - 125
Iron	50.0	50.1		mg/Kg		100	75 - 125
Li	5.00	5.01		mg/Kg		100	75 - 125
Manganese	5.00	4.99		mg/Kg		100	75 - 125
Mo	25.0	25.1		mg/Kg		100	75 - 125

Method: 6010B SEP - SEP Metals (ICP) (Continued)

Lab Sample ID: LCS 140-30481/12-B
Matrix: Solid
Analysis Batch: 31197

Client Sample ID: Lab Control Sample
Prep Type: Step 4
Prep Batch: 30528

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Selenium	7.50	0.489	J *	mg/Kg		7	75 - 125
Thallium	20.0	18.2		mg/Kg		91	75 - 125

Lab Sample ID: LCSD 140-30481/13-B
Matrix: Solid
Analysis Batch: 31197

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 4
Prep Batch: 30528

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Aluminum	100	100		mg/Kg		100	75 - 125	4	30
Antimony	25.0	26.1		mg/Kg		104	75 - 125	5	30
Arsenic	5.00	5.60		mg/Kg		112	75 - 125	4	30
Barium	5.00	5.02		mg/Kg		100	75 - 125	3	30
Beryllium	2.50	2.71		mg/Kg		108	75 - 125	4	30
Cobalt	5.00	5.15		mg/Kg		103	75 - 125	3	30
Iron	50.0	51.4		mg/Kg		103	75 - 125	3	30
Li	5.00	5.15		mg/Kg		103	75 - 125	3	30
Manganese	5.00	5.14		mg/Kg		103	75 - 125	3	30
Mo	25.0	26.7		mg/Kg		107	75 - 125	6	30
Selenium	7.50	0.529	*	mg/Kg		7	75 - 125	8	30
Thallium	20.0	18.7		mg/Kg		94	75 - 125	3	30

Lab Sample ID: 140-15376-1 DU
Matrix: Solid
Analysis Batch: 31197

Client Sample ID: FGO-15 (25-27)
Prep Type: Step 4
Prep Batch: 30528

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Aluminum	600		659		mg/Kg	☼	9	30
Antimony	ND		ND		mg/Kg	☼	NC	30
Arsenic	0.64	J B	0.637	J	mg/Kg	☼	0.5	30
Barium	9.6		10.1		mg/Kg	☼	5	30
Beryllium	0.12	J	0.120	J	mg/Kg	☼	4	30
Cobalt	0.41	J	0.445	J	mg/Kg	☼	8	30
Iron	1400		1370		mg/Kg	☼	2	30
Li	0.93	J	1.11	J	mg/Kg	☼	18	30
Manganese	6.9		5.98		mg/Kg	☼	14	30
Mo	ND		ND		mg/Kg	☼	NC	30
Selenium	0.65	* B	0.697	*	mg/Kg	☼	8	30
Thallium	ND		ND		mg/Kg	☼	NC	30

Lab Sample ID: MB 140-30481/11-C
Matrix: Solid
Analysis Batch: 31812

Client Sample ID: Method Blank
Prep Type: Step 4
Prep Batch: 31697

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	ND		2.5	0.053	mg/Kg		07/16/19 08:00	07/17/19 11:02	1

Method: 6010B SEP - SEP Metals (ICP) (Continued)

Lab Sample ID: LCS 140-30481/12-C
Matrix: Solid
Analysis Batch: 31812

Client Sample ID: Lab Control Sample
Prep Type: Step 4
Prep Batch: 31697

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Cobalt			5.00	5.05		mg/Kg		101	75 - 125		

Lab Sample ID: LCSD 140-30481/13-C
Matrix: Solid
Analysis Batch: 31812

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 4
Prep Batch: 31697

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Cobalt			5.00	5.21		mg/Kg		104	75 - 125	3	30

Lab Sample ID: MB 140-30529/11-B ^5
Matrix: Solid
Analysis Batch: 31197

Client Sample ID: Method Blank
Prep Type: Step 5
Prep Batch: 30726

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		150	24	mg/Kg		06/12/19 08:00	06/26/19 19:48	5
Antimony	ND		45	4.2	mg/Kg		06/12/19 08:00	06/26/19 19:48	5
Arsenic	ND		7.5	1.9	mg/Kg		06/12/19 08:00	06/26/19 19:48	5
Barium	ND		38	1.8	mg/Kg		06/12/19 08:00	06/26/19 19:48	5
Beryllium	ND		3.8	0.32	mg/Kg		06/12/19 08:00	06/26/19 19:48	5
Cobalt	ND		38	0.60	mg/Kg		06/12/19 08:00	06/26/19 19:48	5
Iron	ND		75	44	mg/Kg		06/12/19 08:00	06/26/19 19:48	5
Li	ND		38	2.2	mg/Kg		06/12/19 08:00	06/26/19 19:48	5
Manganese	ND		11	1.9	mg/Kg		06/12/19 08:00	06/26/19 19:48	5
Mo	ND		30	1.3	mg/Kg		06/12/19 08:00	06/26/19 19:48	5
Selenium	ND		7.5	2.6	mg/Kg		06/12/19 08:00	06/26/19 19:48	5
Thallium	ND		26	3.5	mg/Kg		06/12/19 08:00	06/26/19 19:48	5

Lab Sample ID: LCS 140-30529/12-B ^5
Matrix: Solid
Analysis Batch: 31197

Client Sample ID: Lab Control Sample
Prep Type: Step 5
Prep Batch: 30726

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Aluminum			300	30.0	J *	mg/Kg		10	75 - 125		
Antimony			75.0	85.8		mg/Kg		114	75 - 125		
Arsenic			15.0	12.7		mg/Kg		85	75 - 125		
Barium			15.0	8.33	J *	mg/Kg		56	75 - 125		
Beryllium			7.50	4.27	*	mg/Kg		57	75 - 125		
Cobalt			15.0	5.06	J *	mg/Kg		34	75 - 125		
Iron			150	ND	*	mg/Kg		0.4	75 - 125		
Li			15.0	16.5	J	mg/Kg		110	75 - 125		
Manganese			15.0	3.17	J *	mg/Kg		21	75 - 125		
Mo			75.0	63.7		mg/Kg		85	75 - 125		
Selenium			22.5	26.1		mg/Kg		116	75 - 125		
Thallium			60.0	25.2	J *	mg/Kg		42	75 - 125		

Method: 6010B SEP - SEP Metals (ICP) (Continued)

Lab Sample ID: LCSD 140-30529/13-B ^5
Matrix: Solid
Analysis Batch: 31197

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 5
Prep Batch: 30726

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Aluminum			300	ND	*	mg/Kg		6	75 - 125	43	30
Antimony			75.0	85.4		mg/Kg		114	75 - 125	0	30
Arsenic			15.0	12.5		mg/Kg		84	75 - 125	2	30
Barium			15.0	8.04	J *	mg/Kg		54	75 - 125	3	30
Beryllium			7.50	4.25	*	mg/Kg		57	75 - 125	0	30
Cobalt			15.0	4.94	J *	mg/Kg		33	75 - 125	2	30
Iron			150	ND	*	mg/Kg		1	75 - 125	103	30
Li			15.0	17.4	J	mg/Kg		116	75 - 125	5	30
Manganese			15.0	4.43	J *	mg/Kg		30	75 - 125	33	30
Mo			75.0	64.0		mg/Kg		85	75 - 125	0	30
Selenium			22.5	27.5		mg/Kg		122	75 - 125	5	30
Thallium			60.0	26.1	*	mg/Kg		44	75 - 125	3	30

Lab Sample ID: 140-15376-1 DU
Matrix: Solid
Analysis Batch: 31197

Client Sample ID: FGO-15 (25-27)
Prep Type: Step 5
Prep Batch: 30726

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Aluminum	67	J *		61.2	J *	mg/Kg	☼			10	30
Antimony	ND			ND		mg/Kg	☼			NC	30
Arsenic	ND			ND		mg/Kg	☼			NC	30
Barium	ND	*		ND	*	mg/Kg	☼			NC	30
Beryllium	ND	*		ND	*	mg/Kg	☼			NC	30
Cobalt	ND	*		ND	*	mg/Kg	☼			NC	30
Iron	ND	*		ND	*	mg/Kg	☼			NC	30
Li	ND			ND		mg/Kg	☼			NC	30
Manganese	ND	*		ND	*	mg/Kg	☼			NC	30
Mo	ND			ND		mg/Kg	☼			NC	30
Selenium	ND			ND		mg/Kg	☼			NC	30
Thallium	ND	*		ND	*	mg/Kg	☼			NC	30

Lab Sample ID: MB 140-30781/11-A
Matrix: Solid
Analysis Batch: 31197

Client Sample ID: Method Blank
Prep Type: Step 6
Prep Batch: 30781

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		10	1.6	mg/Kg		06/15/19 08:00	06/26/19 21:23	1
Antimony	ND		3.0	0.28	mg/Kg		06/15/19 08:00	06/26/19 21:23	1
Arsenic	ND		0.50	0.15	mg/Kg		06/15/19 08:00	06/26/19 21:23	1
Barium	ND		2.5	0.12	mg/Kg		06/15/19 08:00	06/26/19 21:23	1
Beryllium	ND		0.25	0.012	mg/Kg		06/15/19 08:00	06/26/19 21:23	1
Cobalt	ND		2.5	0.046	mg/Kg		06/15/19 08:00	06/26/19 21:23	1
Iron	ND		5.0	2.9	mg/Kg		06/15/19 08:00	06/26/19 21:23	1
Li	ND		2.5	0.15	mg/Kg		06/15/19 08:00	06/26/19 21:23	1
Manganese	ND		0.75	0.25	mg/Kg		06/15/19 08:00	06/26/19 21:23	1
Mo	ND		2.0	0.099	mg/Kg		06/15/19 08:00	06/26/19 21:23	1
Selenium	ND		0.50	0.17	mg/Kg		06/15/19 08:00	06/26/19 21:23	1
Thallium	ND		1.8	0.21	mg/Kg		06/15/19 08:00	06/26/19 21:23	1

Method: 6010B SEP - SEP Metals (ICP) (Continued)

Lab Sample ID: LCS 140-30781/12-A
Matrix: Solid
Analysis Batch: 31197

Client Sample ID: Lab Control Sample
Prep Type: Step 6
Prep Batch: 30781

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	100	97.3		mg/Kg		97	75 - 125
Antimony	25.0	25.0		mg/Kg		100	75 - 125
Arsenic	5.00	5.14		mg/Kg		103	75 - 125
Barium	5.00	4.63		mg/Kg		93	75 - 125
Beryllium	2.50	2.59		mg/Kg		104	75 - 125
Cobalt	5.00	4.78		mg/Kg		96	75 - 125
Iron	50.0	49.6		mg/Kg		99	75 - 125
Li	5.00	4.67		mg/Kg		93	75 - 125
Manganese	5.00	4.87		mg/Kg		97	75 - 125
Mo	25.0	24.3		mg/Kg		97	75 - 125
Selenium	7.50	7.24		mg/Kg		97	75 - 125
Thallium	20.0	19.7		mg/Kg		99	75 - 125

Lab Sample ID: LCSD 140-30781/13-A
Matrix: Solid
Analysis Batch: 31197

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 6
Prep Batch: 30781

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Aluminum	100	103		mg/Kg		103	75 - 125	5	30
Antimony	25.0	26.5		mg/Kg		106	75 - 125	6	30
Arsenic	5.00	5.49		mg/Kg		110	75 - 125	7	30
Barium	5.00	4.90		mg/Kg		98	75 - 125	6	30
Beryllium	2.50	2.76		mg/Kg		110	75 - 125	6	30
Cobalt	5.00	5.04		mg/Kg		101	75 - 125	5	30
Iron	50.0	52.4		mg/Kg		105	75 - 125	5	30
Li	5.00	4.93		mg/Kg		99	75 - 125	5	30
Manganese	5.00	5.14		mg/Kg		103	75 - 125	5	30
Mo	25.0	25.7		mg/Kg		103	75 - 125	6	30
Selenium	7.50	7.77		mg/Kg		104	75 - 125	7	30
Thallium	20.0	20.7		mg/Kg		104	75 - 125	5	30

Lab Sample ID: 140-15376-1 DU
Matrix: Solid
Analysis Batch: 31197

Client Sample ID: FGO-15 (25-27)
Prep Type: Step 6
Prep Batch: 30781

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Aluminum	1200		1360		mg/Kg	☼	9	30
Antimony	ND		ND		mg/Kg	☼	NC	30
Arsenic	0.62	J	0.568	J	mg/Kg	☼	9	30
Barium	6.0		6.53		mg/Kg	☼	8	30
Beryllium	0.053	J	0.0522	J	mg/Kg	☼	1	30
Cobalt	0.27	J	0.286	J	mg/Kg	☼	8	30
Iron	1100		1090		mg/Kg	☼	2	30
Li	0.93	J	0.902	J	mg/Kg	☼	3	30
Manganese	10		10.8		mg/Kg	☼	5	30
Mo	ND		ND		mg/Kg	☼	NC	30
Selenium	ND		ND		mg/Kg	☼	NC	30
Thallium	ND		ND		mg/Kg	☼	NC	30

Method: 6010B SEP - SEP Metals (ICP) (Continued)

Lab Sample ID: MB 140-30852/11-A
Matrix: Solid
Analysis Batch: 31255

Client Sample ID: Method Blank
Prep Type: Step 7
Prep Batch: 30852

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		10	1.6	mg/Kg		06/16/19 08:00	06/28/19 12:11	1
Antimony	ND		3.0	0.14	mg/Kg		06/16/19 08:00	06/28/19 12:11	1
Arsenic	ND		0.50	0.13	mg/Kg		06/16/19 08:00	06/28/19 12:11	1
Barium	ND		2.5	0.12	mg/Kg		06/16/19 08:00	06/28/19 12:11	1
Beryllium	ND		0.25	0.0075	mg/Kg		06/16/19 08:00	06/28/19 12:11	1
Cobalt	ND		2.5	0.15	mg/Kg		06/16/19 08:00	06/28/19 12:11	1
Iron	ND		5.0	4.1	mg/Kg		06/16/19 08:00	06/28/19 12:11	1
Li	ND		2.5	0.15	mg/Kg		06/16/19 08:00	06/28/19 12:11	1
Manganese	0.0585	J	0.75	0.052	mg/Kg		06/16/19 08:00	06/28/19 12:11	1
Mo	ND		2.0	0.082	mg/Kg		06/16/19 08:00	06/28/19 12:11	1
Selenium	ND		0.50	0.17	mg/Kg		06/16/19 08:00	06/28/19 12:11	1
Thallium	ND		1.8	0.18	mg/Kg		06/16/19 08:00	06/28/19 12:11	1

Lab Sample ID: LCS 140-30852/12-A
Matrix: Solid
Analysis Batch: 31255

Client Sample ID: Lab Control Sample
Prep Type: Step 7
Prep Batch: 30852

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	100	96.0		mg/Kg		96	75 - 125
Antimony	25.0	25.5		mg/Kg		102	75 - 125
Arsenic	5.00	5.23		mg/Kg		105	75 - 125
Barium	5.00	5.07		mg/Kg		101	75 - 125
Beryllium	2.50	2.50		mg/Kg		100	75 - 125
Cobalt	5.00	5.26		mg/Kg		105	75 - 125
Iron	50.0	51.1		mg/Kg		102	75 - 125
Li	5.00	5.34		mg/Kg		107	75 - 125
Manganese	5.00	5.28		mg/Kg		106	75 - 125
Mo	25.0	26.6		mg/Kg		106	75 - 125
Selenium	7.50	7.39		mg/Kg		98	75 - 125
Thallium	20.0	21.5		mg/Kg		108	75 - 125

Lab Sample ID: LCSD 140-30852/13-A
Matrix: Solid
Analysis Batch: 31255

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 7
Prep Batch: 30852

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Aluminum	100	95.8		mg/Kg		96	75 - 125	0	30
Antimony	25.0	25.6		mg/Kg		102	75 - 125	0	30
Arsenic	5.00	5.24		mg/Kg		105	75 - 125	0	30
Barium	5.00	5.13		mg/Kg		103	75 - 125	1	30
Beryllium	2.50	2.51		mg/Kg		100	75 - 125	0	30
Cobalt	5.00	5.29		mg/Kg		106	75 - 125	1	30
Iron	50.0	51.1		mg/Kg		102	75 - 125	0	30
Li	5.00	5.47		mg/Kg		109	75 - 125	2	30
Manganese	5.00	5.42		mg/Kg		108	75 - 125	3	30
Mo	25.0	26.8		mg/Kg		107	75 - 125	1	30
Selenium	7.50	7.49		mg/Kg		100	75 - 125	1	30
Thallium	20.0	21.6		mg/Kg		108	75 - 125	0	30

Method: 6010B SEP - SEP Metals (ICP) (Continued)

Lab Sample ID: 140-15376-1 DU
Matrix: Solid
Analysis Batch: 31255

Client Sample ID: FGO-15 (25-27)
Prep Type: Step 7
Prep Batch: 30852

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Antimony	ND		ND		mg/Kg	☼	NC	30
Beryllium	0.48		0.502		mg/Kg	☼	5	30
Iron	2900		3090		mg/Kg	☼	5	30
Li	7.0		8.01		mg/Kg	☼	13	30
Manganese	54	B	51.4		mg/Kg	☼	6	30
Mo	0.11	J	ND		mg/Kg	☼	NC	30

Lab Sample ID: 140-15376-1 DU
Matrix: Solid
Analysis Batch: 31255

Client Sample ID: FGO-15 (25-27)
Prep Type: Step 7
Prep Batch: 30852

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Aluminum	28000		35200		mg/Kg	☼	23	30
Barium	510		545		mg/Kg	☼	6	30

Lab Sample ID: 140-15376-1 DU
Matrix: Solid
Analysis Batch: 31255

Client Sample ID: FGO-15 (25-27)
Prep Type: Step 7
Prep Batch: 30852

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Arsenic	0.90	J	0.478	J F5	mg/Kg	☼	61	30
Cobalt	0.48	J	0.509	J	mg/Kg	☼	7	30
Selenium	ND		ND		mg/Kg	☼	NC	30
Thallium	0.59	J	0.828	J F5	mg/Kg	☼	34	30

Method: 7470A - SEP Mercury (CVAA) - Total

Lab Sample ID: MB 140-30373/11-B
Matrix: Solid
Analysis Batch: 30491

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 30373

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.10	0.040	mg/Kg		05/30/19 08:00	06/03/19 14:34	1

Lab Sample ID: LCS 140-30373/12-B
Matrix: Solid
Analysis Batch: 30491

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 30373

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Hg	2.50	2.54		mg/Kg		101	75 - 125

Lab Sample ID: LCSD 140-30373/13-B
Matrix: Solid
Analysis Batch: 30491

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 30373

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Hg	2.50	2.53		mg/Kg		101	75 - 125	0	30

Client: Golder Associates Inc.
Job ID: 140-15376-1
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Method: 7470A - SEP Mercury (CVAA) - Total (Continued)

Lab Sample ID: 140-15376-A-1-J DU
Matrix: Solid
Analysis Batch: 30491

Client Sample ID: 140-15376-A-1-J DU
Prep Type: Total/NA
Prep Batch: 30373

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Hg	ND			ND		mg/Kg	☼			NC	30

Metals

Prep Batch: 30373

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-1	FGO-15 (25-27)	Total/NA	Solid	Total	
140-15376-2	FGO-14 (30-32)	Total/NA	Solid	Total	
140-15376-3	FGO-2019-1 (23-25)	Total/NA	Solid	Total	
MB 140-30373/11-A	Method Blank	Total/NA	Solid	Total	
MB 140-30373/11-B	Method Blank	Total/NA	Solid	Total	
LCS 140-30373/12-A	Lab Control Sample	Total/NA	Solid	Total	
LCS 140-30373/12-B	Lab Control Sample	Total/NA	Solid	Total	
LCSD 140-30373/13-A	Lab Control Sample Dup	Total/NA	Solid	Total	
LCSD 140-30373/13-B	Lab Control Sample Dup	Total/NA	Solid	Total	
140-15376-1 DU	FGO-15 (25-27)	Total/NA	Solid	Total	
140-15376-A-1-J DU	140-15376-A-1-J DU	Total/NA	Solid	Total	

SEP Batch: 30374

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-1	FGO-15 (25-27)	Step 1	Solid	Exchangeable	
140-15376-2	FGO-14 (30-32)	Step 1	Solid	Exchangeable	
140-15376-3	FGO-2019-1 (23-25)	Step 1	Solid	Exchangeable	
MB 140-30374/11-B ^4	Method Blank	Step 1	Solid	Exchangeable	
LCS 140-30374/12-B ^5	Lab Control Sample	Step 1	Solid	Exchangeable	
LCSD 140-30374/13-B ^5	Lab Control Sample Dup	Step 1	Solid	Exchangeable	
140-15376-1 DU	FGO-15 (25-27)	Step 1	Solid	Exchangeable	

Prep Batch: 30422

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-1	FGO-15 (25-27)	Step 1	Solid	3010A	30374
140-15376-2	FGO-14 (30-32)	Step 1	Solid	3010A	30374
140-15376-3	FGO-2019-1 (23-25)	Step 1	Solid	3010A	30374
MB 140-30374/11-B ^4	Method Blank	Step 1	Solid	3010A	30374
LCS 140-30374/12-B ^5	Lab Control Sample	Step 1	Solid	3010A	30374
LCSD 140-30374/13-B ^5	Lab Control Sample Dup	Step 1	Solid	3010A	30374
140-15376-1 DU	FGO-15 (25-27)	Step 1	Solid	3010A	30374

SEP Batch: 30423

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-1	FGO-15 (25-27)	Step 2	Solid	Carbonate	
140-15376-2	FGO-14 (30-32)	Step 2	Solid	Carbonate	
140-15376-3	FGO-2019-1 (23-25)	Step 2	Solid	Carbonate	
MB 140-30423/11-B ^3	Method Blank	Step 2	Solid	Carbonate	
LCS 140-30423/12-B ^5	Lab Control Sample	Step 2	Solid	Carbonate	
LCSD 140-30423/13-B ^5	Lab Control Sample Dup	Step 2	Solid	Carbonate	
140-15376-1 DU	FGO-15 (25-27)	Step 2	Solid	Carbonate	

Prep Batch: 30447

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-2	FGO-14 (30-32)	Total/NA	Solid	7470A	30373
140-15376-3	FGO-2019-1 (23-25)	Total/NA	Solid	7470A	30373
MB 140-30373/11-B	Method Blank	Total/NA	Solid	7470A	30373
LCS 140-30373/12-B	Lab Control Sample	Total/NA	Solid	7470A	30373
LCSD 140-30373/13-B	Lab Control Sample Dup	Total/NA	Solid	7470A	30373
140-15376-A-1-J DU	140-15376-A-1-J DU	Total/NA	Solid	7470A	30373

Metals

Prep Batch: 30452

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-1	FGO-15 (25-27)	Step 2	Solid	3010A	30423
140-15376-2	FGO-14 (30-32)	Step 2	Solid	3010A	30423
140-15376-3	FGO-2019-1 (23-25)	Step 2	Solid	3010A	30423
MB 140-30423/11-B ^3	Method Blank	Step 2	Solid	3010A	30423
LCS 140-30423/12-B ^5	Lab Control Sample	Step 2	Solid	3010A	30423
LCSD 140-30423/13-B ^5	Lab Control Sample Dup	Step 2	Solid	3010A	30423
140-15376-1 DU	FGO-15 (25-27)	Step 2	Solid	3010A	30423

SEP Batch: 30453

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-1	FGO-15 (25-27)	Step 3	Solid	Non-Crystalline	
140-15376-2	FGO-14 (30-32)	Step 3	Solid	Non-Crystalline	
140-15376-3	FGO-2019-1 (23-25)	Step 3	Solid	Non-Crystalline	
MB 140-30453/11-B	Method Blank	Step 3	Solid	Non-Crystalline	
MB 140-30453/11-C	Method Blank	Step 3	Solid	Non-Crystalline	
LCS 140-30453/12-B	Lab Control Sample	Step 3	Solid	Non-Crystalline	
LCS 140-30453/12-C	Lab Control Sample	Step 3	Solid	Non-Crystalline	
LCSD 140-30453/13-B	Lab Control Sample Dup	Step 3	Solid	Non-Crystalline	
LCSD 140-30453/13-C	Lab Control Sample Dup	Step 3	Solid	Non-Crystalline	
140-15376-1 DU	FGO-15 (25-27)	Step 3	Solid	Non-Crystalline	

Prep Batch: 30480

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-1	FGO-15 (25-27)	Step 3	Solid	3010A	30453
140-15376-2	FGO-14 (30-32)	Step 3	Solid	3010A	30453
140-15376-3	FGO-2019-1 (23-25)	Step 3	Solid	3010A	30453
MB 140-30453/11-B	Method Blank	Step 3	Solid	3010A	30453
LCS 140-30453/12-B	Lab Control Sample	Step 3	Solid	3010A	30453
LCSD 140-30453/13-B	Lab Control Sample Dup	Step 3	Solid	3010A	30453
140-15376-1 DU	FGO-15 (25-27)	Step 3	Solid	3010A	30453

SEP Batch: 30481

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-1	FGO-15 (25-27)	Step 4	Solid	Metal Hydroxide	
140-15376-2	FGO-14 (30-32)	Step 4	Solid	Metal Hydroxide	
140-15376-3	FGO-2019-1 (23-25)	Step 4	Solid	Metal Hydroxide	
MB 140-30481/11-B	Method Blank	Step 4	Solid	Metal Hydroxide	
MB 140-30481/11-C	Method Blank	Step 4	Solid	Metal Hydroxide	
LCS 140-30481/12-B	Lab Control Sample	Step 4	Solid	Metal Hydroxide	
LCS 140-30481/12-C	Lab Control Sample	Step 4	Solid	Metal Hydroxide	
LCSD 140-30481/13-B	Lab Control Sample Dup	Step 4	Solid	Metal Hydroxide	
LCSD 140-30481/13-C	Lab Control Sample Dup	Step 4	Solid	Metal Hydroxide	
140-15376-1 DU	FGO-15 (25-27)	Step 4	Solid	Metal Hydroxide	

Analysis Batch: 30491

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-2	FGO-14 (30-32)	Total/NA	Solid	7470A	30447
140-15376-3	FGO-2019-1 (23-25)	Total/NA	Solid	7470A	30447
MB 140-30373/11-B	Method Blank	Total/NA	Solid	7470A	30447
LCS 140-30373/12-B	Lab Control Sample	Total/NA	Solid	7470A	30447
LCSD 140-30373/13-B	Lab Control Sample Dup	Total/NA	Solid	7470A	30447

Metals (Continued)

Analysis Batch: 30491 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-A-1-J DU	140-15376-A-1-J DU	Total/NA	Solid	7470A	30447

Prep Batch: 30528

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-1	FGO-15 (25-27)	Step 4	Solid	3010A	30481
140-15376-2	FGO-14 (30-32)	Step 4	Solid	3010A	30481
140-15376-3	FGO-2019-1 (23-25)	Step 4	Solid	3010A	30481
MB 140-30481/11-B	Method Blank	Step 4	Solid	3010A	30481
LCS 140-30481/12-B	Lab Control Sample	Step 4	Solid	3010A	30481
LCSD 140-30481/13-B	Lab Control Sample Dup	Step 4	Solid	3010A	30481
140-15376-1 DU	FGO-15 (25-27)	Step 4	Solid	3010A	30481

SEP Batch: 30529

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-1	FGO-15 (25-27)	Step 5	Solid	Organic-Bound	
140-15376-2	FGO-14 (30-32)	Step 5	Solid	Organic-Bound	
140-15376-3	FGO-2019-1 (23-25)	Step 5	Solid	Organic-Bound	
MB 140-30529/11-B ^5	Method Blank	Step 5	Solid	Organic-Bound	
LCS 140-30529/12-B ^5	Lab Control Sample	Step 5	Solid	Organic-Bound	
LCSD 140-30529/13-B ^5	Lab Control Sample Dup	Step 5	Solid	Organic-Bound	
140-15376-1 DU	FGO-15 (25-27)	Step 5	Solid	Organic-Bound	

Prep Batch: 30726

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-1	FGO-15 (25-27)	Step 5	Solid	3010A	30529
140-15376-2	FGO-14 (30-32)	Step 5	Solid	3010A	30529
140-15376-3	FGO-2019-1 (23-25)	Step 5	Solid	3010A	30529
MB 140-30529/11-B ^5	Method Blank	Step 5	Solid	3010A	30529
LCS 140-30529/12-B ^5	Lab Control Sample	Step 5	Solid	3010A	30529
LCSD 140-30529/13-B ^5	Lab Control Sample Dup	Step 5	Solid	3010A	30529
140-15376-1 DU	FGO-15 (25-27)	Step 5	Solid	3010A	30529

SEP Batch: 30781

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-1	FGO-15 (25-27)	Step 6	Solid	Acid/Sulfide	
140-15376-2	FGO-14 (30-32)	Step 6	Solid	Acid/Sulfide	
140-15376-3	FGO-2019-1 (23-25)	Step 6	Solid	Acid/Sulfide	
MB 140-30781/11-A	Method Blank	Step 6	Solid	Acid/Sulfide	
LCS 140-30781/12-A	Lab Control Sample	Step 6	Solid	Acid/Sulfide	
LCSD 140-30781/13-A	Lab Control Sample Dup	Step 6	Solid	Acid/Sulfide	
140-15376-1 DU	FGO-15 (25-27)	Step 6	Solid	Acid/Sulfide	

Prep Batch: 30852

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-1	FGO-15 (25-27)	Step 7	Solid	Residual	
140-15376-2	FGO-14 (30-32)	Step 7	Solid	Residual	
140-15376-3	FGO-2019-1 (23-25)	Step 7	Solid	Residual	
MB 140-30852/11-A	Method Blank	Step 7	Solid	Residual	
LCS 140-30852/12-A	Lab Control Sample	Step 7	Solid	Residual	
LCSD 140-30852/13-A	Lab Control Sample Dup	Step 7	Solid	Residual	
140-15376-1 DU	FGO-15 (25-27)	Step 7	Solid	Residual	

QC Association Summary

Client: Golder Associates Inc.
Job ID: 140-15376-1
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Metals

Prep Batch: 30853

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-1	FGO-15 (25-27)	Total/NA	Solid	3050B	
140-15376-2	FGO-14 (30-32)	Total/NA	Solid	3050B	
140-15376-3	FGO-2019-1 (23-25)	Total/NA	Solid	3050B	
MB 140-30853/8-A	Method Blank	Total/NA	Solid	3050B	
LCS 140-30853/9-A	Lab Control Sample	Total/NA	Solid	3050B	
140-15376-1 MS	FGO-15 (25-27)	Total/NA	Solid	3050B	
140-15376-1 MSD	FGO-15 (25-27)	Total/NA	Solid	3050B	

Analysis Batch: 30900

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-1	FGO-15 (25-27)	Step 1	Solid	6010B SEP	30422
140-15376-1	FGO-15 (25-27)	Step 2	Solid	6010B SEP	30452
140-15376-1	FGO-15 (25-27)	Total/NA	Solid	6010B	30853
140-15376-2	FGO-14 (30-32)	Step 1	Solid	6010B SEP	30422
140-15376-2	FGO-14 (30-32)	Step 2	Solid	6010B SEP	30452
140-15376-2	FGO-14 (30-32)	Total/NA	Solid	6010B	30853
140-15376-3	FGO-2019-1 (23-25)	Step 1	Solid	6010B SEP	30422
140-15376-3	FGO-2019-1 (23-25)	Step 2	Solid	6010B SEP	30452
140-15376-3	FGO-2019-1 (23-25)	Total/NA	Solid	6010B	30853
MB 140-30374/11-B ^4	Method Blank	Step 1	Solid	6010B SEP	30422
MB 140-30423/11-B ^3	Method Blank	Step 2	Solid	6010B SEP	30452
MB 140-30853/8-A	Method Blank	Total/NA	Solid	6010B	30853
LCS 140-30374/12-B ^5	Lab Control Sample	Step 1	Solid	6010B SEP	30422
LCS 140-30423/12-B ^5	Lab Control Sample	Step 2	Solid	6010B SEP	30452
LCS 140-30853/9-A	Lab Control Sample	Total/NA	Solid	6010B	30853
LCSD 140-30374/13-B ^5	Lab Control Sample Dup	Step 1	Solid	6010B SEP	30422
LCSD 140-30423/13-B ^5	Lab Control Sample Dup	Step 2	Solid	6010B SEP	30452
140-15376-1 MS	FGO-15 (25-27)	Total/NA	Solid	6010B	30853
140-15376-1 MSD	FGO-15 (25-27)	Total/NA	Solid	6010B	30853
140-15376-1 DU	FGO-15 (25-27)	Step 1	Solid	6010B SEP	30422
140-15376-1 DU	FGO-15 (25-27)	Step 2	Solid	6010B SEP	30452

Analysis Batch: 31197

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-1	FGO-15 (25-27)	Step 3	Solid	6010B SEP	30480
140-15376-1	FGO-15 (25-27)	Step 4	Solid	6010B SEP	30528
140-15376-1	FGO-15 (25-27)	Step 5	Solid	6010B SEP	30726
140-15376-1	FGO-15 (25-27)	Step 6	Solid	6010B SEP	30781
140-15376-2	FGO-14 (30-32)	Step 3	Solid	6010B SEP	30480
140-15376-2	FGO-14 (30-32)	Step 4	Solid	6010B SEP	30528
140-15376-2	FGO-14 (30-32)	Step 5	Solid	6010B SEP	30726
140-15376-2	FGO-14 (30-32)	Step 6	Solid	6010B SEP	30781
140-15376-3	FGO-2019-1 (23-25)	Step 3	Solid	6010B SEP	30480
140-15376-3	FGO-2019-1 (23-25)	Step 4	Solid	6010B SEP	30528
140-15376-3	FGO-2019-1 (23-25)	Step 5	Solid	6010B SEP	30726
140-15376-3	FGO-2019-1 (23-25)	Step 6	Solid	6010B SEP	30781
MB 140-30453/11-B	Method Blank	Step 3	Solid	6010B SEP	30480
MB 140-30481/11-B	Method Blank	Step 4	Solid	6010B SEP	30528
MB 140-30529/11-B ^5	Method Blank	Step 5	Solid	6010B SEP	30726
MB 140-30781/11-A	Method Blank	Step 6	Solid	6010B SEP	30781
LCS 140-30453/12-B	Lab Control Sample	Step 3	Solid	6010B SEP	30480

Metals (Continued)

Analysis Batch: 31197 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 140-30481/12-B	Lab Control Sample	Step 4	Solid	6010B SEP	30528
LCS 140-30529/12-B ^5	Lab Control Sample	Step 5	Solid	6010B SEP	30726
LCS 140-30781/12-A	Lab Control Sample	Step 6	Solid	6010B SEP	30781
LCSD 140-30453/13-B	Lab Control Sample Dup	Step 3	Solid	6010B SEP	30480
LCSD 140-30481/13-B	Lab Control Sample Dup	Step 4	Solid	6010B SEP	30528
LCSD 140-30529/13-B ^5	Lab Control Sample Dup	Step 5	Solid	6010B SEP	30726
LCSD 140-30781/13-A	Lab Control Sample Dup	Step 6	Solid	6010B SEP	30781
140-15376-1 DU	FGO-15 (25-27)	Step 3	Solid	6010B SEP	30480
140-15376-1 DU	FGO-15 (25-27)	Step 4	Solid	6010B SEP	30528
140-15376-1 DU	FGO-15 (25-27)	Step 5	Solid	6010B SEP	30726
140-15376-1 DU	FGO-15 (25-27)	Step 6	Solid	6010B SEP	30781

Analysis Batch: 31255

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-1	FGO-15 (25-27)	Step 7	Solid	6010B SEP	30852
140-15376-1	FGO-15 (25-27)	Step 7	Solid	6010B SEP	30852
140-15376-1	FGO-15 (25-27)	Step 7	Solid	6010B SEP	30852
140-15376-1	FGO-15 (25-27)	Total/NA	Solid	6010B	30373
140-15376-1	FGO-15 (25-27)	Total/NA	Solid	6010B	30373
140-15376-1	FGO-15 (25-27)	Total/NA	Solid	6010B	30373
140-15376-2	FGO-14 (30-32)	Step 7	Solid	6010B SEP	30852
140-15376-2	FGO-14 (30-32)	Step 7	Solid	6010B SEP	30852
140-15376-2	FGO-14 (30-32)	Step 7	Solid	6010B SEP	30852
140-15376-2	FGO-14 (30-32)	Total/NA	Solid	6010B	30373
140-15376-2	FGO-14 (30-32)	Total/NA	Solid	6010B	30373
140-15376-2	FGO-14 (30-32)	Total/NA	Solid	6010B	30373
140-15376-3	FGO-2019-1 (23-25)	Step 7	Solid	6010B SEP	30852
140-15376-3	FGO-2019-1 (23-25)	Step 7	Solid	6010B SEP	30852
140-15376-3	FGO-2019-1 (23-25)	Step 7	Solid	6010B SEP	30852
140-15376-3	FGO-2019-1 (23-25)	Total/NA	Solid	6010B	30373
140-15376-3	FGO-2019-1 (23-25)	Total/NA	Solid	6010B	30373
MB 140-30373/11-A	Method Blank	Total/NA	Solid	6010B	30373
MB 140-30852/11-A	Method Blank	Step 7	Solid	6010B SEP	30852
LCS 140-30373/12-A	Lab Control Sample	Total/NA	Solid	6010B	30373
LCS 140-30852/12-A	Lab Control Sample	Step 7	Solid	6010B SEP	30852
LCSD 140-30373/13-A	Lab Control Sample Dup	Total/NA	Solid	6010B	30373
LCSD 140-30852/13-A	Lab Control Sample Dup	Step 7	Solid	6010B SEP	30852
140-15376-1 DU	FGO-15 (25-27)	Step 7	Solid	6010B SEP	30852
140-15376-1 DU	FGO-15 (25-27)	Step 7	Solid	6010B SEP	30852
140-15376-1 DU	FGO-15 (25-27)	Step 7	Solid	6010B SEP	30852
140-15376-1 DU	FGO-15 (25-27)	Total/NA	Solid	6010B	30373
140-15376-1 DU	FGO-15 (25-27)	Total/NA	Solid	6010B	30373
140-15376-1 DU	FGO-15 (25-27)	Total/NA	Solid	6010B	30373

Analysis Batch: 31570

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-1	FGO-15 (25-27)	Sum of Steps 1-7	Solid	6010B SEP	
140-15376-2	FGO-14 (30-32)	Sum of Steps 1-7	Solid	6010B SEP	
140-15376-3	FGO-2019-1 (23-25)	Sum of Steps 1-7	Solid	6010B SEP	

QC Association Summary

Client: Golder Associates Inc.
Job ID: 140-15376-1
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Metals

Prep Batch: 31695

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-3	FGO-2019-1 (23-25)	Total/NA	Solid	Total	
MB 140-31695/2-A	Method Blank	Total/NA	Solid	Total	
LCS 140-31695/3-A	Lab Control Sample	Total/NA	Solid	Total	
LCSD 140-31695/4-A	Lab Control Sample Dup	Total/NA	Solid	Total	

Prep Batch: 31696

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-3	FGO-2019-1 (23-25)	Step 3	Solid	3010A	30453
MB 140-30453/11-C	Method Blank	Step 3	Solid	3010A	30453
LCS 140-30453/12-C	Lab Control Sample	Step 3	Solid	3010A	30453
LCSD 140-30453/13-C	Lab Control Sample Dup	Step 3	Solid	3010A	30453

Prep Batch: 31697

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-3	FGO-2019-1 (23-25)	Step 4	Solid	3010A	30481
MB 140-30481/11-C	Method Blank	Step 4	Solid	3010A	30481
LCS 140-30481/12-C	Lab Control Sample	Step 4	Solid	3010A	30481
LCSD 140-30481/13-C	Lab Control Sample Dup	Step 4	Solid	3010A	30481

Analysis Batch: 31812

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-3	FGO-2019-1 (23-25)	Step 3	Solid	6010B SEP	31696
140-15376-3	FGO-2019-1 (23-25)	Step 4	Solid	6010B SEP	31697
140-15376-3	FGO-2019-1 (23-25)	Total/NA	Solid	6010B	31695
MB 140-30453/11-C	Method Blank	Step 3	Solid	6010B SEP	31696
MB 140-30481/11-C	Method Blank	Step 4	Solid	6010B SEP	31697
MB 140-31695/2-A	Method Blank	Total/NA	Solid	6010B	31695
LCS 140-30453/12-C	Lab Control Sample	Step 3	Solid	6010B SEP	31696
LCS 140-30481/12-C	Lab Control Sample	Step 4	Solid	6010B SEP	31697
LCS 140-31695/3-A	Lab Control Sample	Total/NA	Solid	6010B	31695
LCSD 140-30453/13-C	Lab Control Sample Dup	Step 3	Solid	6010B SEP	31696
LCSD 140-30481/13-C	Lab Control Sample Dup	Step 4	Solid	6010B SEP	31697
LCSD 140-31695/4-A	Lab Control Sample Dup	Total/NA	Solid	6010B	31695

General Chemistry

Analysis Batch: 30352

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-1	FGO-15 (25-27)	Total/NA	Solid	Moisture	
140-15376-2	FGO-14 (30-32)	Total/NA	Solid	Moisture	
140-15376-3	FGO-2019-1 (23-25)	Total/NA	Solid	Moisture	
140-15376-1 DU	FGO-15 (25-27)	Total/NA	Solid	Moisture	

Lab Chronicle

Client: Golder Associates Inc.
Job ID: 140-15376-1
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Client Sample ID: FGO-15 (25-27)
Lab Sample ID: 140-15376-1
Date Collected: 05/22/19 19:15
Matrix: Solid
Date Received: 05/24/19 09:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Sum of Steps 1-7	Analysis	6010B SEP		1			31570	07/11/19 10:59	CLJ	TAL KNX
	Instrument ID: NOEQUIP									
Total/NA	Analysis	Moisture		1			30352	05/28/19 16:16	BKD	TAL KNX
	Instrument ID: W3									

Client Sample ID: FGO-15 (25-27)
Lab Sample ID: 140-15376-1
Date Collected: 05/22/19 19:15
Matrix: Solid
Date Received: 05/24/19 09:40
Percent Solids: 76.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			0.542 g	50 mL	30853	06/16/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			30900	06/17/19 11:27	KNC	TAL KNX
	Instrument ID: DUO									
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			31255	06/28/19 15:23	KNC	TAL KNX
	Instrument ID: DUO									
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		10			31255	06/28/19 16:37	KNC	TAL KNX
	Instrument ID: DUO									
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		2			31255	06/28/19 18:40	KNC	TAL KNX
	Instrument ID: DUO									
Step 1	SEP	Exchangeable			5.000 g	25 mL	30374	05/30/19 08:00	KNC	TAL KNX
Step 1	Prep	3010A			5 mL	50 mL	30422	05/31/19 08:00	KNC	TAL KNX
Step 1	Analysis	6010B SEP		4			30900	06/17/19 14:14	KNC	TAL KNX
	Instrument ID: DUO									
Step 2	SEP	Carbonate			5.000 g	25 mL	30423	05/31/19 08:00	KNC	TAL KNX
Step 2	Prep	3010A			5 mL	50 mL	30452	06/03/19 08:00	KNC	TAL KNX
Step 2	Analysis	6010B SEP		3			30900	06/17/19 15:37	KNC	TAL KNX
	Instrument ID: DUO									
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	30453	06/03/19 08:00	KNC	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	30480	06/04/19 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			31197	06/26/19 17:30	KNC	TAL KNX
	Instrument ID: DUO									
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	30481	06/04/19 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	30528	06/10/19 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			31197	06/26/19 18:52	KNC	TAL KNX
	Instrument ID: DUO									
Step 5	SEP	Organic-Bound			5.000 g	75 mL	30529	06/10/19 08:00	KNC	TAL KNX
Step 5	Prep	3010A			5 mL	50 mL	30726	06/12/19 08:00	KNC	TAL KNX
Step 5	Analysis	6010B SEP		5			31197	06/26/19 20:25	KNC	TAL KNX
	Instrument ID: DUO									
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	30781	06/15/19 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		1			31197	06/26/19 21:48	KNC	TAL KNX
	Instrument ID: DUO									

Lab Chronicle

Client: Golder Associates Inc.
Job ID: 140-15376-1
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Client Sample ID: FGO-15 (25-27)
Lab Sample ID: 140-15376-1
Date Collected: 05/22/19 19:15
Matrix: Solid
Date Received: 05/24/19 09:40
Percent Solids: 76.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 7	Prep	Residual			1.000 g	50 mL	30852	06/16/19 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			31255	06/28/19 12:53	KNC	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	30852	06/16/19 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		10			31255	06/28/19 14:17	KNC	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	30852	06/16/19 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		2			31255	06/28/19 17:43	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: FGO-14 (30-32)
Lab Sample ID: 140-15376-2
Date Collected: 05/23/19 10:40
Matrix: Solid
Date Received: 05/24/19 09:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Sum of Steps 1-7	Analysis	6010B SEP		1			31570	07/11/19 10:59	CLJ	TAL KNX
	Instrument ID: NOEQUIP									
Total/NA	Analysis	Moisture		1			30352	05/28/19 16:16	BKD	TAL KNX
	Instrument ID: W3									

Client Sample ID: FGO-14 (30-32)
Lab Sample ID: 140-15376-2
Date Collected: 05/23/19 10:40
Matrix: Solid
Date Received: 05/24/19 09:40
Percent Solids: 79.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			0.535 g	50 mL	30853	06/16/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			30900	06/17/19 11:41	KNC	TAL KNX
	Instrument ID: DUO									
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			31255	06/28/19 15:34	KNC	TAL KNX
	Instrument ID: DUO									
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		10			31255	06/28/19 16:47	KNC	TAL KNX
	Instrument ID: DUO									
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		2			31255	06/28/19 18:50	KNC	TAL KNX
	Instrument ID: DUO									
Step 1	SEP	Exchangeable			5.000 g	25 mL	30374	05/30/19 08:00	KNC	TAL KNX
Step 1	Prep	3010A			5 mL	50 mL	30422	05/31/19 08:00	KNC	TAL KNX
Step 1	Analysis	6010B SEP		4			30900	06/17/19 14:24	KNC	TAL KNX
	Instrument ID: DUO									
Step 2	SEP	Carbonate			5.000 g	25 mL	30423	05/31/19 08:00	KNC	TAL KNX
Step 2	Prep	3010A			5 mL	50 mL	30452	06/03/19 08:00	KNC	TAL KNX
Step 2	Analysis	6010B SEP		3			30900	06/17/19 15:58	KNC	TAL KNX
	Instrument ID: DUO									

Lab Chronicle

Client: Golder Associates Inc. Job ID: 140-15376-1
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Client Sample ID: FGO-14 (30-32) Lab Sample ID: 140-15376-2

Date Collected: 05/23/19 10:40 **Matrix: Solid**
Date Received: 05/24/19 09:40 **Percent Solids: 79.2**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	30453	06/03/19 08:00	KNC	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	30480	06/04/19 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			31197	06/26/19 17:40	KNC	TAL KNX
	Instrument ID: DUO									
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	30481	06/04/19 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	30528	06/10/19 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			31197	06/26/19 19:13	KNC	TAL KNX
	Instrument ID: DUO									
Step 5	SEP	Organic-Bound			5.000 g	75 mL	30529	06/10/19 08:00	KNC	TAL KNX
Step 5	Prep	3010A			5 mL	50 mL	30726	06/12/19 08:00	KNC	TAL KNX
Step 5	Analysis	6010B SEP		5			31197	06/26/19 20:35	KNC	TAL KNX
	Instrument ID: DUO									
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	30781	06/15/19 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		1			31197	06/26/19 22:14	KNC	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	30852	06/16/19 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			31255	06/28/19 13:19	KNC	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	30852	06/16/19 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		10			31255	06/28/19 14:27	KNC	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	30852	06/16/19 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		2			31255	06/28/19 17:53	KNC	TAL KNX
	Instrument ID: DUO									
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Prep	7470A			5.0 mL	50.0 mL	30447	05/31/19 12:19	DKW	TAL KNX
Total/NA	Analysis	7470A		1			30491	06/03/19 14:52	DKW	TAL KNX
	Instrument ID: HG									

Client Sample ID: FGO-2019-1 (23-25) Lab Sample ID: 140-15376-3

Date Collected: 05/23/19 15:20 **Matrix: Solid**
Date Received: 05/24/19 09:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Sum of Steps 1-7	Analysis	6010B SEP		1			31570	07/11/19 10:59	CLJ	TAL KNX
	Instrument ID: NOEQUIP									
Total/NA	Analysis	Moisture		1			30352	05/28/19 16:16	BKD	TAL KNX
	Instrument ID: W3									

Lab Chronicle

Client: Golder Associates Inc.
Job ID: 140-15376-1
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Client Sample ID: FGO-2019-1 (23-25)
Date Collected: 05/23/19 15:20
Date Received: 05/24/19 09:40

Lab Sample ID: 140-15376-3
Matrix: Solid
Percent Solids: 77.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			0.534 g	50 mL	30853	06/16/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			30900	06/17/19 11:47	KNC	TAL KNX
	Instrument ID: DUO									
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			31255	06/28/19 15:40	KNC	TAL KNX
	Instrument ID: DUO									
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		10			31255	06/28/19 16:52	KNC	TAL KNX
	Instrument ID: DUO									
Total/NA	Prep	Total			1.000 g	50 mL	31695	07/16/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		2			31812	07/17/19 12:03	KNC	TAL KNX
	Instrument ID: DUO									
Step 1	SEP	Exchangeable			5.000 g	25 mL	30374	05/30/19 08:00	KNC	TAL KNX
Step 1	Prep	3010A			5 mL	50 mL	30422	05/31/19 08:00	KNC	TAL KNX
Step 1	Analysis	6010B SEP		4			30900	06/17/19 14:29	KNC	TAL KNX
	Instrument ID: DUO									
Step 2	SEP	Carbonate			5.000 g	25 mL	30423	05/31/19 08:00	KNC	TAL KNX
Step 2	Prep	3010A			5 mL	50 mL	30452	06/03/19 08:00	KNC	TAL KNX
Step 2	Analysis	6010B SEP		3			30900	06/17/19 16:03	KNC	TAL KNX
	Instrument ID: DUO									
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	30453	06/03/19 08:00	KNC	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	30480	06/04/19 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			31197	06/26/19 17:45	KNC	TAL KNX
	Instrument ID: DUO									
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	30453	06/03/19 08:00	KNC	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	31696	07/16/19 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			31812	07/17/19 11:32	KNC	TAL KNX
	Instrument ID: DUO									
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	30481	06/04/19 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	30528	06/10/19 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			31197	06/26/19 19:18	KNC	TAL KNX
	Instrument ID: DUO									
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	30481	06/04/19 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	31697	07/16/19 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			31812	07/17/19 11:53	KNC	TAL KNX
	Instrument ID: DUO									
Step 5	SEP	Organic-Bound			5.000 g	75 mL	30529	06/10/19 08:00	KNC	TAL KNX
Step 5	Prep	3010A			5 mL	50 mL	30726	06/12/19 08:00	KNC	TAL KNX
Step 5	Analysis	6010B SEP		5			31197	06/26/19 20:41	KNC	TAL KNX
	Instrument ID: DUO									
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	30781	06/15/19 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		1			31197	06/26/19 22:20	KNC	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	30852	06/16/19 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			31255	06/28/19 13:24	KNC	TAL KNX
	Instrument ID: DUO									

Lab Chronicle

Client: Golder Associates Inc. Job ID: 140-15376-1
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Client Sample ID: FGO-2019-1 (23-25)
Lab Sample ID: 140-15376-3
Date Collected: 05/23/19 15:20 **Matrix: Solid**
Date Received: 05/24/19 09:40 **Percent Solids: 77.2**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 7	Prep	Residual			1.000 g	50 mL	30852	06/16/19 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		10			31255	06/28/19 14:32	KNC	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	30852	06/16/19 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		2			31255	06/28/19 17:58	KNC	TAL KNX
	Instrument ID: DUO									
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Prep	7470A			5.0 mL	50.0 mL	30447	05/31/19 12:19	DKW	TAL KNX
Total/NA	Analysis	7470A		1			30491	06/03/19 14:54	DKW	TAL KNX
	Instrument ID: HG									

Client Sample ID: Method Blank
Lab Sample ID: MB 140-30373/11-A
Date Collected: N/A **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			31255	06/28/19 12:27	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Method Blank
Lab Sample ID: MB 140-30373/11-B
Date Collected: N/A **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Prep	7470A			5.0 mL	50.0 mL	30447	05/31/19 12:19	DKW	TAL KNX
Total/NA	Analysis	7470A		1			30491	06/03/19 14:34	DKW	TAL KNX
	Instrument ID: HG									

Client Sample ID: Method Blank
Lab Sample ID: MB 140-30374/11-B ^4
Date Collected: N/A **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 1	SEP	Exchangeable			5.000 g	25 mL	30374	05/30/19 08:00	KNC	TAL KNX
Step 1	Prep	3010A			5 mL	50 mL	30422	05/31/19 08:00	KNC	TAL KNX
Step 1	Analysis	6010B SEP		4			30900	06/17/19 13:48	KNC	TAL KNX
	Instrument ID: DUO									

Lab Chronicle

Client: Golder Associates Inc. Job ID: 140-15376-1
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Client Sample ID: Method Blank — Lab Sample ID: MB 140-30423/11-B ^3
Date Collected: N/A — **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 2	SEP	Carbonate			5.000 g	25 mL	30423	05/31/19 08:00	KNC	TAL KNX
Step 2	Prep	3010A			5 mL	50 mL	30452	06/03/19 08:00	KNC	TAL KNX
Step 2	Analysis	6010B SEP		3			30900	06/17/19 15:11	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Method Blank — Lab Sample ID: MB 140-30453/11-B
Date Collected: N/A — **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	30453	06/03/19 08:00	KNC	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	30480	06/04/19 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			31197	06/26/19 17:04	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Method Blank — Lab Sample ID: MB 140-30453/11-C
Date Collected: N/A — **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	30453	06/03/19 08:00	KNC	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	31696	07/16/19 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			31812	07/17/19 10:47	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Method Blank — Lab Sample ID: MB 140-30481/11-B
Date Collected: N/A — **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	30481	06/04/19 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	30528	06/10/19 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			31197	06/26/19 18:27	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Method Blank — Lab Sample ID: MB 140-30481/11-C
Date Collected: N/A — **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	30481	06/04/19 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	31697	07/16/19 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			31812	07/17/19 11:02	KNC	TAL KNX
	Instrument ID: DUO									

Lab Chronicle

Client: Golder Associates Inc. Job ID: 140-15376-1
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Client Sample ID: Method Blank — Lab Sample ID: MB 140-30529/11-B ^5

Date Collected: N/A **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 5	SEP	Organic-Bound			5.000 g	75 mL	30529	06/10/19 08:00	KNC	TAL KNX
Step 5	Prep	3010A			5 mL	50 mL	30726	06/12/19 08:00	KNC	TAL KNX
Step 5	Analysis	6010B SEP		5			31197	06/26/19 19:48	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Method Blank — Lab Sample ID: MB 140-30781/11-A

Date Collected: N/A **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	30781	06/15/19 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		1			31197	06/26/19 21:23	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Method Blank — Lab Sample ID: MB 140-30852/11-A

Date Collected: N/A **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 7	Prep	Residual			1.000 g	50 mL	30852	06/16/19 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			31255	06/28/19 12:11	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Method Blank — Lab Sample ID: MB 140-30853/8-A

Date Collected: N/A **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			0.500 g	50 mL	30853	06/16/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			30900	06/17/19 11:06	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Method Blank — Lab Sample ID: MB 140-31695/2-A

Date Collected: N/A **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	31695	07/16/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			31812	07/17/19 11:17	KNC	TAL KNX
	Instrument ID: DUO									

Lab Chronicle

Client: Golder Associates Inc. Job ID: 140-15376-1
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Client Sample ID: Lab Control Sample — Lab Sample ID: LCS 140-30373/12-A

Date Collected: N/A **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			31255	06/28/19 12:32	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample — Lab Sample ID: LCS 140-30373/12-B

Date Collected: N/A **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Prep	7470A			5.0 mL	50.0 mL	30447	05/31/19 12:19	DKW	TAL KNX
Total/NA	Analysis	7470A		1			30491	06/03/19 14:37	DKW	TAL KNX
	Instrument ID: HG									

Client Sample ID: Lab Control Sample — Lab Sample ID: LCS 140-30374/12-B ^5

Date Collected: N/A **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 1	SEP	Exchangeable			5.000 g	25 mL	30374	05/30/19 08:00	KNC	TAL KNX
Step 1	Prep	3010A			5 mL	50 mL	30422	05/31/19 08:00	KNC	TAL KNX
Step 1	Analysis	6010B SEP		5			30900	06/17/19 13:53	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample — Lab Sample ID: LCS 140-30423/12-B ^5

Date Collected: N/A **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 2	SEP	Carbonate			5.000 g	25 mL	30423	05/31/19 08:00	KNC	TAL KNX
Step 2	Prep	3010A			5 mL	50 mL	30452	06/03/19 08:00	KNC	TAL KNX
Step 2	Analysis	6010B SEP		5			30900	06/17/19 15:16	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample — Lab Sample ID: LCS 140-30453/12-B

Date Collected: N/A **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	30453	06/03/19 08:00	KNC	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	30480	06/04/19 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			31197	06/26/19 17:09	KNC	TAL KNX
	Instrument ID: DUO									

Lab Chronicle

Client: Golder Associates Inc. Job ID: 140-15376-1
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Client Sample ID: Lab Control Sample — Lab Sample ID: LCS 140-30453/12-C
Date Collected: N/A — **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	30453	06/03/19 08:00	KNC	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	31696	07/16/19 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			31812	07/17/19 10:52	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample — Lab Sample ID: LCS 140-30481/12-B
Date Collected: N/A — **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	30481	06/04/19 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	30528	06/10/19 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			31197	06/26/19 18:32	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample — Lab Sample ID: LCS 140-30481/12-C
Date Collected: N/A — **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	30481	06/04/19 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	31697	07/16/19 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			31812	07/17/19 11:07	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample — Lab Sample ID: LCS 140-30529/12-B ^5
Date Collected: N/A — **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 5	SEP	Organic-Bound			5.000 g	75 mL	30529	06/10/19 08:00	KNC	TAL KNX
Step 5	Prep	3010A			5 mL	50 mL	30726	06/12/19 08:00	KNC	TAL KNX
Step 5	Analysis	6010B SEP		5			31197	06/26/19 19:54	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample — Lab Sample ID: LCS 140-30781/12-A
Date Collected: N/A — **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	30781	06/15/19 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		1			31197	06/26/19 21:28	KNC	TAL KNX
	Instrument ID: DUO									

Lab Chronicle

Client: Golder Associates Inc. Job ID: 140-15376-1
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Client Sample ID: Lab Control Sample — Lab Sample ID: LCS 140-30852/12-A

Date Collected: N/A — **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 7	Prep	Residual			1.000 g	50 mL	30852	06/16/19 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			31255	06/28/19 12:17	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample — Lab Sample ID: LCS 140-30853/9-A

Date Collected: N/A — **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			0.500 g	50 mL	30853	06/16/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			30900	06/17/19 11:11	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample — Lab Sample ID: LCS 140-31695/3-A

Date Collected: N/A — **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	31695	07/16/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			31812	07/17/19 11:22	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample Dup — Lab Sample ID: LCSD 140-30373/13-A

Date Collected: N/A — **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			31255	06/28/19 12:37	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample Dup — Lab Sample ID: LCSD 140-30373/13-B

Date Collected: N/A — **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Prep	7470A			5.0 mL	50.0 mL	30447	05/31/19 12:19	DKW	TAL KNX
Total/NA	Analysis	7470A		1			30491	06/03/19 14:40	DKW	TAL KNX
	Instrument ID: HG									

Lab Chronicle

Client: Golder Associates Inc. Job ID: 140-15376-1
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Client Sample ID: Lab Control Sample Dup — Lab Sample ID: LCSD 140-30374/13-B ^5

Date Collected: N/A **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 1	SEP	Exchangeable			5.000 g	25 mL	30374	05/30/19 08:00	KNC	TAL KNX
Step 1	Prep	3010A			5 mL	50 mL	30422	05/31/19 08:00	KNC	TAL KNX
Step 1	Analysis	6010B SEP		5			30900	06/17/19 13:58	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample Dup — Lab Sample ID: LCSD 140-30423/13-B ^5

Date Collected: N/A **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 2	SEP	Carbonate			5.000 g	25 mL	30423	05/31/19 08:00	KNC	TAL KNX
Step 2	Prep	3010A			5 mL	50 mL	30452	06/03/19 08:00	KNC	TAL KNX
Step 2	Analysis	6010B SEP		5			30900	06/17/19 15:21	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample Dup — Lab Sample ID: LCSD 140-30453/13-B

Date Collected: N/A **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	30453	06/03/19 08:00	KNC	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	30480	06/04/19 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			31197	06/26/19 17:14	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample Dup — Lab Sample ID: LCSD 140-30453/13-C

Date Collected: N/A **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	30453	06/03/19 08:00	KNC	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	31696	07/16/19 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			31812	07/17/19 10:57	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample Dup — Lab Sample ID: LCSD 140-30481/13-B

Date Collected: N/A **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	30481	06/04/19 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	30528	06/10/19 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			31197	06/26/19 18:37	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample Dup — Lab Sample ID: LCSD 140-30481/13-C

Date Collected: N/A **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	30481	06/04/19 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	31697	07/16/19 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			31812	07/17/19 11:12	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample Dup — Lab Sample ID: LCSD 140-30529/13-B ^5

Date Collected: N/A **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 5	SEP	Organic-Bound			5.000 g	75 mL	30529	06/10/19 08:00	KNC	TAL KNX
Step 5	Prep	3010A			5 mL	50 mL	30726	06/12/19 08:00	KNC	TAL KNX
Step 5	Analysis	6010B SEP		5			31197	06/26/19 20:09	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample Dup — Lab Sample ID: LCSD 140-30781/13-A

Date Collected: N/A **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	30781	06/15/19 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		1			31197	06/26/19 21:33	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample Dup — Lab Sample ID: LCSD 140-30852/13-A

Date Collected: N/A **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 7	Prep	Residual			1.000 g	50 mL	30852	06/16/19 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			31255	06/28/19 12:22	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample Dup — Lab Sample ID: LCSD 140-31695/4-A

Date Collected: N/A **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	31695	07/16/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			31812	07/17/19 11:27	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: FGO-15 (25-27) — Lab Sample ID: 140-15376-1 MS

Date Collected: 05/22/19 19:15 — **Matrix: Solid**
Date Received: 05/24/19 09:40 — **Percent Solids: 76.6**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			0.512 g	50 mL	30853	06/16/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			30900	06/17/19 11:32	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: FGO-15 (25-27) — Lab Sample ID: 140-15376-1 MSD

Date Collected: 05/22/19 19:15 — **Matrix: Solid**
Date Received: 05/24/19 09:40 — **Percent Solids: 76.6**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			0.514 g	50 mL	30853	06/16/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			30900	06/17/19 11:37	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: FGO-15 (25-27) — Lab Sample ID: 140-15376-1 DU

Date Collected: 05/22/19 19:15 — **Matrix: Solid**
Date Received: 05/24/19 09:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			30352	05/28/19 16:16	BKD	TAL KNX
	Instrument ID: W3									

Client Sample ID: FGO-15 (25-27) — Lab Sample ID: 140-15376-1 DU

Date Collected: 05/22/19 19:15 — **Matrix: Solid**
Date Received: 05/24/19 09:40 — **Percent Solids: 76.6**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			31255	06/28/19 15:29	KNC	TAL KNX
	Instrument ID: DUO									
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		10			31255	06/28/19 16:42	KNC	TAL KNX
	Instrument ID: DUO									
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		2			31255	06/28/19 18:45	KNC	TAL KNX
	Instrument ID: DUO									
Step 1	SEP	Exchangeable			5.000 g	25 mL	30374	05/30/19 08:00	KNC	TAL KNX
Step 1	Prep	3010A			5 mL	50 mL	30422	05/31/19 08:00	KNC	TAL KNX
Step 1	Analysis	6010B SEP		4			30900	06/17/19 14:19	KNC	TAL KNX
	Instrument ID: DUO									
Step 2	SEP	Carbonate			5.000 g	25 mL	30423	05/31/19 08:00	KNC	TAL KNX
Step 2	Prep	3010A			5 mL	50 mL	30452	06/03/19 08:00	KNC	TAL KNX
Step 2	Analysis	6010B SEP		3			30900	06/17/19 15:53	KNC	TAL KNX
	Instrument ID: DUO									

Lab Chronicle

Client: Golder Associates Inc.
Job ID: 140-15376-1
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Client Sample ID: FGO-15 (25-27)
Date Collected: 05/22/19 19:15
Date Received: 05/24/19 09:40

Lab Sample ID: 140-15376-1 DU
Matrix: Solid
Percent Solids: 76.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	30453	06/03/19 08:00	KNC	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	30480	06/04/19 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			31197	06/26/19 17:35	KNC	TAL KNX
	Instrument ID: DUO									
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	30481	06/04/19 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	30528	06/10/19 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			31197	06/26/19 19:08	KNC	TAL KNX
	Instrument ID: DUO									
Step 5	SEP	Organic-Bound			5.000 g	75 mL	30529	06/10/19 08:00	KNC	TAL KNX
Step 5	Prep	3010A			5 mL	50 mL	30726	06/12/19 08:00	KNC	TAL KNX
Step 5	Analysis	6010B SEP		5			31197	06/26/19 20:30	KNC	TAL KNX
	Instrument ID: DUO									
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	30781	06/15/19 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		1			31197	06/26/19 21:54	KNC	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	30852	06/16/19 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			31255	06/28/19 13:13	KNC	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	30852	06/16/19 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		10			31255	06/28/19 14:22	KNC	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	30852	06/16/19 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		2			31255	06/28/19 17:48	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: 140-15376-A-1-J DU
Date Collected: 05/22/19 19:15
Date Received: 05/24/19 09:40

Lab Sample ID: 140-15376-A-1-J DU
Matrix: Solid
Percent Solids: 76.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Prep	7470A			5.0 mL	50.0 mL	30447	05/31/19 12:19	DKW	TAL KNX
Total/NA	Analysis	7470A		1			30491	06/03/19 14:49	DKW	TAL KNX
	Instrument ID: HG									

Laboratory References:
TAL KNX = Eurofins TestAmerica, Knoxville, 5815 Middlebrook Pike, Knoxville, TN 37921, TEL (865)291-3000

Method Summary

Client: Golder Associates Inc.
Job ID: 140-15376-1
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Method	Method Description	Protocol	Laboratory
6010B	Metals (ICP)	SW846	TAL KNX
6010B	SEP Metals (ICP) - Total	SW846	TAL KNX
6010B SEP	SEP Metals (ICP)	SW846	TAL KNX
7470A	SEP Mercury (CVAA) - Total	SW846	TAL KNX
Moisture	Percent Moisture	EPA	TAL KNX
3010A	Preparation, Total Metals	SW846	TAL KNX
3050B	Preparation, Metals	SW846	TAL KNX
7470A	Preparation, Mercury	SW846	TAL KNX
Acid/Sulfide	Sequential Extraction Procedure, Acid/Sulfide Fraction	TAL-KNOX	TAL KNX
Carbonate	Sequential Extraction Procedure, Carbonate Fraction	TAL-KNOX	TAL KNX
Exchangeable	Sequential Extraction Procedure, Exchangeable Fraction	TAL-KNOX	TAL KNX
Metal Hydroxide	Sequential Extraction Procedure, Metal Hydroxide Fraction	TAL-KNOX	TAL KNX
Non-Crystalline	Sequential Extraction Procedure, Non-crystalline Materials	TAL-KNOX	TAL KNX
Organic-Bound	Sequential Extraction Procedure, Organic Bound Fraction	TAL-KNOX	TAL KNX
Residual	Sequential Extraction Procedure, Residual Fraction	TAL-KNOX	TAL KNX
Total	Preparation, Total Material	TAL-KNOX	TAL KNX

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

TAL-KNOX = TestAmerica Laboratories, Knoxville, Facility Standard Operating Procedure.

Laboratory References:

TAL KNX = Eurofins TestAmerica, Knoxville, 5815 Middlebrook Pike, Knoxville, TN 37921, TEL (865)291-3000

Sample Summary

Client: Golder Associates Inc.
Job ID: 140-15376-1
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
140-15376-1	FGO-15 (25-27)	Solid	05/22/19 19:15	05/24/19 09:40	
140-15376-2	FGO-14 (30-32)	Solid	05/23/19 10:40	05/24/19 09:40	
140-15376-3	FGO-2019-1 (23-25)	Solid	05/23/19 15:20	05/24/19 09:40	

Eurofins TestAmerica, Knoxville
5815 Middlebrook Pike
Knoxville, TN 37921
Phone (865) 291-3000 Fax (865) 584-4315

Chain of Custody Record

eurofins | Environment Testing TestAmerica

Client Information	Sampler: Jacob Jarvis	Lab PM: Walker Wasmund, Terry	Carrier Tracking No(s):	COC No: 140-6678-2224.1
Client Contact: Will Vienne	Phone: 361 877 5553	E-Mail: terry.wasmund@testamericainc.com		Page: Page 1 of 1
Company: Golder Associates Inc.		Analysis Requested		Job #:
Address: 2201 Double Creek Dr Suite 4004	Due Date Requested:			Preservation Codes:
City: Round Rock	TAT Requested (days):			A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
State, Zip: TX, 78664				
Phone: 512-671-3434(Tel)	PO #: 19122434-F			
Email: William_Vienne@golder.com	WO #: 1922434-F			Other:
Project Name: Oak Grove FGD Ponds - SEP and Totals	Project #: 14005266			
Site:	SSOW#:			

140-15376 Chain of Custody

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010B_SEP - 7-Step SEP (12 metals)	6010B Total B, Cr, Pb, P	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N			
FGD-15 (25-27)	5/22/19	1415	C	S	N		X	X		
FGD-121 (30-32)	5/23/19	1040	C	ES						
FGD-2019-1 (23-25)	5/23/19	1520	CS	S						
RT: 0.8°C CT: 0.8°C										
1 Cooler, Fedex Po										
Custody seal intact										
tr# 7874 5047 1949										
KWS/24/19										

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		5/23/19 5:50p			5/24/19 940	TA-Knx
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

Ver: 01/16/2019

TESTAMERICA KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

Log In Number: Loc: 140 **15376**

Review Items	Yes	No	NA	If No, what was the problem?
1. Are the shipping containers intact?	✓			☐ **Containers, Broken**
2. Were ambient air containers received intact?			✓	☐ Checked in lab
3. The coolers/containers custody seal if present, is it intact?	✓			☐ Yes ☐ NA
4. Is the cooler temperature within limits? (> freezing temp. of water to 6 °C, VOST: 10°C) Thermometer ID : IC68 Correction factor: +0.2	✓			☐ **Cooler Out of Temp, Client Contacted, Proceed/Cancel** ☐ **Cooler Out of Temp, Same Day Receipt**
5. Were all of the sample containers received intact?	✓			☐ **Containers, Broken**
6. Were samples received in appropriate containers?	✓			☐ **Containers, Improper; Client Contacted; Proceed/Cancel**
7. Do sample container labels match COC? (IDs, Dates, Times)	✓			☐ **COC & Samples Do Not Match** ☐ **COC Incorrect/Incomplete** ☐ **COC Not Received**
8. Were all of the samples listed on the COC received?	✓			☐ **Sample Received, Not on COC** ☐ **Sample on COC, Not Received**
9. Is the date/time of sample collection noted?	✓			☐ **COC; No Date/Time; Client Contacted**
10. Was the sampler identified on the COC?	✓			☐ **Sampler Not Listed on COC**
11. Is the client and project name/# identified?	✓			☐ **COC Incorrect/Incomplete**
12. Are tests/parameters listed for each sample?	✓			☐ **COC No tests on COC**
13. Is the matrix of the samples noted?	✓			☐ **COC Incorrect/Incomplete**
14. Was COC relinquished? (Signed/Dated/Timed)	✓			☐ **COC Incorrect/Incomplete**
15. Were samples received within holding time?	✓			☐ **Holding Time - Receipt**
16. Were samples received with correct chemical preservative (excluding Encore)?			✓	☐ **pH Adjusted, pH Included (See box 16A)** ☐ **Incorrect Preservative**
17. Were VOA samples received without headspace?			✓	☐ **Headspace (VOA only)**
18. Did you check for residual chlorine, if necessary? (e.g. 1613B, 1668) Chlorine test strip lot number:			✓	☐ **Residual Chlorine**
19. For 1613B water samples is pH<9?			✓	☐ If no, notify lab to adjust
20. For rad samples was sample activity info. Provided?			✓	☐ Project missing info

Comments/Actions Taken

Labeling Verified by: **Date:**

pH test strip lot number:

	Box 16A: pH Preservation	Box 18A: Residual Chlorine
Preservative:		
Lot Number:		
Exp Date:		
Analyst:		
Date:		
Time:		

Project #: 140S266 PM Instructions: _____

Sample Receiving Associate: _____ Date: 5/24/19

QA026R31.doc, 112618

APPENDIX D

GROUNDWATER SAMPLING RECORDS

RECORD OF WATER LEVEL READINGS

GOLDER

Project Name: LUMINANT-OGSES-PONDS Location: NEAR FRANKLIN, TX Project No.: 19122262-F

Borehole No.	Date	Time	Measuring Device / Serial No.	Measurement Point (M.P)	Water Level Below M.P.	Correction To Survey Mark	Survey Mark Elevation	Water Level Elevation	By	Comments
FGD-16	5-16-19	[redacted]	SOLINST	TOC	16.37				JTB	
FGD-4	5-16-19		"	TOC	19.52				"	
FGD-3	5-16-19		"	TOC	22.13				"	
FGD-2	5-16-19		"	TOC	27.97				"	
FGD-5	5-16-19		"	TOC	20.41				"	
FGD-1	5-16-19		"	TOC	12.34				"	
FGD-8	5-16-19		"	TOC	29.11				"	
FGD-11	5-16-19		"	TOC	38.72				"	
FGD-12	5-16-19		"	TOC	30.18				"	

Sheet 1 of 1

GROUNDWATER SAMPLING RECORD

PAGE 1 of 1

Project Number: 191|22262-F Project Name: LUMINANT - OGSES Date: 5-16-19

Sample Number: FGD-1

Sampling Location (well ID, etc.): FGD-1

Sampled by: JTB

Measuring Point (MP) of Well: TOC|PVC

Screened Interval (ft. BGL): —

Filter Pack Interval (ft. BGL): —

Starting Water Level (ft. BMP): 12.34

Casing Stickup (ft.): —

Starting Water Level (ft. BGL): 12.34

Total Depth (ft. BGL): —

Casing Diameter (In ID): 2.0

Casing Volume (gal.): —

QUALITY ASSURANCE

METHODS (describe):

Cleaning Equipment: alconox & DI rinse

Purging: peristaltic / bladder Sampling: same

Disposal of Discharged Water: on site

INSTRUMENTS (Indicate make, model, I.d.)

Water Level: KECK Thermometer: HORIBA

pH Meter: HORIBA Field Calibration: 7-4

Conductivity Meter: HORIBA Field Calibration: 1413

Filter / Filter Size: — Other:

SAMPLING MEASUREMENTS

1412 Time	Cum. Vol. (gal. or L)	Purge Rate (gal. or L/m)	Temp. (oC)	pH	Spec. Cond. (mmhos/cm)	D.O	Redox (mV)	Turbidity & Color	Water Depth (ft BMP)
1422	—	.2	22.6	6.71	1430	0.71	-26	4.2	12.52
1426		1	22.7	6.64	1460	0.59	-31	4.6	12.53
1433		↓	22.7	6.63	1470	0.58	-32	4.7	12.52

Water Level (ft. BMP) at End of Purge: 12.52 Sample Intake Depth (ft. BMP):

SAMPLE INVENTORY

Bottles Collected				Filtration (Y / N)	Preservation	Remarks (quality control sample, other)
Time	Volume	Composition (G, P)	No.			
1450	250mL	P	1	N	—	GEN CHEM
1450	500mL	P	1	N	HNO_3	METALS

Comments:

Pastor, Behling & Wheeler, LLC
2201 Double Creek Dr., Suite 4004
Round Rock, TX 78664
(512) 671-3434 Fax (512) 671-3446

GROUNDWATER SAMPLING RECORD

PAGE 1 of 1

Project Number: 191 22262-F Project Name: LUMINANT - OGSES Date: 5-16-19

Sample Number: FGD-2

Sampling Location (well ID, etc.): FGD-2

Sampled by: JTB

Measuring Point (MP) of Well: TOC/PVC

Screened Interval (ft. BGL): -

Filter Pack Interval (ft. BGL): -

Starting Water Level (ft. BMP): 27.97

Casing Stickup (ft.): -

Starting Water Level (ft. BGL): 27.97

Total Depth (ft. BGL): -

Casing Diameter (in ID): 2.0

Casing Volume (gal.):

QUALITY ASSURANCE

METHODS (describe):

Cleaning Equipment: alconox & DI rinse

Purging: peristaltic / bladder Sampling: same

Disposal of Discharged Water: on site

INSTRUMENTS (Indicate make, model, I.d.)

Water Level: KECK Thermometer: HORIBA

pH Meter: HORIBA Field Calibration: 7-4

Conductivity Meter: HORIBA Field Calibration: 1413

Filter / Filter Size: - Other:

SAMPLING MEASUREMENTS

Time	Cum. Vol. (gal. or L)	Purge Rate (gal. or L/m)	Temp. (oC)	pH	Spec. Cond. (mmhos/cm)	D.O	Redox (mV)	Turbidity & Color	Water Depth (ft BMP)
1126									
1136	-	.2	23.1	6.86	1320	0.47	-92	6.2	28.17
1141		"	22.9	6.87	1360	0.39	-91	7.1	28.16
1147		"	22.9	6.86	1370	0.40	-91	6.8	28.16

Water Level (ft. BMP) at End of Purge: 28.16 Sample Intake Depth (ft. BMP):

SAMPLE INVENTORY

Bottles Collected				Filtration		Remarks
Time	Volume	Composition (G, P)	No.	(Y / N)	Preservation	(quality control sample, other)
1200	250mL	P	1	N	-	GEN CHEM
1200	500mL	P	1	N	HNO3	METALS

Comments:

Pastor, Behling & Wheeler, LLC
2201 Double Creek Dr., Suite 4004
Round Rock, TX 78664
(512) 671-3434 Fax (512) 671-3446

GROUNDWATER SAMPLING RECORD

PAGE 1 of 1

Project Number: 191 22262-F Project Name: LUMINANT - OGSES Date: 5-16-19

Sample Number: FGD-3

Sampling Location (well ID, etc.): FGD-3

Sampled by: JTB

Measuring Point (MP) of Well: TOC/PVC

Screened Interval (ft. BGL): -

Filter Pack Interval (ft. BGL): -

Starting Water Level (ft. BMP): 22.13

Casing Stickup (ft.): -

Starting Water Level (ft. BGL): 22.13

Total Depth (ft. BGL): -

Casing Diameter (In ID): 2.0

Casing Volume (gal.):

QUALITY ASSURANCE

METHODS (describe):

Cleaning Equipment: alconox & DI rinse

Purging: peristaltic / bladder Sampling: none

Disposal of Discharged Water: on site

INSTRUMENTS (Indicate make, model, I.d.)

Water Level: KECK Thermometer: HORIBA

pH Meter: HORIBA Field Calibration: 7-4

Conductivity Meter: HORIBA Field Calibration: 1413

Filter / Filter Size: - Other:

SAMPLING MEASUREMENTS

1032 Time	Cum. Vol. (gal. or L)	Purge Rate (gal. or L/m)	Temp. (oC)	pH	Spec. Cond. (mmhos/cm)	D.O	Redox (mV)	Turbidity & Color	Water Depth (ft BMP)
1041	-	.2	23.1	6.71	1620	0.71	-57	6.7	22.31
1047		1	22.7	6.74	1630	0.61	-56	7.1	22.32
1053		↓	22.7	6.73	1630	0.62	-56	7.2	22.31

Water Level (ft. BMP) at End of Purge: 22.31 Sample Intake Depth (ft. BMP):

SAMPLE INVENTORY

Bottles Collected				Filtration (Y / N)	Preservation	Remarks (quality control sample, other)
Time	Volume	Composition (G, P)	No.			
1110	250mL	P	1	N	-	GEN CHEM
1110	500mL	P	1	N	HNO_3	METALS

Comments:

Pastor, Behling & Wheeler, LLC
2201 Double Creek Dr., Suite 4004
Round Rock, TX 78664
(512) 671-3434 Fax (512) 671-3446

GROUNDWATER SAMPLING RECORD

PAGE 1 of 1

Project Number: 191 22262-F Project Name: LUMINANT - OGSES Date: 5-16-19

Sample Number: FGD-4

Sampling Location (well ID, etc.): FGD-4

Sampled by: JTB

Measuring Point (MP) of Well: TOC/PVC

Screened Interval (ft. BGL): –

Filter Pack Interval (ft. BGL): –

Starting Water Level (ft. BMP): 19.52

Casing Stickup (ft.): –

Starting Water Level (ft. BGL): 19.52

Total Depth (ft. BGL): –

Casing Diameter (In ID): 2.0

Casing Volume (gal.): –

QUALITY ASSURANCE

METHODS (describe):

Cleaning Equipment: alconox & DI rinse

Purging: peristaltic / bladder Sampling: same

Disposal of Discharged Water: on site

INSTRUMENTS (Indicate make, model, I.d.)

Water Level: KECK Thermometer: HORIBA

pH Meter: HORIBA Field Calibration: 7-4

Conductivity Meter: HORIBA Field Calibration: 1413

Filter / Filter Size: – Other:

SAMPLING MEASUREMENTS

0939 Time	Cum. Vol. (gal. or L)	Purge Rate (gal. or L/m)	Temp. (oC)	pH	Spec. Cond. (mmhos/cm)	D.O	Redox (mV)	Turbidity & Color	Water Depth (ft BMP)
0949	–	.2	22.4	6.59	1730	0.63	-42	3.6	19.71
0954		1	22.6	6.56	1760	0.51	-41	4.1	19.72
0958		↓	22.7	6.57	1770	0.52	-41	4.0	19.71

Water Level (ft. BMP) at End of Purge: 19.71 Sample Intake Depth (ft. BMP):

SAMPLE INVENTORY

Bottles Collected				Filtration		Remarks
Time	Volume	Composition (G, P)	No.	(Y / N)	Preservation	(quality control sample, other)
1015	250mL	P	1	N	–	GEN CHEM
1015	500mL	P	1	N	HNO_3	METALS

Comments:

Pastor, Behling & Wheeler, LLC
2201 Double Creek Dr., Suite 4004
Round Rock, TX 78664
(512) 671-3434 Fax (512) 671-3446

GROUNDWATER SAMPLING RECORD

PAGE 1 of 1

Project Number: 191|22262-F Project Name: LUMINANT - OGSES Date: 5-16-19

Sample Number: FGD-S
Sampling Location (well ID, etc.): FGD-S
Sampled by: JTB
Measuring Point (MP) of Well: TOC|PVC
Screened Interval (ft. BGL): –
Filter Pack Interval (ft. BGL): –

Starting Water Level (ft. BMP): 20.41
Casing Stickup (ft.): –
Starting Water Level (ft. BGL): 20.41
Total Depth (ft. BGL): –
Casing Diameter (In ID): 2.0
Casing Volume (gal.):

QUALITY ASSURANCE

METHODS (describe):
Cleaning Equipment: alconox & DI rinse
Purging: peristaltic / bladder Sampling: same
Disposal of Discharged Water: on site

INSTRUMENTS (Indicate make, model, I.d.)

Water Level: KECK Thermometer: HORIBA
pH Meter: HORIBA Field Calibration: 7-4
Conductivity Meter: HORIBA Field Calibration: 1413
Filter / Filter Size: – Other:

SAMPLING MEASUREMENTS

1315 Time	Cum. Vol. (gal. or L)	Purge Rate (gal. or L/m)	Temp. (oC)	pH	Spec. Cond. (mmhos/cm)	D.O.	Redox (mV)	Turbidity & Color	Water Depth (ft BMP)
1323	–	.2	22.6	6.41	1620	0.71	-26	7.4	20.69
1329			22.8	6.46	1610	0.46	-31	6.7	20.71
1334		↓	22.8	6.46	1620	0.51	-31	6.8	20.70

Water Level (ft. BMP) at End of Purge: 20.70
Sample Intake Depth (ft. BMP):

SAMPLE INVENTORY

Bottles Collected				Filtration		Remarks
Time	Volume	Composition (G, P)	No.	(Y / N)	Preservation	(quality control sample, other)
1350	250mL	P	1	N	–	GEN CHEM
1350	500mL	P	1	N	HNO3	METALS

Comments:

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GROUNDWATER SAMPLING RECORD

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Project Number: 191 22262-F Project Name: LUMINANT - OGSES Date: 5-16-19

Sample Number: FGD-6

Sampling Location (well ID, etc.): FGD-6

Sampled by: JTB

Measuring Point (MP) of Well: TOC/PVC

Screened Interval (ft. BGL): —

Filter Pack Interval (ft. BGL): —

Starting Water Level (ft. BMP): 16.37

Casing Stickup (ft.): —

Starting Water Level (ft. BGL): 16.37

Total Depth (ft. BGL): —

Casing Diameter (in ID): 2.0

Casing Volume (gal.): —

QUALITY ASSURANCE

METHODS (describe):

Cleaning Equipment: alconox & DI rinse

Purging: peristaltic / bladder Sampling: same

Disposal of Discharged Water: on site

INSTRUMENTS (Indicate make, model, I.d.)

Water Level: KECK Thermometer: HORIBA

pH Meter: HORIBA Field Calibration: 7-4

Conductivity Meter: HORIBA Field Calibration: 1413

Filter / Filter Size: — Other:

SAMPLING MEASUREMENTS

0843 Time	Cum. Vol. (gal. or L)	Purge Rate (gal. or L/m)	Temp. (oC)	pH	Spec. Cond. (mmhos/cm)	D.O	Redox (mV)	Turbidity & Color	Water Depth (ft BMP)
0852	—	.2	22.7	6.91	1410	1.06	-31	11	16.61
0857		1	22.8	6.86	1440	0.81	-29	6.6	16.62
0904		1	22.9	6.85	1450	0.84	-28	6.2	16.61

Water Level (ft. BMP) at End of Purge: 16.61 Sample Intake Depth (ft. BMP):

SAMPLE INVENTORY

Bottles Collected				Filtration		Remarks
Time	Volume	Composition (G, P)	No.	(Y / N)	Preservation	(quality control sample, other)
0920	250mL	P	1	N	—	GEN CHEM
0920	500mL	P	1	N	HNO_3	METALS

Comments:

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GROUNDWATER SAMPLING RECORD

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Project Number: 191|22262-F Project Name: LUMINANT - OGSES Date: 5-16-19

Sample Number: FGD-8

Sampling Location (well ID, etc.): FGD-8

Sampled by: JTB

Measuring Point (MP) of Well: TOC/PVC

Screened Interval (ft. BGL): -

Filter Pack Interval (ft. BGL): -

Starting Water Level (ft. BMP): 29.11

Casing Stickup (ft.): -

Starting Water Level (ft. BGL): 29.11

Total Depth (ft. BGL): -

Casing Diameter (In ID): 2.0

Casing Volume (gal.): -

QUALITY ASSURANCE

METHODS (describe):

Cleaning Equipment: alconox & DI rinse

Purging: peristaltic / bladder Sampling: same

Disposal of Discharged Water: on site

INSTRUMENTS (Indicate make, model, I.d.)

Water Level: KECK Thermometer: HORIBA

pH Meter: HORIBA Field Calibration: 7-4

Conductivity Meter: HORIBA Field Calibration: 1413

Filter / Filter Size: - Other:

SAMPLING MEASUREMENTS

Time	Cum. Vol. (gal. or L)	Purge Rate (gal. or L/m)	Temp. (oC)	pH	Spec. Cond. (mmhos/cm)	D.O	Redox (mV)	Turbidity & Color	Water Depth (ft BMP)
1513									
1522	-	.2	23.1	6.71	1320	0.76	-36	7.4	29.34
1527		↓	22.6	6.68	1340	0.71	-41	7.6	29.34
1534		↓	22.7	6.67	1340	0.70	-42	7.7	29.35

Water Level (ft. BMP) at End of Purge: 29.35 Sample Intake Depth (ft. BMP):

SAMPLE INVENTORY

Bottles Collected				Filtration (Y / N)	Preservation	Remarks (quality control sample, other)
Time	Volume	Composition (G, P)	No.			
1545	250mL	P	1	N	-	GEN CHEM
1545	500mL	P	1	N	HNO_3	METALS

Comments:

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GROUNDWATER SAMPLING RECORD

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Project Number: 191|22262-F Project Name: LUMINANT - OGSES Date: 5-16-19

Sample Number: FGD-11

Sampling Location (well ID, etc.): FGD-11

Sampled by: JTB

Measuring Point (MP) of Well: TOC/PVC

Screened Interval (ft. BGL): -

Filter Pack Interval (ft. BGL): -

Starting Water Level (ft. BMP): 38.72

Casing Stickup (ft.): -

Starting Water Level (ft. BGL): 38.72

Total Depth (ft. BGL):

Casing Diameter (In ID): 2.0

Casing Volume (gal.):

QUALITY ASSURANCE

METHODS (describe):

Cleaning Equipment: alconox & DI rinse

Purging: peristaltic / bladder Sampling: same

Disposal of Discharged Water: on site

INSTRUMENTS (Indicate make, model, I.d.)

Water Level: KECK Thermometer: HORIBA

pH Meter: HORIBA Field Calibration: 7-4

Conductivity Meter: HORIBA Field Calibration: 1413

Filter / Filter Size: - Other:

SAMPLING MEASUREMENTS

1606 Time	Cum. Vol. (gal. or L)	Purge Rate (gal. or L/m)	Temp. (oC)	pH	Spec. Cond. (mmhos/cm)	D.O.	Redox (mV)	Turbidity & Color	Water Depth (ft BMP)
1616	-	.2	23.4	6.81	1360	0.91	-47	9.1	38.93
1622		1	23.5	6.82	1340	0.77	-48	6.8	38.94
1627		↓	23.5	6.83	1340	0.78	-48	6.9	38.94

Water Level (ft. BMP) at End of Purge: 38.94 Sample Intake Depth (ft. BMP):

SAMPLE INVENTORY

Bottles Collected				Filtration		Remarks
Time	Volume	Composition (G, P)	No.	(Y / N)	Preservation	(quality control sample, other)
1640	250mL	P	1	N	-	GEN CHEM
1640	500mL	P	1	N	HNO_3	METALS

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GROUNDWATER SAMPLING RECORD

PAGE 1 of 1

Project Number: 191 22262-F Project Name: LUMINANT - OGSES Date: 5-16-19

Sample Number: FGD-12

Sampling Location (well ID, etc.): FGD-12

Sampled by: JTB

Measuring Point (MP) of Well: TOC/PVC

Screened Interval (ft. BGL): —

Filter Pack Interval (ft. BGL): —

Starting Water Level (ft. BMP): 30.18

Casing Stickup (ft.): —

Starting Water Level (ft. BGL): 30.18

Total Depth (ft. BGL): —

Casing Diameter (In ID): 2.0

Casing Volume (gal.): —

QUALITY ASSURANCE

METHODS (describe):

Cleaning Equipment: alconox & DI rinse

Purging: peristaltic / bladder Sampling: bailer

Disposal of Discharged Water: on site

INSTRUMENTS (Indicate make, model, I.d.)

Water Level: KECK Thermometer: HORIBA

pH Meter: HORIBA Field Calibration: 7-4

Conductivity Meter: HORIBA Field Calibration: 1413

Filter / Filter Size: — Other:

SAMPLING MEASUREMENTS

1703 Time	Cum. Vol. (gal. or L)	Purge Rate (gal. or L /m)	Temp. (oC)	pH	Spec. Cond. (mmhos/cm)	D.O	Redox (mV)	Turbidity & Color	Water Depth (ft BMP)
1713	—	.2	23.2	6.96	1530	0.71	-17	7.1	30.31
1717		1	23.0	6.51	1510	0.44	-19	7.7	30.32
1724		〃	23.0	6.52	1510	0.46	-19	7.8	30.32

Water Level (ft. BMP) at End of Purge: 30.32 Sample Intake Depth (ft. BMP):

SAMPLE INVENTORY

Bottles Collected				Filtration		Remarks
Time	Volume	Composition (G, P)	No.	(Y / N)	Preservation	(quality control sample, other)
1735	250mL	P	1	N	—	GEN CHEM
1735	500mL	P	1	N	HNO_3	METALS

Comments:

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GROUNDWATER SAMPLING RECORD

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Project Number: 191 22262-F Project Name: LUMINANT - OGSES Date: 5-17-19

Sample Number: FGD-14

Sampling Location (well ID, etc.): FGD-14

Sampled by: HTB

Measuring Point (MP) of Well: TOC/PVC

Screened Interval (ft. BGL): —

Filter Pack Interval (ft. BGL): —

Starting Water Level (ft. BMP): 15.52

Casing Stickup (ft.): —

Starting Water Level (ft. BGL): 15.52

Total Depth (ft. BGL): —

Casing Diameter (In ID): 2.0

Casing Volume (gal.): —

QUALITY ASSURANCE

METHODS (describe):

Cleaning Equipment: alconox & DI rinse

Purging: peristaltic / bladder Sampling: same

Disposal of Discharged Water: on site

INSTRUMENTS (Indicate make, model, I.d.)

Water Level: KECK Thermometer: HORIBA

pH Meter HORIBA Field Calibration: 7-4

Conductivity Meter: HORIBA Field Calibration: 1413

Filter / Filter Size: — Other:

SAMPLING MEASUREMENTS

0724 Time	Cum. Vol. (gal. or L)	Purge Rate (gal. or L/m)	Temp. (oC)	pH	Spec. Cond. (mmhos/cm)	D.O.	Redox (mV)	Turbidity & Color	Water Depth (ft BMP)
0733	—	.2	22.7	6.63	1410	1.24	-6	4.7	15.81
0738		↓	22.9	6.65	1440	1.07	-7	5.2	15.82
0744		↓	22.9	6.65	1430	1.06	-7	5.7	15.82

Water Level (ft. BMP) at End of Purge: 15.82 Sample Intake Depth (ft. BMP):

SAMPLE INVENTORY

Bottles Collected				Filtration		Remarks
Time	Volume	Composition (G, P)	No.	(Y / N)	Preservation	(quality control sample, other)
0750	250mL	P	1	N	—	GEN CHEM
0750	500mL	P	1	N	HNO_3	METALS

Comments:

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GROUNDWATER SAMPLING RECORD

PAGE 1 of 1

Project Number: 191 22262-F Project Name: LUMINANT - OGSES Date: 6-6-19

Sample Number: FGD-15
Sampling Location (well ID, etc.): FGD-15
Sampled by: JTB
Measuring Point (MP) of Well: TOC/PVC
Screened Interval (ft. BGL): -
Filter Pack Interval (ft. BGL): -

Starting Water Level (ft. BMP): 25.22
Casing Stickup (ft.): -
Starting Water Level (ft. BGL): 25.22
Total Depth (ft. BGL): -
Casing Diameter (In ID): 2.0
Casing Volume (gal.): -

QUALITY ASSURANCE

METHODS (describe):
Cleaning Equipment: alconox & DI rinse
Purging: peristaltic / bladder Sampling: same
Disposal of Discharged Water: on site

INSTRUMENTS (Indicate make, model, I.d.)

Water Level: KECK Thermometer: HORIBA
pH Meter: HORIBA Field Calibration: 7-4
Conductivity Meter: HORIBA Field Calibration: 1413
Filter / Filter Size: - Other:

SAMPLING MEASUREMENTS

1412 Time	Cum. Vol. (gal. or (L))	Purge Rate (gal. or (L/m))	Temp. (oC)	pH	Spec. Cond. (mmhos/cm)	D.O.	Redox (mV)	Turbidity & Color	Water Depth (ft BMP)
1421	-	.2	20.9	6.67	1570	1.29	-17	7.7	25.41
1426		1	20.7	6.62	1560	1.06	-16	5.2	25.42
1432		↓	20.6	6.62	1560	1.07	-16	5.9	25.41

Water Level (ft. BMP) at End of Purge: Sample Intake Depth (ft. BMP):

SAMPLE INVENTORY

Bottles Collected				Filtration		Remarks
Time	Volume	Composition (G, P)	No.	(Y / N)	Preservation	(quality control sample, other)
1445	250mL	P	1	N	-	GEN CHEM
1445	500mL	P	1	N	HNO_3	METALS
1445	1L	P	2	N	HNO_3	

Comments:

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GROUNDWATER SAMPLING RECORD

PAGE 1 of 1

Project Number: 191 22262-F Project Name: LUMINANT - OGSES Date: 6-6-19

Sample Number:	FGD-16	Starting Water Level (ft. BMP):	31.06
Sampling Location (well ID, etc.):	FGD-16	Casing Stickup (ft.):	-
Sampled by:	JTB	Starting Water Level (ft. BGL):	31.06
Measuring Point (MP) of Well:	TOC/PVC	Total Depth (ft. BGL):	-
Screened Interval (ft. BGL):	-	Casing Diameter (In ID):	2.0
Filter Pack Interval (ft. BGL):	-	Casing Volume (gal.):	-

QUALITY ASSURANCE

METHODS (describe):

Cleaning Equipment: alconox & DI rinse

Purging: peristaltic / bladder Sampling: none

Disposal of Discharged Water: on site

INSTRUMENTS (Indicate make, model, I.d.)

Water Level:	KECK	Thermometer:	HORIBA
pH Meter	HORIBA	Field Calibration:	7-4
Conductivity Meter:	HORIBA	Field Calibration:	1413
Filter / Filter Size:	-	Other:	

SAMPLING MEASUREMENTS

Time (1232)	Cum. Vol. (gal. or L)	Purge Rate (gal. or L/m)	Temp. (oC)	pH	Spec. Cond. (mmhos/cm)	D.O	Redox (mV)	Turbidity & Color	Water Depth (ft BMP)
1241	-	.2	21.7	6.74	1760	0.71	-39	5.7	31.27
1246		"	21.6	6.73	1740	0.56	-31	6.7	31.26
1253		"	21.6	6.73	1740	0.57	-32	6.9	31.26

Water Level (ft. BMP) at End of Purge: 31.26 Sample Intake Depth (ft. BMP):

SAMPLE INVENTORY

Bottles Collected				Filtration		Remarks
Time	Volume	Composition (G, P)	No.	(Y / N)	Preservation	(quality control sample, other)
1300	250mL	P	1	N	-	GEN CHEM
1300	500mL	P	1	N	HNO_3	METALS
1300	1L	P	2	N	HNO_3	

Comments:

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RECORD OF WATER LEVEL READINGS

GOLDER

Project Name: LUMINANT-OGSES Location: FGD PONDS Project No.: 19122262-F

Borehole No.	Date	Time	Measuring Device / Serial No.	Measurement Point (M.P)	Water Level Below M.P.	Correction To Survey Mark	Survey Mark Elevation	Water Level Elevation	By	Comments
FGD-6	8-19-19		KECK	TOC/PVC	16.61				JTB	
FGD-3					22.19					
FGD-02					26.71					
FGD-05					20.23					
FGD-08					28.72					
FGD-01					16.72					
FGD-14					16.22					
FGD-4					19.44					
FGD-11					39.08					
FGD-12					30.11					
FGD-15					25.71					

Sheet 1 of 1

GROUNDWATER SAMPLING RECORD

PAGE 1 of 1

Project Number: 19122262-F Project Name: LUMINANT - OGSES Date: 8-19-19

Sampling Location (well ID, etc.): FGD-15

Sample Number: FGD-15

Sampled by: JTB

Measuring Point (MP) of Well: (TOC) - Steel or (PVC)

Screened Interval (ft. BGL):

Filter Pack Interval (ft. BGL):

Starting Water Level (ft. BMP): 25.71

Casing Stickup (ft.):

WL (ft. BMP): 25.71 (ft. BGL):

TD (ft. BMP): (ft. BGL):

Ft. water: Casing Dia. (In ID):

1X Casing Vol (gal.): 3X (gal):

QUALITY ASSURANCE

Gallons/Foot: 2": 0.16 4": 0.65 5.25": 1.12 6": 1.47 6.25": 1.59

METHODS (describe): Low Flow - Dedicated Tubing/Equipment

Cleaning Equipment: DI/Alconox Rinse

Purge: Peristaltic Pump / SS Pump / Bailer / bladder Sampling: Peristaltic Pump / SS Pump / Bailer / bladder

Disposal of Discharged Water:

INSTRUMENTS (Indicate make, model, I.d.)

Water Level: KECK Other: —

Multi Meter: HORIBA

Field Calibration: 7-4

Filter / Filter Size: —

SAMPLING MEASUREMENTS

Begin Purge:

Time	DTW (ft BTOC)	Cum. Vol. (gal. or (L))	Purge Rate (gal. or (L/m))	Temp. (oC)	DO (mg/L)	Spec. Cond. (µs/cm)	pH	ORP (mV)	Turbidity (NTU)	Color & Sediment
1707	25.92	—	.2	23.4	1.09	1710	6.81	-31	4.6	medal
1712	25.93		↓	23.5	1.01	1730	6.84	-32	3.8	↓
1717	25.92		↓	23.5	1.02	1740	6.85	-32	3.8	↓

WL (ft. BMP) at End of Purge: Sample Intake Depth (ft. BMP):

SAMPLE INVENTORY

Time		Bottles Collected Volume	Composition (G, P)	No.	Filtration (Y / N)	Preservation (type)	Remarks (quality control sample, other)
1730		250mL	P	1	N	—	APPENDIX III
↓		500mL	P	1	N	HNO_3	APPENDIX III
↓		1L	P	2	N	HNO_3	APPENDIX IV

Comments:

GOLDER
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Round Rock, Texas 78664
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GROUNDWATER SAMPLING RECORD

PAGE 1 of 1

Project Number: 19122262-F Project Name: LUMINANT - OGSES Date: 8-19-19

Sampling Location (well ID, etc.): FGD-12 Starting Water Level (ft. BMP): 30.11

Sample Number: FGD-12 Casing Stickup (ft.):

Sampled by: JTB WL (ft. BMP): 30.11 (ft. BGL):

Measuring Point (MP) of Well: (TOC) - Steel or (PVC) TD (ft. BMP): (ft. BGL):

Screened Interval (ft. BGL): Ft. water: Casing Dia. (In ID):

Filter Pack Interval (ft. BGL): 1X Casing Vol (gal.): 3X (gal):

QUALITY ASSURANCE

Gallons/Foot: 2": 0.16 4": 0.65 5.25": 1.12 6": 1.47 6.25": 1.59

METHODS (describe): Low Flow - Dedicated Tubing/Equipment

Cleaning Equipment: DI/Alconox Rinse

Purge: Peristaltic Pump / SS Pump / Bailer / bladder Sampling: Peristaltic Pump / SS Pump / Bailer / bladder

Disposal of Discharged Water:

INSTRUMENTS (Indicate make, model, I.d.)

Water Level: KECK Other: —

Multi Meter: HORIBA

Field Calibration: 7-4

Filter / Filter Size: —

SAMPLING MEASUREMENTS

Begin Purge:

Time (1553)	DTW (ft BTOC)	Cum. Vol. (gal. or (L))	Purge Rate (gal. or (L) /m)	Temp. (oC)	DO (mg/L)	Spec. Cond. (µs/cm)	pH	ORP (mV)	Turbidity (NTU)	Color & Sediment
1604	30.27	—	.2	24.1	0.64	1390	6.74	-21	6.9	muddy
1609	30.28		↓	23.7	0.47	1360	6.71	-22	6.1	
1614	30.28		↓	23.7	0.46	1360	6.71	-22	6.1	↓

WL (ft. BMP) at End of Purge: Sample Intake Depth (ft. BMP):

SAMPLE INVENTORY

Time	Bottles Collected	Volume	Composition (G, P)	No.	Filtration (Y / N)	Preservation (type)	Remarks (quality control sample, other)
1625		250mL	P	1	N	—	APPENDIX III
↓		500mL	P	1	N	HNO_3	APPENDIX III
↓		1L	P	2	N	HNO_3	APPENDIX IV

Comments:

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GROUNDWATER SAMPLING RECORD

PAGE 1 of 1

Project Number: 19122262-F Project Name: LUMINANT - OGSES Date: 8-19-19

Sampling Location (well ID, etc.): FGD-11 Starting Water Level (ft. BMP): 39.08

Sample Number: FGD-11 Casing Stickup (ft.):

Sampled by: JTB WL (ft. BMP): 39.08 (ft. BGL):

Measuring Point (MP) of Well: (TOC) - Steel or (PVC) TD (ft. BMP): (ft. BGL):

Screened Interval (ft. BGL): Ft. water: Casing Dia. (In ID):

Filter Pack Interval (ft. BGL): 1X Casing Vol (gal.): 3X (gal):

QUALITY ASSURANCE

Gallons/Foot: 2": 0.16 4": 0.65 5.25": 1.12 6": 1.47 6.25": 1.59

METHODS (describe): Low Flow - Dedicated Tubing/Equipment

Cleaning Equipment: DI/Alconox Rinse

Purge: Peristaltic Pump / SS Pump / Bailer / bladder Sampling: Peristaltic Pump / SS Pump / Bailer / bladder

Disposal of Discharged Water:

INSTRUMENTS (Indicate make, model, I.d.)

Water Level: KECK Other: —

Multi Meter: HORIBA

Field Calibration: 7-4

Filter / Filter Size: —

SAMPLING MEASUREMENTS

Begin Purge:

1447 Time	DTW (ft BTOC)	Cum. Vol. (gal. or (L))	Purge Rate (gal. or L /m)	Temp. (oC)	DO (mg/L)	Spec. Cond. (µs/cm)	pH	ORP (mV)	Turbidity (NTU)	Color & Sediment
1458	39.27	—	2	23.6	0.88	1480	6.72	-39	6.8	mustard
1503	39.29		↓	23.7	0.61	1470	6.71	-43	7.8	↓
1509	39.29		↓	23.7	0.61	1470	6.71	-44	7.4	↓

WL (ft. BMP) at End of Purge: Sample Intake Depth (ft. BMP):

SAMPLE INVENTORY

Time		Bottles Collected Volume	Composition (G, P)	No.	Filtration (Y / N)	Preservation (type)	Remarks (quality control sample, other)
1520		250mL	P	1	N	—	APPENDIX III
↓		500mL	P	1	N	HNO_3	APPENDIX III
↓		1L	P	2	N	HNO_3	APPENDIX IV

Comments:

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GROUNDWATER SAMPLING RECORD

PAGE 1 of 1

Project Number: 19122262-F Project Name: LUMINANT - OGSES Date: 8-19-19

Sampling Location (well ID, etc.): FGD-4

Sample Number: FGD-4

Sampled by: JTB

Measuring Point (MP) of Well: (TOC) - Steel or (PVC)

Screened Interval (ft. BGL):

Filter Pack Interval (ft. BGL):

Starting Water Level (ft. BMP): 19.44

Casing Stickup (ft.):

WL (ft. BMP): 19.44 (ft. BGL):

TD (ft. BMP): (ft. BGL):

Ft. water: Casing Dia. (In ID):

1X Casing Vol (gal.): 3X (gal):

QUALITY ASSURANCE

Gallons/Foot: 2": 0.16 4": 0.65 5.25": 1.12 6": 1.47 6.25": 1.59

METHODS (describe): Low Flow - Dedicated Tubing/Equipment

Cleaning Equipment: DI/Alconox Rinse

Purge: Peristaltic Pump / SS Pump / Bailer / bladder Sampling: Peristaltic Pump / SS Pump / Bailer / bladder

Disposal of Discharged Water:

INSTRUMENTS (Indicate make, model, I.d.)

Water Level: KECK Other: —

Multi Meter: HORIBA

Field Calibration: 7-4

Filter / Filter Size: —

SAMPLING MEASUREMENTS

Begin Purge:

1342 Time	DTW (ft BTOC)	Cum. Vol. (gal. or L)	Purge Rate (gal. or L / m)	Temp. (oC)	DO (mg/L)	Spec. Cond. (µs/cm)	pH	ORP (mV)	Turbidity (NTU)	Color & Sediment
1351	19.62	—	.2	23.4	1.34	1570	6.67	-42	8.6	muddy
1356	19.63		↓	23.6	1.03	1540	6.69	-47	9.2	↓
1402	19.62		↓	23.7	1.04	1550	6.69	-46	9.1	↓

WL (ft. BMP) at End of Purge: Sample Intake Depth (ft. BMP):

SAMPLE INVENTORY

Bottles Collected					Filtration (Y / N)	Preservation (type)	Remarks (quality control sample, other)
Time		Volume	Composition (G, P)	No.			
1415		250mL	P	1	N	—	APPENDIX III
↓		500mL	P	1	N	HNO_3	APPENDIX III
↓		1L	P	2	N	HNO_3	APPENDIX IV

Comments:

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GROUNDWATER SAMPLING RECORD

PAGE 1 of 1

Project Number: 19122262-F Project Name: LUMINANT - OGSES Date: 8-19-19

Sampling Location (well ID, etc.): FGD-14 Starting Water Level (ft. BMP): 16.22

Sample Number: FGD-14 Casing Stickup (ft.):

Sampled by: JTB WL (ft. BMP): 16.22 (ft. BGL):

Measuring Point (MP) of Well: (TOC) - Steel or (PVC) TD (ft. BMP): (ft. BGL):

Screened Interval (ft. BGL): Ft. water: Casing Dia. (In ID):

Filter Pack Interval (ft. BGL): 1X Casing Vol (gal.): 3X (gal):

QUALITY ASSURANCE

Gallons/Foot: 2": 0.16 4": 0.65 5.25": 1.12 6": 1.47 6.25": 1.59

METHODS (describe): Low Flow - Dedicated Tubing/Equipment

Cleaning Equipment: DI/Alconox Rinse

Purge: Peristaltic Pump / SS Pump / Bailer / bladder Sampling: Peristaltic Pump / SS Pump / Bailer / bladder

Disposal of Discharged Water:

INSTRUMENTS (Indicate make, model, I.d.)

Water Level: KECK Other: —

Multi Meter: HORIBA

Field Calibration: 7-4

Filter / Filter Size: —

SAMPLING MEASUREMENTS

Begin Purge:

1239 Time	DTW (ft BTOC)	Cum. Vol. (gal. or (L))	Purge Rate (gal. or (L/m))	Temp. (oC)	DO (mg/L)	Spec. Cond. (µs/cm)	pH	ORP (mV)	Turbidity (NTU)	Color & Sediment
1249	16.41	—	.2	23.4	0.72	1410	6.63	-29	4.6	neutral
1254	16.41		↓	23.3	0.61	1460	6.67	-27	5.1	↓
1259	16.41		↓	23.3	0.62	1470	6.68	-27	5.0	↓

WL (ft. BMP) at End of Purge: Sample Intake Depth (ft. BMP):

SAMPLE INVENTORY

Bottles Collected					Filtration (Y / N)	Preservation (type)	Remarks (quality control sample, other)
Time		Volume	Composition (G, P)	No.			
1315		250mL	P	1	N	—	APPENDIX III
↓		500mL	P	1	N	HNO_3	APPENDIX III
↓		1L	P	2	N	HNO_3	APPENDIX IV

Comments:

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GROUNDWATER SAMPLING RECORD

PAGE 1 of 1

Project Number: 19122262-F Project Name: LUMINANT - OGSES Date: 8-19-19

Sampling Location (well ID, etc.): FGD-01 Starting Water Level (ft. BMP): 16.72

Sample Number: FGD-01 Casing Stickup (ft.):

Sampled by: JTB WL (ft. BMP): 16.72 (ft. BGL):

Measuring Point (MP) of Well: (TOC) - Steel or (PVC) TD (ft. BMP): (ft. BGL):

Screened Interval (ft. BGL): Ft. water: Casing Dia. (In ID):

Filter Pack Interval (ft. BGL): 1X Casing Vol (gal.): 3X (gal):

QUALITY ASSURANCE

Gallons/Foot: 2": 0.16 4": 0.65 5.25": 1.12 6": 1.47 6.25": 1.59

METHODS (describe): Low Flow - Dedicated Tubing/Equipment

Cleaning Equipment: DI/Alconox Rinse

Purge: Peristaltic Pump / SS Pump / Bailer / bladder Sampling: Peristaltic Pump / SS Pump / Bailer / bladder

Disposal of Discharged Water:

INSTRUMENTS (Indicate make, model, I.d.)

Water Level: KECK Other: —

Multi Meter: HORIBA

Field Calibration: 7-4

Filter / Filter Size: —

SAMPLING MEASUREMENTS

Begin Purge:

Time (1133)	DTW (ft BTOC)	Cum. Vol. (gal. or (L))	Purge Rate (gal. or (L/m))	Temp. (oC)	DO (mg/L)	Spec. Cond. (µs/cm)	pH	ORP (mV)	Turbidity (NTU)	Color & Sediment
1144	16.96	—	.2	22.9	0.84	1610	6.47	-32	7.2	marbled
1149	16.96		↓	23.2	0.79	1610	6.49	-36	7.7	
1154	16.95		↓	23.2	0.77	1610	6.49	-36	7.7	

WL (ft. BMP) at End of Purge: Sample Intake Depth (ft. BMP):

SAMPLE INVENTORY

Time		Bottles Collected Volume	Composition (G, P)	No.	Filtration (Y / N)	Preservation (type)	Remarks (quality control sample, other)
1205		250mL	P	1	N	—	APPENDIX III
↓		500mL	P	1	N	HNO_3	APPENDIX III
↓		1L	P	2	N	HNO_3	APPENDIX IV

Comments:

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GROUNDWATER SAMPLING RECORD

PAGE 1 of 1

Project Number: 19122262-F Project Name: LUMINANT - OGSES Date: 8-19-19

Sampling Location (well ID, etc.): FGD-08 Starting Water Level (ft. BMP): 28.72

Sample Number: FGD-08 Casing Stickup (ft.):

Sampled by: JTB WL (ft. BMP): 28.72 (ft. BGL):

Measuring Point (MP) of Well: (TOC) - Steel or (PVC) TD (ft. BMP): (ft. BGL):

Screened Interval (ft. BGL): Ft. water: Casing Dia. (In ID):

Filter Pack Interval (ft. BGL): 1X Casing Vol (gal.): 3X (gal):

QUALITY ASSURANCE

Gallons/Foot: 2": 0.16 4": 0.65 5.25": 1.12 6": 1.47 6.25": 1.59

METHODS (describe): Low Flow - Dedicated Tubing/Equipment

Cleaning Equipment: DI/Alconox Rinse

Purge: Peristaltic Pump / SS Pump / Bailer / bladder Sampling: Peristaltic Pump / SS Pump / Bailer / bladder

Disposal of Discharged Water:

INSTRUMENTS (Indicate make, model, I.d.)

Water Level: KECK Other: —

Multi Meter: HORIBA

Field Calibration: 7-4

Filter / Filter Size: —

SAMPLING MEASUREMENTS

Begin Purge:

1028 Time	DTW (ft BTOC)	Cum. Vol. (gal. or (L))	Purge Rate (gal. or (L / m))	Temp. (oC)	DO (mg/L)	Spec. Cond. (µs/cm)	pH	ORP (mV)	Turbidity (NTU)	Color & Sediment
1037	29.04	—	.2	23.4	1.09	1860	6.86	-43	4.8	medium
1043	29.11		↓	23.3	1.01	1880	6.89	-46	6.1	↓
1049	29.10		↓	23.3	1.02	1890	6.89	-47	6.2	↓

WL (ft. BMP) at End of Purge: Sample Intake Depth (ft. BMP):

SAMPLE INVENTORY

Bottles Collected					Filtration	Preservation	Remarks
Time		Volume	Composition (G, P)	No.	(Y / N)	(type)	(quality control sample, other)
1100		250mL	P	1	N	—	APPENDIX III
↓		500mL	P	1	N	HNO_3	APPENDIX III
↓		1L	P	2	N	HNO_3	APPENDIX IV

Comments:

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GROUNDWATER SAMPLING RECORD

PAGE 1 of 1

Project Number: 19122262-F Project Name: LUMINANT - OGSES Date: 8-19-19

Sampling Location (well ID, etc.): FGD-05

Sample Number: FGD-05

Sampled by: JTB

Measuring Point (MP) of Well: (TOC) - Steel or (PVC)

Screened Interval (ft. BGL):

Filter Pack Interval (ft. BGL):

Starting Water Level (ft. BMP): 20.23

Casing Stickup (ft.):

WL (ft. BMP): 20.23 (ft. BGL):

TD (ft. BMP): (ft. BGL):

Ft. water: Casing Dia. (In ID):

1X Casing Vol (gal.): 3X (gal):

QUALITY ASSURANCE

Gallons/Foot: 2": 0.16 4": 0.65 5.25": 1.12 6": 1.47 6.25": 1.59

METHODS (describe): Low Flow - Dedicated Tubing/Equipment

Cleaning Equipment: DI/Alconox Rinse

Purge: Peristaltic Pump / SS Pump / Bailer / bladder Sampling: Peristaltic Pump / SS Pump / Bailer / bladder

Disposal of Discharged Water:

INSTRUMENTS (Indicate make, model, I.d.)

Water Level: KECK Other: —

Multi Meter: HORIBA

Field Calibration: 7-4

Filter / Filter Size: —

SAMPLING MEASUREMENTS

Begin Purge:

0928 Time	DTW (ft BTOC)	Cum. Vol. (gal. or (L))	Purge Rate (gal. or L /(m))	Temp. (oC)	DO (mg/L)	Spec. Cond. (µs/cm)	pH	ORP (mV)	Turbidity (NTU)	Color & Sediment
0938	20.42	—	.2	23.4	1.39	2310	6.74	-17	4.8	neutral
0943	20.41		↓	23.5	1.31	2360	6.77	-16	3.6	↓
0949	20.41		↓	23.5	1.32	2360	6.76	-16	3.8	↓

WL (ft. BMP) at End of Purge: Sample Intake Depth (ft. BMP):

SAMPLE INVENTORY

Bottles Collected					Filtration	Preservation	Remarks
Time		Volume	Composition (G, P)	No.	(Y / N)	(type)	(quality control sample, other)
1000		250mL	P	1	N	—	APPENDIX III
↓		500mL	P	1	N	HNO_3	APPENDIX III
↓		1L	P	2	N	HNO_3	APPENDIX IV

Comments:

DUP-1

1000- dammple time

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GROUNDWATER SAMPLING RECORD

PAGE 1 of 1

Project Number: 19122262-F Project Name: LUMINANT - OGSES Date: 8-19-19

Sampling Location (well ID, etc.): FGD-02 Starting Water Level (ft. BMP): 26.71

Sample Number: FGD-02 Casing Stickup (ft.):

Sampled by: NB WL (ft. BMP): 26.71 (ft. BGL):

Measuring Point (MP) of Well: (TOC) - Steel or (PVC) TD (ft. BMP): (ft. BGL):

Screened Interval (ft. BGL): Ft. water: Casing Dia. (In ID):

Filter Pack Interval (ft. BGL): 1X Casing Vol (gal.): 3X (gal):

QUALITY ASSURANCE

Gallons/Foot: 2": 0.16 4": 0.65 5.25": 1.12 6": 1.47 6.25": 1.59

METHODS (describe): Low Flow - Dedicated Tubing/Equipment

Cleaning Equipment: DI/Alconox Rinse

Purge: Peristaltic Pump / SS Pump / Bailer / bladder Sampling: Peristaltic Pump / SS Pump / Bailer / bladder

Disposal of Discharged Water:

INSTRUMENTS (Indicate make, model, I.d.)

Water Level: KECK Other: —

Multi Meter: HORIBA

Field Calibration: 7-4

Filter / Filter Size: —

SAMPLING MEASUREMENTS

Begin Purge: 0835

Time	DTW (ft BTOC)	Cum. Vol. (gal. or (L))	Purge Rate (gal. or (L)/m)	Temp. (oC)	DO (mg/L)	Spec. Cond. (µs/cm)	pH	ORP (mV)	Turbidity (NTU)	Color & Sediment
0849	26.88	—	.2	23.1	0.99	1720	6.91	-101	13	mentod
0854	26.87		↓	23.0	0.94	1730	6.89	-102	10	↓
0859	26.87		↓	23.1	0.95	1720	6.88	-101	8.9	↓

WL (ft. BMP) at End of Purge: Sample Intake Depth (ft. BMP):

SAMPLE INVENTORY

Time		Bottles Collected Volume	Composition (G, P)	No.	Filtration (Y / N)	Preservation (type)	Remarks (quality control sample, other)
0915		250mL	P	1	N	—	APPENDIX III
↓		500mL	P	1	N	HNO_3	APPENDIX III
↓		1L	P	2	N	HNO_3	APPENDIX IV

Comments:

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GROUNDWATER SAMPLING RECORD

PAGE 1 of 1

Project Number: 19122262-F Project Name: LUMINANT - OGSES Date: 8-19-19

Sampling Location (well ID, etc.): FGD-03 Starting Water Level (ft. BMP): 22.19

Sample Number: FGD-03 Casing Stickup (ft.):

Sampled by: JTB WL (ft. BMP): 22.19 (ft. BGL):

Measuring Point (MP) of Well: (TOC) - Steel or (PVC) TD (ft. BMP): (ft. BGL):

Screened Interval (ft. BGL): Ft. water: Casing Dia. (In ID):

Filter Pack Interval (ft. BGL): 1X Casing Vol (gal.): 3X (gal):

QUALITY ASSURANCE

Gallons/Foot: 2": 0.16 4": 0.65 5.25": 1.12 6": 1.47 6.25": 1.59

METHODS (describe): Low Flow - Dedicated Tubing/Equipment

Cleaning Equipment: DI/Alconox Rinse

Purge: Peristaltic Pump / SS Pump / Bailer / bladder Sampling: Peristaltic Pump / SS Pump / Bailer / bladder

Disposal of Discharged Water:

INSTRUMENTS (Indicate make, model, I.d.)

Water Level: KECK Other: —

Multi Meter: HORIBA

Field Calibration: 7-4

Filter / Filter Size: —

SAMPLING MEASUREMENTS

Begin Purge:

0752 Time	DTW (ft BTOC)	Cum. Vol. (gal. or (L))	Purge Rate (gal. or (L) /min)	Temp. (oC)	DO (mg/L)	Spec. Cond. (µs/cm)	pH	ORP (mV)	Turbidity (NTU)	Color & Sediment
0803	22.36	—	.2	23.4	0.77	1630	6.71	-41	6.2	neutral
0807	22.38			23.6	0.61	1640	6.72	-43	7.4	
0814	22.38			23.6	0.62	1640	6.72	-43	7.4	

WL (ft. BMP) at End of Purge: Sample Intake Depth (ft. BMP):

SAMPLE INVENTORY

Time		Bottles Collected Volume	Composition (G, P)	No.	Filtration (Y / N)	Preservation (type)	Remarks (quality control sample, other)
0825		250mL	P	1	N	—	APPENDIX III
		500mL	P	1	N	HNO_3	APPENDIX III
		1L	P	2	N	HNO_3	APPENDIX IV

Comments:

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GROUNDWATER SAMPLING RECORD

PAGE 1 of 1

Project Number: 19122262-F Project Name: LUMINANT - OGSES Date: 8-19-19

Sampling Location (well ID, etc.): FGD-6 Starting Water Level (ft. BMP): 16.61

Sample Number: FGD-6 Casing Stickup (ft.):

Sampled by: JTB WL (ft. BMP): 16.61 (ft. BGL):

Measuring Point (MP) of Well: (TOC) - Steel or (PVC) TD (ft. BMP): (ft. BGL):

Screened Interval (ft. BGL): Ft. water: Casing Dia. (In ID):

Filter Pack Interval (ft. BGL): 1X Casing Vol (gal.): 3X (gal):

QUALITY ASSURANCE

Gallons/Foot: 2": 0.16 4": 0.65 5.25": 1.12 6": 1.47 6.25": 1.59

METHODS (describe): Low Flow - Dedicated Tubing/Equipment

Cleaning Equipment: DI/Alconox Rinse

Purge: Peristaltic Pump / SS Pump / Bailer / bladder Sampling: Peristaltic Pump / SS Pump / Bailer / bladder

Disposal of Discharged Water:

INSTRUMENTS (Indicate make, model, I.d.)

Water Level: KECK Other: —

Multi Meter: HORIBA

Field Calibration: 7-4

Filter / Filter Size: —

SAMPLING MEASUREMENTS

Begin Purge:

0701 Time	DTW (ft BTOC)	Cum. Vol. (gal. or (L))	Purge Rate (gal. or (L/m))	Temp. (oC)	DO (mg/L)	Spec. Cond. (µs/cm)	pH	ORP (mV)	Turbidity (NTU)	Color & Sediment
0711	16.86	—	.2	21.7	0.91	2110	6.74	-17	6.8	neutral
0716	16.89		↓	22.3	0.73	2120	6.71	-13	7.2	↓
0725	16.88		↓	22.4	0.74	2120	6.72	-12	7.2	↓

WL (ft. BMP) at End of Purge: Sample Intake Depth (ft. BMP):

SAMPLE INVENTORY

Bottles Collected					Filtration	Preservation	Remarks
Time		Volume	Composition (G, P)	No.	(Y / N)	(type)	(quality control sample, other)
0735		250mL	P	1	N	—	APPENDIX III
↓		500mL	P	1	N	HNO_3	APPENDIX III
↓		1L	P	2	N	HNO_3	APPENDIX IV

Comments:

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RECORD OF WATER LEVEL READINGS

GOLDER

Project Name: LUMINANT- OGSES Location: OGSES - FGD Project No.: 19122262

Borehole No.	Date	Time	Measuring Device / Serial No.	Measurement Point (M.P)	Water Level Below M.P.	Correction To Survey Mark	Survey Mark Elevation	Water Level Elevation	By	Comments
FGD-6	5-6-20		SOLINST	TOC/PVC	16.84				JB	
FGD-3					22.64					
FGD-14					16.82					
FGD-15					25.63					
FGD-16					31.26					
FGD-4					[illegible]	19.78				
FGD-2					26.98					
FGD-5					20.09					
FGD-1					11.59					
FGD-8					28.99					
FGD-11					38.91					
FGD-12	↓		↓	↓	29.97				↓	

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Groundwater Sample Collection

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GOLDER

Project/Phase	19116549/19122262	Equipment Decon	☒ Dedicated equipment	Depth to Water	16.82 ft. BMP
Site Location	OGSES		☐ Decon between locations	Casing Stickup	— ft.
Date	5-6-20	Reference Point	☒ Top of casing	☐ Depth to Water	16.82 ft. BGL
MW ID	FGD-14	Location	Other	Total MW Depth	ft. BGL
Sample ID	FGD-14	Water Quality		MW Diameter	2.0 inches
Pump	☐ Waterra ☐ Submersible	Meter Model	YSI - HORIBA	MW Volume	gallons
	☒ Peristaltic ☐ Bladder	Unit Number	U-50	Pump Intake Depth	ft. BGL

Standard volume capacity of monitoring wells: Schedule 40 PVC (1-inch OD, 0.04 gallons/foot; 2-inch OD, 0.16 gallons/foot; 4-inch OD, 0.65 gallons/foot)

Time	Purge Rate	Cumulative Purge Volume	Depth to Water	Temp (°C)	pH	Conductivity (µS/m or mS/cm)	Dissolved Oxygen (mg/L)	Redox Potential (mV)	Turbidity (NTU)
1436	(L/min)	(L)	(ft)	☐ NM	☐ NM	☐ not measured	☐ not measured	☐ not measured	☐ NM
1447	.2	/	17.14	21.7	6.81	1320	2.34	26	7.6
1451	↓	/	17.17	21.9	6.86	1360	1.94	27	6.3
1456	↓	/	17.18	21.9	6.87	1350	1.93	27	6.7

Purging was completed based on: ☒ stabilization of water quality parameters ☐ removal of three well volumes ☐ removal of at least one half well volume (low yield well)

Bottles Collected				Filtration	Preserved	Notes and Observations
Time	Volume	Composition (G / P)	No.	(10µm / 45µm)	(type)	(quality control sample, other)
1505	1L	P	2	☐ filtered ☒ unfiltered	HNO3	MNA
				☐ filtered ☐ unfiltered		

Notes: record time at which purging is started. For low flow sampling, recommended stabilization criteria: temp ± 0.5°C; pH ± 0.1 units; conductivity ± 3%; DO ± 1 mg/L; ORP ± 10 mV; for at least three successive measurements that are made every 3-5 minutes with <1 foot of stable draw down.

Unless otherwise noted, groundwater sample collection was completed in accordance with the applicable requirements of Golder's Quality Assurance Program and Standard Operating Procedure ☐ 9 Conventional Groundwater Sample Collection ☒ 10 Low Flow Groundwater Sample Collection.

Field Team Leader JOHN BRAYTON (name) (signature)

Groundwater Sample Collection

Page 1 of 1

GOLDER

Project/Phase	19116549/19122262	Equipment Decon	☒ Dedicated equipment	Depth to Water	25.63 ft. BMP
Site Location	OGSES		☐ Decon between locations	Casing Stickup	– ft.
Date	5-6-20	Reference Point	☒ Top of casing	☐ Depth to Water	25.63 ft. BGL
MW ID	FGD-15	Location	Other	Total MW Depth	– ft. BGL
Sample ID	FGD-15	Water Quality		MW Diameter	2.0 inches
Pump	☐ Waterra ☐ Submersible	Meter Model	YSI - HORIBA	MW Volume	/ gallons
	☒ Peristaltic ☐ Bladder	Unit Number	U-50	Pump Intake Depth	ft. BGL

Standard volume capacity of monitoring wells: Schedule 40 PVC (1-inch OD, 0.04 gallons/foot; 2-inch OD, 0.16 gallons/foot; 4-inch OD, 0.65 gallons/foot)

Time	Purge Rate	Cumulative Purge Volume	Depth to Water	Temp (°C)	pH	Conductivity (µS/m or mS/cm)	Dissolved Oxygen (mg/L)	Redox Potential (mV)	Turbidity (NTU)
1521	(L/min)	(L)	(ft)	☐ NM	☐ NM	☐ not measured	☐ not measured	☐ not measured	☐ NM
1531	.2	/	25.91	22.3	6.87	1920	1.31	-31	7.2
1536	↓	/	25.96	22.2	6.83	1930	1.06	-36	3.6
1541	↓	/	25.99	22.2	6.82	1920	1.07	-37	4.7

Purging was completed based on: ☒ stabilization of water quality parameters ☐ removal of three well volumes ☐ removal of at least one half well volume (low yield well)

Bottles Collected				Filtration	Preserved	Notes and Observations
Time	Volume	Composition (G / P)	No.	(10µm / 45µm)	(type)	(quality control sample, other)
1545	1L	P	2	☐ filtered ☒ unfiltered	HNO_3	MNA
				☐ filtered ☐ unfiltered		

Notes: record time at which purging is started. For low flow sampling, recommended stabilization criteria: temp ± 0.5°C; pH ± 0.1 units; conductivity ± 3%; DO ± 1 mg/L; ORP ± 10 mV; for at least three successive measurements that are made every 3-5 minutes with <1 foot of stable draw down.

Unless otherwise noted, groundwater sample collection was completed in accordance with the applicable requirements of Golder's Quality Assurance Program and Standard Operating Procedure ☐ 9 Conventional Groundwater Sample Collection ☒ 10 Low Flow Groundwater Sample Collection.

Field Team Leader JOHN BRAYTON (name) (signature)

Groundwater Sample Collection

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GOLDER

Project/Phase	19116549/19122263	Equipment Decon	☒ Dedicated equipment	Depth to Water	31.26	ft. BMP
Site Location	OGSES		☐ Decon between locations	Casing Stickup	–	ft.
Date	5-6-20	Reference Point	☒ Top of casing	☐ Depth to Water	31.26	ft. BGL
MW ID	FGD-16	Location	Other _____	Total MW Depth	–	ft, BGL
Sample ID	FGD-16	Water Quality		MW Diameter	2.0	inches
Pump	☐ Waterra ☐ Submersible	Meter Model	YSI - HORIBA	MW Volume	/	gallons
	☐ Peristaltic ☒ Bladder	Unit Number	U-50	Pump Intake Depth	/	ft. BGL

Standard volume capacity of monitoring wells: Schedule 40 PVC (1-inch OD, 0.04 gallons/foot; 2-inch OD, 0.16 gallons/foot; 4-inch OD, 0.65 gallons/foot)

Time	Purge Rate	Cumulative Purge Volume	Depth to Water	Temp (°C)	pH	Conductivity (µS/m or mS/cm)	Dissolved Oxygen (mg/L)	Redox Potential (mV)	Turbidity (NTU)
1602	(L/min)	(L)	(ft)	☐ NM	☐ NM	☐ not measured	☐ not measured	☐ not measured	☐ NM
1612	.2	/	31.57	21.4	6.81	1720	1.79	-21	8.4
1617	↓	/	31.59	21.9	6.77	1710	1.29	-26	9.2
1622	↓	/	31.59	21.9	6.76	1710	1.31	-26	9.7

Purging was completed based on: ☒ stabilization of water quality parameters ☐ removal of three well volumes ☐ removal of at least one half well volume (low yield well)

Bottles Collected				Filtration (10µm / 45µm)	Preserved (type)	Notes and Observations (quality control sample, other)
Time	Volume	Composition (G / P)	No.			
1630	1L	P	2	☐ filtered ☒ unfiltered	HNO_3	MNA
				☐ filtered ☐ unfiltered		

Notes: record time at which purging is started. For low flow sampling, recommended stabilization criteria: temp ± 0.5°C; pH ± 0.1 units; conductivity ± 3%; DO ± 1 mg/L; ORP ± 10 mV; for at least three successive measurements that are made every 3-5 minutes with <1 foot of stable draw down.

Unless otherwise noted, groundwater sample collection was completed in accordance with the applicable requirements of Golder's Quality Assurance Program and Standard Operating Procedure ☐ 9 Conventional Groundwater Sample Collection ☒ 10 Low Flow Groundwater Sample Collection.

Field Team Leader JOHN BRAYDEN (name) _____ (signature)

Groundwater Sample Collection

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GOLDER

Project/Phase	19116549/19122262	Equipment Decon	☒ Dedicated equipment	Depth to Water	16.84 ft. BMP
Site Location	OGSES		☐ Decon between locations	Casing Stickup	– ft.
Date	5-6-20	Reference Point	☒ Top of casing	☐ Depth to Water	16.84 ft. BGL
MW ID	FGD-6	Location	Other	Total MW Depth	ft, BGL
Sample ID	FGD-6	Water Quality		MW Diameter	2.0 inches
Pump	☐ Waterra ☐ Submersible	Meter Model	YSI - HORIBA	MW Volume	– gallons
	☒ Peristaltic ☐ Bladder	Unit Number	U-50	Pump Intake Depth	– ft. BGL

Standard volume capacity of monitoring wells: Schedule 40 PVC (1-inch OD, 0.04 gallons/foot; 2-inch OD, 0.16 gallons/foot; 4-inch OD, 0.65 gallons/foot)

Time	Purge Rate (L/min)	Cumulative Purge Volume (L)	Depth to Water (ft)	Temp (°C) ☐ NM	pH ☐ NM	Conductivity (µS/m or mS/cm) ☐ not measured	Dissolved Oxygen (mg/L) ☐ not measured	Redox Potential (mV) ☐ not measured	Turbidity (NTU) ☐ NM
1249									
1258	.2	/	17.13	21.3	6.71	1620	0.99	-14	4.2
1304	↓	/	17.16	21.4	6.74	1640	0.76	-17	6.7
1309	↓	/	17.17	21.6	6.75	1640	0.77	-17	6.9

Purging was completed based on: ☒ stabilization of water quality parameters ☐ removal of three well volumes ☐ removal of at least one half well volume (low yield well)

Bottles Collected				Filtration	Preserved	Notes and Observations
Time	Volume	Composition (G / P)	No.	(10µm / 45µm)	(type)	(quality control sample, other)
1320	250mL	P	2	☐ filtered ☒ unfiltered	NONE, HNO_3	MNA
1320	1L	P	4	☐ filtered ☒ unfiltered	HNO_3	APPENDIX III & IV

Notes: record time at which purging is started. For low flow sampling, recommended stabilization criteria: temp ± 0.5°C; pH ± 0.1 units; conductivity ± 3%; DO ± 1 mg/L; ORP ± 10 mV; for at least three successive measurements that are made every 3-5 minutes with <1 foot of stable draw down.

Unless otherwise noted, groundwater sample collection was completed in accordance with the applicable requirements of Golder's Quality Assurance Program and Standard Operating Procedure ☐ 9 Conventional Groundwater Sample Collection ☒ 10 Low Flow Groundwater Sample Collection.

Field Team Leader JOHN BRAYTON (name) (signature)

Groundwater Sample Collection

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GOLDER

Project/Phase	19116549/19122262	Equipment Decon	☒ Dedicated equipment	Depth to Water	22.64 ft. BMP
Site Location	OGSES		☐ Decon between locations	Casing Stickup	– ft.
Date	5-6-20	Reference Point	☒ Top of casing	☐ Depth to Water	22.64 ft. BGL
MW ID	FGD-3	Location	Other	Total MW Depth	– ft. BGL
Sample ID	FGD-3	Water Quality		MW Diameter	2.0 inches
Pump	☐ Waterra ☐ Submersible	Meter Model	YSI - HORIBA	MW Volume	~~2.0~~ gallons
	☒ Peristaltic ☐ Bladder	Unit Number	U-50	Pump Intake Depth	ft. BGL

Standard volume capacity of monitoring wells: Schedule 40 PVC (1-inch OD, 0.04 gallons/foot; 2-inch OD, 0.16 gallons/foot; 4-inch OD, 0.65 gallons/foot)

Time	Purge Rate	Cumulative Purge Volume	Depth to Water	Temp (°C)	pH	Conductivity (µS/m or mS/cm)	Dissolved Oxygen (mg/L)	Redox Potential (mV)	Turbidity (NTU)
1341	(L/min)	(L)	(ft)	☐ NM	☐ NM	☐ not measured	☐ not measured	☐ not measured	☐ NM
1349	.2	/	22.87	20.9	6.64	1520	1.39	13	9.2
1356	↓	/	22.89	21.2	6.62	1570	1.17	16	8.6
1402	↓	/	22.89	21.2	6.62	1580	1.18	16	8.9

Purging was completed based on: ☒ stabilization of water quality parameters ☐ removal of three well volumes ☐ removal of at least one half well volume (low yield well)

Bottles Collected				Filtration	Preserved	Notes and Observations
Time	Volume	Composition (G / P)	No.	(10µm / 45µm)	(type)	(quality control sample, other)
1420	250mL	P	2	☐ filtered ☐ unfiltered	NONE, HNO_3	MNA
1420	1L	P	4	☐ filtered ☒ unfiltered	HNO_3	APPENDIX III & IV

Notes: record time at which purging is started. For low flow sampling, recommended stabilization criteria: temp ± 0.5°C; pH ± 0.1 units; conductivity ± 3%; DO ± 1 mg/L; ORP ± 10 mV; for at least three successive measurements that are made every 3-5 minutes with <1 foot of stable draw down.

Unless otherwise noted, groundwater sample collection was completed in accordance with the applicable requirements of Golder's Quality Assurance Program and Standard Operating Procedure ☐ 9 Conventional Groundwater Sample Collection ☒ 10 Low Flow Groundwater Sample Collection.

Field Team Leader JOHN BRAYTON (name) (signature)

Groundwater Sample Collection

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GOLDER

Project/Phase	19116549/19122262	Equipment Decon	☒ Dedicated equipment	Depth to Water	29.97 ft. BMP
Site Location	OGSES		☐ Decon between locations	Casing Stickup	ft.
Date	5-11-20	Reference Point	☒ Top of casing	☐ Depth to Water	29.97 ft. BGL
MW ID	FGD-12	Location	Other	Total MW Depth	ft. BGL
Sample ID	FGD-12	Water Quality		MW Diameter	2.0 inches
Pump	☐ Waterra ☐ Submersible	Meter Model	YSI - HORIBA	MW Volume	1 gallons
	☐ Peristaltic ☒ Bladder	Unit Number	U-50	Pump Intake Depth	ft. BGL

Standard volume capacity of monitoring wells: Schedule 40 PVC (1-inch OD, 0.04 gallons/foot; 2-inch OD, 0.16 gallons/foot; 4-inch OD, 0.65 gallons/foot)

Time	Purge Rate	Cumulative Purge Volume	Depth to Water	Temp (°C)	pH	Conductivity (µS/m or mS/cm)	Dissolved Oxygen (mg/L)	Redox Potential (mV)	Turbidity (NTU)
1309	(L/min)	(L)	(ft)	☐ NM	☐ NM	☐ not measured	☐ not measured	☐ not measured	☐ NM
1319	.2	/	30.26	22.4	6.56	1560	1.26	-29	12
1324	↓	/	30.29	22.5	6.59	1590	0.91	-34	10
1329	↓	/	30.29	22.5	6.59	1590	0.92	-33	10

Purging was completed based on: ☒ stabilization of water quality parameters ☐ removal of three well volumes ☐ removal of at least one half well volume (low yield well)

Bottles Collected				Filtration	Preserved	Notes and Observations
Time	Volume	Composition (G / P)	No.	(10µm / 45µm)	(type)	(quality control sample, other)
1345	250mL	P	2	☐ filtered ☒ unfiltered	NONE, HNO_3	CCR
1345	250mL	P	2	☐ filtered ☒ unfiltered	NONE, HNO_3	MNA

Notes: record time at which purging is started. For low flow sampling, recommended stabilization criteria: temp ± 0.5°C; pH ± 0.1 units; conductivity ± 3%; DO ± 1 mg/L; ORP ± 10 mV; for at least three successive measurements that are made every 3-5 minutes with <1 foot of stable draw down.

Unless otherwise noted, groundwater sample collection was completed in accordance with the applicable requirements of Golder's Quality Assurance Program and Standard Operating Procedure ☐ 9 Conventional Groundwater Sample Collection ☒ 10 Low Flow Groundwater Sample Collection.

Field Team Leader JOHN BRAYTON (name) (signature)

Groundwater Sample Collection

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GOLDER

Project/Phase	19116549/19122262	Equipment Decon	☒ Dedicated equipment	Depth to Water	38.91 ft. BMP
Site Location	OGSES		☐ Decon between locations	Casing Stickup	– ft.
Date	5-11-20	Reference Point	☒ Top of casing	☐ Depth to Water	38.91 ft. BGL
MW ID	FGD-11	Location	Other	Total MW Depth	ft. BGL
Sample ID	FGD-11	Water Quality		MW Diameter	2.0 inches
Pump	☐ Waterra ☐ Submersible	Meter Model	YSI - HORIBA	MW Volume	1 gallons
	☐ Peristaltic ☒ Bladder	Unit Number	U-50	Pump Intake Depth	ft. BGL

Standard volume capacity of monitoring wells: Schedule 40 PVC (1-inch OD, 0.04 gallons/foot; 2-inch OD, 0.16 gallons/foot; 4-inch OD, 0.65 gallons/foot)

Time	Purge Rate (L/min)	Cumulative Purge Volume (L)	Depth to Water (ft)	Temp (°C) ☐ NM	pH ☐ NM	Conductivity (µS/m or mS/cm) ☐ not measured	Dissolved Oxygen (mg/L) ☐ not measured	Redox Potential (mV) ☐ not measured	Turbidity (NTU) ☐ NM
1213									
1223	.2	1	39.19	22.6	6.79	1210	1.67	-41	3.2
1228	↓	1	39.22	22.7	6.76	1260	1.52	-46	3.7
1233	↓	1	39.23	22.6	6.74	1270	1.53	-45	3.6

Purging was completed based on: ☒ stabilization of water quality parameters ☐ removal of three well volumes ☐ removal of at least one half well volume (low yield well)

Bottles Collected				Filtration	Preserved	Notes and Observations
Time	Volume	Composition (G / P)	No.	(10µm / 45µm)	(type)	(quality control sample, other)
1245	250mL	P	2	☐ filtered ☒ unfiltered	NONE, HNO_3	CCR
1245	250mL	P	2	☐ filtered ☒ unfiltered	NONE, HNO_3	MNA

Notes: record time at which purging is started. For low flow sampling, recommended stabilization criteria: temp ± 0.5°C; pH ± 0.1 units; conductivity ± 3%; DO ± 1 mg/L; ORP ± 10 mV; for at least three successive measurements that are made every 3-5 minutes with <1 foot of stable draw down.

Unless otherwise noted, groundwater sample collection was completed in accordance with the applicable requirements of Golder's Quality Assurance Program and Standard Operating Procedure ☐ 9 Conventional Groundwater Sample Collection ☒ 10 Low Flow Groundwater Sample Collection.

Field Team Leader JOHN BRAYTON (name) (signature)

Groundwater Sample Collection

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GOLDER

Project/Phase	19116549/19122262	Equipment Decon	☒ Dedicated equipment	Depth to Water	28.99	ft. BMP
Site Location	OGSES		☐ Decon between locations	Casing Stickup	–	ft.
Date	5-11-20	Reference Point	☒ Top of casing	☐ Depth to Water	28.99	ft. BGL
MW ID	FGD-8	Location	Other	Total MW Depth		ft. BGL
Sample ID	FGD-8	Water Quality		MW Diameter	2.0	inches
Pump	☐ Waterra ☐ Submersible	Meter Model	YSI - HORIBA	MW Volume	/	gallons
	☒ Peristaltic ☐ Bladder	Unit Number	U-50	Pump Intake Depth		ft. BGL

Standard volume capacity of monitoring wells: Schedule 40 PVC (1-inch OD, 0.04 gallons/foot; 2-inch OD, 0.16 gallons/foot; 4-inch OD, 0.65 gallons/foot)

Time	Purge Rate	Cumulative Purge Volume	Depth to Water	Temp (°C)	pH	Conductivity (µS/m or mS/cm)	Dissolved Oxygen (mg/L)	Redox Potential (mV)	Turbidity (NTU)
1038	(L/min)	(L)	(ft)	☐ NM	☐ NM	☐ not measured	☐ not measured	☐ not measured	☐ NM
1048	.2	/	29.16	6.76	21.7	2160	1.67	-12	3.6
1053	↓	/	29.17	6.71	21.9	2120	1.34	-14	4.7
1058	↓	/	29.17	6.69	21.9	2130	1.33	-14	4.7
				↖	↗				

Purging was completed based on: ☒ stabilization of water quality parameters ☐ removal of three well volumes ☐ removal of at least one half well volume (low yield well)

Bottles Collected				Filtration	Preserved	Notes and Observations
Time	Volume	Composition (G / P)	No.	(10µm / 45µm)	(type)	(quality control sample, other)
1110	250mL	P	2	☐ filtered ☒ unfiltered	NONE, HNO3	CCS
1110	250mL	P	2	☐ filtered ☒ unfiltered	NONE, HNO3	MNA

Notes: record time at which purging is started. For low flow sampling, recommended stabilization criteria: temp ± 0.5°C; pH ± 0.1 units; conductivity ± 3%; DO ± 1 mg/L; ORP ± 10 mV; for at least three successive measurements that are made every 3-5 minutes with <1 foot of stable draw down.

Unless otherwise noted, groundwater sample collection was completed in accordance with the applicable requirements of Golder's Quality Assurance Program and Standard Operating Procedure ☐ 9 Conventional Groundwater Sample Collection ☒ 10 Low Flow Groundwater Sample Collection.

Field Team Leader JOHN BRAYTON (name) (signature)

Groundwater Sample Collection

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GOLDER

Project/Phase	19116549/19122262	Equipment Decon	☒ Dedicated equipment	Depth to Water	11.59 ft. BMP
Site Location	OGSES		☐ Decon between locations	Casing Stickup	– ft.
Date	5-11-20	Reference Point	☒ Top of casing	☐ Depth to Water	11.59 ft. BGL
MW ID	FGD-1	Location	Other	Total MW Depth	ft. BGL
Sample ID	FGD-1	Water Quality		MW Diameter	2.0 inches
Pump	☐ Waterra ☐ Submersible	Meter Model	YSI - HORIBA	MW Volume	/ gallons
	☒ Peristaltic ☐ Bladder	Unit Number	U-50	Pump Intake Depth	ft. BGL

Standard volume capacity of monitoring wells: Schedule 40 PVC (1-inch OD, 0.04 gallons/foot; 2-inch OD, 0.16 gallons/foot; 4-inch OD, 0.65 gallons/foot)

Time	Purge Rate	Cumulative Purge Volume	Depth to Water	Temp (°C)	pH	Conductivity (µS/m or mS/cm)	Dissolved Oxygen (mg/L)	Redox Potential (mV)	Turbidity (NTU)
0941	(L/min)	(L)	(ft)	☐ NM	☐ NM	☐ not measured	☐ not measured	☐ not measured	☐ NM
0951	.2	/	11.79	22.4	6.91	1360	2.39	-49	13
0956	↓	/	11.91	22.6	6.94	1390	2.06	-56	10
1001	↓	/	11.80	22.6	6.95	1380	2.09	-55	10

Purging was completed based on: ☒ stabilization of water quality parameters ☐ removal of three well volumes ☐ removal of at least one half well volume (low yield well)

Bottles Collected				Filtration	Preserved	Notes and Observations
Time	Volume	Composition (G / P)	No.	(10µm / 45µm)	(type)	(quality control sample, other)
1015	250mL	P	2	☐ filtered ☒ unfiltered	NONE, HNO_3	CCR
1015	250mL	P	2	☐ filtered ☒ unfiltered	NONE, HNO_3	MNA

Notes: record time at which purging is started. For low flow sampling, recommended stabilization criteria: temp ± 0.5°C; pH ± 0.1 units; conductivity ± 3%; DO ± 1 mg/L; ORP ± 10 mV; for at least three successive measurements that are made every 3-5 minutes with <1 foot of stable draw down.

Unless otherwise noted, groundwater sample collection was completed in accordance with the applicable requirements of Golder's Quality Assurance Program and Standard Operating Procedure ☐ 9 Conventional Groundwater Sample Collection ☒ 10 Low Flow Groundwater Sample Collection.

Field Team Leader JOHN BRAYTON (name) (signature)

Groundwater Sample Collection

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GOLDER

Project/Phase	19116549/19122262	Equipment Decon	☒ Dedicated equipment	Depth to Water	26.98	ft. BMP
Site Location	OGSES		☐ Decon between locations	Casing Stickup	—	ft.
Date	5-11-20	Reference Point	☒ Top of casing	☐ Depth to Water	26.98	ft. BGL
MW ID	FGD-2	Location	Other	Total MW Depth		ft. BGL
Sample ID	FGD-2	Water Quality		MW Diameter	2.0	inches
Pump	☐ Waterra ☐ Submersible	Meter Model	YSI - HORIBA	MW Volume	1	gallons
	☒ Peristaltic ☐ Bladder	Unit Number	U-50	Pump Intake Depth		ft. BGL

Standard volume capacity of monitoring wells: Schedule 40 PVC (1-inch OD, 0.04 gallons/foot; 2-inch OD, 0.16 gallons/foot; 4-inch OD, 0.65 gallons/foot)

Time	Purge Rate	Cumulative Purge Volume	Depth to Water	Temp (°C)	pH	Conductivity (µS/m or mS/cm)	Dissolved Oxygen (mg/L)	Redox Potential (mV)	Turbidity (NTU)
0804	(L/min)	(L)	(ft)	☐ NM	☐ NM	☐ not measured	☐ not measured	☐ not measured	☐ NM
0814	.2	1	27.22	22.4	6.54	1110	0.91	-29	4.7
0819	↓	1	27.26	22.6	6.61	1140	0.76	-26	4.9
0824	↓	1	27.25	22.6	6.61	1130	0.77	-27	4.9

Purging was completed based on: ☒ stabilization of water quality parameters ☐ removal of three well volumes ☐ removal of at least one half well volume (low yield well)

Bottles Collected				Filtration	Preserved	Notes and Observations
Time	Volume	Composition (G / P)	No.	(10µm / 45µm)	(type)	(quality control sample, other)
0835	250mL	P	2	☐ filtered ☒ unfiltered	NONE, HNO_3	CCR
0835	250mL	P	2	☐ filtered ☒ unfiltered	NONE, HNO_3	MNA

Notes: record time at which purging is started. For low flow sampling, recommended stabilization criteria: temp ± 0.5°C; pH ± 0.1 units; conductivity ± 3%; DO ± 1 mg/L; ORP ± 10 mV; for at least three successive measurements that are made every 3-5 minutes with <1 foot of stable draw down.

Unless otherwise noted, groundwater sample collection was completed in accordance with the applicable requirements of Golder's Quality Assurance Program and Standard Operating Procedure ☐ 9 Conventional Groundwater Sample Collection ☒ 10 Low Flow Groundwater Sample Collection.

Field Team Leader JOHN BRAYTON (name) (signature)

Groundwater Sample Collection

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GOLDER

Project/Phase	19116549/19122262	Equipment Decon	☒ Dedicated equipment	Depth to Water	20.09	ft. BMP
Site Location	OGSES		☐ Decon between locations	Casing Stickup	–	ft.
Date	5-11-20	Reference Point	☒ Top of casing	☐ Depth to Water	20.09	ft. BGL
MW ID	FGD-5	Location	Other	Total MW Depth		ft. BGL
Sample ID	FGD-5	Water Quality		MW Diameter	2.0	inches
Pump	☐ Waterra ☐ Submersible	Meter Model	YSI - HORIBA	MW Volume	1.	gallons
	☒ Peristaltic ☐ Bladder	Unit Number	U-50	Pump Intake Depth		ft. BGL

Standard volume capacity of monitoring wells: Schedule 40 PVC (1-inch OD, 0.04 gallons/foot; 2-inch OD, 0.16 gallons/foot; 4-inch OD, 0.65 gallons/foot)

Time	Purge Rate	Cumulative Purge Volume	Depth to Water	Temp (°C)	pH	Conductivity (µS/m or mS/cm)	Dissolved Oxygen (mg/L)	Redox Potential (mV)	Turbidity (NTU)
0852	(L/min)	(L)	(ft)	☐ NM	☐ NM	☐ not measured	☐ not measured	☐ not measured	☐ NM
0903	.2	1	20.26	21.4	6.84	1640	1.43	-7	6.7
0907	↓	1	20.29	21.5	6.81	1670	1.27	-14	7.9
0913	↓	1	20.29	21.5	6.82	1670	1.26	-15	7.1

Purging was completed based on: ☒ stabilization of water quality parameters ☐ removal of three well volumes ☐ removal of at least one half well volume (low yield well)

Bottles Collected				Filtration	Preserved	Notes and Observations
Time	Volume	Composition (G / P)	No.	(10µm / 45µm)	(type)	(quality control sample, other)
0925	250mL	P	2	☐ filtered ☒ unfiltered	NONE, HNO_3	CCR
0925	250mL	P	2	☐ filtered ☒ unfiltered	NONE, HNO_3	MNA

Notes: record time at which purging is started. For low flow sampling, recommended stabilization criteria: temp ± 0.5°C; pH ± 0.1 units; conductivity ± 3%; DO ± 1 mg/L; ORP ± 10 mV; for at least three successive measurements that are made every 3-5 minutes with <1 foot of stable draw down.

Unless otherwise noted, groundwater sample collection was completed in accordance with the applicable requirements of Golder's Quality Assurance Program and Standard Operating Procedure ☐ 9 Conventional Groundwater Sample Collection ☒ 10 Low Flow Groundwater Sample Collection.

Field Team Leader JOHN BRAYTON (name) (signature)

Groundwater Sample Collection

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GOLDER

Project/Phase	19116549/19122262	Equipment Decon	☒ Dedicated equipment	Depth to Water	19.78 ft. BMP
Site Location	OGSES		☐ Decon between locations	Casing Stickup	– ft.
Date	5-11-20	Reference Point	☒ Top of casing	☐ Depth to Water	19.78 ft. BGL
MW ID	FGD-4	Location	Other	Total MW Depth	ft. BGL
Sample ID	FGD-4	Water Quality		MW Diameter	2.0 inches
Pump	☐ Waterra ☐ Submersible	Meter Model	YSI - HORIBA	MW Volume	1 gallons
	☒ Peristaltic ☐ Bladder	Unit Number	U-50	Pump Intake Depth	ft. BGL

Standard volume capacity of monitoring wells: Schedule 40 PVC (1-inch OD, 0.04 gallons/foot; 2-inch OD, 0.16 gallons/foot; 4-inch OD, 0.65 gallons/foot)

Time	Purge Rate	Cumulative Purge Volume	Depth to Water	Temp (°C)	pH	Conductivity (µS/m or mS/cm)	Dissolved Oxygen (mg/L)	Redox Potential (mV)	Turbidity (NTU)
0709	(L/min)	(L)	(ft)	☐ NM	☐ NM	☐ not measured	☐ not measured	☐ not measured	☐ NM
0719	.2	1	20.06	22.4	6.67	1260	1.72	-42	9.2
0724	↓	1	20.11	22.6	6.63	1290	1.77	-46	7.6
0729	↓	1	20.12	22.7	6.62	1290	1.78	-46	7.8

Purging was completed based on: ☒ stabilization of water quality parameters ☐ removal of three well volumes ☐ removal of at least one half well volume (low yield well)

Bottles Collected				Filtration	Preserved	Notes and Observations
Time	Volume	Composition (G / P)	No.	(10µm / 45µm)	(type)	(quality control sample, other)
0745	250mL	P	2	☐ filtered ☒ unfiltered	NONE, HNO_3	CCR
0745	250mL	P	2	☐ filtered ☒ unfiltered	NONE, HNO_3	MNA

Notes: record time at which purging is started. For low flow sampling, recommended stabilization criteria: temp ± 0.5°C; pH ± 0.1 units; conductivity ± 3%; DO ± 1 mg/L; ORP ± 10 mV; for at least three successive measurements that are made every 3-5 minutes with <1 foot of stable draw down.

Unless otherwise noted, groundwater sample collection was completed in accordance with the applicable requirements of Golder's Quality Assurance Program and Standard Operating Procedure ☐ 9 Conventional Groundwater Sample Collection ☒ 10 Low Flow Groundwater Sample Collection.

Field Team Leader JOHN BRAYTON (name) (signature)

SURFACE WATER SAMPLING RECORD

SAMPLE ID: FGD-A-POND

Project No: 19122262 Project Name: LUMINANT-OGSES Page 1 of: 1

Sampled by JTB Date: 5-11-20

Weather (@ sampling): cloudy 75° Weather (past 48 hrs.) NO RAIN

Sampling Location (i.d., description): POND

Water Body (describe type, flow): —

QUALITY ASSURANCE

METHODS (describe):
Cleaning Equipment: new equipment
Sampling: —

INSTRUMENTS (indicate make, model, i.d.):
Flow Measurement: —
pH Meter: HORIBA
Conductivity Meter: HORIBA
Filtration: —
Thermometer: HORIBA
Field Calibration: 7-4
Field Calibration: 1413
Other: —

SAMPLING MEASUREMENTS

Time	Sampling Depth (ft)	Water Quality Data: Temp. (°C)	pH	Specific Conductance (µmhos/cm) @ Field	Specific Conductance (µmhos/cm) @ 25° C.	DO (mg/L)	Appearance: Color	Appearance: Turbidity & Sediment	Remarks (debris, sheen, etc.)
1405	surface	23.1	6.59	1610		3.67	tan	sl. cloudy	

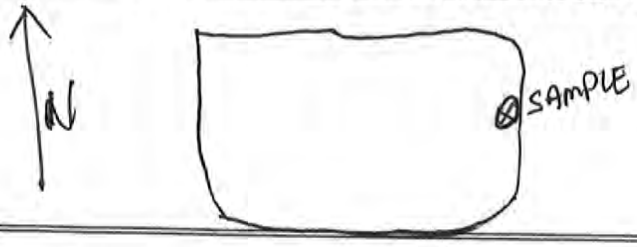
STAFF GAUGE AND DISCHARGE MEASUREMENTS

Staff Gauge Reading (ft)	Stream Width (ft)	Center Depth (ft)	Velocity (ft/sec):	Remarks

SAMPLE INVENTORY

Bottles Collected: Time	Volume	Composition (glass, plastic)	Quantity	Filtration (Y/N)	Preservation (type)	Remarks (quality control sample, etc.)
1405	1L	P	4	N	- HNO_3	CCR
1405	250mL	P	3	N	HNO_3	MNA

SAMPLING LOCATION MAP AND OTHER INFORMATION



GOLDER
2201 Double Creek Dr., Suite 4004
Round Rock, Texas 78664
(512) 671-3434

SURFACE WATER SAMPLING RECORD

SAMPLE ID: FGD-B-POND

Project No: 19122262 Project Name: LUMINANT-OGSES Page 1 of: 1

Sampled by JTB Date: 5-11-20

Weather (@ sampling): cloudy 75° Weather (past 48 hrs.) NO RAIN

Sampling Location (i.d., description): POND

Water Body (describe type, flow): —

QUALITY ASSURANCE

METHODS (describe):
Cleaning Equipment: new equipment
Sampling: —

INSTRUMENTS (indicate make, model, i.d.):
Flow Measurement: —
pH Meter: HORIBA
Conductivity Meter: HORIBA
Filtration: —
Thermometer: HORIBA
Field Calibration: 7-4
Field Calibration: 1413
Other: —

SAMPLING MEASUREMENTS

Time	Sampling Depth (ft)	Water Quality Data: Temp. (°C)	pH	Specific Conductance (µmhos/cm) @ Field	Specific Conductance (µmhos/cm) @ 25° C.	DO (mg/L)	Appearance: Color	Appearance: Turbidity & Sediment	Remarks (debris, sheen, etc.)
1425	surface	23.1	6.64		1790	4.06	Hi tan	sld. cloudy	

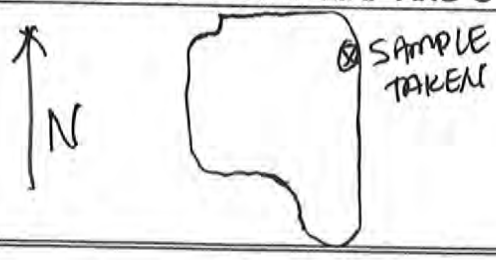
STAFF GAUGE AND DISCHARGE MEASUREMENTS

Staff Gauge Reading (ft)	Stream Width (ft)	Center Depth (ft)	Velocity (ft/sec):	Remarks

SAMPLE INVENTORY

Bottles Collected: Time	Volume	Composition (glass, plastic)	Quantity	Filtration (Y/N)	Preservation (type)	Remarks (quality control sample, etc.)	
1425	1L	P	4	N	- HNO_3	CCR	
1425	250mL	P	3	N	HNO_3	MNA	

SAMPLING LOCATION MAP AND OTHER INFORMATION



GOLDER
2201 Double Creek Dr., Suite 4004
Round Rock, Texas 78664
(512) 671-3434

RECORD OF WATER LEVEL READINGS

GOLDER

Project Name: LUMINANT - OGSES Location: OGSES - FGD PONDS - CCR Project No.: 19122262 - F2020

Borehole No.	Date	Time	Measuring Device / Serial No.	Measurement Point (M.P)	Water Level Below M.P.	Correction To Survey Mark	Survey Mark Elevation	Water Level Elevation	By	Comments
FGD-5	9-9-20		SOLINST	TOC/PVC	20.48				JB	
FGD-2	"		"	"	27.49				"	
FGD-11	"		"	"	39.97				"	
FGD-12	"		"	"	30.31				"	
FGD-6	"		"	"	16.91				"	
FGD-4	"		"	"	20.04				"	
FGD-3	"		"	"	22.83				"	
FGD-8	"		"	"	29.06				"	
FGD-1	"		"	"	12.12				"	

Sheet 1 of 1

Groundwater Sample Collection

Page 1 of 1

GOLDER

Project/Phase	19122262-F2020	Equipment Decon	☒ Dedicated equipment	Depth to Water	12.12 ft. BMP
Site Location	LIMINANT-OGSES		☐ Decon between locations	Casing Stickup	— ft.
Date	9-9-20	Reference Point	☒ Top of casing	☐ Depth to Water	12.12 ft. BGL
MW ID	FGD-1	Location	Other	Total MW Depth	ft. BGL
Sample ID	FGD-1	Water Quality		MW Diameter	2.0 inches
Pump	☐ Waterra ☐ Submersible	Meter Model	HORIBA	MW Volume	gallons
	☒ Peristaltic ☐ Bladder	Unit Number	U-SODO	Pump Intake Depth	ft. BGL

Standard volume capacity of monitoring wells: Schedule 40 PVC (1-inch OD, 0.04 gallons/foot; 2-inch OD, 0.16 gallons/foot; 4-inch OD, 0.65 gallons/foot)

Time	Purge Rate (L/min)	Cumulative Purge Volume (L)	Depth to Water (ft)	Temp (°C) ☐ NM	pH ☐ NM	Conductivity (µS/m or mS/cm) ☐ not measured	Dissolved Oxygen (mg/L) ☐ not measured	Redox Potential (mV) ☐ not measured	Turbidity (NTU) ☐ NM
1156									
1206	.2	1	12.49	23.1	6.77	1560	0.93	-21	4.7
1212	↓	1	12.46	22.9	6.74	1570	0.71	-24	8.6
1219	↓	1	12.45	22.9	6.73	1570	0.72	-24	9.1

Purging was completed based on: ☒ stabilization of water quality parameters ☐ removal of three well volumes ☐ removal of at least one half well volume (low yield well)

Bottles Collected				Filtration (10µm / 45µm)	Preserved (type)	Notes and Observations (quality control sample, other)
Time	Volume	Composition (G / P)	No.			
1235	250 mL	P	2	☐ filtered ☒ unfiltered	HNO_3, NEAT	
1235	1L	P	2	☐ filtered ☒ unfiltered	HNO_3, HNO_3	

Notes: record time at which purging is started. For low flow sampling, recommended stabilization criteria: temp ± 0.5°C; pH ± 0.1 units; conductivity ± 3%; DO ± 1 mg/L; ORP ± 10 mV; for at least three successive measurements that are made every 3-5 minutes with <1 foot of stable draw down.

Unless otherwise noted, groundwater sample collection was completed in accordance with the applicable requirements of Golder's Quality Assurance Program and Standard Operating Procedure ☐ 9 Conventional Groundwater Sample Collection ☒ 10 Low Flow Groundwater Sample Collection.

DUP-01
1235 - Sample time

Field Team Leader JOHN BEAKTON
name

signature

Groundwater Sample Collection

Page 1 of 1

GOLDER

Project/Phase	1912226.2 - F2020	Equipment Decon	☒ Dedicated equipment	Depth to Water	29.06	ft. BMP
Site Location	LUMINANT - OGSES		☐ Decon between locations	Casing Stickup	—	ft.
Date	9-9-20	Reference Point	☒ Top of casing	☐ Depth to Water	29.06	ft. BGL
MW ID	FGD-8	Location	Other	Total MW Depth		ft. BGL
Sample ID	FGD-8	Water Quality		MW Diameter	2.0	inches
Pump	☐ Waterra ☐ Submersible	Meter Model	HORIBA	MW Volume		gallons
	☒ Peristaltic ☐ Bladder	Unit Number	U-5000	Pump Intake Depth		ft. BGL

Standard volume capacity of monitoring wells: Schedule 40 PVC (1-inch OD, 0.04 gallons/foot; 2-inch OD, 0.16 gallons/foot; 4-inch OD, 0.65 gallons/foot)

Time	Purge Rate	Cumulative Purge Volume	Depth to Water	Temp (°C)	pH	Conductivity (µS/m or mS/cm)	Dissolved Oxygen (mg/L)	Redox Potential (mV)	Turbidity (NTU)
1013	(L/min)	(L)	(ft)	☐ NM	☐ NM	☐ not measured	☐ not measured	☐ not measured	☐ NM
1024	.2	1	29.31	23.6	6.82	1630	1.46	-15	7.6
1029	↓	↓	29.36	23.4	6.86	1650	1.21	-17	7.7
1035	↓	↓	29.39	23.3	6.87	1650	1.20	-17	7.1

Purging was completed based on: ☒ stabilization of water quality parameters ☐ removal of three well volumes ☐ removal of at least one half well volume (low yield well)

Bottles Collected				Filtration	Preserved	Notes and Observations
Time	Volume	Composition (G / P)	No.	(10µm / 45µm)	(type)	(quality control sample, other)
1045	250 mL	P	2	☐ filtered ☒ unfiltered	HNO_3, NEAT	
1045	1L	P	2	☐ filtered ☒ unfiltered	HNO_3, HNO_3	

Notes: record time at which purging is started. For low flow sampling, recommended stabilization criteria: temp ± 0.5°C; pH ± 0.1 units; conductivity ± 3%; DO ± 1 mg/L; ORP ± 10 mV; for at least three successive measurements that are made every 3-5 minutes with <1 foot of stable draw down.

Unless otherwise noted, groundwater sample collection was completed in accordance with the applicable requirements of Golder's Quality Assurance Program and Standard Operating Procedure ☐ 9 Conventional Groundwater Sample Collection ☒ 10 Low Flow Groundwater Sample Collection.

Field Team Leader JOHN BRAXTON
name

signature

Groundwater Sample Collection

Page 1 of 1

GOLDER

Project/Phase	19122262 - F2020	**Equipment Decon**	☒ Dedicated equipment	**Depth to Water**	22.83	ft. BMP	
Site Location	LVMINANT - OGSES		☐ Decon between locations	**Casing Stickup**	—	ft.	
Date	9-9-20	**Reference Point**	☒ Top of casing	☐ **Depth to Water**	22.83	ft. BGL	
MW ID	FGD-3	**Location**	Other	**Total MW Depth**		ft. BGL	
Sample ID	FGD-3	**Water Quality**		**MW Diameter**	2.0	inches	
Pump	☐ Waterra ☐ Submersible	**Meter Model**	HORIBA	**MW Volume**		gallons	
	☒ Peristaltic ☐ Bladder	**Unit Number**	U-5000	**Pump Intake Depth**		ft. BGL	

Standard volume capacity of monitoring wells: Schedule 40 PVC (1-inch OD, 0.04 gallons/foot; 2-inch OD, 0.16 gallons/foot; 4-inch OD, 0.65 gallons/foot)

Time	Purge Rate	Cumulative Purge Volume	Depth to Water	Temp (°C)	pH	Conductivity (µS/m or mS/cm)	Dissolved Oxygen (mg/L)	Redox Potential (mV)	Turbidity (NTU)
0917	(L/min)	(L)	(ft)	☐ NM	☐ NM	☐ not measured	☐ not measured	☐ not measured	☐ NM
0927	.2	1	23.16	22.9	6.86	1480	0.79	-21	8.6
0932	1	1	23.14	22.4	6.81	1460	0.36	-26	9.6
0937	1	1	23.14	22.5	6.82	1460	0.39	-27	9.1

Purging was completed based on: ☒ stabilization of water quality parameters ☐ removal of three well volumes ☐ removal of at least one half well volume (low yield well)

Bottles Collected				Filtration	Preserved	Notes and Observations
Time	Volume	Composition (G / P)	No.	(10µm / 45 µm)	(type)	(quality control sample, other)
0945	250 mL	P	2	☐ filtered ☒ unfiltered	HNO_3, NEAT	
0945	1L	P	2	☐ filtered ☒ unfiltered	HNO_3, HNO_3	

Notes: record time at which purging is started. For low flow sampling, recommended stabilization criteria: temp ± 0.5°C; pH ± 0.1 units; conductivity ± 3%; DO ± 1 mg/L; ORP ± 10 mV; for at least three successive measurements that are made every 3-5 minutes with <1 foot of stable draw down.

Unless otherwise noted, groundwater sample collection was completed in accordance with the applicable requirements of Golder's Quality Assurance Program and Standard Operating Procedure ☐ 9 Conventional Groundwater Sample Collection ☒ 10 Low Flow Groundwater Sample Collection.

Field Team Leader JOHN BRAXTON (name) (signature)

Groundwater Sample Collection

Page 1 of 1

GOLDER

Project/Phase	19122262-F2020	Equipment Decon	☒ Dedicated equipment ☐ Decon between locations	Depth to Water	20.04 ft. BMP
Site Location	VMINANT-OGSES			Casing Stickup	— ft.
Date	9-15-20	Reference Point Location	☒ Top of casing Other	☐ Depth to Water	20.04 ft. BGL
MW ID	FGD-4			Total MW Depth	ft. BGL
Sample ID	FGD-4	Water Quality Meter Model	HORIBA	MW Diameter	2.0 inches
Pump	☐ Waterra ☐ Submersible ☒ Peristaltic ☐ Bladder	Unit Number	U-5000	MW Volume	gallons
				Pump Intake Depth	ft. BGL

Standard volume capacity of monitoring wells: Schedule 40 PVC (1-inch OD, 0.04 gallons/foot; 2-inch OD, 0.16 gallons/foot; 4-inch OD, 0.65 gallons/foot)

Time	Purge Rate (L/min)	Cumulative Purge Volume (L)	Depth to Water (ft)	Temp (°C) ☐ NM	pH ☐ NM	Conductivity (µS/m or mS/cm) ☐ not measured	Dissolved Oxygen (mg/L) ☐ not measured	Redox Potential (mV) ☐ not measured	Turbidity (NTU) ☐ NM
0822									
0831	.2		20.31	6.79	20.9	1710	1.69	-71	4.7
0837	↓		20.36	6.86	22.6	1760	1.33	-76	6.2
0843	↓		20.38	6.87	22.7	1750	1.34	-77	6.7

Purging was completed based on: ☒ stabilization of water quality parameters ☐ removal of three well volumes ☐ removal of at least one half well volume (low yield well)

Bottles Collected				Filtration (10µm / 45µm)	Preserved (type)	Notes and Observations (quality control sample, other)
Time	Volume	Composition (G / P)	No.			
0855	250 mL	P	2	☐ filtered ☒ unfiltered	HNO_3, NEAT	
0855	1L	P	2	☐ filtered ☒ unfiltered	HNO_3, HNO_3	

Notes: record time at which purging is started. For low flow sampling, recommended stabilization criteria: temp ± 0.5°C; pH ± 0.1 units; conductivity ± 3%; DO ± 1 mg/L; ORP ± 10 mV; for at least three successive measurements that are made every 3-5 minutes with <1 foot of stable draw down.

Unless otherwise noted, groundwater sample collection was completed in accordance with the applicable requirements of Golder's Quality Assurance Program and Standard Operating Procedure ☐ 9 Conventional Groundwater Sample Collection ☒ 10 Low Flow Groundwater Sample Collection.

Field Team Leader JOHN BRAXTON
name

signature

Groundwater Sample Collection

Page 1 of 1

GOLDER

Project/Phase	19122262-F2020	Equipment Decon	☒ Dedicated equipment	Depth to Water	16.91	ft. BMP
Site Location	LUMINANT-OGSES		☐ Decon between locations	Casing Stickup	—	ft.
Date	9-15-20	Reference Point	☒ Top of casing	☐ Depth to Water	16.91	ft. BGL
MW ID	FGD-6	Location	Other	Total MW Depth		ft. BGL
Sample ID	FGD-6	Water Quality		MW Diameter	2.0	inches
Pump	☐ Waterra ☐ Submersible	Meter Model	HORIBA	MW Volume		gallons
	☒ Peristaltic ☐ Bladder	Unit Number	U-5000	Pump Intake Depth		ft. BGL

Standard volume capacity of monitoring wells: Schedule 40 PVC (1-inch OD, 0.04 gallons/foot; 2-inch OD, 0.16 gallons/foot; 4-inch OD, 0.65 gallons/foot)

Time	Purge Rate	Cumulative Purge Volume	Depth to Water	Temp (°C)	pH	Conductivity (µS/m or mS/cm)	Dissolved Oxygen (mg/L)	Redox Potential (mV)	Turbidity (NTU)
0736	(L/min)	(L)	(ft)	☐ NM	☐ NM	☐ not measured	☐ not measured	☐ not measured	☐ NM
0746	.2	1	17.26	23.2	6.72	1730	0.79	-29	11
0751	↓	1	17.25	23.4	6.76	1740	0.56	-34	7.2
0756	↓	1	17.26	23.4	6.77	1740	0.57	-34	7.9

Purging was completed based on: ☒ stabilization of water quality parameters ☐ removal of three well volumes ☐ removal of at least one half well volume (low yield well)

Bottles Collected				Filtration	Preserved	Notes and Observations
Time	Volume	Composition (G / P)	No.	(10µm / 45µm)	(type)	(quality control sample, other)
0805	250mL	P	2	☐ filtered ☒ unfiltered	HNO_3, NEAT	
0805	1L	P	2	☐ filtered ☒ unfiltered	HNO_3, HNO_3	

Notes: record time at which purging is started. For low flow sampling, recommended stabilization criteria: temp ± 0.5°C; pH ± 0.1 units; conductivity ± 3%; DO ± 1 mg/L; ORP ± 10 mV; for at least three successive measurements that are made every 3-5 minutes with <1 foot of stable draw down.

Unless otherwise noted, groundwater sample collection was completed in accordance with the applicable requirements of Golder's Quality Assurance Program and Standard Operating Procedure ☐ 9 Conventional Groundwater Sample Collection ☒ 10 Low Flow Groundwater Sample Collection.

Field Team Leader JOHN BRAXTON (name) (signature)

Groundwater Sample Collection

Page 1 of 1

GOLDER

Project/Phase	19122262-F2020	Equipment Decon	☒ Dedicated equipment	Depth to Water	30.31	ft. BMP
Site Location	LUMINANT-OGSES		☐ Decon between locations	Casing Stickup	—	ft.
Date	9-9-20	Reference Point	☒ Top of casing	☐ Depth to Water	30.31	ft. BGL
MW ID	FGD-12	Location	Other	Total MW Depth		ft. BGL
Sample ID	FGD-12	Water Quality		MW Diameter	2.0	inches
Pump	☐ Waterra ☐ Submersible	Meter Model	HORIBA	MW Volume		gallons
	☒ Peristaltic ☐ Bladder	Unit Number	U-5000	Pump Intake Depth		ft. BGL

Standard volume capacity of monitoring wells: Schedule 40 PVC (1-inch OD, 0.04 gallons/foot; 2-inch OD, 0.16 gallons/foot; 4-inch OD, 0.65 gallons/foot)

Time	Purge Rate	Cumulative Purge Volume	Depth to Water	Temp (°C)	pH	Conductivity (µS/m or mS/cm)	Dissolved Oxygen (mg/L)	Redox Potential (mV)	Turbidity (NTU)
1008	(L/min)	(L)	(ft)	☐ NM	☐ NM	☐ not measured	☐ not measured	☐ not measured	☐ NM
1017	.2	1	30.62	22.6	6.79	1620	0.86	-26	6.7
1022	↓	1	30.61	22.7	6.81	1630	0.61	-24	7.2
1029	↓	1	30.61	22.7	6.82	1630	0.61	-24	7.1

Purging was completed based on: ☒ stabilization of water quality parameters ☐ removal of three well volumes ☐ removal of at least one half well volume (low yield well)

Bottles Collected				Filtration	Preserved	Notes and Observations
Time	Volume	Composition (G / P)	No.	(10µm / 45µm)	(type)	(quality control sample, other)
1040	250 mL	P	2	☐ filtered ☒ unfiltered	HNO_3, NEAT	
1040	1L	P	2	☐ filtered ☒ unfiltered	HNO_3, HNO_3	

Notes: record time at which purging is started. For low flow sampling, recommended stabilization criteria: temp ± 0.5°C; pH ± 0.1 units; conductivity ± 3%; DO ± 1 mg/L; ORP ± 10 mV; for at least three successive measurements that are made every 3-5 minutes with <1 foot of stable draw down.

Unless otherwise noted, groundwater sample collection was completed in accordance with the applicable requirements of Golder's Quality Assurance Program and Standard Operating Procedure ☐ 9 Conventional Groundwater Sample Collection ☒ 10 Low Flow Groundwater Sample Collection.

Field Team Leader JOHN BRAXTON (name) (signature)

Groundwater Sample Collection

Page 1 of 1

GOLDER

Project/Phase	19122262 - F2020	Equipment Decon	☒ Dedicated equipment	Depth to Water	39.97	ft. BMP
Site Location	LUMINANT - OGSES		☐ Decon between locations	Casing Stickup	—	ft.
Date	9-9-20	Reference Point	☒ Top of casing	☐ Depth to Water	39.97	ft. BGL
MW ID	FGD-11	Location	Other	Total MW Depth		ft. BGL
Sample ID	FGD-11	Water Quality		MW Diameter	2.0	inches
Pump	☐ Waterra ☐ Submersible	Meter Model	HORIBA	MW Volume		gallons
	☒ Peristaltic ☐ Bladder	Unit Number	U-5000	Pump Intake Depth		ft. BGL

Standard volume capacity of monitoring wells: Schedule 40 PVC (1-inch OD, 0.04 gallons/foot; 2-inch OD, 0.16 gallons/foot; 4-inch OD, 0.65 gallons/foot)

Time	Purge Rate	Cumulative Purge Volume	Depth to Water	Temp (°C)	pH	Conductivity (µS/m or mS/cm)	Dissolved Oxygen (mg/L)	Redox Potential (mV)	Turbidity (NTU)
0913	(L/min)	(L)	(ft)	☐ NM	☐ NM	☐ not measured	☐ not measured	☐ not measured	☐ NM
0922	.2	1	40.26	22.9	6.77	1540	1.31	-19	8.3
0928	1	1	40.28	23.0	6.78	1560	1.12	-21	7.6
0933	↓	1	40.28	23.0	6.79	1570	1.13	-21	7.7

Purging was completed based on: ☒ stabilization of water quality parameters ☐ removal of three well volumes ☐ removal of at least one half well volume (low yield well)

Bottles Collected				Filtration	Preserved	Notes and Observations
Time	Volume	Composition (G / P)	No.	(10µm / 45µm)	(type)	(quality control sample, other)
0940	250 mL	P	2	☐ filtered ☒ unfiltered	HNO_3, NEAT	
0940	1L	P	2	☐ filtered ☒ unfiltered	HNO_3, HNO_3	

Notes: record time at which purging is started. For low flow sampling, recommended stabilization criteria: temp ± 0.5°C; pH ± 0.1 units; conductivity ± 3%; DO ± 1 mg/L; ORP ± 10 mV; for at least three successive measurements that are made every 3-5 minutes with <1 foot of stable draw down.

Unless otherwise noted, groundwater sample collection was completed in accordance with the applicable requirements of Golder's Quality Assurance Program and Standard Operating Procedure ☐ 9 Conventional Groundwater Sample Collection ☒ 10 Low Flow Groundwater Sample Collection.

Field Team Leader JOHN BRAXTON (name) (signature)

Groundwater Sample Collection

Page 1 of 1

GOLDER

Project/Phase	19122262 - F2020	**Equipment Decon**	☒ Dedicated equipment	**Depth to Water**	27.49	ft. BMP	
Site Location	LUMINANT - OGSES		☐ Decon between locations	**Casing Stickup**	—	ft.	
Date	9-9-20	**Reference Point**	☒ Top of casing	☐ **Depth to Water**	27.49	ft. BGL	
MW ID	FGD-2	**Location**	Other ____	**Total MW Depth**		ft. BGL	
Sample ID	FGD-2	**Water Quality**		**MW Diameter**	2.0	inches	
Pump	☐ Waterra ☐ Submersible	**Meter Model**	HORIBA	**MW Volume**	/	gallons	
	☒ Peristaltic ☐ Bladder	**Unit Number**	U-5000	**Pump Intake Depth**	/	ft. BGL	

Standard volume capacity of monitoring wells: Schedule 40 PVC (1-inch OD, 0.04 gallons/foot; 2-inch OD, 0.16 gallons/foot; 4-inch OD, 0.65 gallons/foot)

Time	Purge Rate	Cumulative Purge Volume	Depth to Water	Temp (°C)	pH	Conductivity (µS/m or mS/cm)	Dissolved Oxygen (mg/L)	Redox Potential (mV)	Turbidity (NTU)
0818	(L/min)	(L)	(ft)	☐ NM	☐ NM	☐ not measured	☐ not measured	☐ not measured	☐ NM
0828	.2	1	27.81	23.1	6.59	1290	1.29	-31	7.4
0833	↓	↓	27.81	22.7	6.57	1310	1.06	-29	6.2
0838	↓	↓	27.82	22.6	6.57	1310	1.08	-29	6.1

Purging was completed based on: ☒ stabilization of water quality parameters ☐ removal of three well volumes ☐ removal of at least one half well volume (low yield well)

Bottles Collected				Filtration	Preserved	Notes and Observations
Time	Volume	Composition (G / P)	No.	(10µm / 45µm)	(type)	(quality control sample, other)
0845	250mL	P	2	☐ filtered ☒ unfiltered	HNO_3, NEAT	
0845	1L	P	2	☐ filtered ☒ unfiltered	HNO_3, HNO_3	

Notes: record time at which purging is started. For low flow sampling, recommended stabilization criteria: temp ± 0.5°C; pH ± 0.1 units; conductivity ± 3%; DO ± 1 mg/L; ORP ± 10 mV; for at least three successive measurements that are made every 3-5 minutes with <1 foot of stable draw down.

Unless otherwise noted, groundwater sample collection was completed in accordance with the applicable requirements of Golder's Quality Assurance Program and Standard Operating Procedure ☐ 9 Conventional Groundwater Sample Collection ☒ 10 Low Flow Groundwater Sample Collection.

Field Team Leader JOHN BRAXTON (name) _____ (signature)

Groundwater Sample Collection

Page 1 of 1

GOLDER

Project/Phase	1912262-F2020	**Equipment Decon**	☒ Dedicated equipment	**Depth to Water**	20.48 ft. BMP
Site Location	LUMINANT-OGSES		☐ Decon between locations	**Casing Stickup**	— ft.
Date	9/10-20	**Reference Point**	☒ Top of casing	☐ **Depth to Water**	20.48 ft. BGL
MW ID	FGD-5	**Location**	Other	**Total MW Depth**	ft. BGL
Sample ID	FGD-5	**Water Quality**		**MW Diameter**	2.0 inches
Pump	☐ Waterra ☐ Submersible	**Meter Model**	HORIBA	**MW Volume**	gallons
	☒ Peristaltic ☐ Bladder	**Unit Number**	U-5000	**Pump Intake Depth**	ft. BGL

Standard volume capacity of monitoring wells: Schedule 40 PVC (1-inch OD, 0.04 gallons/foot; 2-inch OD, 0.16 gallons/foot; 4-inch OD, 0.65 gallons/foot)

Time	Purge Rate	Cumulative Purge Volume	Depth to Water	Temp (°C)	pH	Conductivity (µS/m or mS/cm)	Dissolved Oxygen (mg/L)	Redox Potential (mV)	Turbidity (NTU)
0726	(L/min)	(L)	(ft)	☐ NM	☐ NM	☐ not measured	☐ not measured	☐ not measured	☐ NM
0737	.2	1	20.74	22.4	6.81	1670	0.94	-29	13
0741	↓	1	20.76	22.5	6.84	1630	0.76	-26	9.7
0746	↓	1	20.76	22.5	6.84	1640	0.77	-26	9.6

Purging was completed based on: ☒ stabilization of water quality parameters ☐ removal of three well volumes ☐ removal of at least one half well volume (low yield well)

Bottles Collected				Filtration	Preserved	Notes and Observations
Time	Volume	Composition (G / P)	No.	(10µm / 45µm)	(type)	(quality control sample, other)
0750	250mL	P	2	☐ filtered ☒ unfiltered	HNO_3, NEAT	
0750	1L	P	2	☐ filtered ☒ unfiltered	HNO_3, HNO_3	

Notes: record time at which purging is started. For low flow sampling, recommended stabilization criteria: temp ± 0.5°C; pH ± 0.1 units; conductivity ± 3%; DO ± 1 mg/L; ORP ± 10 mV; for at least three successive measurements that are made every 3-5 minutes with <1 foot of stable draw down.

Unless otherwise noted, groundwater sample collection was completed in accordance with the applicable requirements of Golder's Quality Assurance Program and Standard Operating Procedure ☐ 9 Conventional Groundwater Sample Collection ☒ 10 Low Flow Groundwater Sample Collection.

Field Team Leader JOHN BRAXTON (name) (signature)



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