



Illinois Power Generating Company
1500 Eastport Plaza Drive
Collinsville, IL 62234

December 15, 2023
Illinois Environmental Protection Agency
DWPC – Permits MC#15
Attn: 35 I.A.C. § 845.650(e) Alternative Source Demonstration Submittal
1021 North Grand Avenue East
P.O. Box 19276
Springfield, IL 62794-9276

Re: Coffen Power Plant Ash Pond No 2; IEPA ID # W1350150004-02

Dear Mr. LeCrone:

In accordance with Title 35 of the Illinois Administrative Code (35 I.A.C.) Section (§) 845.650(e), Illinois Power Generating Company (IPGC) is submitting this Alternative Source Demonstration (ASD) for the cobalt exceedance observed at well G401 from the Quarter 2 2023 sampling event at the Coffeen Power Plant Ash Pond No. 2, identified by Illinois Environmental Protection Agency (IEPA) ID No. W1350150004-02.

This ASD is being submitted within 60 days from the date of determination of an exceedance of a groundwater protection standard (GWPS) for constituents listed in 35 I.A.C. § 845.600. As required by 35 I.A.C. § 845.650 (e)(1), the ASD was placed on the facility's website within 24 hours of submittal to the agency.

One hard copy is provided with this submittal.

Sincerely,

A handwritten signature in blue ink that reads "Dianna Tickner".

Dianna Tickner
Sr. Director – Decommission and Demolition

Enclosures

Alternate Source Demonstration, Quarter 2 2023, Ash Pond No.2 Coffeen Power Plant, Coffeen Illinois



engineers | scientists | innovators

Alternative Source Demonstration

Coffeen Power Plant Ash Pond No. 2

(Unit ID #102)

IEPA ID: W1350150004-02

35 I.A.C. 845.650

Prepared for

Illinois Power Generating Company

134 Cips Lane

Coffeen, Illinois 62017

Prepared by

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Project Number: GLP8029

December 2023

Alternative Source Demonstration

Coffeen Power Plant Bottom Ash Pond No. 2

(Unit ID #102)

IEPA ID: W1350150004-02

35 I.A.C. § 845.650

Prepared for

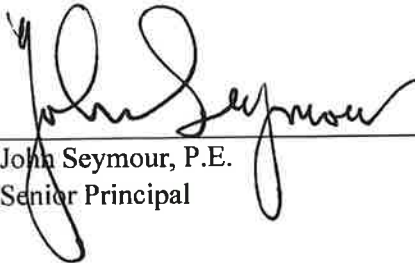
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Senior Principal



Project Number: GLP8029

December 2023

TABLE OF CONTENTS

1. INTRODUCTION	1
2. BACKGROUND	2
2.1 Site Location and Description	2
2.2 Description of the CCR Unit	2
2.3 Geology and Hydrogeology	2
3. G401 ASD LINES OF EVIDENCE	4
3.1 LOE #1: AP2 Porewater Samples Do Not Contain Detectable Concentrations of Cobalt	4
3.2 LOE #2: Cobalt Is Present in Aquifer Solids	5
3.3 LOE #3: Geochemical Conditions Favor Mobilization of Cobalt from Iron-bearing Minerals	6
3.3.1 Mineralogical Analysis	6
3.3.2 Geochemical Conditions	7
3.4 LOE #4: Geochemical Modeling of Cobalt Mobilization from Aquifer Solids Supports the Determination of Naturally Occurring Cobalt	7
4. CONCLUSIONS	9
5. REFERENCES	10

LIST OF TABLES

Table 1:	Cobalt SEP Results Summary
Table 2:	Summary of X-Ray Diffraction Analysis
Table 3:	Summary of Geochemical Model Inputs

LIST OF FIGURES

Figure 1:	Ash Pond No. 2 Geologic Cross-Section
Figure 2:	Cobalt Time Series
Figure 3:	Iron Eh-pH Phase Stability Diagram – G401
Figure 4:	G401 Cobalt-Iron Relationship
Figure 5:	AP2 Groundwater pH Time Series
Figure 6:	Geochemical Model Output – Aqueous Cobalt and Iron Concentrations
Figure 7:	Geochemical Model Output – Sorbed Cobalt and Mineral Mass

LIST OF APPENDICES

- Attachment 1: Proposed 845 Groundwater Monitoring Network
- Attachment 2: G401 Boring Log and Well Construction Diagram
- Attachment 3: Potentiometric Surface Map – May 30, 2023
- Attachment 4: Field Boring Logs
- Attachment 5: 2016 AP2 Porewater Sampling Locations
- Attachment 6: Coffeen AP2 Porewater Laboratory Analytical Data
- Attachment 7: Sequential Extraction Procedure Laboratory Analytical Report
- Attachment 8: X-Ray Diffraction Laboratory Analytical Report
- Attachment 9: Total Metals Laboratory Analytical Report

ACRONYMS AND ABBREVIATIONS

ASD	Alternative source demonstration
AP2	Ash Pond 2
CCR	Coal combustion residuals
CPP	Coffeen Power Plant
DA	Deep aquifer
EPRI	Electric Power Research Institute
GWB	Geochemists Workbench
GWPS	Groundwater protection standard
HCR	Hydrogeologic site characterization report
IAC	Illinois Administrative Code
IEPA	Illinois Environmental Protection Agency
IPGC	Illinois Power Generating Company
LCU	Lower confining unit
LEAF	Leaching Environmental Assessment Framework
LOE	Line of evidence
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
NID	National Inventory of Dams
redox	oxidation/reduction
SEP	Sequential extraction procedure
SI	Surface impoundment
SU	standard units
UA	Uppermost aquifer
UCU	Upper confining unit
USEPA	United States Environmental Protection Agency
XRD	X-ray diffraction

1. INTRODUCTION

Geosyntec Consultants, Inc. has prepared this alternative source demonstration (ASD) on behalf of Illinois Power Generating Company (IPGC) regarding the Ash Pond No. 2 coal combustion residuals (CCR) unit at the Coffeen Power Plant (CPP) near Coffeen, Illinois. The ASD is completed pursuant to Illinois Administrative Code (IAC) Title 35, Part 845 (“Standards for the Disposal of CCR in Surface Impoundments”) and was completed by December 15, 2023, within 60 days of determination of the exceedances (October 16, 2023), as required by 35 I.A.C.§ 845.650(e). This report applies specifically to the CCR Unit referred to as Ash Pond No. 2 (AP2), identification (ID) number (No.) 102, IEPA ID No. W1350150004-02, and National Inventory of Dams (NID) ID No. IL50723 and was prepared in conformance with guidance provided in the Electric Power Research Institute (EPRI) guidance for development of ASDs at CCR sites (EPRI 2017), and the United States Environmental Protection Agency (USEPA)’s Solid Waste Disposal Facility Criteria: Technical Manual (USEPA 1993).

An exceedance of cobalt was identified above the site-specific groundwater protection standard (GWPS) of 0.006 milligrams per liter (mg/L) at downgradient monitoring well G401 following the Second Quarter 2023 sampling event. Under 35 IAC 845.650(e), the owner or operator of a CCR surface impoundment may submit a demonstration that a source other than the CCR surface impoundment caused the contamination and the CCR surface impoundment did not contribute to the contamination, or that the exceedance of the groundwater protection standard resulted from error in sampling, analysis, or statistical evaluation, natural variation in groundwater quality, or a change in the potentiometric surface and groundwater flow direction.

Pursuant to 35 IAC 845.650(e), the lines of evidence (LOEs) documented in this ASD demonstrate that a source other than the CPP AP2 CCR unit was the cause of the GWPS exceedance for cobalt at downgradient monitoring well G401 and that AP2 did not contribute to the exceedance. Natural variability associated with the lithology of the aquifer was identified as the alternative source for the elevated cobalt concentrations at G401.

2. BACKGROUND

2.1 Site Location and Description

The CPP, operated by the IPGC is located in Montgomery County, Illinois approximately two miles south of the City of Coffeen in Section 11, Township 7 North, and Range 7 East. The CPP is located between the two lobes of Coffeen Lake to the west, east, and south, and is bordered by agricultural land to the north. The CPP operated as a coal-fired power plant from 1964 to November 2019 and has five CCR management units. The approximately 1,100-acre Coffeen Lake was built by damming the McDavid Branch of the East Fork of Shoal Creek in 1963 for use as an artificial cooling lake for the CPP. Historically, underground coal mines were operated in the vicinity of the CPP. An aerial view of the site is shown in **Attachment 1**.

2.2 Description of the CCR Unit

Coffeen AP2 is an unlined surface impoundment with a surface area of approximately 60 acres, with berms up to 47 feet above the surrounding land surface. AP2 was removed from service and capped in the mid-1980s using a two-foot compacted clay and soil cap (Ramboll 2019).

AP2 was recapped starting in 2019 using a geomembrane cover system in accordance with a closure plan submitted to the Illinois Environmental Protection Agency (IEPA; AECOM, 2017). The cover system installation was completed on November 17, 2020. The geomembrane cap design addresses the potential for slope failure and water infiltration into the closed CCR unit by directing the drainage of surface water (i.e., precipitation) off the cover system.

2.3 Geology and Hydrogeology

Significant site investigation has been completed to fully characterize the geology, hydrogeology, and groundwater quality as provided in the AP2 Initial Operating Permit Application (Burns & McDonnell 2021) and the Hydrogeologic Site Characterization Report (HCR) for AP2 (NRT 2017). These materials are incorporated herein.

There are multiple layers of unlithified material present beneath AP2 and above bedrock which are categorized into hydrostratigraphic units listed below (from the surface downward) based on stratigraphic relationships and hydrogeologic characteristics:

- **Upper Confining Unit (UCU):** Composed of the Roxana and Peoria Silts (Loess Unit) and the upper clayey portion of the Hagarstown member which are classified as silts-clayey silts and gravelly clay below the surficial soil.
- **Uppermost Aquifer (UA):** Composed of the Hagarstown Member which is classified as primarily sandy-gravelly silts and clays with beds of sedimentary deposits. Beds consist of thin (generally less than three feet in thickness), moderate to high permeability sand, silty sand, and sandy silt/clay units.

- **Lower Confining Unit (LCU):** Comprised of the Vandalia Member, Mulberry Grove Member, and Smithboro Member. The LCU in the vicinity of AP2 consists of thick (generally greater than 15 feet), very low permeability sandy to silty till or clay till.
- **Deep Aquifer (DA):** Comprised of sand and sandy silt/clay units of the Yarmouth Soil, which include accretionary deposits of fine sediment and organic materials, typically less than five feet thick and discontinuous across the CPP.

Bedrock is comprised of the Pennsylvanian-age Bond Formation, which consists of limestone and calcareous clays and shale. A geologic cross-section modified from a version provided in the Hydrogeologic Characterization Report is provided as **Figure 1**. CCR within AP2 is underlain by the UCU in the majority of the footprint.

G401 is screened from 14.36 feet below ground surface (ft. bgs) to 18.8 ft. bgs (608.7 to 604.2 feet in elevation [North American Vertical Datum of 1988, NAVD88]). The boring log for G401, provided in **Attachment 2**, indicates that the lithology of the upper portion of the screened interval is gray/yellowish brown clay with some silt and sand, and the lithology of the lower portion of the screened interval is yellowish brown fine sand and silt.

The groundwater monitoring well network for AP2 consists of 11 monitoring wells: three background monitoring wells (G270, G280, G281) and eight downgradient monitoring locations (G1001, G401, G402, G403, G404, G405, G406, G407) (**Attachment 1**). Monitoring wells within the network are screened in the Uppermost Aquifer from approximately elevations 600 to 610 ft.

The potentiometric groundwater contours and generalized groundwater flow directions at the site are shown in **Attachment 3**. Groundwater flow in the vicinity of AP2 is generally to the south and east. The groundwater to the west of AP2 is separated from the groundwater flow regime under AP2 by a groundwater divide.

3. G401 ASD LINES OF EVIDENCE

3.1 LOE #1: AP2 Porewater Samples Do Not Contain Detectable Concentrations of Cobalt

Porewater (i.e., water within the CCR) samples were collected from four locations (Ap2e, AP2f, AP2g, Ap2h) throughout AP2 in 2016 and analyzed for total cobalt. The locations of these porewater samples are shown on **Attachment 5**. Of these samples, none contained cobalt at concentrations above the method detection limit of 0.002 mg/L (**Figure 2**). One additional porewater sample was collected from an AP2 leachate collection system in May 2020 and analyzed for cobalt. This sample contained cobalt at a concentration of 0.0046 mg/L (**Figure 2**). Analytical data for the porewater samples is provided in **Attachment 6**. The cobalt concentrations detected in the porewater samples are less than the lower confidence limits of cobalt concentrations observed at downgradient well G401 for the Second Quarter 2023 sampling event (0.0629 mg/L calculated using a confidence band around a linear regression, Ramboll 2023).

Because the concentrations in porewater within AP2 are lower than the concentrations of cobalt at monitoring well G401, this exceedance is not attributed to impacts from the AP2 CCR unit.

As background information, CCR porewater most accurately represents the mobile constituents associated with the waste management activity within the CCR surface impoundment (SI) (EPRI 2017). The composition of CCR porewater accumulated at the base of the CCR unit, which is derived from, and represents contact with, CCR material above and around the well screen, is the truest representation of mobile constituents throughout the CCR SI. Leach tests presented in SW-846 (e.g., toxicity characteristic leaching procedure, synthetic precipitation leaching procedure, Leachate Environmental Assessment Framework [LEAF 1313 – 1316]) are inconsistent predictors or surrogates of *in situ* porewater chemical concentrations (EPRI 2020, EPRI 2021, and EPRI 2022). Indeed, laboratory leach test effectiveness is determined by comparing results to porewater data (USEPA 2014, EPRI 2020, EPRI 2021, and EPRI 2022). These laboratory leach tests most accurately predict porewater concentrations when conditions in the test closely reflect conditions present in the field (USEPA, 2019). In many cases, the pH and/or oxidation-reduction (redox) potential of porewater is poorly represented by any laboratory leach test conditions. For these reasons, analysis of actual CCR porewater is more representative of potential contributions to groundwater observed in compliance monitoring wells than laboratory leach testing. The uncertainty in comparing the laboratory leach test results with the actual porewater concentrations means that the contribution of laboratory leach test data as a line of evidence to an ASD would be minimal.

Testing of porewater is a direct source term for evaluating potential influence on groundwater. SW-846 provides analytical methods for evaluating solid waste using leach tests that are designed to replicate potential *in situ* conditions (either current or future). The goal of these laboratory leach tests is to predict the potential concentration of chemicals under laboratory-controlled conditions (e.g., landfill leachate, synthetic precipitation, variable pH) which may or may not represent conditions observed in the field. The use of leach test results performed under variable conditions

collected from any number of locations within the CCR SI to estimate a total potential for chemical leaching from CCR into groundwater under a variety of different conditions is irrelevant to an ASD. ASDs are prepared to evaluate the potential for actual porewater leaking from a CCR SI to be the cause of or contribute to a detected exceedance observed in a compliance well.

3.2 LOE #2: Cobalt Is Present in Aquifer Solids

Aquifer solids samples were collected from three soil borings across CPP in May 2021, including one sample adjacent to the screened interval of G401 and one sample adjacent to the screened interval of background well G270. The field boring logs for these samples are provided as **Attachment 7**. These samples were submitted for analyses of total cobalt and cobalt distribution within the aquifer solids using sequential extraction procedure (SEP). Results for total and SEP analyses of cobalt in these samples are presented in **Table 1** and the analytical laboratory reports are provided as **Attachment 7**¹.

SEP is an analytical technique that uses progressively stronger reagents to solubilize metals from specific phases within the solid matrix and is used to infer associations between constituents and different classes of solids (Tessier et al. 1979). These classes of solids are identified based on their solubility under different reagents and include the exchangeable fraction, the carbonate-bound fraction, the fraction bound to non-crystalline materials (typically amorphous oxides), the iron/manganese oxide-bound fraction, the organic matter-bound fraction, and the residual fraction. To evaluate data quality in an SEP analysis, first the sum of individual extraction steps from the SEP was compared to the total cobalt concentration. The sum of the SEP is not expected to be exactly equal to the total metals analysis but should be generally consistent with the total metals result. The total cobalt concentration from the G401 sample was reported as 7.7 milligrams per kilogram of soil (mg/kg). The total cobalt concentration from the background G270 sample was reported as 7.3 mg/kg. The summed concentration of cobalt from the SEP analyses of the G401 sample was 5.2 mg/kg, and the summed concentration of cobalt from the G270 sample was 9.1 mg/kg, indicating general consistency between the total metals analyses and the summed SEP steps and therefore good metals recovery and data quality.

These results indicate that cobalt is naturally present in the solids comprising the screened interval of both well of interest G401 and background location G270. In both samples, the largest component of cobalt was found to be associated with the ammonium oxalate reactive fraction (often correlated to non-crystalline metal oxides) and the reducing agent extractable fraction (often correlated to iron/manganese oxides), which together comprise 82% of recovered cobalt from G401 and 78% of recovered cobalt from G270 (**Table 1**). Smaller components of cobalt were found to be associated with the stronger reagents used to mobilize constituents from sulfides or

¹ Sample G1001 is included in Attachment 7 but excluded from subsequent results tables and discussion in order to emphasize findings associated with the cobalt exceedance at G401.

residual materials within the solid phase. These results demonstrate that naturally occurring cobalt is present and ubiquitous throughout the site, including at upgradient locations.

3.3 LOE #3: Geochemical Conditions Favor Mobilization of Cobalt from Iron-bearing Minerals

Additional evaluation of solid phase data and geochemical conditions at G401 provide evidence that the naturally occurring cobalt within the solid phase is mobilized to groundwater.

3.3.1 Mineralogical Analysis

SEP testing indicated that the largest components of cobalt are likely associated with non-crystalline metal oxides and iron/manganese oxides (Section 3.2). Mineralogical analysis of aquifer solids collected adjacent to G401 was completed using X-ray Diffraction (XRD) to evaluate the mineralogy of the screened interval and identify the phases present in the aquifer matrix material. Mineralogy results are provided in **Table 2**, and the laboratory analytical report is included as **Attachment 8**. Mineralogy of the sampled interval of G401 consists primarily of quartz, various feldspars (albite, microcline), and various phyllosilicate minerals (muscovite, stilpnomelane [smectite-group], biotite). Minor abundances of diopside, actinolite, and ankerite were reported as well.

The results of the SEP analyses indicated that non-crystalline oxides and crystalline oxide minerals were found to have the greatest and second association with cobalt, respectively (**Table 1**). The iron concentration measured during step 3 of the extraction procedure (the extraction phase typically associated with amorphous oxides) was 580 mg/kg and the iron concentration measured in step 4 (the extraction phase typically associated with crystalline iron and manganese oxides) was 6,400 mg/kg, suggesting that iron oxides are present within the aquifer matrix and are strongly associated with cobalt (**Attachment 7**). Total metals concentrations are provided in **Attachment 9**. In contrast to SEP and total metals results, no crystalline iron or manganese oxide minerals were reported in the XRD analyses. XRD does not provide an assessment of amorphous materials due to analytical limitations; XRD results are normalized to 100% to exclude non-crystalline components.

Cobalt is known to undergo isomorphic substitution for iron in crystalline iron minerals such as iron oxides, iron sulfides, and iron carbonates due to the similar ionic radii (Clementi and Raimondi, 1963; Krupka and Serne, 2002; Hitzman et al., 2017). Cobalt which has been isomorphically substituted for iron in the crystal structure of iron-bearing minerals or adsorbed to their surfaces would also be subject to mobilization via initiation of weathering reactions in which mineral crystal structures dissolve. Minor abundances of ankerite, an iron-bearing carbonate mineral, were reported in XRD results. Iron carbonate minerals are known to undergo pH and redox-driven reversible weathering reactions with ferric iron minerals such as iron oxides (Taylor 1980, Schwertmann and Taylor 1989, Schwertmann and Fitzpatrick 1993). The likely presence of iron oxide minerals coupled with the reported presence of an iron-bearing carbonate mineral

suggests that iron exists in multiple solid phases in the G401 aquifer material which have the potential to undergo dissolution reactions in response to aqueous geochemistry. Such reactions would mobilize iron and isomorphically substituted cobalt into groundwater.

3.3.2 Geochemical Conditions

The SEP results indicate that cobalt is likely associated with the iron oxide fraction and the non-crystalline material fraction of the aquifer matrix. An Eh-pH diagram was generated using the average composition of G401 groundwater (**Figure 3**) to evaluate groundwater conditions at G401 relative to the thermodynamic stability of iron oxide and iron carbonate minerals. Groundwater geochemistry from G401 sampling events consistently plot along the stability boundaries between aqueous Fe^{2+} , ferrous iron carbonate (siderite, FeCO_3), and amorphous ferric iron oxide ($\text{Fe}(\text{OH})_3$), indicating that groundwater is in a state of dynamic equilibrium between the three phases. Based on **Figure 3**, subtle shifts in pH or redox conditions within G401 groundwater would be expected to result in alteration reactions between ferrous and ferric iron minerals which may trigger mineral dissolution and subsequent mobilization of iron and the associated cobalt to groundwater.

Further evidence of the association of cobalt with iron mineral phases is provided by **Figure 4**, which indicates a strong correlation between aqueous iron and aqueous cobalt in groundwater at G401 as well as a general shift in aqueous cobalt and iron trends occurring within the same time interval. This strong correlation reinforces the likelihood that isomorphic substitution of cobalt into iron minerals is occurring in the natural lithology adjacent to AP2, as aqueous iron is observed to behave in a very similar manner to aqueous cobalt. Such concurrent changes suggest an identical source of both aqueous cobalt and aqueous iron, that source being the presence of mineral-bearing minerals.

G401 groundwater has a notably lower pH than all other AP2 compliance wells (**Figure 5**). Measured pH values at G401 range from 5.58 to 6.40 Standard Units (SU). These values are lower than those measured from AP2 porewater samples during 2016 sampling, which range from 6.5 to 7.2 SU, suggesting that AP2 is not affecting the pH at G401 and it is instead driven by variability in the aquifer. The lower pH values at G401 contribute to the relative instability of iron-bearing minerals as shown in the thermodynamic speciation diagram in **Figure 3**. The lower pH condition at G401 groundwater likely accounts for the elevated aqueous iron and cobalt concentrations in G401 groundwater relative to other compliance wells.

3.4 LOE #4: Geochemical Modeling of Cobalt Mobilization from Aquifer Solids Supports the Determination of Naturally Occurring Cobalt

Geochemical modeling was used to investigate the influence of pH conditions on aqueous cobalt concentrations at well G401. Thermodynamic reaction pathway modeling was conducted using the React module of Geochemist's Workbench (GWB) geochemical modeling software package (version 17.0.1). The purpose of the model is to show the relationship between pH and aqueous cobalt concentrations as a function of variable pH and iron mineral instability and sorption capability.

The initial aqueous component of the geochemical model was populated using the groundwater composition of the most recent sample collected at G401 on June 7, 2023 (**Table 3**). The pH value of the aqueous component was not defined and was set as a sliding scale. Solid-phase reactants incorporated into the model were limited to iron-bearing minerals to evaluate iron and associated cobalt dynamics in the system and were defined based on results of the solid phase analyses: 0.1 weight percentage (wt. %) siderite (FeCO_3) as a proxy for ankerite and 0.1 wt. % of iron hydroxide, $\text{Fe}(\text{OH})_3$. Ankerite ($\text{Ca}[\text{Fe},\text{Mg},\text{Mn}][\text{CO}_3]_2$) is a complex iron-carbonate solid-solution mineral with limited thermodynamic data available and is not included in most thermodynamic databases. $\text{Fe}(\text{OH})_3$ was included to account for the iron oxide mineral phase which is suggested by SEP results (**Table 1**) and predicted to occur based on thermodynamic speciation (**Figure 3**). Both siderite and iron hydroxide were included as reactant phases, and $\text{Fe}(\text{OH})_3$ was modified in the thermodynamic database to incorporate a small fraction of cobalt (**Table 3**) to represent isomorphically substituted cobalt within the crystal structure of this mineral as suggested by SEP results (**Table 1**). The cobalt-iron hydroxide phase represents a natural cobalt source within the model and allows for evaluation of cobalt stability as a function of pH variability.

The thermodynamic database used for the model (thermo.dat) was adjusted to include the newly-defined cobalt-iron hydroxide mineral phase discussed above. Sorption to iron oxyhydroxides was incorporated into model calculations using the Dzombak and Morel (1990) two-layer surface complexation model. This sorption dataset was modified to recognize the cobalt-substituted source phase of $\text{Fe}(\text{OH})_3$. Crystalline iron minerals ferrite, hematite, goethite, and magnetite were suppressed during model simulations due to their lack of detection by XRD. A porosity value of 25% was used for the UA.

The geochemical model simulates cobalt and iron concentrations over the pH range observed in groundwater at well G401 from November 2015 (the beginning of monitoring) to the present, as well as the average pH value across all other AP2 compliance wells since sampling began (**Figure 6**). Iron concentrations are included to illustrate the effects of dissolution of the cobalt-bearing iron mineral source phase on aqueous conditions. Generally, both aqueous iron and cobalt concentrations are predicted to be higher at lower pH values (such as those observed at G401). This effect is due to the combined instability of the cobalt-bearing iron hydroxide and desorption of aqueous cobalt from the surface complexes of the $\text{Fe}(\text{OH})_3$ mineral with declining pH. **Figure 7a** shows the fraction of cobalt predicted to sorb to this iron oxide component at varying pH levels (maximum adsorption at pH 7.19), and **Figure 7b** shows the predicted mass of each mineral at varying pH levels, which represents the availability of sorption sites for cobalt. The results of the equilibrium geochemical model demonstrate an increase in aqueous cobalt in groundwater as desorption from iron oxide surfaces and dissolution of iron-bearing oxide minerals are promoted at groundwater pH conditions below 7.0. Geochemical modeling results support the hypothesis that the lower pH levels documented at G401 relative to all other AP2 compliance wells are the primary cause of elevated aqueous cobalt concentrations.

4. CONCLUSIONS

It has been demonstrated that the cobalt GWPS exceedance at G401 is not due to a release from the AP2 CCR unit and that the unit has not contributed to the exceedance, but instead the exceedance is attributed to a natural source. The following summarizes the four LOEs used to support this alternative source demonstration:

1. AP2 porewater samples do not contain detectable concentrations of aqueous cobalt and can therefore not be the source of cobalt exceedances to downgradient groundwater.
2. Cobalt has been detected in aquifer solids samples collected adjacent to well G401 and adjacent to background well G270 which constitute a naturally occurring cobalt source.
3. Geochemical conditions of G401 groundwater indicate that multiple iron phases are present in the aquifer-groundwater system, and small changes in pH or redox conditions are expected to result in the dissolution of cobalt-bearing phases and the release of cobalt and dissolved iron into groundwater.
4. Geochemical modeling of cobalt mobilization from aquifer solids predicts that pH conditions govern aqueous cobalt concentrations in Site groundwater. Lower pH levels documented in G401 groundwater are predicted to result in elevated aqueous cobalt relative to other AP2 compliance wells.

The alternative source of cobalt at G401 is the influence of the till lithology on groundwater composition. This demonstration fulfills the requirements of both 35 IAC 845.650(e) and the technical manual for the Municipal Solid Waste Landfill federal regulatory program (Code of Federal Regulations, Title 40, Section 258) that a statistically significant increase may result from natural variation in groundwater quality.

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TABLES

**Table 1 - Cobalt SEP Results Summary
Coffeen Power Plant**

Geosyntec Consultants, Inc.

Soil Boring Location		G270A		G401A	
Sample Depth (ft)		(12-16)		(16-20)	
Location		Background		Upgradient	
Field Boring Log Description		Brown silty sand		Brown sand transitioning to light gray/brown sandy clay	
Total Cobalt		7.3		7.7	
SEP Results					
SEP Fraction	SEP Reagent	Concentration	% of Total	Concentration	% of Total
Exchangeable Metals Fraction	MgSO ₄	<0.21	--	<0.21	--
Bound to Carbonates Fraction	Sodium acetate, acetic acid	<0.22	--	<0.22	--
Bound to Non-crystalline Materials	Ammonium oxalate (pH 3)	4.3	47%	2.4 J	46%
Bound to Fe/Mn Oxides Fraction	Hydroxylamine HCl and acetic acid	2.8 J	31%	1.9 J	36%
Bound to Organic Material Fraction	5% sodium hypochlorite (pH 9.5)	<0.70	--	<0.69	--
Bound to Sulfides Fraction	HNO ₃ , HCl-H ₂ O solution	1.6 J	18%	0.85 J	16%
Residual Metals Fraction	HF, HNO ₃ , HCL, and H ₃ BO ₃	0.36 J	4%	0.061 J	1.0%
SEP Total		9.1	100%	5.1	100%

Notes:

SEP - sequential extraction procedure

ft bgs - feet below ground surface

All results shown in milligram of cobalt per kilogram of soil (mg/kg).

Non-detect values are shown as less than the detection limit.

The cobalt fraction associated with each SEP phase is shown.

% of total cobalt is calculated from the sum of the SEP fractions.

**Table 2 - Summary of X-Ray Diffraction Analysis
Coffeen Power Plant**

Geosyntec Consultants, Inc.

Field Boring Location			G270A	G401A
Sample Depth (ft bgs)			(12-16)	(16-20)
Location			Upgradient	Downgradient
Field Boring Log Description			Brown silty sand	Brown sand transitioning to light gray/brown sandy clay
Mineral/Compound	Formula	Mineral Type	(wt %)	(wt %)
Quartz	SiO ₂	Silicate	60.6	68.9
Albite	NaAlSi ₃ O ₈	Feldspar	9.1	8.6
Microcline	KAlSi ₃ O ₈	Feldspar	9.8	7.8
Muscovite	KAl ₂ (AlSi ₃ O ₁₀)(OH) ₂	Mica	9.0	6.8
Stilpnomelane	K(Fe,Mg) ₈ (Si,Al) ₁₂ (O,OH) ₂₇ •H ₂ O	Clay	2.0	2.7
Biotite	K(Mg,Fe) ₃ AlSi ₃ O ₁₀ (OH) ₂	Mica	2.4	2.1
Diopside	CaMgSi ₂ O ₆	Pyroxene	1.3	1.4
Actinolite	Ca ₂ (Mg,Fe) ₃ Si ₈ O ₂₂ (OH) ₂	Amphibole	3.3	1.4
Chlorite	(Fe,(Mg,Mn) ₅ ,Al)(Si ₃ Al)O ₁₀ (OH) ₈	Clay	1.4	-
Dolomite	(Mg,Ca)(CO ₃) ₂	Carbonate	0.6	-
Ankerite	CaFe(CO ₃) ₂	Carbonate	0.5	0.1
Pyrite	FeS ₂	Sulfide	0.2	-

Notes:

Sample depth is shown in feet below ground surface (ft bgs).

wt %: percentage by weight

- : Mineral was not detected at abundances above the instrument detection limit

Table 3 - Summary of Geochemical Model Inputs *Geosyntec Consultants, Inc.*
Coffeen Power Plant

Aqueous Phase			
Parameter	Unit	Input Value	Source
Calcium	mg/L	490	June 7, 2023 sampling event
Chloride	mg/L	3.60	June 7, 2023 sampling event
Cobalt	mg/L	0.110	June 7, 2023 sampling event
Iron	mg/L	84.0	June 7, 2023 sampling event
Magnesium	mg/L	150	June 7, 2023 sampling event
Manganese	mg/L	27.0	June 7, 2023 sampling event
Potassium	mg/L	2.20	June 7, 2023 sampling event
Sodium	mg/L	71.0	June 7, 2023 sampling event
Sulfate	mg/L	2100	June 7, 2023 sampling event
Bicarbonate Alkalinity	mg/L	140	June 7, 2023 sampling event
Eh	V	0.168	June 7, 2023 sampling event
Temperature	°C	12.3	June 7, 2023 sampling event
pH	SU	5.0-8.0	Model variable
Solid Phase			
Reactant	Unit	Input Value	Source
Fe(OH) ₃ -Cobalt Source Phase ¹	wt. %	0.1	Assumption based on SEP results indicating iron oxide presence and thermodynamic speciation modeling
Siderite	wt. %	0.1	May 2021 sample XRD results (for iron carbonate mineral ankerite ²)
Porosity	%	25	Assumed

Notes:

mg/L: milligrams per liter

V: volts

°C: degrees Celsius

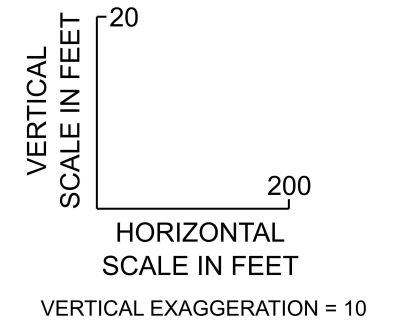
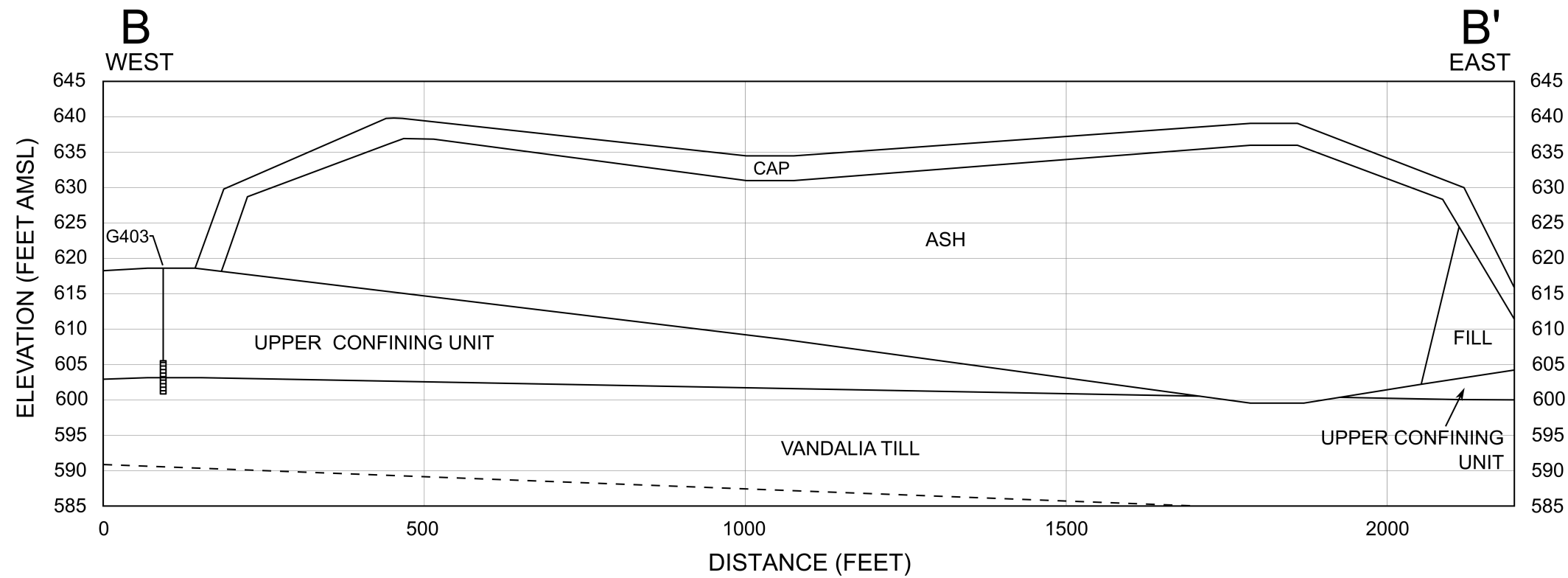
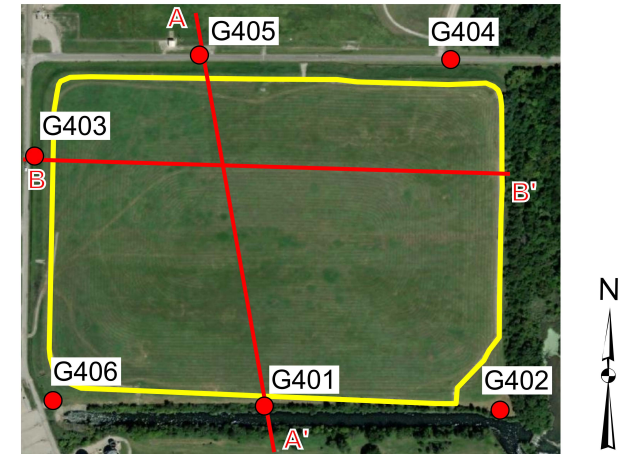
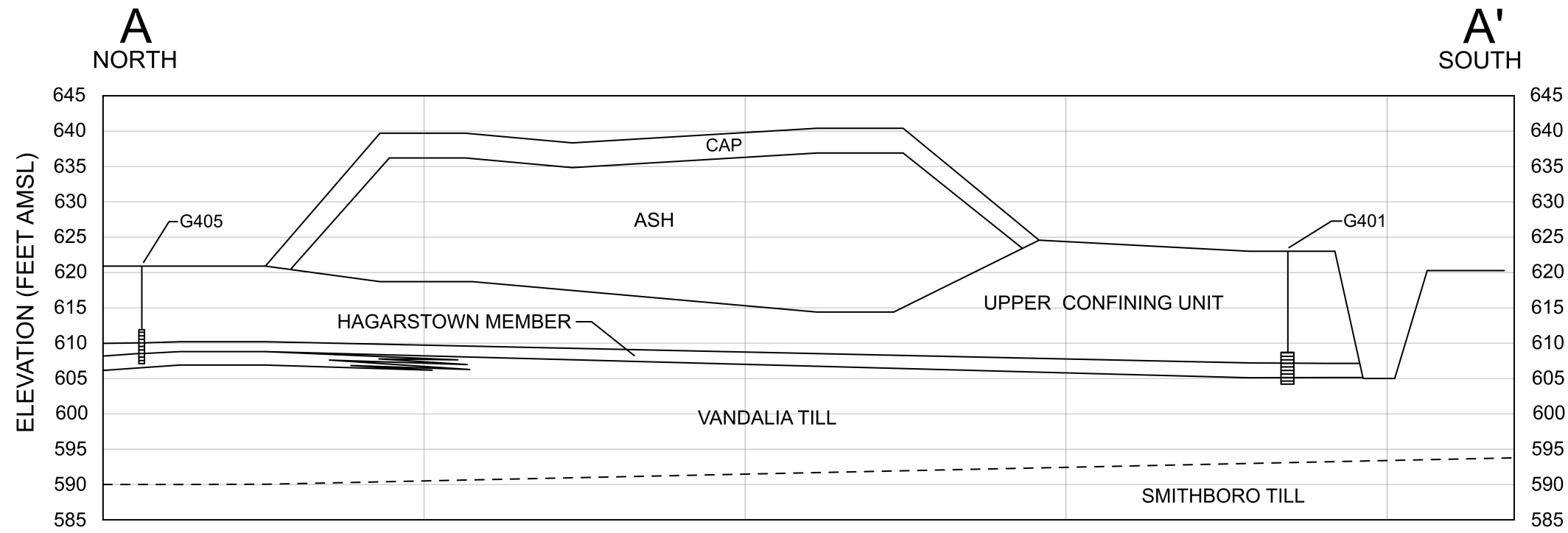
SU: standard units

wt. %: weight percentage

1: Mineral formula $Fe^{3+}_{0.99}Co^{2+}_{0.015}(OH)_3$

2: Thermodynamic information for ankerite is not readily available, so iron carbonate mineral siderite was used in modeling efforts in place of ankerite

FIGURES



- Legend**
- Monitoring Wells
 - Pond Outline
 - Well Screen

- Notes**
- Well locations are approximate
 - Geologic cross-sections modified from Hydrogeologic Monitoring Plan (Natural Resource Technology, 2017)
 - Cap thickness is approximate

Ash Pond No. 2 Geologic Cross-Section

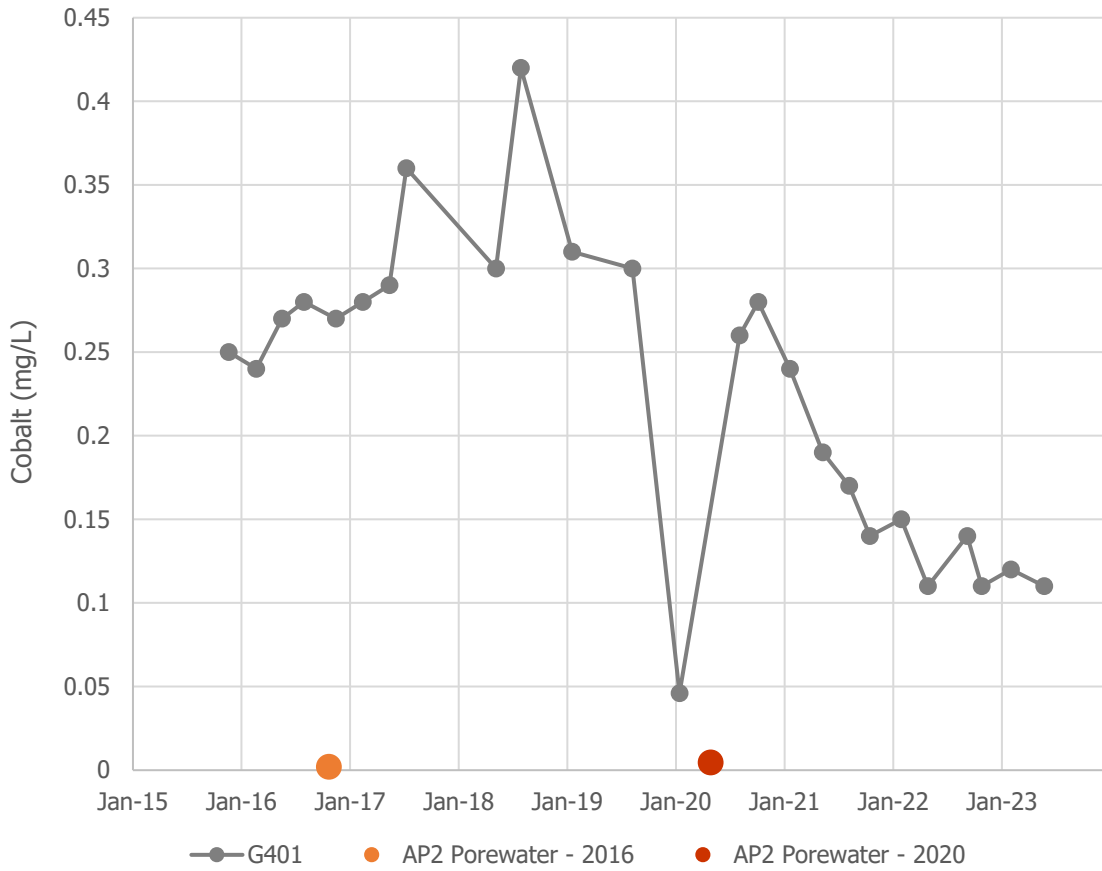
134 Cips Lane
Coffeen, Illinois

Geosyntec
consultants

Columbus, OH

November 2023

Figure
1



Notes: Cobalt results are shown for unfiltered samples in units of milligrams per liter (mg/L). The 2016 porewater sample datapoint represents four separate sampling locations throughout AP2, all of which did not contain detectable cobalt. The method detection limit of 0.002 mg/L is shown.

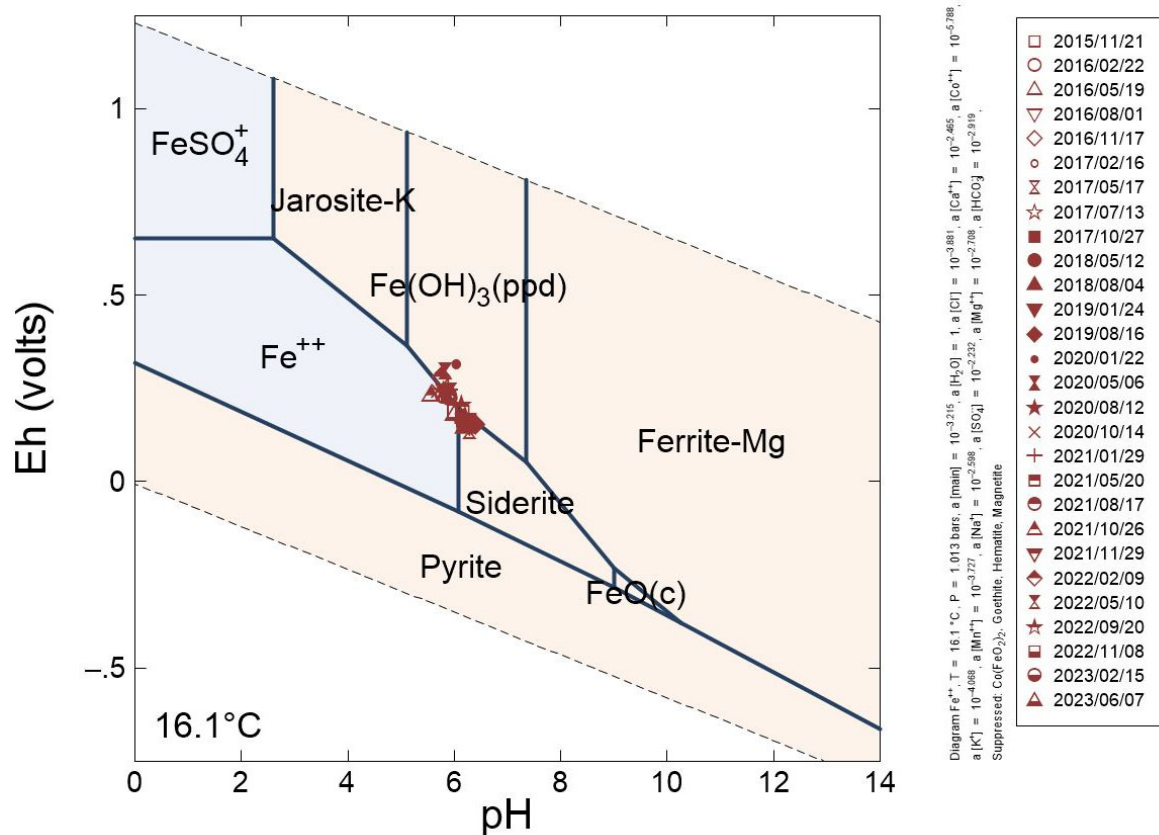
Cobalt Time Series



Figure
2

Columbus, OH

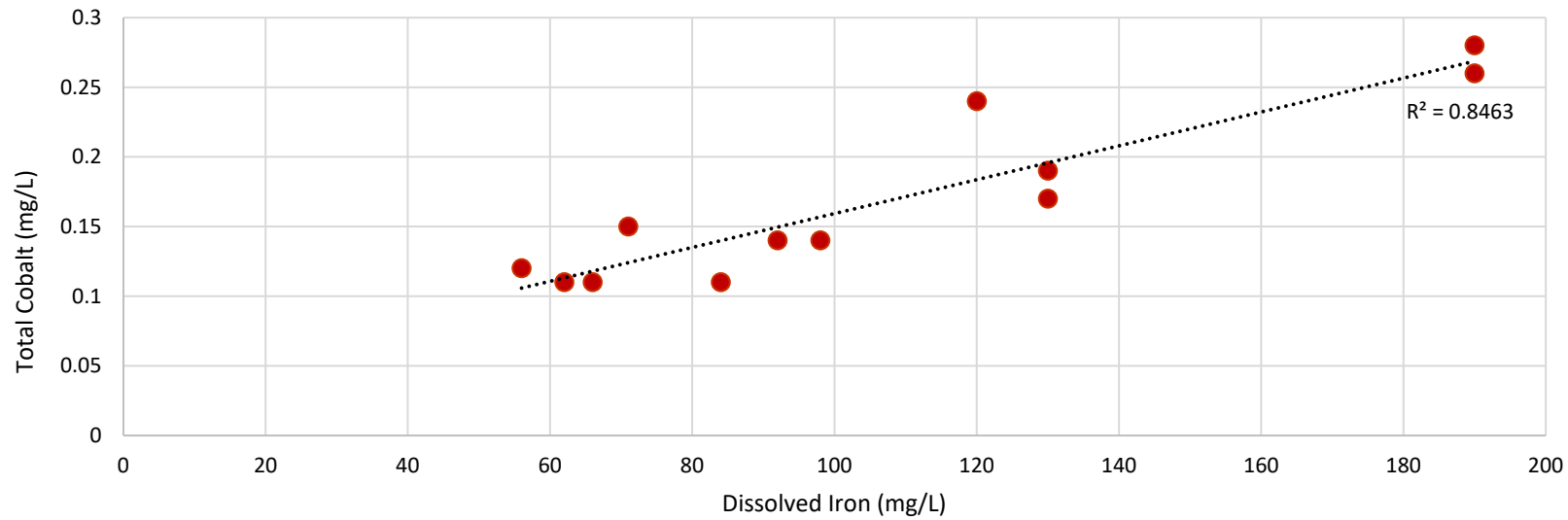
November 2023



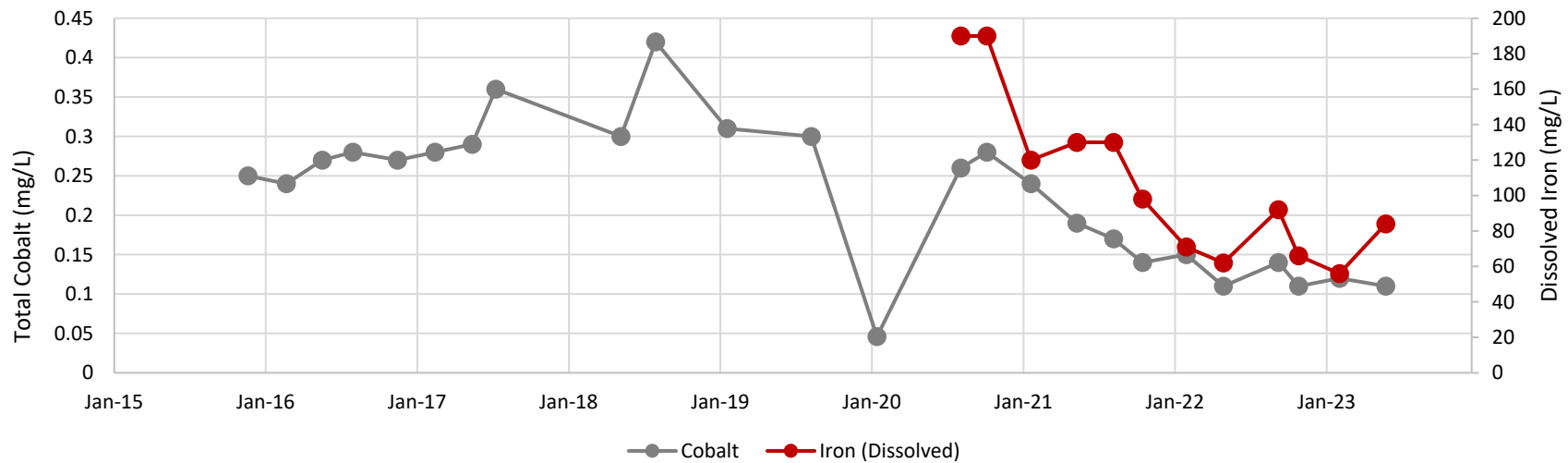
Notes: Groundwater compositions from all G401 sampling events were averaged and used to establish baseline conditions for the diagram. Eh and pH values for sampling dates at G401 are shown on the diagram. pH is displayed in standard units (SU).
 V - volts

Iron Eh-pH Phase Stability Diagram – G401	
Columbus, OH	October 2023

Figure
3



A



B

Notes: Figure A displays a scatterplot of groundwater data for G401 samples in units of milligrams per liter (mg/L). Iron concentrations are from filtered samples, and cobalt concentrations are from unfiltered samples. Figure B displays a time series plot of aqueous iron and cobalt concentrations at G401 in units of mg/L. Iron concentrations are from filtered samples, and cobalt concentrations are from unfiltered samples.

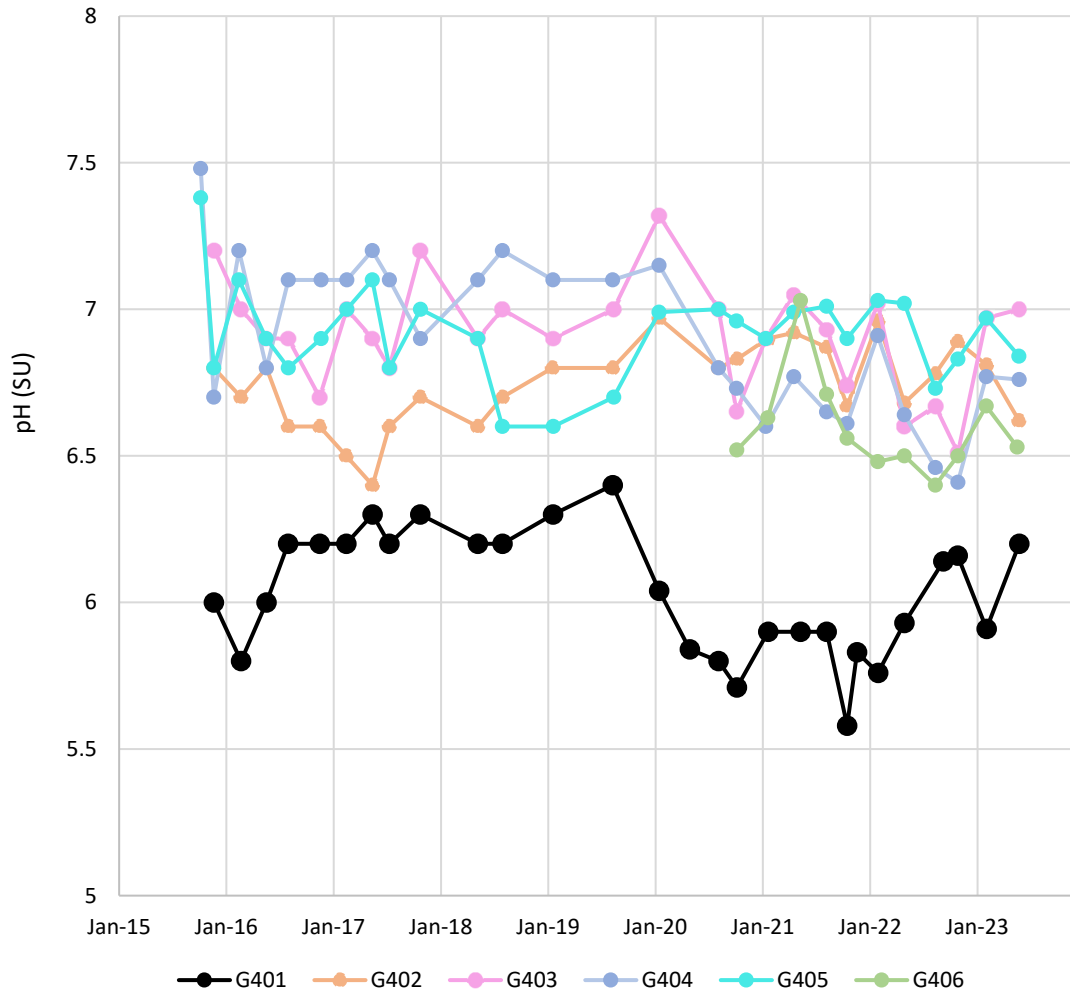
G401 Cobalt-Iron Relationship



Columbus, OH

November 2023

Figure
4



Notes: Field-measured values for pH at all Coffeen Ash Pond 2 compliance wells are shown in standard units (SU).

AP2 Groundwater pH Time Series

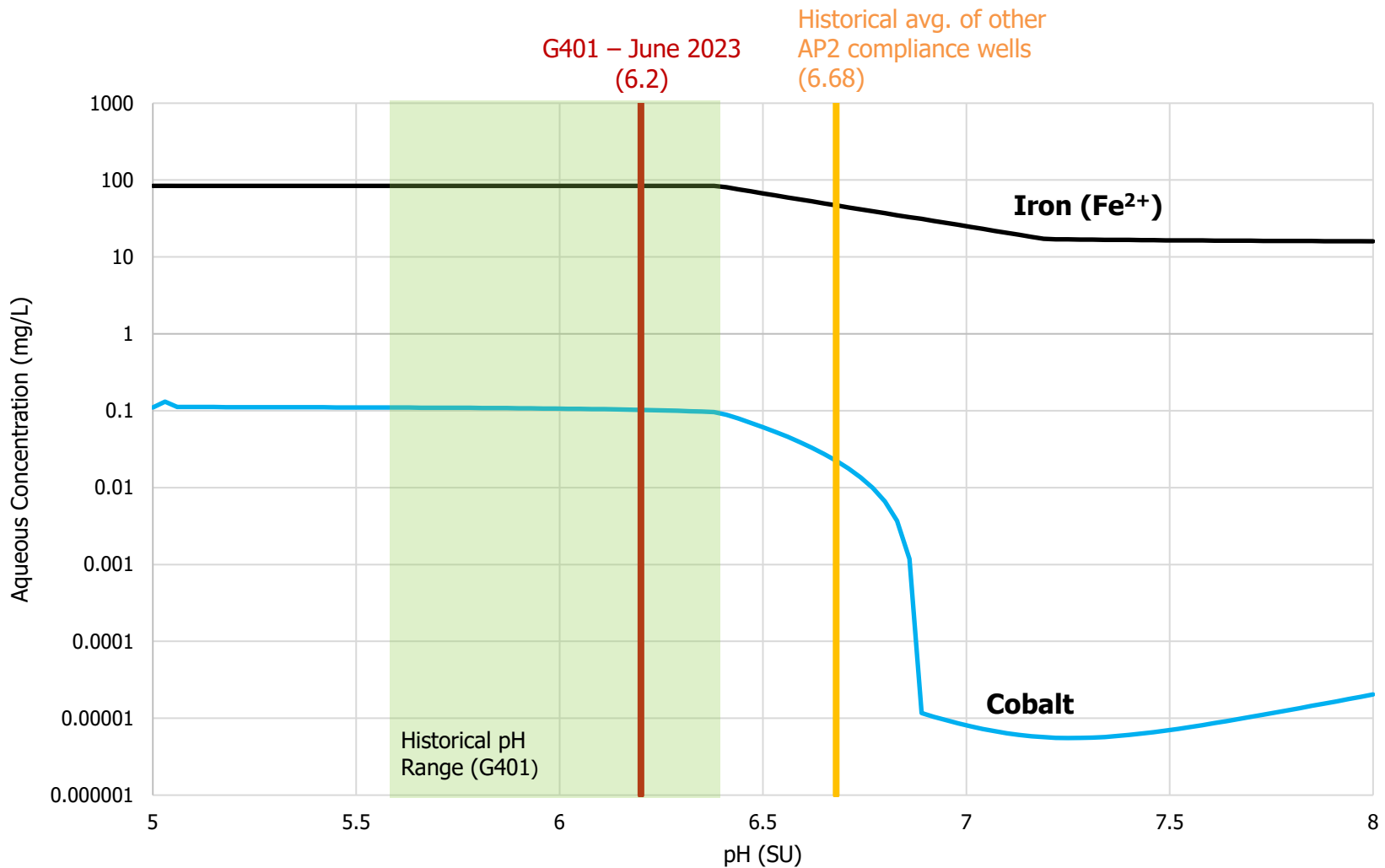


Columbus, OH

November 2023

Figure

5



Notes: pH values are shown in standard units (SU). Predicted concentrations of aqueous cobalt and iron in units of milligrams per liter (mg/L) on a log scale as a function of pH are shown. The historical range of measured pH values at monitoring well G401 groundwater from 2015 to the present are indicated by the green shading. The pH value of the most recent groundwater sample from G401 is indicated by the red line. The average pH value of all sampling events from all AP2 compliance wells (not including G401) is indicated by the orange line.

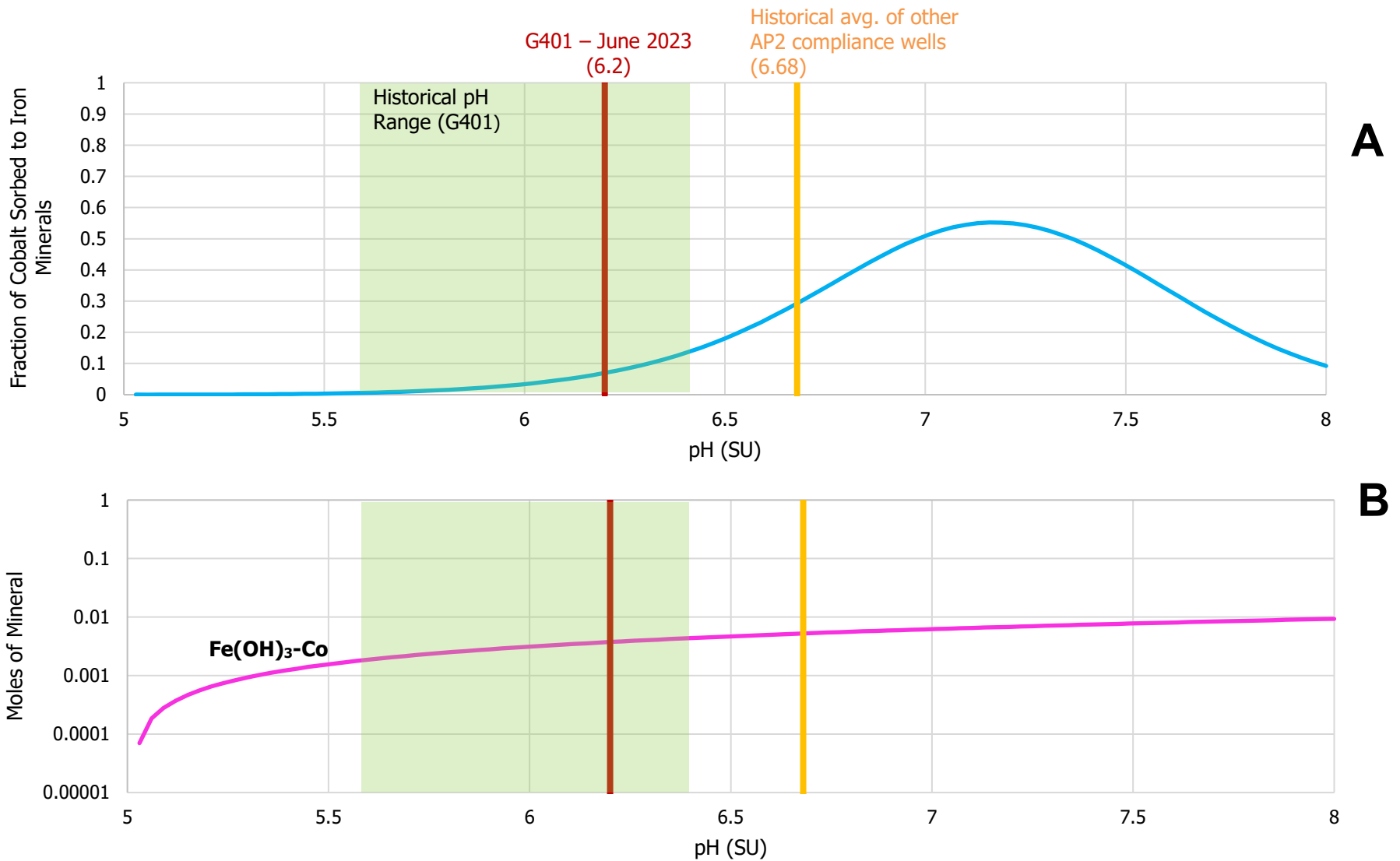
Geochemical Model Output – Aqueous Cobalt and Iron Concentrations



Figure
6

Columbus, OH

November 2023



Notes: pH values are shown in standard units (SU). Plot A displays the fraction of cobalt in the system that is predicted to sorb to iron-bearing minerals. Plot B displays the predicted number of moles of Fe(OH)₃-Co as a function of pH. The historical range of measured pH values at monitoring well G401 groundwater from 2015 to the present are indicated by the green shading. The pH value of the most recent groundwater sample from G401 is indicated by the red line. The average pH value of all sampling events from all AP2 compliance wells (not including G401) is indicated by the orange line.

Geochemical Model Output – Sorbed Cobalt and Mineral Mass



Figure
7

Columbus, OH

December 2023

ATTACHMENT 1
Proposed 845 Groundwater Monitoring Network

PROJECT: 169000XXXXX | DATED: 10/6/2021 | DESIGNER: STOLZSD
 Y:\Mapping\Projects\2202285\MXD\945_Operating_Permit\Coffeen\AP2_GMP\Figure 2-1_Proposed Monitoring Well Network.mxd



- COMPLIANCE WELL
- BACKGROUND WELL
- MONITORING WELL
- STAFF GAGE
- PART 845 REGULATED UNIT (SUBJECT UNIT)
- SITE FEATURE
- LIMITS OF FINAL COVER
- PROPERTY BOUNDARY



PROPOSED 845 GROUNDWATER MONITORING WELL NETWORK

FIGURE 2-3

ADDENDUM TO THE GROUNDWATER MONITORING PLAN
ASH POND NO. 2
 COFFEEN POWER PLANT
 COFFEEN, ILLINOIS

RAMBOLL AMERICAS
 ENGINEERING SOLUTIONS, INC.



ATTACHMENT 2
G401 Boring Log and Well Construction
Diagram

FIELD BORING LOG



CLIENT: Natural Resource Technology, Inc.
Site: Coffeen Energy Center
Location: Coffeen, Illinois
Project: 15E0030
DATES: Start: 9/14/2015
Finish: 9/14/2015
WEATHER: Sunny, hi 60's

CONTRACTOR: Ramsey Geotechnical Engineering, LLC
Rig mfg/model: D-50 Turbo Tracked MST 800ATV
Drilling Method: Hollow Stem Auger (3/4" overdrill / 4/4")
FIELD STAFF: Driller: D. Crump
Helper: D. Groves
Eng/Geo: R. Hasenyager

BOREHOLE ID: G401
Well ID: G401
Surface Elev: 623.03 ft. MSL
Completion: 19.30 ft. BGS
Station: 2,515,614.84N
 872,510.57E

SAMPLE		TESTING					TOPOGRAPHIC MAP INFORMATION:		WATER LEVEL INFORMATION:		
Number	Recov / Total (in) % Recovery	Type	Blows / 6 in N - Value RQD	Moisture (%)	Dry Den. (lb/ft ³)	Qu (tsf) Qp (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
1A	16/24 67%	ss	2-2 3-7 N=5		17			Dark grayish brown (10YR4/2), moist, soft, CLAY with little silt and trace very fine- to fine-grained sand - FILL.		622	
2A	21/24 88%	ss	8-11 8-9 N=19		17	1.80		Yellowish brown (10YR5/6) moist, medium, CLAY with some silt and trace very fine- to coarse-grained sand - FILL.		620	
2B					25		4	Dark gray (10YR4/1), moist, stiff, SILT with little clay and trace very fine-grained sand.			
3A	23/24 96%	ss	3-4 7-8 N=11		23	2.50		Yellowish brown (10YR5/6), moist, stiff, CLAY with some silt and trace very fine- to fine-grained sand.		618	
4A	24/24 100%	ss	8-9 12-14 N=21		21	3.30		Gray (10YR5/1) with 20% yellowish brown (10YR5/6) mottles, moist, medium, CLAY with some silt and trace very fine- to fine-grained sand.		616	
4B					19	2.80	8	Gray (10YR5/1) with 30% yellowish brown (10YR5/8) mottles, moist, stiff, SILT and very fine-grained SAND with trace clay.			
5A	24/24 100%	ss	2-3 4-5 N=7		21	1.30				614	
6A	24/24 100%	ss	2-4 5-6 N=9		17	2.50		Gray (10YR5/1) with 30% yellowish brown (10YR5/6) mottles, moist, medium, CLAY with some silt and trace very fine- to fine-grained sand.		612	
7A	24/24 100%	ss	9-7 8-9 N=15		21	1.40				610	
8A	24/24 100%	ss	2-3 2-4 N=5		17	1.30		Gray (10YR6/1), moist soft, CLAY with very fine- to fine-grained sand and little silt.		608	
8B					19		16	Yellowish brown (10YR5/6), wet, loose, very fine- to fine-grained SAND with trace silt.			
9A	20/24 83%	ss	5-4 5-10 N=9		21			Yellowish brown (10YR5/6), wet, medium, SILT with some very fine-grained sand and little clay.		606	
9B					16		18	Yellowish brown (10YR5/6), wet, loose, very fine- to medium-grained SAND with trace silt.			
10A	12/16 75%	ss	23-41 50/4"		6	4.50		Gray (10YR5/1), moist, very hard, SILT with few clay and little very fine- to very coarse sand.		604	

End of boring = 19.3 feet

NOTE(S): G401 installed in borehole.



Site #: _____ County: Montgomery Well #: G401

Site Name: Natural Resource Technology, Inc. Coffeen Energy Center Borehole #: G401

State _____
Plane Coordinate: X 872,510.6 Y 2,515,614.8 (or) Latitude: _____ Longitude: _____

Surveyed By: Gary C. Rogers IL Registration #: 035-002957

Drilling Contractor: Ramsey Geotechnical Engineering, LLC Driller: D. Crump

Consulting Firm: Hanson Professional Services Inc. Geologist: Rhonald W. Hasenyager, LPG #196-000246

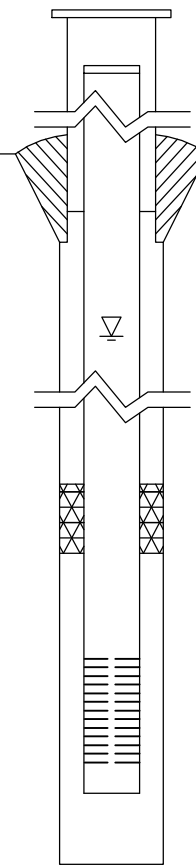
Drilling Method: Hollow stem auger Drilling Fluid (Type): none

Logged By: Rhonald W. Hasenyager Date Started: 9/14/2015 Date Finished: 9/14/2015

Report Form Completed By: Suzanna L. Keim Date: 10/7/2015

ANNULAR SPACE DETAILS

	Elevations (MSL)*	Depths (BGS)	(0.01 ft.)
	<u>625.84</u>	<u>-2.81</u>	Top of Protective Casing
	<u>625.57</u>	<u>-2.54</u>	Top of Riser Pipe
Type of Surface Seal: <u>Concrete</u>	<u>623.03</u>	<u>0.00</u>	Ground Surface
Type of Annular Sealant: <u>Bentonite Chips</u>	<u>621.33</u>	<u>1.70</u>	Top of Annular Sealant
Installation Method: <u>Gravity</u>			
Setting Time: <u>>24 hours</u>			
Type of Bentonite Seal -- <input checked="" type="checkbox"/> Granular <input type="checkbox"/> Pellet <input type="checkbox"/> Slurry (choose one)			Static Water Level (After Completion)
Installation Method: <u>Gravity</u>	<u>n/a</u>	<u>n/a</u>	Top of Seal
Setting Time: <u>25 minutes</u>	<u>610.12</u>	<u>12.91</u>	Top of Sand Pack
Type of Sand Pack: <u>Quartz Sand</u>	<u>608.67</u>	<u>14.36</u>	Top of Screen
Grain Size: <u>10-20</u> (sieve size)	<u>604.24</u>	<u>18.79</u>	Bottom of Screen
Installation Method: <u>Gravity</u>	<u>603.74</u>	<u>19.29</u>	Bottom of Well
Type of Backfill Material: <u>n/a</u> (if applicable)			
Installation Method: _____	<u>603.73</u>	<u>19.30</u>	Bottom of Borehole



* Referenced to a National Geodetic Datum

CASING MEASUREMENTS

Diameter of Borehole	(inches)	8.0
ID of Riser Pipe	(inches)	2.0
Protective Casing Length	(feet)	5.0
Riser Pipe Length	(feet)	16.70
Bottom of Screen to End Cap	(feet)	0.50
Screen Length (1st slot to last slot)	(feet)	4.63
Total Length of Casing	(feet)	21.83
Screen Slot Size **	(inches)	0.010

WELL CONSTRUCTION MATERIALS
(Choose one type of material for each area)

Protective Casing	SS304	SS316	PTFE	PVC	OTHER: Steel
Riser Pipe Above W.T.	SS304	SS316	PTFE	<input checked="" type="checkbox"/> PVC	OTHER:
Riser Pipe Below W.T.	SS304	SS316	PTFE	<input checked="" type="checkbox"/> PVC	OTHER:
Screen	SS304	SS316	PTFE	<input checked="" type="checkbox"/> PVC	OTHER:

ATTACHMENT 3
Potentiometric Surface Map – May 30,2023



Service Layer Credits: World Imagery, State of Missouri, Maxar

- COMPLIANCE MONITORING WELL
- BACKGROUND MONITORING WELL
- SOURCE SAMPLE LOCATION
- PORE WATER WELL
- LEACHATE WELL
- MONITORING WELL
- STAFF GAGE, CCR UNIT
- STAFF GAGE, RIVER

- GROUNDWATER ELEVATION CONTOUR (2-FT CONTOUR INTERVAL, NAVD88)
- INFERRED GROUNDWATER ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION
- LIMITS OF FINAL COVER
- PROPERTY BOUNDARY
- REGULATED UNIT (SUBJECT UNIT)

POTENTIOMETRIC SURFACE MAP MAY 30, 2023



NOTES:
 1. ELEVATIONS IN PARENTHESES WERE NOT USED FOR CONTOURING.
 2. ELEVATION CONTOURS SHOWN IN FEET, NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)

ASH POND NO. 2
 COFFEEN POWER PLANT
 COFFEEN, ILLINOIS

RAMBOLL AMERICAS
 ENGINEERING SOLUTIONS, INC.



ATTACHMENT 4

Field Boring Logs

Drilling Start Date: 04/05/2021	Boring Depth (ft): 20
Drilling End Date: 04/05/2021	Boring Diameter (in): 6
Drilling Company: Roberts Drilling	Sampling Method(s): Direct Push
Drilling Method: Direct Push	DTW During Drilling (ft):
Drilling Equipment: Geoprobe	DTW After Drilling (ft):
Driller:	Ground Surface Elev. (ft):
Logged By: A. Toye	Northing, Easting (NAD83):

DEPTH (ft)	LITHOLOGY	WATER LEVEL	BORING COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	MEASURE	ELEVATION (ft)
				Sample Type	Recovery (in)	Blow Counts	N Value RQD (%)		Lab Sample	
0				DP	12/48			(0') CLAY (CL); brown (7.5YR 5/2), soft, moist, low plasticity.		
5				DP	27/48			(4') 14" of As above: trace gravel. (4.16') 13" of CLAYEY SILT (ML); trace gravel, medium stiff, moist.		
10				DP	48/48			(8') SILTY CLAY (CL); brown (7.5YR 5/4), stiff to medium stiff, moist, low plasticity.		
15				DP	48/48			(12') As above: trace gravel and siltier starting at 45", some sand for first 12".		
17.83				DP	48/48			(16') 22" of SAND (SP); strong brown (7.5YR 4/6) to brown (7.5YR 5/2), fine to coarse grained, stiff to soft,	Chem (16-20')	
20								(17.83') 26" of SANDY CLAY (CL); light gray (7.5YR 7/1) to strong brown (7.5YR 5/8), soft, moist, medium plasticity, trace ash.		
								(20') End of Boring.		

NOTES: No groundwater encountered.

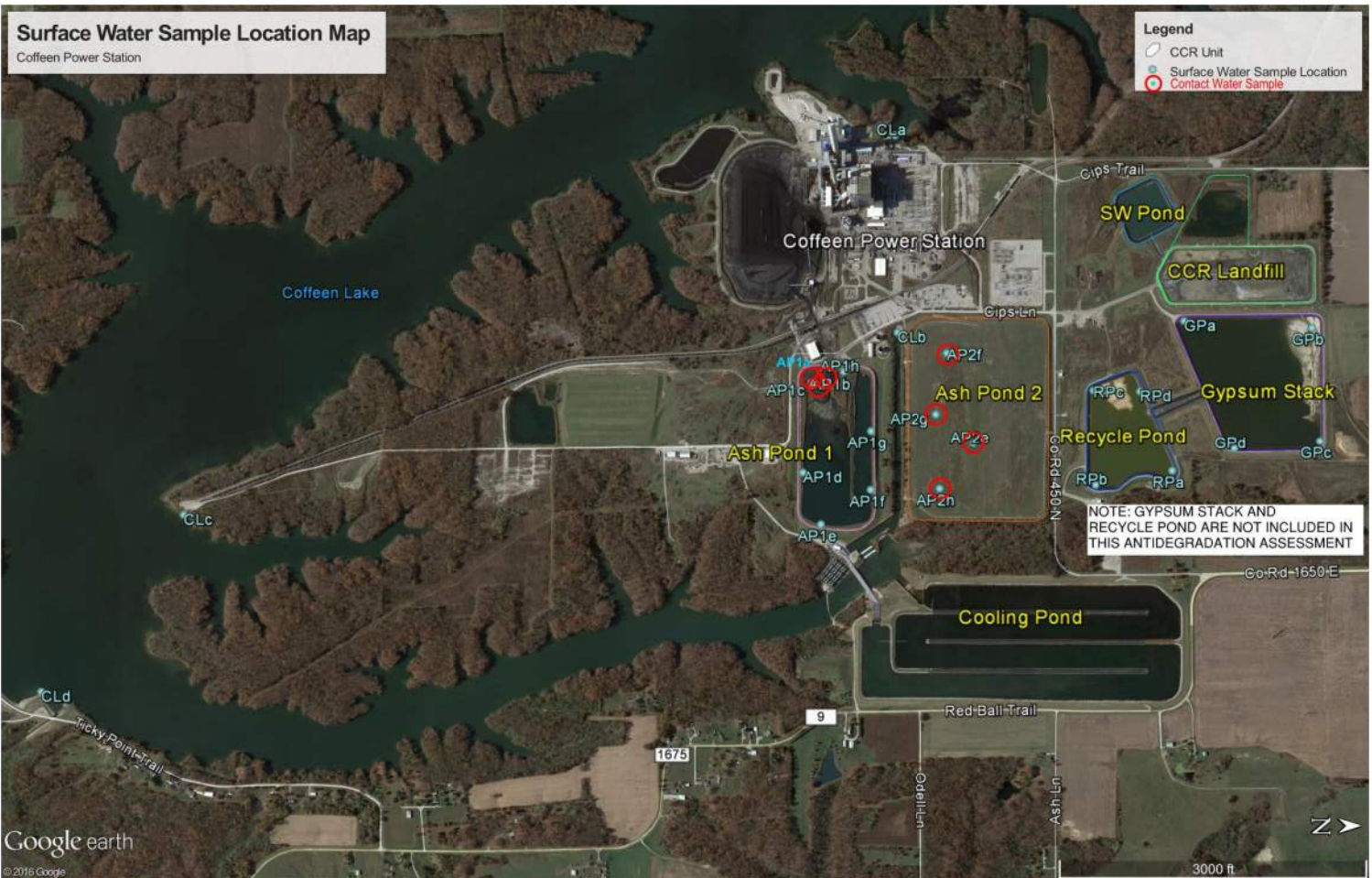
Drilling Start Date: 04/05/2021	Boring Depth (ft): 18
Drilling End Date: 04/05/2021	Boring Diameter (in): 6
Drilling Company: Roberts Drilling	Sampling Method(s): Direct Push
Drilling Method: Direct Push	DTW During Drilling (ft):
Drilling Equipment: Geoprobe	DTW After Drilling (ft):
Driller:	Ground Surface Elev. (ft):
Logged By: A. Toye	Northing, Easting (NAD83):

DEPTH (ft)	LITHOLOGY	WATER LEVEL	BORING COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	MEASURE	ELEVATION (ft)
				Sample Type	Recovery (in)	Blow Counts	N Value RQD (%)		Lab Sample	
0				DP	29/48			(0') 15" of SILT (ML); light gray (10YR 7/2), medium stiff, moist, no plasticity.		
								(1.25') 14" of CLAY (CL); light brownish gray (10YR 6/2), medium stiff, moist, medium plasticity.		
5				DP	18/48			(4') CLAY (CL); brown (7.5YR 5/2), soft, moist, medium plasticity, some silt, trace gravel.		
								(8') As above: more silt.		
10				DP	25/48					
				DP	48/48			(12') SILTY SAND (SM); strong brown (7.5YR 5/8), soft, wet, fine grained, sandier at bottom 6".	Chem (12-16')	
15				DP	24/24			(16') 6" of As above.		
								(16.5') 18" of CLAY (CL); gray (7.5YR 6/1), stiff, dry, trace gravel.		
20								(18') End of Boring: Refusal.		

NOTES: No groundwater encountered.

ATTACHMENT 5
2016 AP2 Porewater Sampling Locations

Figure 1 Site Map



ATTACHMENT 6
Coffeen AP2 Porewater Laboratory Analytical
Data



May 29, 2020

John Romang
Vistra - Coffeen
134 CIPS Lane
Coffeen, IL 62017

RE: COFFEEN DEWATERING

Dear John Romang:

Please find enclosed the **revised** analytical results for the **1** sample(s) the laboratory received on **5/7/20 8:54 am** and logged in under work order **0051246**. All testing is performed according to our current TNI accreditations unless otherwise noted. This report cannot be reproduced, except in full, without the written permission of PDC Laboratories, Inc.

If you have any questions regarding your report, please contact your project manager. Quality and timely data is of the utmost importance to us.

PDC Laboratories, Inc. appreciates the opportunity to provide you with analytical expertise. We are always trying to improve our customer service and we welcome you to contact the Director of Client Services, Lisa Grant, with any feedback you have about your experience with our laboratory at 309-683-1764 or lgrant@pdclab.com.

Sincerely,

Gail Schindler

Gail Schindler
Project Manager
(309) 692-9688 x1716
gschindler@pdclab.com





ANALYTICAL RESULTS

Sample: 0051246-01
Name: CO 102 PumpQbox Source Water CCR
Matrix: Ground Water - Grab

Sampled: 05/06/20 10:40
Received: 05/07/20 08:54
PO #: 663168

Table with 10 columns: Parameter, Result, Unit, Qualifier, Prepared, Dilution, MRL, Analyzed, Analyst, Method. Rows include Anions - PIA (Chloride, Fluoride, Sulfate), General Chemistry - PIA (Alkalinity, pH, Solids, Temperature), Soluble Metals - PIA (Cobalt, Iron, Manganese), and Total Metals - PIA (Antimony, Arsenic, Barium, Boron, Cadmium, Calcium, Cobalt, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Potassium, Selenium, Sodium, Thallium, Lithium).



QC SAMPLE RESULTS

Parameter	Result	Unit	Qual	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<u>Batch B010928 - IC No Prep - EPA 300.0 REV 2.1</u>									
Calibration Blank (B010928-CCB1)				Prepared & Analyzed: 05/07/20					
Chloride	0.00	mg/L							
Fluoride	0.00	mg/L							
Calibration Check (B010928-CCV1)				Prepared & Analyzed: 05/07/20					
Chloride	4.48	mg/L		5.000		90	90-110		
Fluoride	5.01	mg/L		5.000		100	90-110		
<u>Batch B011061 - IC No Prep - EPA 300.0 REV 2.1</u>									
Calibration Blank (B011061-CCB1)				Prepared & Analyzed: 05/08/20					
Sulfate	0.00	mg/L							
Calibration Check (B011061-CCV1)				Prepared & Analyzed: 05/08/20					
Sulfate	4.77	mg/L		5.000		95	90-110		
<u>Batch B011151 - 6020 Sol no prep - EPA 6020A</u>									
Blank (B011151-BLK1)				Prepared: 05/12/20 Analyzed: 05/13/20					
Cobalt	< 2.0	ug/L							
Iron	< 10	ug/L							
Manganese	< 1.0	ug/L							
LCS (B011151-BS1)				Prepared: 05/12/20 Analyzed: 05/13/20					
Cobalt	234	ug/L		250.0		94	80-120		
Iron	23900	ug/L		25000		96	80-120		
Manganese	243	ug/L		250.0		97	80-120		
Matrix Spike (B011151-MS1)				Sample: 0051228-06		Prepared: 05/12/20 Analyzed: 05/13/20			
Cobalt	230	ug/L		250.0	ND	92	75-125		
Iron	23800	ug/L		25000	ND	95	75-125		
Manganese	242	ug/L		250.0	1.60	96	75-125		
Matrix Spike Dup (B011151-MSD1)				Sample: 0051228-06		Prepared: 05/12/20 Analyzed: 05/13/20			
Cobalt	224	ug/L		250.0	ND	89	75-125	3	20
Iron	23100	ug/L		25000	ND	92	75-125	3	20
Manganese	236	ug/L		250.0	1.60	94	75-125	3	20
<u>Batch B011162 - No Prep - SM 2540 D 1997</u>									
Blank (B011162-BLK1)				Prepared & Analyzed: 05/12/20					
Solids - total suspended solids (TSS)	< 4.0	mg/L							
LCS (B011162-BS1)				Prepared & Analyzed: 05/12/20					
Solids - total suspended solids (TSS)	480	mg/L		500.0		96	0-200		
Duplicate (B011162-DUP1)				Sample: 0051312-02		Prepared & Analyzed: 05/12/20			
Solids - total suspended solids (TSS)	3.20	mg/L			2.40			29	5
Duplicate (B011162-DUP2)				Sample: 0051314-02		Prepared & Analyzed: 05/12/20			
Solids - total suspended solids (TSS)	5.60	mg/L			4.80			15	5
<u>Batch B011183 - No Prep - SM 2540C</u>									
Blank (B011183-BLK1)				Prepared & Analyzed: 05/12/20					
Solids - total dissolved solids (TDS)	< 17	mg/L							



QC SAMPLE RESULTS

Parameter	Result	Unit	Qual	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<u>Batch B011183 - No Prep - SM 2540C</u>									
LCS (B011183-BS1)				Prepared & Analyzed: 05/12/20					
Solids - total dissolved solids (TDS)	967	mg/L		1000		97	67.9-132		
Duplicate (B011183-DUP1)				Sample: 0051246-01 Prepared & Analyzed: 05/12/20					
Solids - total dissolved solids (TDS)	2120	mg/L			2120			0	5
Duplicate (B011183-DUP2)				Sample: 0051350-01 Prepared & Analyzed: 05/12/20					
Solids - total dissolved solids (TDS)	2140	mg/L			2210			3	5
<u>Batch B011270 - SW 3015 - EPA 6020A</u>									
Blank (B011270-BLK1)				Prepared: 05/13/20 Analyzed: 05/19/20					
Antimony	< 3.0	ug/L							
Arsenic	< 1.0	ug/L							
Barium	< 1.0	ug/L							
Boron	< 10	ug/L							
Cadmium	< 1.0	ug/L							
Calcium	< 0.20	mg/L							
Cobalt	< 2.0	ug/L							
Iron	< 10	ug/L							
Lead	< 1.0	ug/L							
Magnesium	< 0.10	mg/L							
Manganese	< 1.0	ug/L							
Mercury	< 0.20	ug/L							
Molybdenum	< 1.0	ug/L							
Potassium	< 0.10	mg/L							
Selenium	< 1.0	ug/L							
Sodium	< 0.10	mg/L							
Thallium	< 1.0	ug/L							
Lithium	< 20	ug/L							
LCS (B011270-BS1)				Prepared: 05/13/20 Analyzed: 05/19/20					
Antimony	533	ug/L		555.6		96	80-120		
Arsenic	556	ug/L		555.6		100	80-120		
Barium	557	ug/L		555.6		100	80-120		
Boron	508	ug/L		555.6		91	80-120		
Cadmium	552	ug/L		555.6		99	80-120		
Calcium	5.33	mg/L		5.556		96	80-120		
Cobalt	586	ug/L		555.6		105	80-120		
Iron	577	ug/L		555.6		104	80-120		
Lead	572	ug/L		555.6		103	80-120		
Magnesium	5.48	mg/L		5.556		99	80-120		
Manganese	568	ug/L		555.6		102	80-120		
Mercury	54.8	ug/L		55.56		99	80-120		
Molybdenum	550	ug/L		555.6		99	80-120		
Potassium	5.11	mg/L		5.556		92	80-120		
Selenium	541	ug/L		555.6		97	80-120		
Sodium	5.53	mg/L		5.556		100	80-120		



QC SAMPLE RESULTS

Parameter	Result	Unit	Qual	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<u>Batch B011270 - SW 3015 - EPA 6020A</u>									
LCS (B011270-BS1)				Prepared: 05/13/20 Analyzed: 05/19/20					
Thallium	549	ug/L		555.6		99	80-120		
Lithium	587	ug/L		555.6		106	80-120		
Matrix Spike (B011270-MS1)				Sample: 0051254-01		Prepared: 05/13/20 Analyzed: 05/19/20			
Antimony	539	ug/L		555.6	ND	97	75-125		
Arsenic	578	ug/L		555.6	ND	104	75-125		
Barium	605	ug/L		555.6	20.2	105	75-125		
Boron	499	ug/L		555.6	65.9	78	75-125		
Cadmium	575	ug/L		555.6	ND	103	75-125		
Calcium	118	mg/L	Q4	5.556	114	87	75-125		
Cobalt	584	ug/L		555.6	ND	105	75-125		
Iron	661	ug/L		555.6	39.4	112	75-125		
Lead	573	ug/L		555.6	ND	103	75-125		
Magnesium	75.6	mg/L		5.556	69.2	116	75-125		
Manganese	588	ug/L		555.6	5.24	105	75-125		
Mercury	55.0	ug/L		55.56	ND	99	75-125		
Molybdenum	584	ug/L		555.6	0.261	105	75-125		
Potassium	10.1	mg/L		5.556	4.20	105	75-125		
Selenium	562	ug/L		555.6	ND	101	75-125		
Sodium	9.38	mg/L		5.556	4.03	96	75-125		
Thallium	555	ug/L		555.6	ND	100	75-125		
Matrix Spike Dup (B011270-MSD1)				Sample: 0051254-01		Prepared: 05/13/20 Analyzed: 05/19/20			
Antimony	527	ug/L		555.6	ND	95	75-125	2	20
Arsenic	568	ug/L		555.6	ND	102	75-125	2	20
Barium	585	ug/L		555.6	20.2	102	75-125	3	20
Boron	499	ug/L		555.6	65.9	78	75-125	0.1	20
Cadmium	565	ug/L		555.6	ND	102	75-125	2	20
Calcium	118	mg/L	Q4	5.556	114	69	75-125	0.8	20
Cobalt	570	ug/L		555.6	ND	103	75-125	3	20
Iron	623	ug/L		555.6	39.4	105	75-125	6	20
Lead	570	ug/L		555.6	ND	103	75-125	0.5	20
Magnesium	75.0	mg/L		5.556	69.2	105	75-125	0.8	20
Manganese	579	ug/L		555.6	5.24	103	75-125	1	20
Mercury	55.2	ug/L		55.56	ND	99	75-125	0.3	20
Molybdenum	576	ug/L		555.6	0.261	104	75-125	2	20
Potassium	9.88	mg/L		5.556	4.20	102	75-125	2	20
Selenium	549	ug/L		555.6	ND	99	75-125	2	20
Sodium	9.41	mg/L		5.556	4.03	97	75-125	0.3	20
Thallium	551	ug/L		555.6	ND	99	75-125	0.7	20
<u>Batch B011779 - No Prep - SM 2320B 1997</u>									
Blank (B011779-BLK1)				Prepared & Analyzed: 05/18/20					
Alkalinity - bicarbonate as CaCO3	< 2.0	mg/L							
LCS (B011779-BS1)				Prepared & Analyzed: 05/18/20					



QC SAMPLE RESULTS

Parameter	Result	Unit	Qual	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<u>Batch B011779 - No Prep - SM 2320B 1997</u>									
LCS (B011779-BS1)					Prepared & Analyzed: 05/18/20				
Alkalinity - bicarbonate as CaCO3	80.0	mg/L					90-110		
<u>Batch B012057 - No Prep - SM 2550 B</u>									
Duplicate (B012057-DUP1)					Sample: 0052610-02 Prepared & Analyzed: 05/21/20				
Temperature at pH measurement	14.2	°C			14.4			2	200
pH	7.62	pH Units	H		7.58			0.6	10
Duplicate (B012057-DUP2)					Sample: 0052632-01 Prepared & Analyzed: 05/21/20				
pH	8.17	pH Units	H		8.13			0.5	10
Temperature at pH measurement	14.4	°C			15.2			5	200
Duplicate (B012057-DUP3)					Sample: 0052653-01 Prepared & Analyzed: 05/21/20				
pH	7.53	pH Units	H, M		7.64			1	10
Temperature at pH measurement	15.0	°C	M		15.4			2	200
Duplicate (B012057-DUP4)					Sample: 0052653-02 Prepared & Analyzed: 05/21/20				
pH	8.18	pH Units	H		8.16			0.3	10
Temperature at pH measurement	16.0	°C			15.6			3	200
Duplicate (B012057-DUP5)					Sample: 0052781-02 Prepared & Analyzed: 05/21/20				
pH	8.41	pH Units	H		8.46			0.6	10
Temperature at pH measurement	16.5	°C			16.1			2	200
Duplicate (B012057-DUP6)					Sample: 0052615-01 Prepared & Analyzed: 05/21/20				
pH	7.98	pH Units	H		7.93			0.7	10
Temperature at pH measurement	17.2	°C			17.0			1	200
Duplicate (B012057-DUP7)					Sample: 0053401-01 Prepared & Analyzed: 05/21/20				
Temperature at pH measurement	17.7	°C			17.8			0.2	200
pH	7.73	pH Units	H		7.73			0.03	10
Duplicate (B012057-DUP8)					Sample: 0052828-01 Prepared & Analyzed: 05/21/20				
Temperature at pH measurement	12.5	°C			12.9			3	200
pH	7.20	pH Units	H		7.21			0.2	10



NOTES

Specific method revisions used for analysis are available upon request.

* Not a TNI accredited analyte

Memos

Revised Report - client requested sample name change

Certifications

CHI - McHenry, IL - 4314 W Crystal Lake Road A, McHenry, IL 60050

TNI Accreditation for Drinking Water, Wastewater, Fields of Testing through IL EPA Lab No. 100279

Illinois Department of Public Health Bacteriological Analysis in Drinking Water Approved Laboratory Registry No. 17556

PIA - Peoria, IL - 2231 W Altorfer Drive, Peoria, IL 61615

TNI Accreditation for Drinking Water, Wastewater, Hazardous and Solid Wastes Fields of Testing through IL EPA Lab No. 100230

Illinois Department of Public Health Bacteriological Analysis in Drinking Water Approved Laboratory Registry No. 17553

Drinking Water Certifications: Iowa (240); Kansas (E-10338); Missouri (870)

Wastewater Certifications: Arkansas (88-0677); Iowa (240); Kansas (E-10338)

Hazardous/Solid Waste Certifications: Arkansas (88-0677); Iowa (240); Kansas (E-10338)

SPIL - Springfield, IL - 1210 Capitol Airport Drive, Springfield, IL 62707

TNI Accreditation through IL EPA Lab No. 100323

SPMO - Springfield, MO - 1805 W Sunset Street, Springfield, MO 65807

USEPA DMR-QA Program

STL - St. Louis, MO - 3278 N Highway 67, Florissant, MO 63033

TNI Accreditation for Wastewater, Hazardous and Solid Wastes Fields of Testing through KS Lab No. E-10389

TNI Accreditation for Wastewater, Hazardous, and Solid Waste Analysis through IL EPA No. 200080

Illinois Department of Public Health Bacteriological Analysis in Drinking Water Approved Laboratory Registry No. 171050

Missouri Department of Natural Resources

Microbiological Laboratory Service for Drinking Water

Qualifiers

- H Test performed after the expiration of the appropriate regulatory/advisory maximum allowable hold time.
- M Analyte failed to meet the required acceptance criteria for duplicate analysis.
- Q4 The matrix spike recovery result is unusable since the analyte concentration in the sample is greater than four times the spike level. The associated blank spike was acceptable.

Gail Schindler



Certified by: Gail Schindler, Project Manager



REGULATORY PROGRAM (CIRCLE):	NPDES
MORBCA	RCRA
CCDD	TACO: RES OR IND/COMM

ALL HIGHLIGHTED AREAS MUST BE COMPLETED BY CLIENT (PLEASE PRINT)

1 CLIENT VISTRA - COFFEEN	PROJECT NUMBER GMZ	PROJECT LOCATION	PURCHASE ORDER #	3 ANALYSIS REQUESTED	4 (FOR LAB USE ONLY)
	ADDRESS 134 CIPS LANE	PHONE NUMBER	E-MAIL		
CITY COFFEEN, IL 62017	SAMPLER (PLEASE PRINT) <i>Sam David</i>	MATRIX TYPES: WW- WASTEWATER DW- DRINKING WATER GW- GROUND WATER WWSL- SLUDGE NAS- NON AQUEOUS SOLID LCHT- LEACHATE OIL- OIL SO- SOIL SOL- SOLID		CO*, FE*, FE, MN*, MN, TDS CA, MG, NA, K, ALK HCO3 CN, NO3, PERCHLORATE V, CU, NI, AG, ZN, B, CA, CL F, SO4, PH, SB, AS, BA, CD, CO, PB, MO, SE, TL, LI, HG	LOGIN # 0051246-01 LOGGED BY: <i>DCW</i> CLIENT: VISTRA-COFFEEN PROJECT: COFFEEN SOURCE WATER CCR PROJ. MGR.: GJ SCHINDLER
CONTACT PERSON JOHN ROMANG	SAMPLER'S SIGNATURE <i>John Romang</i>				

2 SAMPLE DESCRIPTION (UNIQUE DESCRIPTION AS IT WILL APPEAR ON THE ANALYTICAL REPORT)	DATE COLLECTED	TIME COLLECTED	SAMPLE TYPE		MATRIX TYPE	BOTTLE COUNT	PRES CODE CLIENT PROVIDED	CO*, FE*, FE, MN*, MN, TDS	CA, MG, NA, K, ALK HCO3	CN, NO3, PERCHLORATE	V, CU, NI, AG, ZN, B, CA, CL	F, SO4, PH, SB, AS, BA, CD,	CO, PB, MO, SE, TL, LI, HG	REMARKS
			GRAB	COMP										
SOURCE WATER CCR SAMPLE	5/6/20	1040	X			7	3, 4, 6	X	X	X	X	X	X	*DISSOLVED <i>Well pump discharge F, B, G on during Sampling</i>

CHEMICAL PRESERVATION CODES: 1 - HCL 2 - H2SO4 3 - HNO3 4 - NAOH 5 - NA2S2O3 6 - UNPRESERVED 7 - OTHER

5 TURNAROUND TIME REQUESTED (PLEASE CIRCLE) NORMAL RUSH RUSH RESULTS VIA (PLEASE CIRCLE) EMAIL PHONE	DATE RESULTS NEEDED	6 I understand that by initialing this box I give the lab permission to proceed with analysis, even though it may not meet all sample conformance requirements as defined in the receiving facility's Sample Acceptance Policy and the data will be qualified. Qualified data may NOT be acceptable to report to all regulatory authorities. PROCEED WITH ANALYSIS AND QUALIFY RESULTS: (INITIALS)
---	---------------------	---

7 RELINQUISHED BY: (SIGNATURE) <i>John Romang</i>	DATE 5/6/20 TIME 1830	RECEIVED BY: (SIGNATURE) <i>Charles Hattell</i>	DATE 5/7/20 TIME 730	8 COMMENTS: (FOR LAB USE ONLY) SAMPLE TEMPERATURE UPON RECEIPT <i>1.6</i> °C CHILL PROCESS STARTED PRIOR TO RECEIPT <i>Y</i> OR N SAMPLE(S) RECEIVED ON ICE <i>Y</i> OR N SAMPLE ACCEPTANCE NONCONFORMANT REPORT IS NEEDED <i>Y</i> OR N DATE AND TIME TAKEN FROM SAMPLE BOTTLE
RELINQUISHED BY: (SIGNATURE) <i>Charles Hattell</i>	DATE 5/7/20 TIME 851	RECEIVED BY: (SIGNATURE)	DATE 5/7/20 TIME 854	
RELINQUISHED BY: (SIGNATURE)	DATE	RECEIVED BY: (SIGNATURE)	DATE	



PDC Laboratories, Inc.

PROFESSIONAL • DEPENDABLE • COMMITTED

November 08, 2016

Rhonald Hasenyager
Hanson Professional Services, Inc.
1525 South Sixth Street
Springfield, IL 62703-2886

Dear Rhonald Hasenyager:

Please find enclosed the analytical results for the sample(s) the laboratory received on **10/25/16 7:45 am** and logged in under work order **6103663**. All testing is performed according to our current TNI certifications unless otherwise noted. This report cannot be reproduced, except in full, without the written permission of PDC Laboratories, Inc.

If you have any questions regarding your report, please contact your project manager. Quality and timely data is of the utmost importance to us.

PDC Laboratories, Inc. appreciates the opportunity to provide you with analytical expertise. We are always trying to improve our customer service and we welcome you to contact the Vice President, John LaPayne with any feedback you have about your experience with our laboratory.

Sincerely,

Gail Schindler
Project Manager
(309) 692-9688 x1716
gschindler@pdclab.com





ANALYTICAL RESULTS

Sample: 6103663-01
Name: AP1a
Matrix: Surface Water - Grab

Sampled: 10/24/16 11:52
Received: 10/25/16 07:45

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
<u>Anions - PIA</u>							
Chloride	3.2	mg/L		10/25/16 11:16	10/25/16 11:16	TAS	EPA 300.0
Fluoride	< 0.250	mg/L		10/25/16 11:16	10/25/16 11:16	TAS	EPA 300.0
Nitrite-N	< 0.15	mg/L		10/25/16 11:16	10/25/16 11:16	TAS	EPA 300.0
Sulfate	1500	mg/L		10/27/16 13:02	10/27/16 13:02	TAS	EPA 300.0
<u>Field - PIA</u>							
pH, Field Measured	6.99	pH Units		10/24/16 11:52	10/24/16 11:52	FIELD	Field*
<u>General Chemistry - PIA</u>							
Alkalinity - bicarbonate as CaCO3	90	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Alkalinity - carbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Solids - total dissolved solids (TDS)	1800	mg/L		10/25/16 14:59	10/25/16 15:33	DMB/ARL	SM 2540C
<u>Total Metals - PIA</u>							
Antimony	3.1	ug/L		10/26/16 13:38	11/02/16 12:10	JMW	SW 6020
Arsenic	7.2	ug/L		10/26/16 13:38	11/01/16 11:23	JMW	SW 6020
Barium	130	ug/L		10/26/16 13:38	11/01/16 11:23	JMW	SW 6020
Beryllium	< 1.0	ug/L		10/26/16 13:38	11/01/16 11:23	JMW	SW 6020
Boron	3800	ug/L		10/26/16 13:38	11/03/16 07:54	JMW	SW 6020
Cadmium	< 1.0	ug/L		10/26/16 13:38	11/01/16 11:23	JMW	SW 6020
Calcium	380	mg/L		10/26/16 13:38	11/01/16 11:23	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 13:38	11/01/16 11:23	JMW	SW 6020
Cobalt	< 2.0	ug/L		10/26/16 13:38	11/01/16 11:23	JMW	SW 6020
Lithium	39	ug/L		10/26/16 13:38	10/27/16 11:24	KJP	SW 6010*
Magnesium	67	mg/L		10/26/16 13:38	11/01/16 11:23	JMW	SW 6020
Mercury	< 0.20	ug/L		10/26/16 13:38	11/01/16 13:53	JMW	SW 6020
Molybdenum	47	ug/L		10/26/16 13:38	11/01/16 11:23	JMW	SW 6020
Potassium	7.3	mg/L		10/26/16 13:38	11/01/16 11:23	JMW	SW 6020
Selenium	3.0	ug/L		10/26/16 13:38	11/01/16 11:23	JMW	SW 6020
Sodium	33	mg/L		10/26/16 13:38	11/01/16 11:23	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 13:38	11/01/16 11:23	JMW	SW 6020



ANALYTICAL RESULTS

Sample: 6103663-02
Name: AP1b
Matrix: Surface Water - Grab

Sampled: 10/24/16 11:56
Received: 10/25/16 07:45

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
<u>Anions - PIA</u>							
Chloride	13	mg/L		10/27/16 13:20	10/27/16 13:20	TAS	EPA 300.0
Nitrite-N	< 0.15	mg/L		10/25/16 12:45	10/25/16 12:45	TAS	EPA 300.0
Sulfate	1300	mg/L		10/27/16 13:38	10/27/16 13:38	TAS	EPA 300.0
<u>Field - PIA</u>							
pH, Field Measured	7.01	pH Units		10/24/16 11:56	10/24/16 11:56	FIELD	Field*
<u>General Chemistry - PIA</u>							
Alkalinity - bicarbonate as CaCO3	120	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Alkalinity - carbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Fluoride	0.977	mg/L		10/27/16 13:26	10/27/16 13:26	TTH	SM 4500-F C
Solids - total dissolved solids (TDS)	1600	mg/L		10/25/16 14:59	10/25/16 15:33	DMB/ARL	SM 2540C
<u>Total Metals - PIA</u>							
Antimony	3.3	ug/L		10/26/16 13:38	11/02/16 12:23	JMW	SW 6020
Arsenic	17	ug/L		10/26/16 13:38	11/01/16 11:36	JMW	SW 6020
Barium	100	ug/L		10/26/16 13:38	11/01/16 11:36	JMW	SW 6020
Beryllium	< 1.0	ug/L		10/26/16 13:38	11/01/16 11:36	JMW	SW 6020
Boron	3100	ug/L		10/26/16 13:38	11/03/16 07:59	JMW	SW 6020
Cadmium	< 1.0	ug/L		10/26/16 13:38	11/01/16 11:36	JMW	SW 6020
Calcium	320	mg/L		10/26/16 13:38	11/01/16 11:36	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 13:38	11/01/16 11:36	JMW	SW 6020
Cobalt	< 2.0	ug/L		10/26/16 13:38	11/01/16 11:36	JMW	SW 6020
Lithium	47	ug/L		10/26/16 13:38	10/27/16 11:33	KJP	SW 6010*
Magnesium	52	mg/L		10/26/16 13:38	11/01/16 11:36	JMW	SW 6020
Mercury	< 0.20	ug/L		10/26/16 13:38	11/01/16 14:06	JMW	SW 6020
Molybdenum	100	ug/L		10/26/16 13:38	11/01/16 11:36	JMW	SW 6020
Potassium	18	mg/L		10/26/16 13:38	11/01/16 11:36	JMW	SW 6020
Selenium	6.9	ug/L		10/26/16 13:38	11/01/16 11:36	JMW	SW 6020
Sodium	53	mg/L		10/26/16 13:38	11/01/16 11:36	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 13:38	11/01/16 11:36	JMW	SW 6020



ANALYTICAL RESULTS

Sample: 6103663-03
Name: AP1c
Matrix: Surface Water - Grab

Sampled: 10/24/16 12:10
Received: 10/25/16 07:45

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
<u>Anions - PIA</u>							
Chloride	13	mg/L		10/27/16 13:55	10/27/16 13:55	TAS	EPA 300.0
Nitrite-N	< 0.15	mg/L		10/25/16 13:21	10/25/16 13:21	TAS	EPA 300.0
Sulfate	1600	mg/L		10/27/16 14:13	10/27/16 14:13	TAS	EPA 300.0
<u>Field - PIA</u>							
pH, Field Measured	7.05	pH Units		10/24/16 12:10	10/24/16 12:10	FIELD	Field*
<u>General Chemistry - PIA</u>							
Alkalinity - bicarbonate as CaCO3	80	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Alkalinity - carbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Fluoride	0.614	mg/L		10/27/16 13:30	10/27/16 13:30	TTH	SM 4500-F C
Solids - total dissolved solids (TDS)	1900	mg/L		10/25/16 14:59	10/25/16 15:33	DMB/ARL	SM 2540C
<u>Total Metals - PIA</u>							
Antimony	< 3.0	ug/L		10/26/16 13:38	11/02/16 12:26	JMW	SW 6020
Arsenic	18	ug/L		10/26/16 13:38	11/01/16 11:39	JMW	SW 6020
Barium	130	ug/L		10/26/16 13:38	11/01/16 11:39	JMW	SW 6020
Beryllium	< 1.0	ug/L		10/26/16 13:38	11/01/16 11:39	JMW	SW 6020
Boron	2900	ug/L		10/26/16 13:38	11/03/16 08:01	JMW	SW 6020
Cadmium	< 1.0	ug/L		10/26/16 13:38	11/01/16 11:39	JMW	SW 6020
Calcium	390	mg/L		10/26/16 13:38	11/01/16 11:39	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 13:38	11/01/16 11:39	JMW	SW 6020
Cobalt	< 2.0	ug/L		10/26/16 13:38	11/01/16 11:39	JMW	SW 6020
Lithium	51	ug/L		10/26/16 13:38	10/27/16 11:36	KJP	SW 6010*
Magnesium	49	mg/L		10/26/16 13:38	11/01/16 11:39	JMW	SW 6020
Mercury	< 0.20	ug/L		10/26/16 13:38	11/01/16 14:10	JMW	SW 6020
Molybdenum	81	ug/L		10/26/16 13:38	11/01/16 11:39	JMW	SW 6020
Potassium	18	mg/L		10/26/16 13:38	11/01/16 11:39	JMW	SW 6020
Selenium	3.1	ug/L		10/26/16 13:38	11/01/16 11:39	JMW	SW 6020
Sodium	59	mg/L		10/26/16 13:38	11/01/16 11:39	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 13:38	11/01/16 11:39	JMW	SW 6020



ANALYTICAL RESULTS

Sample: 6103663-04
Name: AP1d
Matrix: Surface Water - Grab

Sampled: 10/24/16 12:15
Received: 10/25/16 07:45

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
<u>Anions - PIA</u>							
Chloride	18	mg/L		10/27/16 14:31	10/27/16 14:31	TAS	EPA 300.0
Nitrite-N	< 0.15	mg/L		10/25/16 13:57	10/25/16 13:57	TAS	EPA 300.0
Sulfate	1000	mg/L		10/27/16 14:48	10/27/16 14:48	TAS	EPA 300.0
<u>Field - PIA</u>							
pH, Field Measured	7.21	pH Units		10/24/16 12:15	10/24/16 12:15	FIELD	Field*
<u>General Chemistry - PIA</u>							
Alkalinity - bicarbonate as CaCO3	90	mg/L		10/25/16 09:29	10/25/16 09:29	CJN	SM 2320B*
Alkalinity - carbonate as CaCO3	< 20	mg/L		10/25/16 09:29	10/25/16 09:29	CJN	SM 2320B*
Fluoride	1.08	mg/L		10/27/16 13:43	10/27/16 13:43	TTH	SM 4500-F C
Solids - total dissolved solids (TDS)	980	mg/L		10/25/16 14:59	10/25/16 15:33	DMB/ARL	SM 2540C
<u>Total Metals - PIA</u>							
Antimony	< 3.0	ug/L		10/26/16 13:38	11/02/16 12:30	JMW	SW 6020
Arsenic	2.0	ug/L		10/26/16 13:38	11/01/16 11:43	JMW	SW 6020
Barium	200	ug/L		10/26/16 13:38	11/01/16 11:43	JMW	SW 6020
Beryllium	< 1.0	ug/L		10/26/16 13:38	11/01/16 11:43	JMW	SW 6020
Boron	2000	ug/L		10/26/16 13:38	11/03/16 08:02	JMW	SW 6020
Cadmium	< 1.0	ug/L		10/26/16 13:38	11/01/16 11:43	JMW	SW 6020
Calcium	210	mg/L		10/26/16 13:38	11/01/16 11:43	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 13:38	11/01/16 11:43	JMW	SW 6020
Cobalt	< 2.0	ug/L		10/26/16 13:38	11/01/16 11:43	JMW	SW 6020
Lithium	55	ug/L		10/26/16 13:38	10/27/16 11:39	KJP	SW 6010*
Magnesium	35	mg/L		10/26/16 13:38	11/01/16 11:43	JMW	SW 6020
Mercury	< 0.20	ug/L		10/26/16 13:38	11/01/16 14:13	JMW	SW 6020
Molybdenum	31	ug/L		10/26/16 13:38	11/01/16 11:43	JMW	SW 6020
Potassium	26	mg/L		10/26/16 13:38	11/01/16 11:43	JMW	SW 6020
Selenium	1.5	ug/L		10/26/16 13:38	11/01/16 11:43	JMW	SW 6020
Sodium	83	mg/L		10/26/16 13:38	11/01/16 11:43	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 13:38	11/01/16 11:43	JMW	SW 6020



ANALYTICAL RESULTS

Sample: 6103663-05
Name: AP1e
Matrix: Surface Water - Grab

Sampled: 10/24/16 12:01
Received: 10/25/16 07:45

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
<u>Anions - PIA</u>							
Chloride	18	mg/L		10/27/16 18:37	10/27/16 18:37	TAS	EPA 300.0
Fluoride	1.00	mg/L		10/25/16 13:26	10/25/16 13:26	TAS	EPA 300.0
Nitrite-N	< 0.15	mg/L		10/25/16 13:26	10/25/16 13:26	TAS	EPA 300.0
Sulfate	960	mg/L		10/28/16 11:36	10/28/16 11:36	TAS	EPA 300.0
<u>Field - PIA</u>							
pH, Field Measured	7.12	pH Units		10/24/16 12:01	10/24/16 12:01	FIELD	Field*
<u>General Chemistry - PIA</u>							
Alkalinity - bicarbonate as CaCO3	80	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Alkalinity - carbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Solids - total dissolved solids (TDS)	1200	mg/L		10/25/16 14:59	10/25/16 15:33	DMB/ARL	SM 2540C
<u>Total Metals - PIA</u>							
Antimony	< 3.0	ug/L		10/26/16 13:38	11/02/16 12:45	JMW	SW 6020
Arsenic	1.4	ug/L		10/26/16 13:38	11/01/16 11:46	JMW	SW 6020
Barium	160	ug/L		10/26/16 13:38	11/01/16 11:46	JMW	SW 6020
Beryllium	< 1.0	ug/L		10/26/16 13:38	11/01/16 11:46	JMW	SW 6020
Boron	2100	ug/L		10/26/16 13:38	11/03/16 08:03	JMW	SW 6020
Cadmium	< 1.0	ug/L		10/26/16 13:38	11/01/16 11:46	JMW	SW 6020
Calcium	200	mg/L		10/26/16 13:38	11/01/16 11:46	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 13:38	11/01/16 11:46	JMW	SW 6020
Cobalt	< 2.0	ug/L		10/26/16 13:38	11/01/16 11:46	JMW	SW 6020
Lithium	55	ug/L		10/26/16 13:38	10/27/16 11:48	KJP	SW 6010*
Magnesium	34	mg/L		10/26/16 13:38	11/01/16 11:46	JMW	SW 6020
Mercury	< 0.20	ug/L		10/26/16 13:38	11/01/16 14:17	JMW	SW 6020
Molybdenum	30	ug/L		10/26/16 13:38	11/01/16 11:46	JMW	SW 6020
Potassium	26	mg/L		10/26/16 13:38	11/01/16 11:46	JMW	SW 6020
Selenium	1.2	ug/L		10/26/16 13:38	11/01/16 11:46	JMW	SW 6020
Sodium	80	mg/L		10/26/16 13:38	11/01/16 11:46	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 13:38	11/01/16 11:46	JMW	SW 6020



ANALYTICAL RESULTS

Sample: 6103663-06
Name: AP1f
Matrix: Surface Water - Grab

Sampled: 10/24/16 12:40
Received: 10/25/16 07:45

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
<u>Anions - PIA</u>							
Chloride	17	mg/L		10/27/16 15:06	10/27/16 15:06	TAS	EPA 300.0
Fluoride	1.00	mg/L		10/25/16 14:03	10/25/16 14:03	TAS	EPA 300.0
Nitrite-N	< 0.15	mg/L		10/25/16 14:03	10/25/16 14:03	TAS	EPA 300.0
Sulfate	1000	mg/L		10/27/16 15:23	10/27/16 15:23	TAS	EPA 300.0
<u>Field - PIA</u>							
pH, Field Measured	7.20	pH Units		10/24/16 12:40	10/24/16 12:40	FIELD	Field*
<u>General Chemistry - PIA</u>							
Alkalinity - bicarbonate as CaCO3	110	mg/L		10/25/16 09:29	10/25/16 09:29	CJN	SM 2320B*
Alkalinity - carbonate as CaCO3	< 20	mg/L		10/25/16 09:29	10/25/16 09:29	CJN	SM 2320B*
Solids - total dissolved solids (TDS)	1200	mg/L		10/25/16 14:59	10/25/16 15:33	DMB/ARL	SM 2540C
<u>Total Metals - PIA</u>							
Antimony	< 3.0	ug/L		10/26/16 13:38	11/02/16 12:48	JMW	SW 6020
Arsenic	1.5	ug/L		10/26/16 13:38	11/01/16 11:50	JMW	SW 6020
Barium	150	ug/L		10/26/16 13:38	11/01/16 11:50	JMW	SW 6020
Beryllium	< 1.0	ug/L		10/26/16 13:38	11/01/16 11:50	JMW	SW 6020
Boron	2100	ug/L		10/26/16 13:38	11/03/16 08:13	JMW	SW 6020
Cadmium	< 1.0	ug/L		10/26/16 13:38	11/01/16 11:50	JMW	SW 6020
Calcium	200	mg/L		10/26/16 13:38	11/01/16 11:50	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 13:38	11/01/16 11:50	JMW	SW 6020
Cobalt	< 2.0	ug/L		10/26/16 13:38	11/01/16 11:50	JMW	SW 6020
Lithium	57	ug/L		10/26/16 13:38	10/27/16 11:51	KJP	SW 6010*
Magnesium	35	mg/L		10/26/16 13:38	11/01/16 11:50	JMW	SW 6020
Mercury	< 0.20	ug/L		10/26/16 13:38	11/01/16 14:21	JMW	SW 6020
Molybdenum	31	ug/L		10/26/16 13:38	11/01/16 11:50	JMW	SW 6020
Potassium	26	mg/L		10/26/16 13:38	11/01/16 11:50	JMW	SW 6020
Selenium	1.2	ug/L		10/26/16 13:38	11/01/16 11:50	JMW	SW 6020
Sodium	82	mg/L		10/26/16 13:38	11/01/16 11:50	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 13:38	11/01/16 11:50	JMW	SW 6020



ANALYTICAL RESULTS

Sample: 6103663-07
Name: AP1g
Matrix: Surface Water - Grab

Sampled: 10/24/16 12:50
Received: 10/25/16 07:45

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
<u>Anions - PIA</u>							
Chloride	17	mg/L		10/27/16 15:41	10/27/16 15:41	TAS	EPA 300.0
Fluoride	1.00	mg/L		10/25/16 15:34	10/25/16 15:34	TAS	EPA 300.0
Nitrite-N	< 0.15	mg/L		10/25/16 15:34	10/25/16 15:34	TAS	EPA 300.0
Sulfate	970	mg/L		10/28/16 11:54	10/28/16 11:54	TAS	EPA 300.0
<u>Field - PIA</u>							
pH, Field Measured	7.21	pH Units		10/24/16 12:50	10/24/16 12:50	FIELD	Field*
<u>General Chemistry - PIA</u>							
Alkalinity - bicarbonate as CaCO3	75	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Alkalinity - carbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Solids - total dissolved solids (TDS)	1200	mg/L		10/25/16 14:59	10/25/16 15:33	DMB/ARL	SM 2540C
<u>Total Metals - PIA</u>							
Antimony	< 3.0	ug/L		10/26/16 13:38	11/02/16 12:52	JMW	SW 6020
Arsenic	1.3	ug/L		10/26/16 13:38	11/01/16 12:09	JMW	SW 6020
Barium	140	ug/L		10/26/16 13:38	11/01/16 14:37	JMW	SW 6020
Beryllium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:09	JMW	SW 6020
Boron	2100	ug/L		10/26/16 13:38	11/03/16 08:16	JMW	SW 6020
Cadmium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:09	JMW	SW 6020
Calcium	210	mg/L		10/26/16 13:38	11/02/16 12:52	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 13:38	11/01/16 14:37	JMW	SW 6020
Cobalt	< 2.0	ug/L		10/26/16 13:38	11/02/16 12:52	JMW	SW 6020
Lithium	56	ug/L		10/26/16 13:38	10/27/16 11:54	KJP	SW 6010*
Magnesium	32	mg/L		10/26/16 13:38	11/01/16 14:37	JMW	SW 6020
Mercury	< 0.20	ug/L		10/26/16 13:38	11/01/16 14:37	JMW	SW 6020
Molybdenum	29	ug/L		10/26/16 13:38	11/01/16 12:09	JMW	SW 6020
Potassium	26	mg/L		10/26/16 13:38	11/01/16 12:09	JMW	SW 6020
Selenium	1.4	ug/L		10/26/16 13:38	11/01/16 12:09	JMW	SW 6020
Sodium	100	mg/L		10/26/16 13:38	11/02/16 12:52	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:09	JMW	SW 6020



ANALYTICAL RESULTS

Sample: 6103663-08
Name: AP1h
Matrix: Surface Water - Grab

Sampled: 10/24/16 12:55
Received: 10/25/16 07:45

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
<u>Anions - PIA</u>							
Chloride	17	mg/L		10/27/16 16:51	10/27/16 16:51	TAS	EPA 300.0
Fluoride	0.980	mg/L		10/25/16 16:11	10/25/16 16:11	TAS	EPA 300.0
Nitrite-N	< 0.15	mg/L		10/25/16 16:11	10/25/16 16:11	TAS	EPA 300.0
Sulfate	1000	mg/L		10/28/16 12:12	10/28/16 12:12	TAS	EPA 300.0
<u>Field - PIA</u>							
pH, Field Measured	7.41	pH Units		10/24/16 12:55	10/24/16 12:55	FIELD	Field*
<u>General Chemistry - PIA</u>							
Alkalinity - bicarbonate as CaCO3	90	mg/L		10/25/16 09:29	10/25/16 09:29	CJN	SM 2320B*
Alkalinity - carbonate as CaCO3	< 20	mg/L		10/25/16 09:29	10/25/16 09:29	CJN	SM 2320B*
Solids - total dissolved solids (TDS)	1200	mg/L		10/25/16 14:59	10/25/16 15:33	DMB/ARL	SM 2540C
<u>Total Metals - PIA</u>							
Antimony	< 3.0	ug/L		10/26/16 13:38	11/02/16 12:55	JMW	SW 6020
Arsenic	1.5	ug/L		10/26/16 13:38	11/01/16 12:12	JMW	SW 6020
Barium	180	ug/L		10/26/16 13:38	11/01/16 14:40	JMW	SW 6020
Beryllium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:12	JMW	SW 6020
Boron	2200	ug/L		10/26/16 13:38	11/03/16 08:18	JMW	SW 6020
Cadmium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:12	JMW	SW 6020
Calcium	230	mg/L		10/26/16 13:38	11/02/16 12:55	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 13:38	11/01/16 14:40	JMW	SW 6020
Cobalt	< 2.0	ug/L		10/26/16 13:38	11/02/16 12:55	JMW	SW 6020
Lithium	55	ug/L		10/26/16 13:38	10/27/16 11:57	KJP	SW 6010*
Magnesium	30	mg/L		10/26/16 13:38	11/01/16 14:40	JMW	SW 6020
Mercury	< 0.20	ug/L		10/26/16 13:38	11/01/16 14:40	JMW	SW 6020
Molybdenum	31	ug/L		10/26/16 13:38	11/01/16 12:12	JMW	SW 6020
Potassium	27	mg/L		10/26/16 13:38	11/01/16 12:12	JMW	SW 6020
Selenium	1.2	ug/L		10/26/16 13:38	11/01/16 12:12	JMW	SW 6020
Sodium	110	mg/L		10/26/16 13:38	11/02/16 12:55	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:12	JMW	SW 6020



ANALYTICAL RESULTS

Sample: 6103663-09
Name: AP2e
Matrix: Surface Water - Grab

Sampled: 10/24/16 11:30
Received: 10/25/16 07:45

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
<u>Anions - PIA</u>							
Chloride	< 5.0	mg/L		10/27/16 17:27	10/27/16 17:27	TAS	EPA 300.0
Nitrite-N	< 0.15	mg/L		10/25/16 14:33	10/25/16 14:33	TAS	EPA 300.0
Sulfate	1500	mg/L		10/28/16 12:31	10/28/16 12:31	TAS	EPA 300.0
<u>Field - PIA</u>							
pH, Field Measured	6.49	pH Units		10/24/16 11:30	10/24/16 11:30	FIELD	Field*
<u>General Chemistry - PIA</u>							
Alkalinity - bicarbonate as CaCO3	55	mg/L		10/25/16 09:29	10/25/16 09:29	CJN	SM 2320B*
Alkalinity - carbonate as CaCO3	< 20	mg/L		10/25/16 09:29	10/25/16 09:29	CJN	SM 2320B*
Fluoride	0.438	mg/L		10/27/16 13:58	10/27/16 13:58	TTH	SM 4500-F C
Solids - total dissolved solids (TDS)	1700	mg/L		10/25/16 14:59	10/25/16 15:33	DMB/ARL	SM 2540C
<u>Total Metals - PIA</u>							
Antimony	< 3.0	ug/L		10/26/16 13:38	11/02/16 12:59	JMW	SW 6020
Arsenic	23	ug/L		10/26/16 13:38	11/01/16 12:16	JMW	SW 6020
Barium	26	ug/L		10/26/16 13:38	11/01/16 14:44	JMW	SW 6020
Beryllium	< 1.0	ug/L		10/26/16 13:38	11/02/16 12:59	JMW	SW 6020
Boron	5300	ug/L		10/26/16 13:38	11/03/16 08:19	JMW	SW 6020
Cadmium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:16	JMW	SW 6020
Calcium	210	mg/L		10/26/16 13:38	11/02/16 12:59	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 13:38	11/01/16 14:44	JMW	SW 6020
Cobalt	< 2.0	ug/L		10/26/16 13:38	11/02/16 12:59	JMW	SW 6020
Lithium	190	ug/L		10/26/16 13:38	10/27/16 12:00	KJP	SW 6010*
Magnesium	40	mg/L		10/26/16 13:38	11/01/16 14:44	JMW	SW 6020
Mercury	< 0.20	ug/L		10/26/16 13:38	11/01/16 14:44	JMW	SW 6020
Molybdenum	90	ug/L		10/26/16 13:38	11/01/16 12:16	JMW	SW 6020
Potassium	27	mg/L		10/26/16 13:38	11/01/16 12:16	JMW	SW 6020
Selenium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:16	JMW	SW 6020
Sodium	25	mg/L		10/26/16 13:38	11/02/16 12:59	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:16	JMW	SW 6020



ANALYTICAL RESULTS

Sample: 6103663-10
Name: AP2f
Matrix: Surface Water - Grab

Sampled: 10/24/16 11:20
Received: 10/25/16 07:45

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
<u>Anions - PIA</u>							
Chloride	< 5.0	mg/L		10/27/16 18:02	10/27/16 18:02	TAS	EPA 300.0
Nitrite-N	< 0.15	mg/L		10/25/16 15:09	10/25/16 15:09	TAS	EPA 300.0
Sulfate	1500	mg/L		10/28/16 12:49	10/28/16 12:49	TAS	EPA 300.0
<u>Field - PIA</u>							
pH, Field Measured	6.42	pH Units		10/24/16 11:20	10/24/16 11:20	FIELD	Field*
<u>General Chemistry - PIA</u>							
Alkalinity - bicarbonate as CaCO3	100	mg/L		10/25/16 09:29	10/25/16 09:29	CJN	SM 2320B*
Alkalinity - carbonate as CaCO3	< 20	mg/L		10/25/16 09:29	10/25/16 09:29	CJN	SM 2320B*
Fluoride	0.398	mg/L		10/27/16 14:02	10/27/16 14:02	TTH	SM 4500-F C
Solids - total dissolved solids (TDS)	1700	mg/L		10/25/16 14:59	10/25/16 15:33	DMB/ARL	SM 2540C
<u>Total Metals - PIA</u>							
Antimony	< 3.0	ug/L		10/26/16 13:38	11/02/16 13:03	JMW	SW 6020
Arsenic	1.2	ug/L		10/26/16 13:38	11/01/16 12:20	JMW	SW 6020
Barium	22	ug/L		10/26/16 13:38	11/01/16 14:47	JMW	SW 6020
Beryllium	< 2.0	ug/L		10/26/16 13:38	11/02/16 13:54	JMW	SW 6020
Boron	2000	ug/L		10/26/16 13:38	11/03/16 08:20	JMW	SW 6020
Cadmium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:20	JMW	SW 6020
Calcium	170	mg/L		10/26/16 13:38	11/02/16 13:54	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 13:38	11/01/16 14:47	JMW	SW 6020
Cobalt	< 2.0	ug/L		10/26/16 13:38	11/02/16 13:03	JMW	SW 6020
Lithium	130	ug/L		10/26/16 13:38	10/27/16 12:03	KJP	SW 6010*
Magnesium	33	mg/L		10/26/16 13:38	11/01/16 14:47	JMW	SW 6020
Mercury	< 0.20	ug/L		10/26/16 13:38	11/01/16 14:47	JMW	SW 6020
Molybdenum	3.2	ug/L		10/26/16 13:38	11/01/16 12:20	JMW	SW 6020
Potassium	21	mg/L		10/26/16 13:38	11/01/16 12:20	JMW	SW 6020
Selenium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:20	JMW	SW 6020
Sodium	14	mg/L		10/26/16 13:38	11/02/16 13:03	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:20	JMW	SW 6020



ANALYTICAL RESULTS

Sample: 6103663-11
Name: AP2g
Matrix: Surface Water - Grab

Sampled: 10/24/16 11:10
Received: 10/25/16 07:45

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
<u>Anions - PIA</u>							
Chloride	< 5.0	mg/L		10/27/16 19:12	10/27/16 19:12	TAS	EPA 300.0
Nitrite-N	< 0.15	mg/L		10/25/16 16:20	10/25/16 16:20	TAS	EPA 300.0
Sulfate	2300	mg/L		10/28/16 13:07	10/28/16 13:07	TAS	EPA 300.0
<u>Field - PIA</u>							
pH, Field Measured	6.46	pH Units		10/24/16 11:10	10/24/16 11:10	FIELD	Field*
<u>General Chemistry - PIA</u>							
Alkalinity - bicarbonate as CaCO3	4.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Alkalinity - carbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Fluoride	0.506	mg/L		10/27/16 14:07	10/27/16 14:07	TTH	SM 4500-F C
Solids - total dissolved solids (TDS)	2400	mg/L		10/25/16 14:59	10/25/16 15:33	DMB/ARL	SM 2540C
<u>Total Metals - PIA</u>							
Antimony	< 3.0	ug/L		10/26/16 13:38	11/02/16 13:06	JMW	SW 6020
Arsenic	5.5	ug/L		10/26/16 13:38	11/01/16 12:23	JMW	SW 6020
Barium	20	ug/L		10/26/16 13:38	11/01/16 14:51	JMW	SW 6020
Beryllium	< 2.0	ug/L		10/26/16 13:38	11/02/16 13:57	JMW	SW 6020
Boron	4300	ug/L		10/26/16 13:38	11/03/16 08:22	JMW	SW 6020
Cadmium	4.6	ug/L		10/26/16 13:38	11/01/16 12:23	JMW	SW 6020
Calcium	410	mg/L		10/26/16 13:38	11/02/16 13:57	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 13:38	11/01/16 14:51	JMW	SW 6020
Cobalt	< 2.0	ug/L		10/26/16 13:38	11/02/16 13:06	JMW	SW 6020
Lithium	180	ug/L		10/26/16 13:38	10/27/16 12:06	KJP	SW 6010*
Magnesium	51	mg/L		10/26/16 13:38	11/01/16 14:51	JMW	SW 6020
Mercury	< 0.20	ug/L		10/26/16 13:38	11/01/16 14:51	JMW	SW 6020
Molybdenum	41	ug/L		10/26/16 13:38	11/01/16 12:23	JMW	SW 6020
Potassium	29	mg/L		10/26/16 13:38	11/01/16 12:23	JMW	SW 6020
Selenium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:23	JMW	SW 6020
Sodium	27	mg/L		10/26/16 13:38	11/02/16 13:06	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:23	JMW	SW 6020



ANALYTICAL RESULTS

Sample: 6103663-12
Name: AP2h
Matrix: Surface Water - Grab

Sampled: 10/24/16 11:40
Received: 10/25/16 07:45

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
<u>Anions - PIA</u>							
Chloride	1.7	mg/L		10/25/16 16:56	10/25/16 16:56	TAS	EPA 300.0
Fluoride	0.406	mg/L		10/25/16 16:56	10/25/16 16:56	TAS	EPA 300.0
Nitrite-N	< 0.15	mg/L		10/25/16 16:56	10/25/16 16:56	TAS	EPA 300.0
Sulfate	1300	mg/L		10/28/16 14:57	10/28/16 14:57	TAS	EPA 300.0
<u>Field - PIA</u>							
pH, Field Measured	7.17	pH Units		10/24/16 11:40	10/24/16 11:40	FIELD	Field*
<u>General Chemistry - PIA</u>							
Alkalinity - bicarbonate as CaCO3	140	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Alkalinity - carbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Solids - total dissolved solids (TDS)	1500	mg/L		10/25/16 14:59	10/25/16 15:33	DMB/ARL	SM 2540C
<u>Total Metals - PIA</u>							
Antimony	< 3.0	ug/L		10/26/16 13:38	11/02/16 13:10	JMW	SW 6020
Arsenic	75	ug/L		10/26/16 13:38	11/01/16 12:27	JMW	SW 6020
Barium	23	ug/L		10/26/16 13:38	11/01/16 14:55	JMW	SW 6020
Beryllium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:27	JMW	SW 6020
Boron	14000	ug/L		10/26/16 13:38	11/03/16 08:23	JMW	SW 6020
Cadmium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:27	JMW	SW 6020
Calcium	310	mg/L		10/26/16 13:38	11/02/16 13:10	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 13:38	11/01/16 14:55	JMW	SW 6020
Cobalt	< 2.0	ug/L		10/26/16 13:38	11/02/16 13:10	JMW	SW 6020
Lithium	120	ug/L		10/26/16 13:38	10/27/16 12:09	KJP	SW 6010*
Magnesium	29	mg/L		10/26/16 13:38	11/01/16 14:55	JMW	SW 6020
Mercury	< 0.20	ug/L		10/26/16 13:38	11/01/16 14:55	JMW	SW 6020
Molybdenum	570	ug/L		10/26/16 13:38	11/01/16 12:27	JMW	SW 6020
Potassium	40	mg/L		10/26/16 13:38	11/03/16 08:23	JMW	SW 6020
Selenium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:27	JMW	SW 6020
Sodium	39	mg/L		10/26/16 13:38	11/02/16 13:10	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:27	JMW	SW 6020



ANALYTICAL RESULTS

Sample: 6103663-13
Name: CLa
Matrix: Surface Water - Grab

Sampled: 10/24/16 15:30
Received: 10/25/16 07:45

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
<u>Anions - PIA</u>							
Chloride	23	mg/L		10/27/16 20:41	10/27/16 20:41	TAS	EPA 300.0
Fluoride	0.443	mg/L		10/25/16 17:32	10/25/16 17:32	TAS	EPA 300.0
Nitrite-N	< 0.15	mg/L		10/25/16 17:32	10/25/16 17:32	TAS	EPA 300.0
Sulfate	55	mg/L		10/25/16 17:50	10/25/16 17:50	TAS	EPA 300.0
<u>Field - PIA</u>							
pH, Field Measured	7.22	pH Units		10/24/16 15:30	10/24/16 15:30	FIELD	Field*
<u>General Chemistry - PIA</u>							
Alkalinity - bicarbonate as CaCO3	80	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Alkalinity - carbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Solids - total dissolved solids (TDS)	190	mg/L		10/25/16 14:59	10/25/16 15:33	DMB/ARL	SM 2540C
<u>Total Metals - PIA</u>							
Antimony	< 3.0	ug/L		10/26/16 13:38	11/02/16 13:14	JMW	SW 6020
Arsenic	1.8	ug/L		10/26/16 13:38	11/01/16 12:30	JMW	SW 6020
Barium	54	ug/L		10/26/16 13:38	11/01/16 14:58	JMW	SW 6020
Beryllium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:30	JMW	SW 6020
Boron	270	ug/L		10/26/16 13:38	11/03/16 08:24	JMW	SW 6020
Cadmium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:30	JMW	SW 6020
Calcium	23	mg/L		10/26/16 13:38	11/02/16 13:14	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 13:38	11/01/16 14:58	JMW	SW 6020
Cobalt	< 2.0	ug/L		10/26/16 13:38	11/02/16 13:14	JMW	SW 6020
Lithium	< 10	ug/L		10/26/16 13:38	10/27/16 12:12	KJP	SW 6010*
Magnesium	12	mg/L		10/26/16 13:38	11/01/16 14:58	JMW	SW 6020
Mercury	< 0.20	ug/L		10/26/16 13:38	11/01/16 14:58	JMW	SW 6020
Molybdenum	5.0	ug/L		10/26/16 13:38	11/01/16 12:30	JMW	SW 6020
Potassium	7.4	mg/L		10/26/16 13:38	11/01/16 12:30	JMW	SW 6020
Selenium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:30	JMW	SW 6020
Sodium	19	mg/L		10/26/16 13:38	11/02/16 13:14	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:30	JMW	SW 6020



ANALYTICAL RESULTS

Sample: 6103663-14
Name: CLb
Matrix: Surface Water - Grab

Sampled: 10/24/16 13:35
Received: 10/25/16 07:45

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
<u>Anions - PIA</u>							
Chloride	22	mg/L		10/27/16 20:58	10/27/16 20:58	TAS	EPA 300.0
Fluoride	0.425	mg/L		10/25/16 18:08	10/25/16 18:08	TAS	EPA 300.0
Nitrite-N	< 0.15	mg/L		10/25/16 18:08	10/25/16 18:08	TAS	EPA 300.0
Sulfate	56	mg/L		10/25/16 18:26	10/25/16 18:26	TAS	EPA 300.0
<u>Field - PIA</u>							
pH, Field Measured	7.52	pH Units		10/24/16 13:35	10/24/16 13:35	FIELD	Field*
<u>General Chemistry - PIA</u>							
Alkalinity - bicarbonate as CaCO3	80	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Alkalinity - carbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Solids - total dissolved solids (TDS)	180	mg/L		10/25/16 14:59	10/25/16 15:33	DMB/ARL	SM 2540C
<u>Total Metals - PIA</u>							
Antimony	< 3.0	ug/L		10/26/16 13:38	11/02/16 13:17	JMW	SW 6020
Arsenic	1.8	ug/L		10/26/16 13:38	11/01/16 12:34	JMW	SW 6020
Barium	52	ug/L		10/26/16 13:38	11/01/16 15:02	JMW	SW 6020
Beryllium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:34	JMW	SW 6020
Boron	280	ug/L		10/26/16 13:38	11/03/16 08:26	JMW	SW 6020
Cadmium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:34	JMW	SW 6020
Calcium	23	mg/L		10/26/16 13:38	11/02/16 13:17	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 13:38	11/01/16 15:02	JMW	SW 6020
Cobalt	< 2.0	ug/L		10/26/16 13:38	11/02/16 13:17	JMW	SW 6020
Lithium	< 10	ug/L		10/26/16 13:38	10/27/16 12:15	KJP	SW 6010*
Magnesium	11	mg/L		10/26/16 13:38	11/01/16 15:02	JMW	SW 6020
Mercury	< 0.20	ug/L		10/26/16 13:38	11/01/16 15:02	JMW	SW 6020
Molybdenum	4.9	ug/L		10/26/16 13:38	11/01/16 12:34	JMW	SW 6020
Potassium	7.8	mg/L		10/26/16 13:38	11/01/16 12:34	JMW	SW 6020
Selenium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:34	JMW	SW 6020
Sodium	19	mg/L		10/26/16 13:38	11/02/16 13:17	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:34	JMW	SW 6020



ANALYTICAL RESULTS

Sample: 6103663-15
Name: CLc
Matrix: Surface Water - Grab

Sampled: 10/24/16 13:15
Received: 10/25/16 07:45

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
<u>Anions - PIA</u>							
Chloride	22	mg/L		10/27/16 21:16	10/27/16 21:16	TAS	EPA 300.0
Fluoride	0.426	mg/L		10/25/16 18:43	10/25/16 18:43	TAS	EPA 300.0
Nitrite-N	< 0.15	mg/L		10/25/16 18:43	10/25/16 18:43	TAS	EPA 300.0
Sulfate	54	mg/L		10/25/16 19:01	10/25/16 19:01	TAS	EPA 300.0
<u>Field - PIA</u>							
pH, Field Measured	7.62	pH Units		10/24/16 13:15	10/24/16 13:15	FIELD	Field*
<u>General Chemistry - PIA</u>							
Alkalinity - bicarbonate as CaCO3	75	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Alkalinity - carbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Solids - total dissolved solids (TDS)	160	mg/L		10/25/16 14:59	10/25/16 15:33	DMB/ARL	SM 2540C
<u>Total Metals - PIA</u>							
Antimony	< 3.0	ug/L		10/26/16 13:38	11/02/16 13:29	JMW	SW 6020
Arsenic	1.8	ug/L		10/26/16 13:38	11/01/16 12:38	JMW	SW 6020
Barium	56	ug/L		10/26/16 13:38	11/01/16 15:05	JMW	SW 6020
Beryllium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:38	JMW	SW 6020
Boron	280	ug/L		10/26/16 13:38	11/03/16 08:27	JMW	SW 6020
Cadmium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:38	JMW	SW 6020
Calcium	23	mg/L		10/26/16 13:38	11/02/16 13:29	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 13:38	11/01/16 15:05	JMW	SW 6020
Cobalt	< 2.0	ug/L		10/26/16 13:38	11/02/16 13:29	JMW	SW 6020
Lithium	< 10	ug/L		10/26/16 13:38	10/27/16 12:24	KJP	SW 6010*
Magnesium	12	mg/L		10/26/16 13:38	11/01/16 15:05	JMW	SW 6020
Mercury	< 0.20	ug/L		10/26/16 13:38	11/01/16 15:05	JMW	SW 6020
Molybdenum	4.7	ug/L		10/26/16 13:38	11/01/16 12:38	JMW	SW 6020
Potassium	7.4	mg/L		10/26/16 13:38	11/01/16 12:38	JMW	SW 6020
Selenium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:38	JMW	SW 6020
Sodium	19	mg/L		10/26/16 13:38	11/02/16 13:29	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:38	JMW	SW 6020



ANALYTICAL RESULTS

Sample: 6103663-16
Name: CLd
Matrix: Surface Water - Grab

Sampled: 10/24/16 15:55
Received: 10/25/16 07:45

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
<u>Anions - PIA</u>							
Chloride	23	mg/L		10/27/16 21:34	10/27/16 21:34	TAS	EPA 300.0
Fluoride	0.421	mg/L		10/25/16 19:55	10/25/16 19:55	TAS	EPA 300.0
Nitrite-N	< 0.15	mg/L		10/25/16 19:55	10/25/16 19:55	TAS	EPA 300.0
Sulfate	54	mg/L		10/25/16 20:13	10/25/16 20:13	TAS	EPA 300.0
<u>Field - PIA</u>							
pH, Field Measured	7.30	pH Units		10/24/16 15:55	10/24/16 15:55	FIELD	Field*
<u>General Chemistry - PIA</u>							
Alkalinity - bicarbonate as CaCO3	80	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Alkalinity - carbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Solids - total dissolved solids (TDS)	170	mg/L		10/25/16 14:59	10/25/16 15:33	DMB/ARL	SM 2540C
<u>Total Metals - PIA</u>							
Antimony	< 3.0	ug/L		10/26/16 13:38	11/02/16 13:32	JMW	SW 6020
Arsenic	1.8	ug/L		10/26/16 13:38	11/01/16 12:41	JMW	SW 6020
Barium	54	ug/L		10/26/16 13:38	11/01/16 15:09	JMW	SW 6020
Beryllium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:41	JMW	SW 6020
Boron	270	ug/L		10/26/16 13:38	11/03/16 08:41	JMW	SW 6020
Cadmium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:41	JMW	SW 6020
Calcium	23	mg/L		10/26/16 13:38	11/02/16 13:32	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 13:38	11/01/16 15:09	JMW	SW 6020
Cobalt	< 2.0	ug/L		10/26/16 13:38	11/02/16 13:32	JMW	SW 6020
Lithium	< 10	ug/L		10/26/16 13:38	10/27/16 12:27	KJP	SW 6010*
Magnesium	12	mg/L		10/26/16 13:38	11/01/16 15:09	JMW	SW 6020
Mercury	< 0.20	ug/L		10/26/16 13:38	11/01/16 15:09	JMW	SW 6020
Molybdenum	4.8	ug/L		10/26/16 13:38	11/01/16 12:41	JMW	SW 6020
Potassium	7.5	mg/L		10/26/16 13:38	11/01/16 12:41	JMW	SW 6020
Selenium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:41	JMW	SW 6020
Sodium	20	mg/L		10/26/16 13:38	11/02/16 13:32	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:41	JMW	SW 6020



ANALYTICAL RESULTS

Sample: 6103663-17
Name: GPa
Matrix: Surface Water - Grab

Sampled: 10/24/16 14:00
Received: 10/25/16 07:45

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
<u>Anions - PIA</u>							
Chloride	1900	mg/L		10/27/16 21:51	10/27/16 21:51	TAS	EPA 300.0
Nitrite-N	< 3.0	mg/L		10/26/16 11:42	10/26/16 11:42	TAS	EPA 300.0
Sulfate	17000	mg/L		11/01/16 09:58	11/01/16 09:58	TAS	EPA 300.0
<u>Field - PIA</u>							
pH, Field Measured	7.16	pH Units		10/24/16 14:00	10/24/16 14:00	FIELD	Field*
<u>General Chemistry - PIA</u>							
Alkalinity - bicarbonate as CaCO3	4.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Alkalinity - carbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Fluoride	42.7	mg/L		10/27/16 17:31	10/27/16 17:31	TTH	SM 4500-F C
Solids - total dissolved solids (TDS)	17000	mg/L		10/27/16 12:04	10/27/16 12:28	ARL	SM 2540C
<u>Total Metals - PIA</u>							
Antimony	< 3.0	ug/L		10/26/16 13:38	11/02/16 13:36	JMW	SW 6020
Arsenic	4.7	ug/L		10/26/16 13:38	11/02/16 15:00	JMW	SW 6020
Barium	120	ug/L		10/26/16 13:38	11/02/16 13:36	JMW	SW 6020
Beryllium	2.6	ug/L		10/26/16 13:38	11/02/16 14:16	JMW	SW 6020
Boron	59000	ug/L		10/26/16 13:38	11/03/16 08:44	JMW	SW 6020
Cadmium	40	ug/L		10/26/16 13:38	11/02/16 15:53	JMW	SW 6020
Calcium	450	mg/L		10/26/16 13:38	11/02/16 14:16	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 13:38	11/01/16 15:20	JMW	SW 6020
Cobalt	52	ug/L		10/26/16 13:38	11/02/16 15:00	JMW	SW 6020
Lithium	300	ug/L		10/26/16 13:38	10/27/16 12:30	KJP	SW 6010*
Magnesium	1500	mg/L		10/26/16 13:38	11/02/16 14:16	JMW	SW 6020
Mercury	< 0.80	ug/L		10/26/16 13:38	11/02/16 15:00	JMW	SW 6020
Molybdenum	130	ug/L		10/26/16 13:38	11/02/16 14:16	JMW	SW 6020
Potassium	210	mg/L		10/26/16 13:38	11/03/16 09:03	JMW	SW 6020
Selenium	890	ug/L		10/26/16 13:38	11/02/16 15:00	JMW	SW 6020
Sodium	620	mg/L		10/26/16 13:38	11/02/16 13:36	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 13:38	11/01/16 15:20	JMW	SW 6020



ANALYTICAL RESULTS

Sample: 6103663-18
Name: GPb
Matrix: Surface Water - Grab

Sampled: 10/24/16 14:10
Received: 10/25/16 07:45

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
<u>Anions - PIA</u>							
Chloride	2600	mg/L		10/27/16 22:26	10/27/16 22:26	TAS	EPA 300.0
Nitrite-N	< 3.0	mg/L		10/26/16 12:00	10/26/16 12:00	TAS	EPA 300.0
Sulfate	27000	mg/L		10/28/16 14:39	10/28/16 14:39	TAS	EPA 300.0
<u>Field - PIA</u>							
pH, Field Measured	6.65	pH Units		10/24/16 14:10	10/24/16 14:10	FIELD	Field*
<u>General Chemistry - PIA</u>							
Alkalinity - bicarbonate as CaCO3	10	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Alkalinity - carbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Fluoride	69.4	mg/L		10/27/16 15:56	10/27/16 15:56	TTH	SM 4500-F C
Solids - total dissolved solids (TDS)	28000	mg/L		10/27/16 12:04	10/27/16 12:28	ARL	SM 2540C
<u>Total Metals - PIA</u>							
Antimony	8.6	ug/L		10/26/16 13:38	11/02/16 14:20	JMW	SW 6020
Arsenic	92	ug/L		10/26/16 13:38	11/02/16 15:03	JMW	SW 6020
Barium	1100	ug/L		10/26/16 13:38	11/02/16 14:20	JMW	SW 6020
Beryllium	< 20	ug/L		10/26/16 13:38	11/02/16 14:34	JMW	SW 6020
Boron	97000	ug/L		10/26/16 13:38	11/03/16 08:45	JMW	SW 6020
Cadmium	67	ug/L		10/26/16 13:38	11/02/16 15:55	JMW	SW 6020
Calcium	1400	mg/L		10/26/16 13:38	11/02/16 14:34	JMW	SW 6020
Chromium	150	ug/L		10/26/16 13:38	11/02/16 15:03	JMW	SW 6020
Cobalt	110	ug/L		10/26/16 13:38	11/02/16 15:03	JMW	SW 6020
Lithium	480	ug/L		10/26/16 13:38	10/27/16 12:33	KJP	SW 6010*
Magnesium	2500	mg/L		10/26/16 13:38	11/02/16 14:34	JMW	SW 6020
Mercury	27	ug/L		10/26/16 13:38	11/02/16 15:03	JMW	SW 6020
Molybdenum	140	ug/L		10/26/16 13:38	11/02/16 15:03	JMW	SW 6020
Potassium	360	mg/L		10/26/16 13:38	11/03/16 08:45	JMW	SW 6020
Selenium	1500	ug/L		10/26/16 13:38	11/02/16 15:03	JMW	SW 6020
Sodium	1000	mg/L		10/26/16 13:38	11/02/16 14:34	JMW	SW 6020
Thallium	< 4.0	ug/L		10/26/16 13:38	11/07/16 15:07	JMW	SW 6020



ANALYTICAL RESULTS

Sample: 6103663-19
Name: GPc
Matrix: Surface Water - Grab

Sampled: 10/24/16 14:20
Received: 10/25/16 07:45

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
<u>Anions - PIA</u>							
Chloride	1800	mg/L		10/28/16 01:58	10/28/16 01:58	TAS	EPA 300.0
Nitrite-N	< 3.0	mg/L		10/26/16 12:18	10/26/16 12:18	TAS	EPA 300.0
Sulfate	20000	mg/L		10/28/16 02:16	10/28/16 02:16	TAS	EPA 300.0
<u>Field - PIA</u>							
pH, Field Measured	6.73	pH Units		10/24/16 14:20	10/24/16 14:20	FIELD	Field*
<u>General Chemistry - PIA</u>							
Alkalinity - bicarbonate as CaCO3	5.5	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Alkalinity - carbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Fluoride	49.2	mg/L		10/27/16 17:35	10/27/16 17:35	TTH	SM 4500-F C
Solids - total dissolved solids (TDS)	17000	mg/L		10/27/16 12:04	10/27/16 12:28	ARL	SM 2540C
<u>Total Metals - PIA</u>							
Antimony	< 6.0	ug/L		10/26/16 13:38	11/02/16 14:23	JMW	SW 6020
Arsenic	4.4	ug/L		10/26/16 13:38	11/02/16 15:07	JMW	SW 6020
Barium	110	ug/L		10/26/16 13:38	11/02/16 13:43	JMW	SW 6020
Beryllium	2.6	ug/L		10/26/16 13:38	11/02/16 14:23	JMW	SW 6020
Boron	72000	ug/L		10/26/16 13:38	11/03/16 08:46	JMW	SW 6020
Cadmium	41	ug/L		10/26/16 13:38	11/02/16 15:56	JMW	SW 6020
Calcium	570	mg/L		10/26/16 13:38	11/02/16 14:38	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 13:38	11/01/16 15:27	JMW	SW 6020
Cobalt	54	ug/L		10/26/16 13:38	11/02/16 15:07	JMW	SW 6020
Lithium	300	ug/L		10/26/16 13:38	10/27/16 12:36	KJP	SW 6010*
Magnesium	1500	mg/L		10/26/16 13:38	11/02/16 14:23	JMW	SW 6020
Mercury	< 0.80	ug/L		10/26/16 13:38	11/02/16 15:07	JMW	SW 6020
Molybdenum	120	ug/L		10/26/16 13:38	11/02/16 14:23	JMW	SW 6020
Potassium	260	mg/L		10/26/16 13:38	11/03/16 08:46	JMW	SW 6020
Selenium	890	ug/L		10/26/16 13:38	11/02/16 15:07	JMW	SW 6020
Sodium	650	mg/L		10/26/16 13:38	11/02/16 13:43	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 13:38	11/01/16 15:27	JMW	SW 6020



ANALYTICAL RESULTS

Sample: 6103663-20
Name: GPd
Matrix: Surface Water - Grab

Sampled: 10/24/16 14:30
Received: 10/25/16 07:45

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
<u>Anions - PIA</u>							
Chloride	1900	mg/L		10/28/16 03:09	10/28/16 03:09	TAS	EPA 300.0
Nitrite-N	< 3.0	mg/L		10/26/16 12:36	10/26/16 12:36	TAS	EPA 300.0
Sulfate	19000	mg/L		10/28/16 03:26	10/28/16 03:26	TAS	EPA 300.0
<u>Field - PIA</u>							
pH, Field Measured	6.73	pH Units		10/24/16 14:30	10/24/16 14:30	FIELD	Field*
<u>General Chemistry - PIA</u>							
Alkalinity - bicarbonate as CaCO3	6.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Alkalinity - carbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Fluoride	51.3	mg/L		10/27/16 17:39	10/27/16 17:39	TTH	SM 4500-F C
Solids - total dissolved solids (TDS)	16000	mg/L		10/27/16 12:04	10/27/16 12:28	ARL	SM 2540C
<u>Total Metals - PIA</u>							
Antimony	< 3.0	ug/L		10/26/16 13:38	11/02/16 13:47	JMW	SW 6020
Arsenic	4.2	ug/L		10/26/16 13:38	11/02/16 15:10	JMW	SW 6020
Barium	110	ug/L		10/26/16 13:38	11/02/16 13:47	JMW	SW 6020
Beryllium	< 20	ug/L		10/26/16 13:38	11/02/16 14:41	JMW	SW 6020
Boron	66000	ug/L		10/26/16 13:38	11/03/16 08:48	JMW	SW 6020
Cadmium	38	ug/L		10/26/16 13:38	11/02/16 15:57	JMW	SW 6020
Calcium	560	mg/L		10/26/16 13:38	11/02/16 14:41	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 13:38	11/01/16 15:31	JMW	SW 6020
Cobalt	52	ug/L		10/26/16 13:38	11/02/16 15:10	JMW	SW 6020
Lithium	300	ug/L		10/26/16 13:38	10/27/16 12:39	KJP	SW 6010*
Magnesium	1500	mg/L		10/26/16 13:38	11/02/16 14:27	JMW	SW 6020
Mercury	< 0.80	ug/L		10/26/16 13:38	11/02/16 15:10	JMW	SW 6020
Molybdenum	120	ug/L		10/26/16 13:38	11/02/16 14:27	JMW	SW 6020
Potassium	230	mg/L		10/26/16 13:38	11/03/16 08:48	JMW	SW 6020
Selenium	800	ug/L		10/26/16 13:38	11/01/16 15:31	JMW	SW 6020
Sodium	660	mg/L		10/26/16 13:38	11/02/16 13:47	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 13:38	11/01/16 15:31	JMW	SW 6020



ANALYTICAL RESULTS

Sample: 6103663-21
Name: RPb
Matrix: Surface Water - Grab

Sampled: 10/24/16 14:50
Received: 10/25/16 07:45

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
<u>Anions - PIA</u>							
Chloride	1800	mg/L		10/28/16 03:44	10/28/16 03:44	TAS	EPA 300.0
Nitrite-N	< 3.0	mg/L		10/26/16 12:53	10/26/16 12:53	TAS	EPA 300.0
Sulfate	18000	mg/L		10/28/16 04:01	10/28/16 04:01	TAS	EPA 300.0
<u>Field - PIA</u>							
pH, Field Measured	6.49	pH Units		10/24/16 14:50	10/24/16 14:50	FIELD	Field*
<u>General Chemistry - PIA</u>							
Alkalinity - bicarbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Alkalinity - carbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Fluoride	44.4	mg/L		10/27/16 17:44	10/27/16 17:44	TTH	SM 4500-F C
Solids - total dissolved solids (TDS)	16000	mg/L		10/27/16 12:04	10/27/16 12:28	ARL	SM 2540C
<u>Total Metals - PIA</u>							
Antimony	< 3.0	ug/L		10/26/16 11:03	11/01/16 09:42	JMW	SW 6020
Arsenic	2.8	ug/L		10/26/16 11:03	11/02/16 11:16	JMW	SW 6020
Barium	90	ug/L		10/26/16 11:03	11/01/16 09:42	JMW	SW 6020
Beryllium	2.1	ug/L		10/26/16 11:03	11/01/16 10:30	JMW	SW 6020
Boron	56000	ug/L		10/26/16 11:03	11/02/16 16:34	JMW	SW 6020
Cadmium	33	ug/L		10/26/16 11:03	11/02/16 11:32	JMW	SW 6020
Calcium	380	mg/L		10/26/16 11:03	11/01/16 10:30	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 11:03	11/01/16 09:42	JMW	SW 6020
Cobalt	45	ug/L		10/26/16 11:03	11/01/16 09:42	JMW	SW 6020
Lithium	310	ug/L		10/26/16 11:03	10/27/16 11:01	KJP	SW 6010*
Magnesium	1200	mg/L		10/26/16 11:03	11/01/16 10:30	JMW	SW 6020
Mercury	< 0.40	ug/L		10/26/16 11:03	11/02/16 11:16	JMW	SW 6020
Molybdenum	64	ug/L		10/26/16 11:03	11/01/16 10:30	JMW	SW 6020
Potassium	210	mg/L		10/26/16 11:03	11/02/16 11:32	JMW	SW 6020
Selenium	780	ug/L		10/26/16 11:03	11/02/16 11:16	JMW	SW 6020
Sodium	470	mg/L		10/26/16 11:03	11/01/16 09:42	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 11:03	11/01/16 09:42	JMW	SW 6020



ANALYTICAL RESULTS

Sample: 6103663-22
Name: RPc
Matrix: Surface Water - Grab

Sampled: 10/24/16 15:00
Received: 10/25/16 07:45

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
<u>Anions - PIA</u>							
Chloride	2000	mg/L		10/28/16 04:19	10/28/16 04:19	TAS	EPA 300.0
Nitrite-N	< 3.0	mg/L		10/26/16 14:05	10/26/16 14:05	TAS	EPA 300.0
Sulfate	20000	mg/L		10/28/16 04:37	10/28/16 04:37	TAS	EPA 300.0
<u>Field - PIA</u>							
pH, Field Measured	6.32	pH Units		10/24/16 15:00	10/24/16 15:00	FIELD	Field*
<u>General Chemistry - PIA</u>							
Alkalinity - bicarbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Alkalinity - carbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Fluoride	45.0	mg/L		10/27/16 17:48	10/27/16 17:48	TTH	SM 4500-F C
Solids - total dissolved solids (TDS)	16000	mg/L		10/27/16 12:04	10/27/16 12:28	ARL	SM 2540C
<u>Total Metals - PIA</u>							
Antimony	< 3.0	ug/L		10/26/16 11:03	11/01/16 09:46	JMW	SW 6020
Arsenic	3.1	ug/L		10/26/16 11:03	11/02/16 11:20	JMW	SW 6020
Barium	88	ug/L		10/26/16 11:03	11/01/16 09:46	JMW	SW 6020
Beryllium	2.2	ug/L		10/26/16 11:03	11/01/16 10:34	JMW	SW 6020
Boron	59000	ug/L		10/26/16 11:03	11/02/16 16:36	JMW	SW 6020
Cadmium	37	ug/L		10/26/16 11:03	11/02/16 11:36	JMW	SW 6020
Calcium	380	mg/L		10/26/16 11:03	11/01/16 10:34	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 11:03	11/01/16 09:46	JMW	SW 6020
Cobalt	43	ug/L		10/26/16 11:03	11/01/16 09:46	JMW	SW 6020
Lithium	310	ug/L		10/26/16 11:03	10/27/16 11:04	KJP	SW 6010*
Magnesium	1200	mg/L		10/26/16 11:03	11/01/16 10:34	JMW	SW 6020
Mercury	< 0.20	ug/L		10/26/16 11:03	11/02/16 10:36	JMW	SW 6020
Molybdenum	64	ug/L		10/26/16 11:03	11/01/16 10:34	JMW	SW 6020
Potassium	200	mg/L		10/26/16 11:03	11/02/16 11:36	JMW	SW 6020
Selenium	830	ug/L		10/26/16 11:03	11/02/16 11:20	JMW	SW 6020
Sodium	440	mg/L		10/26/16 11:03	11/01/16 09:46	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 11:03	11/01/16 09:46	JMW	SW 6020



ANALYTICAL RESULTS

Sample: 6103663-23
Name: RPd
Matrix: Surface Water - Grab

Sampled: 10/24/16 15:05
Received: 10/25/16 07:45

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
<u>Anions - PIA</u>							
Chloride	1600	mg/L		10/28/16 04:25	10/28/16 04:25	TAS	EPA 300.0
Nitrite-N	< 3.0	mg/L		10/26/16 14:23	10/26/16 14:23	TAS	EPA 300.0
Sulfate	16000	mg/L		10/28/16 04:43	10/28/16 04:43	TAS	EPA 300.0
<u>Field - PIA</u>							
pH, Field Measured	6.32	pH Units		10/24/16 15:05	10/24/16 15:05	FIELD	Field*
<u>General Chemistry - PIA</u>							
Alkalinity - bicarbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Alkalinity - carbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Fluoride	51.2	mg/L		10/27/16 17:53	10/27/16 17:53	TTH	SM 4500-F C
Solids - total dissolved solids (TDS)	17000	mg/L		10/27/16 12:04	10/27/16 12:28	ARL	SM 2540C
<u>Total Metals - PIA</u>							
Antimony	< 3.0	ug/L		10/26/16 11:03	11/01/16 09:49	JMW	SW 6020
Arsenic	3.4	ug/L		10/26/16 11:03	11/02/16 11:23	JMW	SW 6020
Barium	89	ug/L		10/26/16 11:03	11/01/16 09:49	JMW	SW 6020
Beryllium	2.4	ug/L		10/26/16 11:03	11/01/16 10:37	JMW	SW 6020
Boron	59000	ug/L		10/26/16 11:03	11/02/16 16:37	JMW	SW 6020
Cadmium	36	ug/L		10/26/16 11:03	11/02/16 11:40	JMW	SW 6020
Calcium	400	mg/L		10/26/16 11:03	11/01/16 10:37	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 11:03	11/01/16 09:49	JMW	SW 6020
Cobalt	45	ug/L		10/26/16 11:03	11/01/16 09:49	JMW	SW 6020
Lithium	310	ug/L		10/26/16 11:03	10/27/16 11:13	KJP	SW 6010*
Magnesium	1300	mg/L		10/26/16 11:03	11/01/16 10:37	JMW	SW 6020
Mercury	< 0.20	ug/L		10/26/16 11:03	11/02/16 10:39	JMW	SW 6020
Molybdenum	66	ug/L		10/26/16 11:03	11/01/16 10:37	JMW	SW 6020
Potassium	200	mg/L		10/26/16 11:03	11/02/16 11:40	JMW	SW 6020
Selenium	860	ug/L		10/26/16 11:03	11/02/16 11:23	JMW	SW 6020
Sodium	460	mg/L		10/26/16 11:03	11/01/16 09:49	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 11:03	11/01/16 09:49	JMW	SW 6020



ANALYTICAL RESULTS

Sample: 6103663-24
Name: RPa
Matrix: Surface Water - Grab

Sampled: 10/24/16 14:40
Received: 10/25/16 07:45

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
<u>Anions - PIA</u>							
Chloride	1600	mg/L		10/28/16 05:02	10/28/16 05:02	TAS	EPA 300.0
Nitrite-N	< 3.0	mg/L		10/26/16 13:11	10/26/16 13:11	TAS	EPA 300.0
Sulfate	17000	mg/L		10/28/16 05:20	10/28/16 05:20	TAS	EPA 300.0
<u>Field - PIA</u>							
pH, Field Measured	6.70	pH Units		10/24/16 14:40	10/24/16 14:40	FIELD	Field*
<u>General Chemistry - PIA</u>							
Alkalinity - bicarbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Alkalinity - carbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Fluoride	47.0	mg/L		10/27/16 15:52	10/27/16 15:52	TTH	SM 4500-F C
Solids - total dissolved solids (TDS)	16000	mg/L		10/27/16 12:04	10/27/16 12:28	ARL	SM 2540C
<u>Total Metals - PIA</u>							
Antimony	< 3.0	ug/L		10/26/16 11:03	11/01/16 09:53	JMW	SW 6020
Arsenic	3.3	ug/L		10/26/16 11:03	11/02/16 11:27	JMW	SW 6020
Barium	89	ug/L		10/26/16 11:03	11/01/16 09:53	JMW	SW 6020
Beryllium	2.3	ug/L		10/26/16 11:03	11/01/16 10:41	JMW	SW 6020
Boron	60000	ug/L		10/26/16 11:03	11/02/16 16:38	JMW	SW 6020
Cadmium	37	ug/L		10/26/16 11:03	11/02/16 11:43	JMW	SW 6020
Calcium	380	mg/L		10/26/16 11:03	11/01/16 10:41	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 11:03	11/01/16 09:53	JMW	SW 6020
Cobalt	44	ug/L		10/26/16 11:03	11/01/16 09:53	JMW	SW 6020
Lithium	310	ug/L		10/26/16 11:03	10/27/16 11:16	KJP	SW 6010*
Magnesium	1200	mg/L		10/26/16 11:03	11/01/16 10:41	JMW	SW 6020
Mercury	< 0.20	ug/L		10/26/16 11:03	11/02/16 10:43	JMW	SW 6020
Molybdenum	63	ug/L		10/26/16 11:03	11/01/16 10:41	JMW	SW 6020
Potassium	190	mg/L		10/26/16 11:03	11/02/16 11:43	JMW	SW 6020
Selenium	840	ug/L		10/26/16 11:03	11/02/16 11:27	JMW	SW 6020
Sodium	450	mg/L		10/26/16 11:03	11/01/16 09:53	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 11:03	11/01/16 09:53	JMW	SW 6020



NOTES

Specific method revisions used for analysis are available upon request.

Certifications

PIA - Peoria, IL

TNI Accreditation for Drinking Water, Wastewater, Hazardous and Solid Wastes Fields of Testing through IL EPA Lab No. 100230
Illinois Department of Public Health Bacteriological Analysis in Drinking Water Approved Laboratory Registry No. 17553
Missouri Department of Natural Resources Certificate of Approval for Microbiological Laboratory Service No. 870
Drinking Water Certifications: Iowa (240); Kansas (E-10338); Missouri (870)
Wastewater Certifications: Arkansas (88-0677); Iowa (240); Kansas (E-10338)
Hazardous/Solid Waste Certifications: Arkansas (88-0677); Iowa (240); Kansas (E-10338)

SPMO - Springfield, MO

USEPA DMR-QA Program

STL - St. Louis, MO

TNI Accreditation for Wastewater, Hazardous and Solid Wastes Fields of Testing through KS Lab No. E-10389
Illinois Department of Public Health Bacteriological Analysis in Drinking Water Approved Laboratory Registry No. 171050
Drinking Water Certifications: Missouri (1050)
Missouri Department of Natural Resources

* Not a TNI accredited analyte

Certified by: Gail Schindler, Project Manager



CHAIN OF CUSTODY RECORD

PDC LABORATORIES, INC.
 2231 WEST ALTORFER DRIVE
 PEORIA, IL 61615
 PHONE # 309-692-9688
 FAX # 309-692-9689

6/5/10-26-16


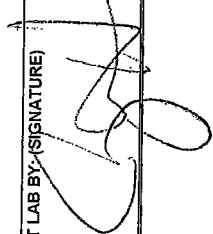

1	CLIENT <u>Hanson Professional Services</u> COFFEEN ENERGY CENTER	PROJECT NUMBER P.O. NUMBER	PHONE NUMBER FAX NUMBER	MEANS SHIPPED DATE SHIPPED	ANALYSIS REQUESTED 6/5/10-26-16	(FOR LAB USE ONLY) LOGIN # <u>6103663-24</u> LOGGED BY: <u>APM</u>
2	ADDRESS 134 CIPS LANE CITY STATE ZIP COFFEEN IL 62017 CONTACT PERSON JOHN ROMANG	MATRIX TYPES: WW- WASTEWATER DW- DRINKING WATER GW- GROUND WATER WWSL- SLUDGE MAS- SOLID OTHER:	DATE COLLECTED TIME COLLECTED SAMPLE TYPE GRAB COMP	DATE SHIPPED	SB, AS, BA, BE, AL, KH, CO3 B, CD, CA, ALK, CO3, CL CR, CR6, CO, CO2, F FE, FB, LI, MG, MN, HG, MO NI, G, O, PHENOL, P, SE, AG, NA, SO4, TL, TDS, ZN TSS, NO2, NO3, NH4, TKN	NATURAL RESOURCE TECHNOLOGY COFFEEN POND LAKE GAIL J SCHINDLER
3	ALL SHADED AREAS MUST BE COMPLETED BY CLIENT (PLEASE PRINT)	DATE COLLECTED TIME COLLECTED SAMPLE TYPE GRAB COMP	DATE SHIPPED	SB, AS, BA, BE, AL, KH, CO3 B, CD, CA, ALK, CO3, CL CR, CR6, CO, CO2, F FE, FB, LI, MG, MN, HG, MO NI, G, O, PHENOL, P, SE, AG, NA, SO4, TL, TDS, ZN TSS, NO2, NO3, NH4, TKN	REMARKS Custom list PH 6.99 PH 7.01 PH 7.05 PH 7.21 PH 7.12 PH 7.20 PH 7.21 PH 7.41 PH 6.49 PH 6.42 PH 6.46	REMARKS
4	TURNAROUND TIME REQUESTED (PLEASE CIRCLE) X RUSH TAT IS SUBJECT TO PDC LABS APPROVAL AND SURCHARGE RUSH RESULTS VIA (PLEASE CIRCLE)	DATE COLLECTED TIME COLLECTED SAMPLE TYPE GRAB COMP	DATE SHIPPED	SB, AS, BA, BE, AL, KH, CO3 B, CD, CA, ALK, CO3, CL CR, CR6, CO, CO2, F FE, FB, LI, MG, MN, HG, MO NI, G, O, PHENOL, P, SE, AG, NA, SO4, TL, TDS, ZN TSS, NO2, NO3, NH4, TKN	REMARKS	REMARKS
5	RELINQUISHED BY: (SIGNATURE) DATE TIME	DATE COLLECTED TIME COLLECTED SAMPLE TYPE GRAB COMP	DATE SHIPPED	SB, AS, BA, BE, AL, KH, CO3 B, CD, CA, ALK, CO3, CL CR, CR6, CO, CO2, F FE, FB, LI, MG, MN, HG, MO NI, G, O, PHENOL, P, SE, AG, NA, SO4, TL, TDS, ZN TSS, NO2, NO3, NH4, TKN	REMARKS	REMARKS
6	RELINQUISHED BY: (SIGNATURE) DATE TIME	DATE COLLECTED TIME COLLECTED SAMPLE TYPE GRAB COMP	DATE SHIPPED	SB, AS, BA, BE, AL, KH, CO3 B, CD, CA, ALK, CO3, CL CR, CR6, CO, CO2, F FE, FB, LI, MG, MN, HG, MO NI, G, O, PHENOL, P, SE, AG, NA, SO4, TL, TDS, ZN TSS, NO2, NO3, NH4, TKN	REMARKS	REMARKS
7	RELINQUISHED BY: (SIGNATURE) DATE TIME	DATE COLLECTED TIME COLLECTED SAMPLE TYPE GRAB COMP	DATE SHIPPED	SB, AS, BA, BE, AL, KH, CO3 B, CD, CA, ALK, CO3, CL CR, CR6, CO, CO2, F FE, FB, LI, MG, MN, HG, MO NI, G, O, PHENOL, P, SE, AG, NA, SO4, TL, TDS, ZN TSS, NO2, NO3, NH4, TKN	REMARKS	REMARKS
8	RECEIVED BY: (SIGNATURE) DATE TIME	DATE COLLECTED TIME COLLECTED SAMPLE TYPE GRAB COMP	DATE SHIPPED	SB, AS, BA, BE, AL, KH, CO3 B, CD, CA, ALK, CO3, CL CR, CR6, CO, CO2, F FE, FB, LI, MG, MN, HG, MO NI, G, O, PHENOL, P, SE, AG, NA, SO4, TL, TDS, ZN TSS, NO2, NO3, NH4, TKN	REMARKS	REMARKS
9	RECEIVED AT LAB BY: (SIGNATURE) DATE TIME	DATE COLLECTED TIME COLLECTED SAMPLE TYPE GRAB COMP	DATE SHIPPED	SB, AS, BA, BE, AL, KH, CO3 B, CD, CA, ALK, CO3, CL CR, CR6, CO, CO2, F FE, FB, LI, MG, MN, HG, MO NI, G, O, PHENOL, P, SE, AG, NA, SO4, TL, TDS, ZN TSS, NO2, NO3, NH4, TKN	REMARKS	REMARKS

CHAIN OF CUSTODY RECORD

PDC LABORATORIES, INC.
 2231 WEST ALTORFER DRIVE
 PEORIA, IL 61615
 PHONE # 309-692-9688
 FAX # 309-692-9689

gjs 10-26-16

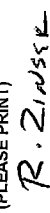


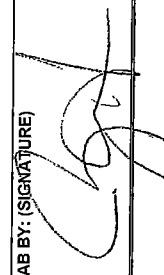
ALL SHADED AREAS MUST BE COMPLETED BY CLIENT (PLEASE PRINT)

1 CLIENT Hanson Professional Services COFFEEN ENERGY CENTER		PROJECT NUMBER P.O. NUMBER		MEANS SHIPPED		ANALYSIS REQUESTED 6/5 10-26-16		(FOR LAB USE ONLY) LOGIN # LOGGED BY: NATURAL RESOURCE TECHNOLOGY COFFEEN POND LAKE GAIL J SCHINDLER			
ADDRESS 134 CIPS LANE COFFEEN IL 62017		PHONE NUMBER FAX NUMBER		DATE SHIPPED		SB,AS,BA,BE,ALKHC03 B,CD,CA,ALK CO3, CL CR,CPR6,CO,CR,CNF, FE,PB,LI,MG,MM,HG,MO M,GO,PH,NOL,F,SE, AG,NA,SO4,TL,TDS,ZN TSS,NO2,NO3,NH3,TAN		REMARKS			
CITY STATE ZIP		SAMPLER (PLEASE PRINT) R.2INSCR		MATRIX TYPES: WW- WASTEWATER DW- DRINKING WATER GW- GROUND WATER WWSL- SLUDGE NAS- SOLID OTHER:		MATRIX TYPE TOTAL # OF CONT		PH 7.17 PH 7.72 PH 7.52 PH 7.62 PH 7.30 PH 7.16 PH 6.65 PH 6.73 PH 6.49 PH 6.32			
CONTACT PERSON JOHN ROMANG		SAMPLER'S SIGNATURE 		DATE COLLECTED TIME COLLECTED		SAMPLE TYPE GRAB COMP		RUSH PHONE			
SAMPLE DESCRIPTION		DATE COLLECTED TIME COLLECTED		SAMPLE TYPE GRAB COMP		RUSH PHONE		6 The sample temperature will be measured upon receipt at the lab. By initialing this area you request that the lab notify you, before proceeding with analysis, if the sample temperature is outside of the range of 0.1-6.0°C. By not initialing this area you allow the lab to proceed with analytical testing regardless of the sample temperature.			
2 AP2 h CL a CL b CL c CL d GP a GP b GP c GP d RP b RP c		10/24/16 11:40 10/24/16 15:30 10/24/16 13:35 10/24/16 13:15 10/24/16 15:55 10/24/16 14:00 10/24/16 14:10 10/24/16 14:20 10/24/16 14:30 10/24/16 14:50 10/24/16 15:00		X X X X X X X X X X		SW SW SW SW SW SW SW SW SW SW		7 7 7 7 7 7 7 7 7 7		7 7 7 7 7 7 7 7 7 7	
5 TURNAROUND TIME REQUESTED (PLEASE CIRCLE) X/RUSH TAT IS SUBJECT TO PDC LABS APPROVAL AND SURCHARGE RUSH RESULTS VIA (PLEASE CIRCLE)		NORMAL RUSH		DATE RECEIVED BY: (SIGNATURE) 10/25/16 TIME 7:45		RECEIVED AT LAB BY: (SIGNATURE) 		SAMPLE TEMPERATURE UPON RECEIPT CHILL PROCESS STARTED PRIOR TO RECEIPT SAMPLE(S) RECEIVED ON ICE BOTTLES RECEIVED IN GOOD CONDITION BOTTLES FILLED TO APPROX. THE NECK SAMPLES RECEIVED WITHIN HOLD TIME(S)			
7 RELINQUISHED BY: (SIGNATURE) 		DATE TIME		RECEIVED BY: (SIGNATURE) DATE TIME		COMMENTS: (FOR LAB USE ONLY) 8		COMMENTS: (FOR LAB USE ONLY)			

CHAIN OF CUSTODY RECORD

PDC LABORATORIES, INC.
 2231 WEST ALTORFER DRIVE
 PEORIA, IL 61615
 PHONE # 309-692-9688
 FAX # 309-692-9689

685 102616

<p>1 CLIENT Hanson Professional Services COFFEEN ENERGY CENTER</p>	<p>ALL SHADED AREAS MUST BE COMPLETED BY CLIENT (PLEASE PRINT) PROJECT NUMBER _____ P.O. NUMBER _____</p>	<p>MEANS SHIPPED _____ DATE SHIPPED _____</p>	<p>ANALYSIS REQUESTED 3 As 102616</p>	<p>(FOR LAB USE ONLY) LOGIN # _____ LOGGED BY: _____ NATURAL RESOURCE TECHNOLOGY COFFEEN POND LAKE GAIL J SCHINDLER</p>
<p>ADDRESS 134 CIPS LANE</p>	<p>PHONE NUMBER _____ FAX NUMBER _____</p>	<p>MATRIX TYPES: WW- WASTEWATER DW- DRINKING WATER GW- GROUND WATER WWSL- SLUDGE NAS- SOLID OTHER: _____</p>	<p>SB, AS, BA, BK, BF, ALKHC03 B, CD, CA, ALK C03, CL CR, CR-6, CO, CU, DN, F FE, FB, LI, MG, MN, HG, MO M, G, O, PHE, POL, P, SE AG, NA, S, O4, TL, TDS, Z, N TSS, NO2, NO3, NH3, TN</p>	<p>REMARKS</p>
<p>2 CITY STATE ZIP COFFEEN IL 62017</p>	<p>SAMPLER (PLEASE PRINT) R. Z. WSK</p>	<p>MATRIX TYPE</p>	<p>TOTAL # OF CONT</p>	<p>REMARKS</p>
<p>CONTACT PERSON JOHN ROMANG</p>	<p>SAMPLER'S SIGNATURE </p>	<p>DATE COLLECTED</p>	<p>TIME COLLECTED</p>	<p>REMARKS</p>
<p>SAMPLE DESCRIPTION RPd</p>	<p>DATE COLLECTED 10/24/16</p>	<p>TIME COLLECTED 15:05</p>	<p>SAMPLE TYPE SW</p>	<p>REMARKS pH 6.32</p>
<p>SAMPLE DESCRIPTION RPa</p>	<p>DATE COLLECTED 10/24/16</p>	<p>TIME COLLECTED 14:40</p>	<p>SAMPLE TYPE SW</p>	<p>REMARKS pH 6.70</p>
<p>5 TURNAROUND TIME REQUESTED (PLEASE CIRCLE) XRUSH TAT IS SUBJECT TO PDC LABS APPROVAL AND SURCHARGE) RUSH RESULTS VIA (PLEASE CIRCLE) FAX # IF DIFFERENT FROM ABOVE: _____</p>	<p>DATE RECEIVED BY: (SIGNATURE) </p>	<p>DATE 10/25/16</p>	<p>TIME 7:45</p>	<p>6 The sample temperature will be measured upon receipt at the lab. By initialing this area you request that the lab notify you, before proceeding with analysis, if the sample temperature is outside of the range of 0.1-6.0°C. By not initialing this area you allow the lab to proceed with analytical testing regardless of the sample temperature.</p>
<p>7 RELINQUISHED BY: (SIGNATURE) </p>	<p>RECEIVED AT LAB BY: (SIGNATURE) </p>	<p>DATE 10/25/16</p>	<p>TIME 7:45</p>	<p>8 COMMENTS: (FOR LAB USE ONLY) SAMPLE TEMPERATURE UPON RECEIPT _____ °C CHILL PROCESS STARTED PRIOR TO RECEIPT _____ SAMPLE(S) RECEIVED ON ICE _____ BOTTLES RECEIVED IN GOOD CONDITION _____ BOTTLES FILLED TO APPROX. THE NECK _____ SAMPLES RECEIVED WITHIN HOLD TIME(S) _____</p>

Chain of Custody Parameters (as totals)

Antimony

Arsenic

Barium

Beryllium

Bicarbonate Alkalinity

Boron

Cadmium

Calcium

Carbonate Alkalinity

Chloride

Chromium

Cobalt

Fluoride

Lithium

Magnesium

Mercury

Molybdenum

Nitrite

pH

Potassium

Selenium

Sodium

Sulfate

Thallium

Total Dissolved Solids (TDS)

ATTACHMENT 7
Sequential Extraction Procedure Laboratory
Analytical Report

 **ANALYTICAL REPORT****PREPARED FOR**

Attn: Michael Healey
Sirem, div of Geosyntec Consultants
130 Stone Rd West
Guelph, Ontario N1G 3Z2

Generated 5/22/2023 11:20:16 AM Revision 1

JOB DESCRIPTION

Coffeen MNA

JOB NUMBER

140-23157-1

Eurofins Knoxville

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins TestAmerica Project Manager.

Authorization



Authorized for release by
Ryan Henry, Project Manager I
WilliamR.Henry@et.eurofinsus.com
(865)291-3000

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Revision 1



Table of Contents

Cover Page	1
Table of Contents	3
Definitions/Glossary	4
Case Narrative	5
Sample Summary	8
Client Sample Results	9
Default Detection Limits	15
QC Sample Results	17
QC Association Summary	23
Lab Chronicle	27
Certification Summary	35
Method Summary	36
Chain of Custody	37

Definitions/Glossary

Client: Sirem, div of Geosyntec Consultants
Project/Site: Coffeen MNA

Job ID: 140-23157-1

Qualifiers

Metals

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
*1	LCS/LCSD RPD exceeds control limits.
B	Compound was found in the blank and sample.
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.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
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)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
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)
TNTC	Too Numerous To Count

Case Narrative

Client: Sirem, div of Geosyntec Consultants
Project/Site: Coffeen MNA

Job ID: 140-23157-1

Job ID: 140-23157-1

Laboratory: Eurofins Knoxville

Narrative

Job Narrative
140-23157-1
Revised

Revision

The report being provided is a revision of the original report sent on 6/15/2021. The report (revision 1) is being revised to include a different analyte list for sample 2.

Receipt

The samples were received on 5/19/2021 at 10:15am and arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 12.8° C.

Receipt Exceptions

The following samples were received at the laboratory outside the required temperature criteria: G1001-(6-11) (140-23157-1), 401B-(16-20) (140-23157-2) and 270A-(12-16) (140-23157-3). The client was contacted regarding this issue, and the laboratory was instructed to proceed with analysis.

The Field Sampler was not listed on the Chain of Custody.

The Chain-of-Custody (COC) was incomplete as received and/or improperly completed. COC not relinquished.

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.

Case Narrative

Client: Sirem, div of Geosyntec Consultants
Project/Site: Coffeen MNA

Job ID: 140-23157-1

Job ID: 140-23157-1 (Continued)

Laboratory: Eurofins Knoxville (Continued)

Results were calculated using the following equation:

$$\text{Result, } \mu\text{g/g or mg/Kg, dry weight} = (C \times V \times V1 \times D) / (W \times S \times V2)$$

Where:

- C = Concentration from instrument readout, $\mu\text{g/mL}$
- 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.

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 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.

Method 6010B: The following samples were diluted due to the presence of titanium which interferes with Cobalt: G1001-(6-11) (140-23157-1) and 401B-(16-20) (140-23157-2). Elevated reporting limits (RLs) are provided.

Method 6010B SEP: The laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for preparation batch 140-50371 and 140-50451 and analytical batch 140-50529 recovered outside control limits for the following analyte: Lithium. This analyte was biased high in the LCS and LCSD and was not detected in the associated samples; therefore, the data have been reported. Lithium results for the samples were either non-detect or estimated values.

Method 6010B SEP: The following samples were diluted due to the presence of silicon which interferes with Arsenic: G1001-(6-11) (140-23157-1), 401B-(16-20) (140-23157-2) and 270A-(12-16) (140-23157-3). Elevated reporting limits (RLs) are provided.

Method 6010B SEP: The method blank for preparation batch 140-50257 and 140-50291 and analytical batch 140-50418 contained Manganese above the reporting limit (RL). Associated sample was not re-extracted and/or re-analyzed because result was greater than 10X the value found in the method blank.

Method 6010B SEP: The laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for preparation batch 140-50257 and 140-50291 and analytical batch 140-50418 recovered outside control limits for the following analyte: Manganese.

Method 6010B SEP: The method blank for step 5 has Iron detected above the reporting limit. The following samples were affected:

Case Narrative

Client: Sirem, div of Geosyntec Consultants
Project/Site: Coffeen MNA

Job ID: 140-23157-1

Job ID: 140-23157-1 (Continued)

Laboratory: Eurofins Knoxville (Continued)

401B-(16-20) (140-23157-2) and (MB 140-50371/16-B ^5)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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Sample Summary

Client: Sirem, div of Geosyntec Consultants
Project/Site: Coffeen MNA

Job ID: 140-23157-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
140-23157-1	G1001-(6-11)	Solid	05/17/21 10:00	05/19/21 10:15
140-23157-2	401B-(16-20)	Solid	05/17/21 10:15	05/19/21 10:15
140-23157-3	270A-(12-16)	Solid	05/17/21 10:30	05/19/21 10:15

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Client Sample Results

Client: Sirem, div of Geosyntec Consultants
 Project/Site: Coffeen MNA

Job ID: 140-23157-1

Client Sample ID: G1001-(6-11)

Lab Sample ID: 140-23157-1

Date Collected: 05/17/21 10:00

Matrix: Solid

Date Received: 05/19/21 10:15

Percent Solids: 90.1

Method: SW846 6010B SEP - SEP Metals (ICP) - Step 1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.2	0.58	mg/Kg	☼	05/27/21 08:00	06/02/21 12:49	4
Boron	ND		44	44	mg/Kg	☼	05/27/21 08:00	06/02/21 12:49	4
Cobalt	ND		11	0.20	mg/Kg	☼	05/27/21 08:00	06/02/21 12:49	4
Lithium	ND		11	0.67	mg/Kg	☼	05/27/21 08:00	06/02/21 12:49	4
Molybdenum	ND		8.9	0.36	mg/Kg	☼	05/27/21 08:00	06/02/21 12:49	4

Method: SW846 6010B SEP - SEP Metals (ICP) - Step 2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.7	0.43	mg/Kg	☼	05/28/21 08:00	06/02/21 14:42	3
Boron	ND		33	33	mg/Kg	☼	05/28/21 08:00	06/02/21 14:42	3
Cobalt	1.2	J	8.3	0.21	mg/Kg	☼	05/28/21 08:00	06/02/21 14:42	3
Lithium	ND		8.3	0.50	mg/Kg	☼	05/28/21 08:00	06/02/21 14:42	3
Molybdenum	ND		6.7	0.27	mg/Kg	☼	05/28/21 08:00	06/02/21 14:42	3

Method: SW846 6010B SEP - SEP Metals (ICP) - Step 3

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.43	J	0.56	0.14	mg/Kg	☼	06/01/21 08:00	06/02/21 16:34	1
Boron	ND		11	11	mg/Kg	☼	06/01/21 08:00	06/02/21 16:34	1
Cobalt	0.74	J	2.8	0.050	mg/Kg	☼	06/01/21 08:00	06/02/21 16:34	1
Lithium	ND		2.8	0.17	mg/Kg	☼	06/01/21 08:00	06/02/21 16:34	1
Molybdenum	0.19	J	2.2	0.091	mg/Kg	☼	06/01/21 08:00	06/02/21 16:34	1

Method: SW846 6010B SEP - SEP Metals (ICP) - Step 4

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1.6	B	0.56	0.24	mg/Kg	☼	06/02/21 08:00	06/05/21 12:15	1
Boron	ND		11	11	mg/Kg	☼	06/02/21 08:00	06/05/21 12:15	1
Cobalt	1.5	J	2.8	0.059	mg/Kg	☼	06/02/21 08:00	06/05/21 12:15	1
Lithium	2.4	J	2.8	0.17	mg/Kg	☼	06/02/21 08:00	06/05/21 12:15	1
Molybdenum	0.59	J	2.2	0.091	mg/Kg	☼	06/02/21 08:00	06/05/21 12:15	1

Method: SW846 6010B SEP - SEP Metals (ICP) - Step 5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		8.3	2.1	mg/Kg	☼	06/04/21 08:00	06/05/21 14:09	5
Boron	ND		170	170	mg/Kg	☼	06/04/21 08:00	06/05/21 14:09	5
Cobalt	ND	*1	42	0.67	mg/Kg	☼	06/04/21 08:00	06/05/21 14:09	5
Lithium	8.8	J B *+	42	2.4	mg/Kg	☼	06/04/21 08:00	06/05/21 14:09	5
Molybdenum	ND		33	1.4	mg/Kg	☼	06/04/21 08:00	06/05/21 14:09	5

Method: SW846 6010B SEP - SEP Metals (ICP) - Step 6

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	2.1		0.56	0.17	mg/Kg	☼	06/04/21 08:00	06/05/21 16:02	1
Boron	ND		11	11	mg/Kg	☼	06/04/21 08:00	06/05/21 16:02	1
Cobalt	2.0	J	2.8	0.051	mg/Kg	☼	06/04/21 08:00	06/05/21 16:02	1
Lithium	6.8	B	2.8	0.17	mg/Kg	☼	06/04/21 08:00	06/05/21 16:02	1
Molybdenum	0.21	J	2.2	0.11	mg/Kg	☼	06/04/21 08:00	06/05/21 16:02	1

Method: SW846 6010B SEP - SEP Metals (ICP) - Step 7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	2.0	B	1.1	0.29	mg/Kg	☼	06/07/21 08:00	06/09/21 14:39	2
Cobalt	0.69	J	5.6	0.058	mg/Kg	☼	06/07/21 08:00	06/09/21 14:39	2
Lithium	11		2.8	0.17	mg/Kg	☼	06/07/21 08:00	06/09/21 13:18	1

Eurofins Knoxville

Client Sample Results

Client: Sirem, div of Geosyntec Consultants
 Project/Site: Coffeen MNA

Job ID: 140-23157-1

Client Sample ID: G1001-(6-11)

Lab Sample ID: 140-23157-1

Date Collected: 05/17/21 10:00

Matrix: Solid

Date Received: 05/19/21 10:15

Percent Solids: 90.1

Method: SW846 6010B SEP - SEP Metals (ICP) - Step 7 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Molybdenum	0.10	J	2.2	0.091	mg/Kg	☼	06/07/21 08:00	06/09/21 13:18	1

Method: SW846 6010B SEP - SEP Metals (ICP) - Sum of Steps 1-7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	6.1		0.50	0.13	mg/Kg			06/13/21 11:52	1
Cobalt	6.1		2.5	0.023	mg/Kg			06/13/21 11:52	1
Lithium	29		2.5	0.15	mg/Kg			06/13/21 11:52	1
Molybdenum	1.1	J	2.0	0.082	mg/Kg			06/13/21 11:52	1

Method: SW846 6010B - SEP Metals (ICP) - Total

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	8.6	B	0.56	0.14	mg/Kg	☼	05/27/21 08:00	06/10/21 13:08	1
Cobalt	5.3	J	5.6	0.058	mg/Kg	☼	05/27/21 08:00	06/10/21 14:47	2
Lithium	21		2.8	0.17	mg/Kg	☼	05/27/21 08:00	06/10/21 13:08	1
Molybdenum	1.5	J	2.2	0.091	mg/Kg	☼	05/27/21 08:00	06/10/21 13:08	1

Client Sample Results

Client: Sirem, div of Geosyntec Consultants
 Project/Site: Coffeen MNA

Job ID: 140-23157-1

Client Sample ID: 401B-(16-20)

Lab Sample ID: 140-23157-2

Date Collected: 05/17/21 10:15

Matrix: Solid

Date Received: 05/19/21 10:15

Percent Solids: 86.5

Method: SW846 6010B SEP - SEP Metals (ICP) - Step 1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.3	0.60	mg/Kg	☼	05/27/21 08:00	06/02/21 12:54	4
Boron	ND		46	46	mg/Kg	☼	05/27/21 08:00	06/02/21 12:54	4
Cobalt	ND		12	0.21	mg/Kg	☼	05/27/21 08:00	06/02/21 12:54	4
Lithium	ND		12	0.69	mg/Kg	☼	05/27/21 08:00	06/02/21 12:54	4
Molybdenum	ND		9.3	0.38	mg/Kg	☼	05/27/21 08:00	06/02/21 12:54	4
Iron	ND		23	13	mg/Kg	☼	05/27/21 08:00	06/02/21 12:54	4
Manganese	17		3.5	0.14	mg/Kg	☼	05/27/21 08:00	06/02/21 12:54	4

Method: SW846 6010B SEP - SEP Metals (ICP) - Step 2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.7	0.45	mg/Kg	☼	05/28/21 08:00	06/02/21 14:47	3
Boron	ND		35	35	mg/Kg	☼	05/28/21 08:00	06/02/21 14:47	3
Cobalt	ND		8.7	0.22	mg/Kg	☼	05/28/21 08:00	06/02/21 14:47	3
Lithium	ND		8.7	0.52	mg/Kg	☼	05/28/21 08:00	06/02/21 14:47	3
Molybdenum	ND		6.9	0.28	mg/Kg	☼	05/28/21 08:00	06/02/21 14:47	3
Iron	ND		17	10	mg/Kg	☼	05/28/21 08:00	06/02/21 14:47	3
Manganese	8.1		2.6	0.97	mg/Kg	☼	05/28/21 08:00	06/02/21 14:47	3

Method: SW846 6010B SEP - SEP Metals (ICP) - Step 3

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.59		0.58	0.15	mg/Kg	☼	06/01/21 08:00	06/02/21 16:39	1
Boron	ND		12	12	mg/Kg	☼	06/01/21 08:00	06/02/21 16:39	1
Cobalt	2.4	J	2.9	0.052	mg/Kg	☼	06/01/21 08:00	06/02/21 16:39	1
Lithium	0.17	J	2.9	0.17	mg/Kg	☼	06/01/21 08:00	06/02/21 16:39	1
Molybdenum	0.16	J	2.3	0.095	mg/Kg	☼	06/01/21 08:00	06/02/21 16:39	1
Iron	580		5.8	3.4	mg/Kg	☼	06/01/21 08:00	06/02/21 16:39	1
Manganese	340	B **	0.87	0.031	mg/Kg	☼	06/01/21 08:00	06/02/21 16:39	1

Method: SW846 6010B SEP - SEP Metals (ICP) - Step 4

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	2.6	B	0.58	0.25	mg/Kg	☼	06/02/21 08:00	06/05/21 12:20	1
Boron	ND		12	12	mg/Kg	☼	06/02/21 08:00	06/05/21 12:20	1
Cobalt	1.9	J	2.9	0.061	mg/Kg	☼	06/02/21 08:00	06/05/21 12:20	1
Lithium	2.9		2.9	0.17	mg/Kg	☼	06/02/21 08:00	06/05/21 12:20	1
Molybdenum	0.17	J	2.3	0.095	mg/Kg	☼	06/02/21 08:00	06/05/21 12:20	1
Iron	6400		5.8	3.4	mg/Kg	☼	06/02/21 08:00	06/05/21 12:20	1
Manganese	130		0.87	0.15	mg/Kg	☼	06/02/21 08:00	06/05/21 12:20	1

Method: SW846 6010B SEP - SEP Metals (ICP) - Step 5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		8.7	2.2	mg/Kg	☼	06/04/21 08:00	06/05/21 14:14	5
Boron	ND		170	170	mg/Kg	☼	06/04/21 08:00	06/05/21 14:14	5
Cobalt	ND	*1	43	0.69	mg/Kg	☼	06/04/21 08:00	06/05/21 14:14	5
Lithium	8.9	J B **	43	2.5	mg/Kg	☼	06/04/21 08:00	06/05/21 14:14	5
Molybdenum	ND		35	1.4	mg/Kg	☼	06/04/21 08:00	06/05/21 14:14	5
Iron	160	B	87	51	mg/Kg	☼	06/04/21 08:00	06/05/21 14:14	5
Manganese	ND	*1	13	2.1	mg/Kg	☼	06/04/21 08:00	06/05/21 14:14	5

Method: SW846 6010B SEP - SEP Metals (ICP) - Step 6

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1.5		0.58	0.17	mg/Kg	☼	06/04/21 08:00	06/05/21 16:07	1

Eurofins Knoxville

Client Sample Results

Client: Sirem, div of Geosyntec Consultants
 Project/Site: Coffeen MNA

Job ID: 140-23157-1

Client Sample ID: 401B-(16-20)

Lab Sample ID: 140-23157-2

Date Collected: 05/17/21 10:15

Matrix: Solid

Date Received: 05/19/21 10:15

Percent Solids: 86.5

Method: SW846 6010B SEP - SEP Metals (ICP) - Step 6 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		12	12	mg/Kg	✧	06/04/21 08:00	06/05/21 16:07	1
Cobalt	0.85	J	2.9	0.053	mg/Kg	✧	06/04/21 08:00	06/05/21 16:07	1
Lithium	4.5	B	2.9	0.17	mg/Kg	✧	06/04/21 08:00	06/05/21 16:07	1
Molybdenum	ND		2.3	0.11	mg/Kg	✧	06/04/21 08:00	06/05/21 16:07	1
Iron	5100		5.8	3.4	mg/Kg	✧	06/04/21 08:00	06/05/21 16:07	1
Manganese	29		0.87	0.29	mg/Kg	✧	06/04/21 08:00	06/05/21 16:07	1

Method: SW846 6010B SEP - SEP Metals (ICP) - Step 7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1.9	B	1.2	0.30	mg/Kg	✧	06/07/21 08:00	06/09/21 14:44	2
Cobalt	0.061	J	2.9	0.030	mg/Kg	✧	06/07/21 08:00	06/09/21 13:23	1
Lithium	9.2		2.9	0.17	mg/Kg	✧	06/07/21 08:00	06/09/21 13:23	1
Molybdenum	ND		2.3	0.095	mg/Kg	✧	06/07/21 08:00	06/09/21 13:23	1
Iron	3000		5.8	4.7	mg/Kg	✧	06/07/21 08:00	06/09/21 13:23	1
Manganese	32		0.87	0.13	mg/Kg	✧	06/07/21 08:00	06/09/21 13:23	1

Method: SW846 6010B SEP - SEP Metals (ICP) - Sum of Steps 1-7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	6.6		0.50	0.13	mg/Kg			06/13/21 11:52	1
Cobalt	5.1		2.5	0.023	mg/Kg			06/13/21 11:52	1
Lithium	26		2.5	0.15	mg/Kg			06/13/21 11:52	1
Molybdenum	0.34	J	2.0	0.082	mg/Kg			06/13/21 11:52	1
Iron	15000		5.0	4.1	mg/Kg			06/13/21 11:52	1
Manganese	550		0.75	0.052	mg/Kg			06/13/21 11:52	1

Method: SW846 6010B - SEP Metals (ICP) - Total

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	6.4	B	0.58	0.15	mg/Kg	✧	05/27/21 08:00	06/10/21 13:13	1
Cobalt	7.7		5.8	0.060	mg/Kg	✧	05/27/21 08:00	06/10/21 14:52	2
Lithium	18		2.9	0.17	mg/Kg	✧	05/27/21 08:00	06/10/21 13:13	1
Molybdenum	0.52	J	2.3	0.095	mg/Kg	✧	05/27/21 08:00	06/10/21 13:13	1
Iron	16000		5.8	4.7	mg/Kg	✧	05/27/21 08:00	06/10/21 13:13	1
Manganese	920	B	0.87	0.13	mg/Kg	✧	05/27/21 08:00	06/10/21 13:13	1

Client Sample Results

Client: Sirem, div of Geosyntec Consultants
 Project/Site: Coffeen MNA

Job ID: 140-23157-1

Client Sample ID: 270A-(12-16)

Lab Sample ID: 140-23157-3

Date Collected: 05/17/21 10:30

Matrix: Solid

Date Received: 05/19/21 10:15

Percent Solids: 85.8

Method: SW846 6010B SEP - SEP Metals (ICP) - Step 1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.3	0.61	mg/Kg	☼	05/27/21 08:00	06/02/21 12:59	4
Boron	ND		47	47	mg/Kg	☼	05/27/21 08:00	06/02/21 12:59	4
Cobalt	ND		12	0.21	mg/Kg	☼	05/27/21 08:00	06/02/21 12:59	4
Lithium	ND		12	0.70	mg/Kg	☼	05/27/21 08:00	06/02/21 12:59	4
Molybdenum	ND		9.3	0.38	mg/Kg	☼	05/27/21 08:00	06/02/21 12:59	4

Method: SW846 6010B SEP - SEP Metals (ICP) - Step 2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.7	0.45	mg/Kg	☼	05/28/21 08:00	06/02/21 14:52	3
Boron	ND		35	35	mg/Kg	☼	05/28/21 08:00	06/02/21 14:52	3
Cobalt	ND		8.7	0.22	mg/Kg	☼	05/28/21 08:00	06/02/21 14:52	3
Lithium	ND		8.7	0.52	mg/Kg	☼	05/28/21 08:00	06/02/21 14:52	3
Molybdenum	ND		7.0	0.29	mg/Kg	☼	05/28/21 08:00	06/02/21 14:52	3

Method: SW846 6010B SEP - SEP Metals (ICP) - Step 3

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1.0		0.58	0.15	mg/Kg	☼	06/01/21 08:00	06/02/21 16:44	1
Boron	ND		12	12	mg/Kg	☼	06/01/21 08:00	06/02/21 16:44	1
Cobalt	4.3		2.9	0.052	mg/Kg	☼	06/01/21 08:00	06/02/21 16:44	1
Lithium	0.35	J	2.9	0.17	mg/Kg	☼	06/01/21 08:00	06/02/21 16:44	1
Molybdenum	0.26	J	2.3	0.096	mg/Kg	☼	06/01/21 08:00	06/02/21 16:44	1

Method: SW846 6010B SEP - SEP Metals (ICP) - Step 4

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	6.0	B	0.58	0.26	mg/Kg	☼	06/02/21 08:00	06/05/21 12:25	1
Boron	ND		12	12	mg/Kg	☼	06/02/21 08:00	06/05/21 12:25	1
Cobalt	2.8	J	2.9	0.062	mg/Kg	☼	06/02/21 08:00	06/05/21 12:25	1
Lithium	2.4	J	2.9	0.17	mg/Kg	☼	06/02/21 08:00	06/05/21 12:25	1
Molybdenum	0.35	J	2.3	0.096	mg/Kg	☼	06/02/21 08:00	06/05/21 12:25	1

Method: SW846 6010B SEP - SEP Metals (ICP) - Step 5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		8.7	2.2	mg/Kg	☼	06/04/21 08:00	06/05/21 14:19	5
Boron	ND		170	170	mg/Kg	☼	06/04/21 08:00	06/05/21 14:19	5
Cobalt	ND	*1	44	0.70	mg/Kg	☼	06/04/21 08:00	06/05/21 14:19	5
Lithium	8.8	J B *+	44	2.6	mg/Kg	☼	06/04/21 08:00	06/05/21 14:19	5
Molybdenum	ND		35	1.5	mg/Kg	☼	06/04/21 08:00	06/05/21 14:19	5

Method: SW846 6010B SEP - SEP Metals (ICP) - Step 6

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	3.2		0.58	0.17	mg/Kg	☼	06/04/21 08:00	06/05/21 16:12	1
Boron	ND		12	12	mg/Kg	☼	06/04/21 08:00	06/05/21 16:12	1
Cobalt	1.6	J	2.9	0.054	mg/Kg	☼	06/04/21 08:00	06/05/21 16:12	1
Lithium	4.6	B	2.9	0.17	mg/Kg	☼	06/04/21 08:00	06/05/21 16:12	1
Molybdenum	0.14	J	2.3	0.12	mg/Kg	☼	06/04/21 08:00	06/05/21 16:12	1

Method: SW846 6010B SEP - SEP Metals (ICP) - Step 7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	2.1	B	1.2	0.30	mg/Kg	☼	06/07/21 08:00	06/09/21 14:49	2
Cobalt	0.36	J	2.9	0.030	mg/Kg	☼	06/07/21 08:00	06/09/21 13:28	1
Lithium	9.8		2.9	0.17	mg/Kg	☼	06/07/21 08:00	06/09/21 13:28	1

Eurofins Knoxville

Client Sample Results

Client: Sirem, div of Geosyntec Consultants
 Project/Site: Coffeen MNA

Job ID: 140-23157-1

Client Sample ID: 270A-(12-16)

Lab Sample ID: 140-23157-3

Date Collected: 05/17/21 10:30

Matrix: Solid

Date Received: 05/19/21 10:15

Percent Solids: 85.8

Method: SW846 6010B SEP - SEP Metals (ICP) - Step 7 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Molybdenum	ND		2.3	0.096	mg/Kg	☼	06/07/21 08:00	06/09/21 13:28	1

Method: SW846 6010B SEP - SEP Metals (ICP) - Sum of Steps 1-7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	12		0.50	0.13	mg/Kg			06/13/21 11:52	1
Cobalt	9.1		2.5	0.023	mg/Kg			06/13/21 11:52	1
Lithium	26		2.5	0.15	mg/Kg			06/13/21 11:52	1
Molybdenum	0.75	J	2.0	0.082	mg/Kg			06/13/21 11:52	1

Method: SW846 6010B - SEP Metals (ICP) - Total

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	9.5	B	0.58	0.15	mg/Kg	☼	05/27/21 08:00	06/10/21 13:28	1
Cobalt	7.3		2.9	0.030	mg/Kg	☼	05/27/21 08:00	06/10/21 13:28	1
Lithium	15		2.9	0.17	mg/Kg	☼	05/27/21 08:00	06/10/21 13:28	1
Molybdenum	0.65	J	2.3	0.096	mg/Kg	☼	05/27/21 08:00	06/10/21 13:28	1

Default Detection Limits

Client: Sirem, div of Geosyntec Consultants
Project/Site: Coffeen MNA

Job ID: 140-23157-1

Method: 6010B SEP - SEP Metals (ICP) - Step 1

Prep: 3010A

SEP: Exchangeable

Analyte	RL	MDL	Units
Arsenic	0.50	0.13	mg/Kg
Boron	10	10	mg/Kg
Cobalt	2.5	0.045	mg/Kg
Iron	5.0	2.9	mg/Kg
Lithium	2.5	0.15	mg/Kg
Manganese	0.75	0.031	mg/Kg
Molybdenum	2.0	0.082	mg/Kg

Method: 6010B SEP - SEP Metals (ICP) - Step 2

Prep: 3010A

SEP: Carbonate

Analyte	RL	MDL	Units
Arsenic	0.50	0.13	mg/Kg
Boron	10	10	mg/Kg
Cobalt	2.5	0.063	mg/Kg
Iron	5.0	2.9	mg/Kg
Lithium	2.5	0.15	mg/Kg
Manganese	0.75	0.28	mg/Kg
Molybdenum	2.0	0.082	mg/Kg

Method: 6010B SEP - SEP Metals (ICP) - Step 3

Prep: 3010A

SEP: Non-Crystalline

Analyte	RL	MDL	Units
Arsenic	0.50	0.13	mg/Kg
Boron	10	10	mg/Kg
Cobalt	2.5	0.045	mg/Kg
Iron	5.0	2.9	mg/Kg
Lithium	2.5	0.15	mg/Kg
Manganese	0.75	0.027	mg/Kg
Molybdenum	2.0	0.082	mg/Kg

Method: 6010B SEP - SEP Metals (ICP) - Step 4

Prep: 3010A

SEP: Metal Hydroxide

Analyte	RL	MDL	Units
Arsenic	0.50	0.22	mg/Kg
Boron	10	10	mg/Kg
Cobalt	2.5	0.053	mg/Kg
Iron	5.0	2.9	mg/Kg
Lithium	2.5	0.15	mg/Kg
Manganese	0.75	0.13	mg/Kg
Molybdenum	2.0	0.082	mg/Kg

Method: 6010B SEP - SEP Metals (ICP) - Step 5

Prep: 3010A

SEP: Organic-Bound

Analyte	RL	MDL	Units
Arsenic	1.5	0.38	mg/Kg
Boron	30	30	mg/Kg

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Default Detection Limits

Client: Sirem, div of Geosyntec Consultants
 Project/Site: Coffeen MNA

Job ID: 140-23157-1

Method: 6010B SEP - SEP Metals (ICP) - Step 5 (Continued)

Prep: 3010A

SEP: Organic-Bound

Analyte	RL	MDL	Units
Cobalt	7.5	0.12	mg/Kg
Iron	15	8.8	mg/Kg
Lithium	7.5	0.44	mg/Kg
Manganese	2.3	0.37	mg/Kg
Molybdenum	6.0	0.25	mg/Kg

Method: 6010B SEP - SEP Metals (ICP) - Step 6

SEP: Acid/Sulfide

Analyte	RL	MDL	Units
Arsenic	0.50	0.15	mg/Kg
Boron	10	10	mg/Kg
Cobalt	2.5	0.046	mg/Kg
Iron	5.0	2.9	mg/Kg
Lithium	2.5	0.15	mg/Kg
Manganese	0.75	0.25	mg/Kg
Molybdenum	2.0	0.099	mg/Kg

Method: 6010B SEP - SEP Metals (ICP) - Step 7

Prep: Residual

Analyte	RL	MDL	Units
Arsenic	0.50	0.13	mg/Kg
Cobalt	2.5	0.026	mg/Kg
Iron	5.0	4.1	mg/Kg
Lithium	2.5	0.15	mg/Kg
Manganese	0.75	0.11	mg/Kg
Molybdenum	2.0	0.082	mg/Kg

Method: 6010B SEP - SEP Metals (ICP) - Sum of Steps 1-7

Analyte	RL	MDL	Units
Arsenic	0.50	0.13	mg/Kg
Cobalt	2.5	0.023	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

Method: 6010B - SEP Metals (ICP) - Total

Prep: Total

Analyte	RL	MDL	Units
Arsenic	0.50	0.13	mg/Kg
Cobalt	2.5	0.026	mg/Kg
Iron	5.0	4.1	mg/Kg
Lithium	2.5	0.15	mg/Kg
Manganese	0.75	0.11	mg/Kg
Molybdenum	2.0	0.082	mg/Kg

QC Sample Results

Client: Sirem, div of Geosyntec Consultants
 Project/Site: Coffeen MNA

Job ID: 140-23157-1

Method: 6010B - SEP Metals (ICP) - Total

Lab Sample ID: MB 140-50176/17-A
Matrix: Solid
Analysis Batch: 50709

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 50176

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Arsenic	0.240	J	0.50	0.13	mg/Kg		05/27/21 08:00	06/10/21 11:30	1
Cobalt	ND		2.5	0.026	mg/Kg		05/27/21 08:00	06/10/21 11:30	1
Lithium	ND		2.5	0.15	mg/Kg		05/27/21 08:00	06/10/21 11:30	1
Molybdenum	ND		2.0	0.082	mg/Kg		05/27/21 08:00	06/10/21 11:30	1
Iron	ND		5.0	4.1	mg/Kg		05/27/21 08:00	06/10/21 11:30	1
Manganese	0.736	J	0.75	0.11	mg/Kg		05/27/21 08:00	06/10/21 11:30	1

Lab Sample ID: LCS 140-50176/18-A
Matrix: Solid
Analysis Batch: 50709

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 50176

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Cobalt	5.00	5.11		mg/Kg		102	80 - 125
Lithium	5.00	4.95		mg/Kg		99	80 - 120
Molybdenum	25.0	25.7		mg/Kg		103	80 - 125
Iron	50.0	53.9		mg/Kg		108	80 - 120
Manganese	5.00	5.26		mg/Kg		105	80 - 120

Lab Sample ID: LCSD 140-50176/19-A
Matrix: Solid
Analysis Batch: 50709

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 50176

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	
								RPD	Limit
Arsenic	5.00	5.02		mg/Kg		100	80 - 120	2	30
Cobalt	5.00	5.01		mg/Kg		100	80 - 125	2	30
Lithium	5.00	4.86		mg/Kg		97	80 - 120	2	30
Molybdenum	25.0	25.2		mg/Kg		101	80 - 125	2	30
Iron	50.0	56.3		mg/Kg		113	80 - 120	4	30
Manganese	5.00	5.29		mg/Kg		106	80 - 120	1	30

Method: 6010B SEP - SEP Metals (ICP)

Lab Sample ID: MB 140-50177/16-B ^4
Matrix: Solid
Analysis Batch: 50418

Client Sample ID: Method Blank
Prep Type: Step 1
Prep Batch: 50219

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Arsenic	ND		2.0	0.52	mg/Kg		05/27/21 08:00	06/02/21 11:27	4
Boron	ND		40	40	mg/Kg		05/27/21 08:00	06/02/21 11:27	4
Cobalt	ND		10	0.18	mg/Kg		05/27/21 08:00	06/02/21 11:27	4
Lithium	ND		10	0.60	mg/Kg		05/27/21 08:00	06/02/21 11:27	4
Molybdenum	ND		8.0	0.33	mg/Kg		05/27/21 08:00	06/02/21 11:27	4
Iron	ND		20	12	mg/Kg		05/27/21 08:00	06/02/21 11:27	4
Manganese	ND		3.0	0.12	mg/Kg		05/27/21 08:00	06/02/21 11:27	4

QC Sample Results

Client: Sirem, div of Geosyntec Consultants
 Project/Site: Coffeen MNA

Job ID: 140-23157-1

Method: 6010B SEP - SEP Metals (ICP) (Continued)

Lab Sample ID: LCS 140-50177/17-B ^5
Matrix: Solid
Analysis Batch: 50418

Client Sample ID: Lab Control Sample
Prep Type: Step 1
Prep Batch: 50219

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	5.00	4.85		mg/Kg		97	80 - 120
Boron	50.0	ND		mg/Kg		92	
Cobalt	5.00	4.80	J	mg/Kg		96	80 - 120
Lithium	5.00	4.95	J	mg/Kg		99	80 - 120
Molybdenum	25.0	24.3		mg/Kg		97	80 - 120
Iron	50.0	51.1		mg/Kg		102	80 - 120
Manganese	5.00	4.87		mg/Kg		97	80 - 120

Lab Sample ID: LCSD 140-50177/18-B ^5
Matrix: Solid
Analysis Batch: 50418

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 1
Prep Batch: 50219

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	5.00	4.83		mg/Kg		97	80 - 120	0	30
Boron	50.0	ND		mg/Kg		96		5	
Cobalt	5.00	4.94	J	mg/Kg		99	80 - 120	3	30
Lithium	5.00	4.67	J	mg/Kg		93	80 - 120	6	30
Molybdenum	25.0	24.6		mg/Kg		99	80 - 120	1	30
Iron	50.0	49.6		mg/Kg		99	80 - 120	3	30
Manganese	5.00	5.01		mg/Kg		100	80 - 120	3	30

Lab Sample ID: MB 140-50220/16-B ^3
Matrix: Solid
Analysis Batch: 50418

Client Sample ID: Method Blank
Prep Type: Step 2
Prep Batch: 50254

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.5	0.39	mg/Kg		05/28/21 08:00	06/02/21 13:18	3
Boron	ND		30	30	mg/Kg		05/28/21 08:00	06/02/21 13:18	3
Cobalt	ND		7.5	0.19	mg/Kg		05/28/21 08:00	06/02/21 13:18	3
Lithium	ND		7.5	0.45	mg/Kg		05/28/21 08:00	06/02/21 13:18	3
Molybdenum	ND		6.0	0.25	mg/Kg		05/28/21 08:00	06/02/21 13:18	3
Iron	ND		15	8.7	mg/Kg		05/28/21 08:00	06/02/21 13:18	3
Manganese	ND		2.3	0.84	mg/Kg		05/28/21 08:00	06/02/21 13:18	3

Lab Sample ID: LCS 140-50220/17-B ^5
Matrix: Solid
Analysis Batch: 50418

Client Sample ID: Lab Control Sample
Prep Type: Step 2
Prep Batch: 50254

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	5.00	4.29		mg/Kg		86	60 - 120
Boron	50.0	ND		mg/Kg		92	
Cobalt	5.00	4.72	J	mg/Kg		94	80 - 120
Lithium	5.00	4.91	J	mg/Kg		98	80 - 120
Molybdenum	25.0	20.8		mg/Kg		83	70 - 120
Iron	50.0	ND		mg/Kg		7	
Manganese	5.00	4.83		mg/Kg		97	80 - 120

QC Sample Results

Client: Sirem, div of Geosyntec Consultants
 Project/Site: Coffeen MNA

Job ID: 140-23157-1

Method: 6010B SEP - SEP Metals (ICP) (Continued)

Lab Sample ID: LCSD 140-50220/18-B ^5
Matrix: Solid
Analysis Batch: 50418

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 2
Prep Batch: 50254

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	5.00	3.95		mg/Kg		79	60 - 120	8	30
Boron	50.0	ND		mg/Kg		94		2	
Cobalt	5.00	4.71	J	mg/Kg		94	80 - 120	0	30
Lithium	5.00	4.53	J	mg/Kg		91	80 - 120	8	30
Molybdenum	25.0	21.1		mg/Kg		84	70 - 120	2	30
Iron	50.0	ND		mg/Kg		21		97	
Manganese	5.00	4.88		mg/Kg		98	80 - 120	1	30

Lab Sample ID: MB 140-50257/16-B
Matrix: Solid
Analysis Batch: 50418

Client Sample ID: Method Blank
Prep Type: Step 3
Prep Batch: 50291

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.50	0.13	mg/Kg		06/01/21 08:00	06/02/21 15:12	1
Boron	ND		10	10	mg/Kg		06/01/21 08:00	06/02/21 15:12	1
Cobalt	ND		2.5	0.045	mg/Kg		06/01/21 08:00	06/02/21 15:12	1
Lithium	ND		2.5	0.15	mg/Kg		06/01/21 08:00	06/02/21 15:12	1
Molybdenum	ND		2.0	0.082	mg/Kg		06/01/21 08:00	06/02/21 15:12	1
Iron	ND		5.0	2.9	mg/Kg		06/01/21 08:00	06/02/21 15:12	1
Manganese	2.11		0.75	0.027	mg/Kg		06/01/21 08:00	06/02/21 15:12	1

Lab Sample ID: LCS 140-50257/17-B
Matrix: Solid
Analysis Batch: 50418

Client Sample ID: Lab Control Sample
Prep Type: Step 3
Prep Batch: 50291

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	5.00	4.85		mg/Kg		97	80 - 120
Boron	50.0	49.3		mg/Kg		99	
Cobalt	5.00	5.10		mg/Kg		102	80 - 120
Lithium	5.00	4.89		mg/Kg		98	80 - 120
Molybdenum	25.0	25.3		mg/Kg		101	80 - 120
Iron	50.0	51.9		mg/Kg		104	80 - 120
Manganese	5.00	6.35	*+	mg/Kg		127	80 - 120

Lab Sample ID: LCSD 140-50257/18-B
Matrix: Solid
Analysis Batch: 50418

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 3
Prep Batch: 50291

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	5.00	4.91		mg/Kg		98	80 - 120	1	30
Boron	50.0	49.7		mg/Kg		99		1	
Cobalt	5.00	5.18		mg/Kg		104	80 - 120	2	30
Lithium	5.00	4.93		mg/Kg		99	80 - 120	1	30
Molybdenum	25.0	25.5		mg/Kg		102	80 - 120	1	30
Iron	50.0	52.3		mg/Kg		105	80 - 120	1	30
Manganese	5.00	6.44	*+	mg/Kg		129	80 - 120	1	30

QC Sample Results

Client: Sirem, div of Geosyntec Consultants
 Project/Site: Coffeen MNA

Job ID: 140-23157-1

Method: 6010B SEP - SEP Metals (ICP) (Continued)

Lab Sample ID: MB 140-50292/16-B
Matrix: Solid
Analysis Batch: 50529

Client Sample ID: Method Blank
Prep Type: Step 4
Prep Batch: 50364

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Arsenic	0.259	J	0.50	0.22	mg/Kg		06/02/21 08:00	06/05/21 10:52	1
Boron	ND		10	10	mg/Kg		06/02/21 08:00	06/05/21 10:52	1
Cobalt	ND		2.5	0.053	mg/Kg		06/02/21 08:00	06/05/21 10:52	1
Lithium	ND		2.5	0.15	mg/Kg		06/02/21 08:00	06/05/21 10:52	1
Molybdenum	ND		2.0	0.082	mg/Kg		06/02/21 08:00	06/05/21 10:52	1
Iron	ND		5.0	2.9	mg/Kg		06/02/21 08:00	06/05/21 10:52	1
Manganese	ND		0.75	0.13	mg/Kg		06/02/21 08:00	06/05/21 10:52	1

Lab Sample ID: LCS 140-50292/17-B
Matrix: Solid
Analysis Batch: 50529

Client Sample ID: Lab Control Sample
Prep Type: Step 4
Prep Batch: 50364

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec	
							Limits	RPD
Arsenic	5.00	5.39		mg/Kg		108	80 - 130	
Boron	50.0	50.9		mg/Kg		102		
Cobalt	5.00	5.15		mg/Kg		103	80 - 120	
Lithium	5.00	5.22		mg/Kg		104	80 - 120	
Molybdenum	25.0	26.3		mg/Kg		105	80 - 120	
Iron	50.0	52.6		mg/Kg		105	80 - 120	
Manganese	5.00	5.29		mg/Kg		106	80 - 120	

Lab Sample ID: LCSD 140-50292/18-B
Matrix: Solid
Analysis Batch: 50529

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 4
Prep Batch: 50364

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec		RPD	
							Limits	RPD	Limit	
Arsenic	5.00	5.27		mg/Kg		105	80 - 130	2	30	
Boron	50.0	49.8		mg/Kg		100		2		
Cobalt	5.00	5.02		mg/Kg		100	80 - 120	3	30	
Lithium	5.00	5.08		mg/Kg		102	80 - 120	3	30	
Molybdenum	25.0	25.7		mg/Kg		103	80 - 120	2	30	
Iron	50.0	51.3		mg/Kg		103	80 - 120	2	30	
Manganese	5.00	5.16		mg/Kg		103	80 - 120	2	30	

Lab Sample ID: MB 140-50371/16-B ^5
Matrix: Solid
Analysis Batch: 50529

Client Sample ID: Method Blank
Prep Type: Step 5
Prep Batch: 50451

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Arsenic	ND		7.5	1.9	mg/Kg		06/04/21 08:00	06/05/21 12:44	5
Boron	ND		150	150	mg/Kg		06/04/21 08:00	06/05/21 12:44	5
Cobalt	ND		38	0.60	mg/Kg		06/04/21 08:00	06/05/21 12:44	5
Lithium	8.12	J	38	2.2	mg/Kg		06/04/21 08:00	06/05/21 12:44	5
Molybdenum	ND		30	1.3	mg/Kg		06/04/21 08:00	06/05/21 12:44	5
Iron	333		75	44	mg/Kg		06/04/21 08:00	06/05/21 12:44	5
Manganese	ND		11	1.9	mg/Kg		06/04/21 08:00	06/05/21 12:44	5

QC Sample Results

Client: Sirem, div of Geosyntec Consultants
 Project/Site: Coffeen MNA

Job ID: 140-23157-1

Method: 6010B SEP - SEP Metals (ICP) (Continued)

Lab Sample ID: LCS 140-50371/17-B ^5
Matrix: Solid
Analysis Batch: 50529

Client Sample ID: Lab Control Sample
Prep Type: Step 5
Prep Batch: 50451

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	15.0	11.3		mg/Kg		76	60 - 100
Boron	150	159		mg/Kg		106	
Cobalt	15.0	0.720	J	mg/Kg		5	1 - 60
Lithium	15.0	23.9	J *+	mg/Kg		159	80 - 150
Molybdenum	75.0	54.0		mg/Kg		72	60 - 100
Iron	150	87.9		mg/Kg		59	
Manganese	15.0	4.04	J	mg/Kg		27	1 - 60

Lab Sample ID: LCSD 140-50371/18-B ^5
Matrix: Solid
Analysis Batch: 50529

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 5
Prep Batch: 50451

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	15.0	12.3		mg/Kg		82	60 - 100	8	30
Boron	150	162		mg/Kg		108		1	
Cobalt	15.0	1.05	J *1	mg/Kg		7	1 - 60	37	30
Lithium	15.0	25.3	J *+	mg/Kg		169	80 - 150	6	30
Molybdenum	75.0	54.3		mg/Kg		72	60 - 100	1	30
Iron	150	ND		mg/Kg		4		174	
Manganese	15.0	ND	*1	mg/Kg		8	1 - 60	108	30

Lab Sample ID: MB 140-50452/16-A
Matrix: Solid
Analysis Batch: 50529

Client Sample ID: Method Blank
Prep Type: Step 6
Prep Batch: 50452

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.50	0.15	mg/Kg		06/04/21 08:00	06/05/21 14:39	1
Boron	ND		10	10	mg/Kg		06/04/21 08:00	06/05/21 14:39	1
Cobalt	ND		2.5	0.046	mg/Kg		06/04/21 08:00	06/05/21 14:39	1
Lithium	0.159	J	2.5	0.15	mg/Kg		06/04/21 08:00	06/05/21 14:39	1
Molybdenum	ND		2.0	0.099	mg/Kg		06/04/21 08:00	06/05/21 14:39	1
Iron	ND		5.0	2.9	mg/Kg		06/04/21 08:00	06/05/21 14:39	1
Manganese	ND		0.75	0.25	mg/Kg		06/04/21 08:00	06/05/21 14:39	1

Lab Sample ID: LCS 140-50452/17-A
Matrix: Solid
Analysis Batch: 50529

Client Sample ID: Lab Control Sample
Prep Type: Step 6
Prep Batch: 50452

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	5.00	4.92		mg/Kg		98	80 - 120
Boron	50.0	50.6		mg/Kg		101	
Cobalt	5.00	4.94		mg/Kg		99	80 - 120
Lithium	5.00	4.88		mg/Kg		98	80 - 120
Molybdenum	25.0	24.8		mg/Kg		99	80 - 120
Iron	50.0	48.8		mg/Kg		98	80 - 120
Manganese	5.00	4.94		mg/Kg		99	80 - 120

QC Sample Results

Client: Sirem, div of Geosyntec Consultants
 Project/Site: Coffeen MNA

Job ID: 140-23157-1

Method: 6010B SEP - SEP Metals (ICP) (Continued)

Lab Sample ID: LCSD 140-50452/18-A
Matrix: Solid
Analysis Batch: 50529

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 6
Prep Batch: 50452

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec		RPD	Limit
							Limits	RPD		
Arsenic	5.00	4.85		mg/Kg		97	80 - 120	2	30	
Boron	50.0	49.8		mg/Kg		100		2		
Cobalt	5.00	4.88		mg/Kg		98	80 - 120	1	30	
Lithium	5.00	4.92		mg/Kg		98	80 - 120	1	30	
Molybdenum	25.0	24.5		mg/Kg		98	80 - 120	1	30	
Iron	50.0	48.0		mg/Kg		96	80 - 120	2	30	
Manganese	5.00	4.85		mg/Kg		97	80 - 120	2	30	

Lab Sample ID: MB 140-50497/16-A
Matrix: Solid
Analysis Batch: 50662

Client Sample ID: Method Blank
Prep Type: Step 7
Prep Batch: 50497

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Arsenic	0.213	J	0.50	0.13	mg/Kg		06/07/21 08:00	06/09/21 11:46	1
Cobalt	ND		2.5	0.026	mg/Kg		06/07/21 08:00	06/09/21 11:46	1
Lithium	ND		2.5	0.15	mg/Kg		06/07/21 08:00	06/09/21 11:46	1
Molybdenum	ND		2.0	0.082	mg/Kg		06/07/21 08:00	06/09/21 11:46	1
Iron	ND		5.0	4.1	mg/Kg		06/07/21 08:00	06/09/21 11:46	1
Manganese	ND		0.75	0.11	mg/Kg		06/07/21 08:00	06/09/21 11:46	1

Lab Sample ID: LCS 140-50497/17-A
Matrix: Solid
Analysis Batch: 50662

Client Sample ID: Lab Control Sample
Prep Type: Step 7
Prep Batch: 50497

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec		RPD	Limit
							Limits	RPD		
Arsenic	5.00	5.16		mg/Kg		103	80 - 120			
Cobalt	5.00	5.17		mg/Kg		103	80 - 125			
Lithium	5.00	4.98		mg/Kg		100	80 - 120			
Molybdenum	25.0	26.1		mg/Kg		104	80 - 125			
Iron	50.0	53.1		mg/Kg		106	80 - 120			
Manganese	5.00	5.32		mg/Kg		106	80 - 120			

Lab Sample ID: LCSD 140-50497/18-A
Matrix: Solid
Analysis Batch: 50662

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 7
Prep Batch: 50497

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec		RPD	Limit
							Limits	RPD		
Arsenic	5.00	5.12		mg/Kg		102	80 - 120	1	30	
Cobalt	5.00	5.13		mg/Kg		103	80 - 125	1	30	
Lithium	5.00	4.89		mg/Kg		98	80 - 120	2	30	
Molybdenum	25.0	25.8		mg/Kg		103	80 - 125	1	30	
Iron	50.0	52.5		mg/Kg		105	80 - 120	1	30	
Manganese	5.00	5.28		mg/Kg		106	80 - 120	1	30	

QC Association Summary

Client: Sirem, div of Geosyntec Consultants
 Project/Site: Coffeen MNA

Job ID: 140-23157-1

Metals

Prep Batch: 50176

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23157-1	G1001-(6-11)	Total/NA	Solid	Total	
140-23157-2	401B-(16-20)	Total/NA	Solid	Total	
140-23157-3	270A-(12-16)	Total/NA	Solid	Total	
MB 140-50176/17-A	Method Blank	Total/NA	Solid	Total	
LCS 140-50176/18-A	Lab Control Sample	Total/NA	Solid	Total	
LCSD 140-50176/19-A	Lab Control Sample Dup	Total/NA	Solid	Total	

SEP Batch: 50177

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23157-1	G1001-(6-11)	Step 1	Solid	Exchangeable	
140-23157-2	401B-(16-20)	Step 1	Solid	Exchangeable	
140-23157-3	270A-(12-16)	Step 1	Solid	Exchangeable	
MB 140-50177/16-B ^4	Method Blank	Step 1	Solid	Exchangeable	
LCS 140-50177/17-B ^5	Lab Control Sample	Step 1	Solid	Exchangeable	
LCSD 140-50177/18-B ^5	Lab Control Sample Dup	Step 1	Solid	Exchangeable	

Prep Batch: 50219

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23157-1	G1001-(6-11)	Step 1	Solid	3010A	50177
140-23157-2	401B-(16-20)	Step 1	Solid	3010A	50177
140-23157-3	270A-(12-16)	Step 1	Solid	3010A	50177
MB 140-50177/16-B ^4	Method Blank	Step 1	Solid	3010A	50177
LCS 140-50177/17-B ^5	Lab Control Sample	Step 1	Solid	3010A	50177
LCSD 140-50177/18-B ^5	Lab Control Sample Dup	Step 1	Solid	3010A	50177

SEP Batch: 50220

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23157-1	G1001-(6-11)	Step 2	Solid	Carbonate	
140-23157-2	401B-(16-20)	Step 2	Solid	Carbonate	
140-23157-3	270A-(12-16)	Step 2	Solid	Carbonate	
MB 140-50220/16-B ^3	Method Blank	Step 2	Solid	Carbonate	
LCS 140-50220/17-B ^5	Lab Control Sample	Step 2	Solid	Carbonate	
LCSD 140-50220/18-B ^5	Lab Control Sample Dup	Step 2	Solid	Carbonate	

Prep Batch: 50254

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23157-1	G1001-(6-11)	Step 2	Solid	3010A	50220
140-23157-2	401B-(16-20)	Step 2	Solid	3010A	50220
140-23157-3	270A-(12-16)	Step 2	Solid	3010A	50220
MB 140-50220/16-B ^3	Method Blank	Step 2	Solid	3010A	50220
LCS 140-50220/17-B ^5	Lab Control Sample	Step 2	Solid	3010A	50220
LCSD 140-50220/18-B ^5	Lab Control Sample Dup	Step 2	Solid	3010A	50220

SEP Batch: 50257

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23157-1	G1001-(6-11)	Step 3	Solid	Non-Crystalline	
140-23157-2	401B-(16-20)	Step 3	Solid	Non-Crystalline	
140-23157-3	270A-(12-16)	Step 3	Solid	Non-Crystalline	
MB 140-50257/16-B	Method Blank	Step 3	Solid	Non-Crystalline	
LCS 140-50257/17-B	Lab Control Sample	Step 3	Solid	Non-Crystalline	
LCSD 140-50257/18-B	Lab Control Sample Dup	Step 3	Solid	Non-Crystalline	

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QC Association Summary

Client: Sirem, div of Geosyntec Consultants
 Project/Site: Coffeen MNA

Job ID: 140-23157-1

Metals

Prep Batch: 50291

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23157-1	G1001-(6-11)	Step 3	Solid	3010A	50257
140-23157-2	401B-(16-20)	Step 3	Solid	3010A	50257
140-23157-3	270A-(12-16)	Step 3	Solid	3010A	50257
MB 140-50257/16-B	Method Blank	Step 3	Solid	3010A	50257
LCS 140-50257/17-B	Lab Control Sample	Step 3	Solid	3010A	50257
LCSD 140-50257/18-B	Lab Control Sample Dup	Step 3	Solid	3010A	50257

SEP Batch: 50292

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23157-1	G1001-(6-11)	Step 4	Solid	Metal Hydroxide	
140-23157-2	401B-(16-20)	Step 4	Solid	Metal Hydroxide	
140-23157-3	270A-(12-16)	Step 4	Solid	Metal Hydroxide	
MB 140-50292/16-B	Method Blank	Step 4	Solid	Metal Hydroxide	
LCS 140-50292/17-B	Lab Control Sample	Step 4	Solid	Metal Hydroxide	
LCSD 140-50292/18-B	Lab Control Sample Dup	Step 4	Solid	Metal Hydroxide	

Prep Batch: 50364

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23157-1	G1001-(6-11)	Step 4	Solid	3010A	50292
140-23157-2	401B-(16-20)	Step 4	Solid	3010A	50292
140-23157-3	270A-(12-16)	Step 4	Solid	3010A	50292
MB 140-50292/16-B	Method Blank	Step 4	Solid	3010A	50292
LCS 140-50292/17-B	Lab Control Sample	Step 4	Solid	3010A	50292
LCSD 140-50292/18-B	Lab Control Sample Dup	Step 4	Solid	3010A	50292

SEP Batch: 50371

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23157-1	G1001-(6-11)	Step 5	Solid	Organic-Bound	
140-23157-2	401B-(16-20)	Step 5	Solid	Organic-Bound	
140-23157-3	270A-(12-16)	Step 5	Solid	Organic-Bound	
MB 140-50371/16-B ^5	Method Blank	Step 5	Solid	Organic-Bound	
LCS 140-50371/17-B ^5	Lab Control Sample	Step 5	Solid	Organic-Bound	
LCSD 140-50371/18-B ^5	Lab Control Sample Dup	Step 5	Solid	Organic-Bound	

Analysis Batch: 50418

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23157-1	G1001-(6-11)	Step 1	Solid	6010B SEP	50219
140-23157-1	G1001-(6-11)	Step 2	Solid	6010B SEP	50254
140-23157-1	G1001-(6-11)	Step 3	Solid	6010B SEP	50291
140-23157-2	401B-(16-20)	Step 1	Solid	6010B SEP	50219
140-23157-2	401B-(16-20)	Step 2	Solid	6010B SEP	50254
140-23157-2	401B-(16-20)	Step 3	Solid	6010B SEP	50291
140-23157-3	270A-(12-16)	Step 1	Solid	6010B SEP	50219
140-23157-3	270A-(12-16)	Step 2	Solid	6010B SEP	50254
140-23157-3	270A-(12-16)	Step 3	Solid	6010B SEP	50291
MB 140-50177/16-B ^4	Method Blank	Step 1	Solid	6010B SEP	50219
MB 140-50220/16-B ^3	Method Blank	Step 2	Solid	6010B SEP	50254
MB 140-50257/16-B	Method Blank	Step 3	Solid	6010B SEP	50291
LCS 140-50177/17-B ^5	Lab Control Sample	Step 1	Solid	6010B SEP	50219
LCS 140-50220/17-B ^5	Lab Control Sample	Step 2	Solid	6010B SEP	50254
LCS 140-50257/17-B	Lab Control Sample	Step 3	Solid	6010B SEP	50291

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QC Association Summary

Client: Sirem, div of Geosyntec Consultants
 Project/Site: Coffeen MNA

Job ID: 140-23157-1

Metals (Continued)

Analysis Batch: 50418 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCSD 140-50177/18-B ^5	Lab Control Sample Dup	Step 1	Solid	6010B SEP	50219
LCSD 140-50220/18-B ^5	Lab Control Sample Dup	Step 2	Solid	6010B SEP	50254
LCSD 140-50257/18-B	Lab Control Sample Dup	Step 3	Solid	6010B SEP	50291

Prep Batch: 50451

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23157-1	G1001-(6-11)	Step 5	Solid	3010A	50371
140-23157-2	401B-(16-20)	Step 5	Solid	3010A	50371
140-23157-3	270A-(12-16)	Step 5	Solid	3010A	50371
MB 140-50371/16-B ^5	Method Blank	Step 5	Solid	3010A	50371
LCS 140-50371/17-B ^5	Lab Control Sample	Step 5	Solid	3010A	50371
LCSD 140-50371/18-B ^5	Lab Control Sample Dup	Step 5	Solid	3010A	50371

SEP Batch: 50452

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23157-1	G1001-(6-11)	Step 6	Solid	Acid/Sulfide	
140-23157-2	401B-(16-20)	Step 6	Solid	Acid/Sulfide	
140-23157-3	270A-(12-16)	Step 6	Solid	Acid/Sulfide	
MB 140-50452/16-A	Method Blank	Step 6	Solid	Acid/Sulfide	
LCS 140-50452/17-A	Lab Control Sample	Step 6	Solid	Acid/Sulfide	
LCSD 140-50452/18-A	Lab Control Sample Dup	Step 6	Solid	Acid/Sulfide	

Prep Batch: 50497

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23157-1	G1001-(6-11)	Step 7	Solid	Residual	
140-23157-2	401B-(16-20)	Step 7	Solid	Residual	
140-23157-3	270A-(12-16)	Step 7	Solid	Residual	
MB 140-50497/16-A	Method Blank	Step 7	Solid	Residual	
LCS 140-50497/17-A	Lab Control Sample	Step 7	Solid	Residual	
LCSD 140-50497/18-A	Lab Control Sample Dup	Step 7	Solid	Residual	

Analysis Batch: 50529

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23157-1	G1001-(6-11)	Step 4	Solid	6010B SEP	50364
140-23157-1	G1001-(6-11)	Step 5	Solid	6010B SEP	50451
140-23157-1	G1001-(6-11)	Step 6	Solid	6010B SEP	50452
140-23157-2	401B-(16-20)	Step 4	Solid	6010B SEP	50364
140-23157-2	401B-(16-20)	Step 5	Solid	6010B SEP	50451
140-23157-2	401B-(16-20)	Step 6	Solid	6010B SEP	50452
140-23157-3	270A-(12-16)	Step 4	Solid	6010B SEP	50364
140-23157-3	270A-(12-16)	Step 5	Solid	6010B SEP	50451
140-23157-3	270A-(12-16)	Step 6	Solid	6010B SEP	50452
MB 140-50292/16-B	Method Blank	Step 4	Solid	6010B SEP	50364
MB 140-50371/16-B ^5	Method Blank	Step 5	Solid	6010B SEP	50451
MB 140-50452/16-A	Method Blank	Step 6	Solid	6010B SEP	50452
LCS 140-50292/17-B	Lab Control Sample	Step 4	Solid	6010B SEP	50364
LCS 140-50371/17-B ^5	Lab Control Sample	Step 5	Solid	6010B SEP	50451
LCS 140-50452/17-A	Lab Control Sample	Step 6	Solid	6010B SEP	50452
LCSD 140-50292/18-B	Lab Control Sample Dup	Step 4	Solid	6010B SEP	50364
LCSD 140-50371/18-B ^5	Lab Control Sample Dup	Step 5	Solid	6010B SEP	50451
LCSD 140-50452/18-A	Lab Control Sample Dup	Step 6	Solid	6010B SEP	50452

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QC Association Summary

Client: Sirem, div of Geosyntec Consultants
Project/Site: Coffeen MNA

Job ID: 140-23157-1

Metals

Analysis Batch: 50662

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23157-1	G1001-(6-11)	Step 7	Solid	6010B SEP	50497
140-23157-1	G1001-(6-11)	Step 7	Solid	6010B SEP	50497
140-23157-2	401B-(16-20)	Step 7	Solid	6010B SEP	50497
140-23157-2	401B-(16-20)	Step 7	Solid	6010B SEP	50497
140-23157-3	270A-(12-16)	Step 7	Solid	6010B SEP	50497
140-23157-3	270A-(12-16)	Step 7	Solid	6010B SEP	50497
MB 140-50497/16-A	Method Blank	Step 7	Solid	6010B SEP	50497
LCS 140-50497/17-A	Lab Control Sample	Step 7	Solid	6010B SEP	50497
LCSD 140-50497/18-A	Lab Control Sample Dup	Step 7	Solid	6010B SEP	50497

Analysis Batch: 50709

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23157-1	G1001-(6-11)	Total/NA	Solid	6010B	50176
140-23157-1	G1001-(6-11)	Total/NA	Solid	6010B	50176
140-23157-2	401B-(16-20)	Total/NA	Solid	6010B	50176
140-23157-2	401B-(16-20)	Total/NA	Solid	6010B	50176
140-23157-3	270A-(12-16)	Total/NA	Solid	6010B	50176
MB 140-50176/17-A	Method Blank	Total/NA	Solid	6010B	50176
LCS 140-50176/18-A	Lab Control Sample	Total/NA	Solid	6010B	50176
LCSD 140-50176/19-A	Lab Control Sample Dup	Total/NA	Solid	6010B	50176

Analysis Batch: 50770

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23157-1	G1001-(6-11)	Sum of Steps 1-7	Solid	6010B SEP	
140-23157-2	401B-(16-20)	Sum of Steps 1-7	Solid	6010B SEP	
140-23157-3	270A-(12-16)	Sum of Steps 1-7	Solid	6010B SEP	

General Chemistry

Analysis Batch: 50469

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23157-1	G1001-(6-11)	Total/NA	Solid	Moisture	
140-23157-2	401B-(16-20)	Total/NA	Solid	Moisture	
140-23157-3	270A-(12-16)	Total/NA	Solid	Moisture	

Lab Chronicle

Client: Sirem, div of Geosyntec Consultants
 Project/Site: Coffeen MNA

Job ID: 140-23157-1

Client Sample ID: G1001-(6-11)

Lab Sample ID: 140-23157-1

Date Collected: 05/17/21 10:00

Matrix: Solid

Date Received: 05/19/21 10:15

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			50770	06/13/21 11:52	DKW	EET KNX
		Instrument ID: NOEQUIP								
Total/NA	Analysis	Moisture		1			50469	06/04/21 07:47	BKD	EET KNX
		Instrument ID: NOEQUIP								

Client Sample ID: G1001-(6-11)

Lab Sample ID: 140-23157-1

Date Collected: 05/17/21 10:00

Matrix: Solid

Date Received: 05/19/21 10:15

Percent Solids: 90.1

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	50176	05/27/21 08:00	JTB	EET KNX
Total/NA	Analysis	6010B		1			50709	06/10/21 13:08	KNC	EET KNX
		Instrument ID: DUO								
Total/NA	Prep	Total			1.000 g	50 mL	50176	05/27/21 08:00	JTB	EET KNX
Total/NA	Analysis	6010B		2			50709	06/10/21 14:47	KNC	EET KNX
		Instrument ID: DUO								
Step 1	SEP	Exchangeable			5.000 g	25 mL	50177	05/26/21 08:00	JTB	EET KNX
Step 1	Prep	3010A			5 mL	50 mL	50219	05/27/21 08:00	KNC	EET KNX
Step 1	Analysis	6010B SEP		4			50418	06/02/21 12:49	KNC	EET KNX
		Instrument ID: DUO								
Step 2	SEP	Carbonate			5 g	25 mL	50220	05/27/21 08:00	JTB	EET KNX
Step 2	Prep	3010A			5 mL	50 mL	50254	05/28/21 08:00	KNC	EET KNX
Step 2	Analysis	6010B SEP		3			50418	06/02/21 14:42	KNC	EET KNX
		Instrument ID: DUO								
Step 3	SEP	Non-Crystalline			5 g	25 mL	50257	05/28/21 08:00	JTB	EET KNX
Step 3	Prep	3010A			5 mL	50 mL	50291	06/01/21 08:00	KNC	EET KNX
Step 3	Analysis	6010B SEP		1			50418	06/02/21 16:34	KNC	EET KNX
		Instrument ID: DUO								
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	50292	06/01/21 08:00	KNC	EET KNX
Step 4	Prep	3010A			5 mL	50 mL	50364	06/02/21 08:00	KNC	EET KNX
Step 4	Analysis	6010B SEP		1			50529	06/05/21 12:15	KNC	EET KNX
		Instrument ID: DUO								
Step 5	SEP	Organic-Bound			5.000 g	75 mL	50371	06/02/21 08:00	KNC	EET KNX
Step 5	Prep	3010A			5 mL	50 mL	50451	06/04/21 08:00	JTB	EET KNX
Step 5	Analysis	6010B SEP		5			50529	06/05/21 14:09	KNC	EET KNX
		Instrument ID: DUO								
Step 6	SEP	Acid/Sulfide			5 g	250 mL	50452	06/04/21 08:00	JTB	EET KNX
Step 6	Analysis	6010B SEP		1			50529	06/05/21 16:02	KNC	EET KNX
		Instrument ID: DUO								
Step 7	Prep	Residual			1 g	50 mL	50497	06/07/21 08:00	JTB	EET KNX
Step 7	Analysis	6010B SEP		1			50662	06/09/21 13:18	KNC	EET KNX
		Instrument ID: DUO								
Step 7	Prep	Residual			1 g	50 mL	50497	06/07/21 08:00	JTB	EET KNX
Step 7	Analysis	6010B SEP		2			50662	06/09/21 14:39	KNC	EET KNX
		Instrument ID: DUO								

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Lab Chronicle

Client: Sirem, div of Geosyntec Consultants
 Project/Site: Coffeen MNA

Job ID: 140-23157-1

Client Sample ID: 401B-(16-20)

Lab Sample ID: 140-23157-2

Date Collected: 05/17/21 10:15

Matrix: Solid

Date Received: 05/19/21 10:15

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			50770	06/13/21 11:52	DKW	EET KNX
		Instrument ID: NOEQUIP								
Total/NA	Analysis	Moisture		1			50469	06/04/21 07:47	BKD	EET KNX
		Instrument ID: NOEQUIP								

Client Sample ID: 401B-(16-20)

Lab Sample ID: 140-23157-2

Date Collected: 05/17/21 10:15

Matrix: Solid

Date Received: 05/19/21 10:15

Percent Solids: 86.5

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	50176	05/27/21 08:00	JTB	EET KNX
Total/NA	Analysis	6010B		1			50709	06/10/21 13:13	KNC	EET KNX
		Instrument ID: DUO								
Total/NA	Prep	Total			1.000 g	50 mL	50176	05/27/21 08:00	JTB	EET KNX
Total/NA	Analysis	6010B		2			50709	06/10/21 14:52	KNC	EET KNX
		Instrument ID: DUO								
Step 1	SEP	Exchangeable			5.000 g	25 mL	50177	05/26/21 08:00	JTB	EET KNX
Step 1	Prep	3010A			5 mL	50 mL	50219	05/27/21 08:00	KNC	EET KNX
Step 1	Analysis	6010B SEP		4			50418	06/02/21 12:54	KNC	EET KNX
		Instrument ID: DUO								
Step 2	SEP	Carbonate			5 g	25 mL	50220	05/27/21 08:00	JTB	EET KNX
Step 2	Prep	3010A			5 mL	50 mL	50254	05/28/21 08:00	KNC	EET KNX
Step 2	Analysis	6010B SEP		3			50418	06/02/21 14:47	KNC	EET KNX
		Instrument ID: DUO								
Step 3	SEP	Non-Crystalline			5 g	25 mL	50257	05/28/21 08:00	JTB	EET KNX
Step 3	Prep	3010A			5 mL	50 mL	50291	06/01/21 08:00	KNC	EET KNX
Step 3	Analysis	6010B SEP		1			50418	06/02/21 16:39	KNC	EET KNX
		Instrument ID: DUO								
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	50292	06/01/21 08:00	KNC	EET KNX
Step 4	Prep	3010A			5 mL	50 mL	50364	06/02/21 08:00	KNC	EET KNX
Step 4	Analysis	6010B SEP		1			50529	06/05/21 12:20	KNC	EET KNX
		Instrument ID: DUO								
Step 5	SEP	Organic-Bound			5.000 g	75 mL	50371	06/02/21 08:00	KNC	EET KNX
Step 5	Prep	3010A			5 mL	50 mL	50451	06/04/21 08:00	JTB	EET KNX
Step 5	Analysis	6010B SEP		5			50529	06/05/21 14:14	KNC	EET KNX
		Instrument ID: DUO								
Step 6	SEP	Acid/Sulfide			5 g	250 mL	50452	06/04/21 08:00	JTB	EET KNX
Step 6	Analysis	6010B SEP		1			50529	06/05/21 16:07	KNC	EET KNX
		Instrument ID: DUO								
Step 7	Prep	Residual			1 g	50 mL	50497	06/07/21 08:00	JTB	EET KNX
Step 7	Analysis	6010B SEP		1			50662	06/09/21 13:23	KNC	EET KNX
		Instrument ID: DUO								
Step 7	Prep	Residual			1 g	50 mL	50497	06/07/21 08:00	JTB	EET KNX
Step 7	Analysis	6010B SEP		2			50662	06/09/21 14:44	KNC	EET KNX
		Instrument ID: DUO								

Eurofins Knoxville

Lab Chronicle

Client: Sirem, div of Geosyntec Consultants
 Project/Site: Coffeen MNA

Job ID: 140-23157-1

Client Sample ID: 270A-(12-16)

Lab Sample ID: 140-23157-3

Date Collected: 05/17/21 10:30

Matrix: Solid

Date Received: 05/19/21 10:15

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			50770	06/13/21 11:52	DKW	EET KNX
	Instrument ID: NOEQUIP									
Total/NA	Analysis	Moisture		1			50469	06/04/21 07:47	BKD	EET KNX
	Instrument ID: NOEQUIP									

Client Sample ID: 270A-(12-16)

Lab Sample ID: 140-23157-3

Date Collected: 05/17/21 10:30

Matrix: Solid

Date Received: 05/19/21 10:15

Percent Solids: 85.8

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	50176	05/27/21 08:00	JTB	EET KNX
Total/NA	Analysis	6010B		1			50709	06/10/21 13:28	KNC	EET KNX
	Instrument ID: DUO									
Step 1	SEP	Exchangeable			5.000 g	25 mL	50177	05/26/21 08:00	JTB	EET KNX
Step 1	Prep	3010A			5 mL	50 mL	50219	05/27/21 08:00	KNC	EET KNX
Step 1	Analysis	6010B SEP		4			50418	06/02/21 12:59	KNC	EET KNX
	Instrument ID: DUO									
Step 2	SEP	Carbonate			5 g	25 mL	50220	05/27/21 08:00	JTB	EET KNX
Step 2	Prep	3010A			5 mL	50 mL	50254	05/28/21 08:00	KNC	EET KNX
Step 2	Analysis	6010B SEP		3			50418	06/02/21 14:52	KNC	EET KNX
	Instrument ID: DUO									
Step 3	SEP	Non-Crystalline			5 g	25 mL	50257	05/28/21 08:00	JTB	EET KNX
Step 3	Prep	3010A			5 mL	50 mL	50291	06/01/21 08:00	KNC	EET KNX
Step 3	Analysis	6010B SEP		1			50418	06/02/21 16:44	KNC	EET KNX
	Instrument ID: DUO									
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	50292	06/01/21 08:00	KNC	EET KNX
Step 4	Prep	3010A			5 mL	50 mL	50364	06/02/21 08:00	KNC	EET KNX
Step 4	Analysis	6010B SEP		1			50529	06/05/21 12:25	KNC	EET KNX
	Instrument ID: DUO									
Step 5	SEP	Organic-Bound			5.000 g	75 mL	50371	06/02/21 08:00	KNC	EET KNX
Step 5	Prep	3010A			5 mL	50 mL	50451	06/04/21 08:00	JTB	EET KNX
Step 5	Analysis	6010B SEP		5			50529	06/05/21 14:19	KNC	EET KNX
	Instrument ID: DUO									
Step 6	SEP	Acid/Sulfide			5 g	250 mL	50452	06/04/21 08:00	JTB	EET KNX
Step 6	Analysis	6010B SEP		1			50529	06/05/21 16:12	KNC	EET KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1 g	50 mL	50497	06/07/21 08:00	JTB	EET KNX
Step 7	Analysis	6010B SEP		1			50662	06/09/21 13:28	KNC	EET KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1 g	50 mL	50497	06/07/21 08:00	JTB	EET KNX
Step 7	Analysis	6010B SEP		2			50662	06/09/21 14:49	KNC	EET KNX
	Instrument ID: DUO									

Lab Chronicle

Client: Sirem, div of Geosyntec Consultants
Project/Site: Coffeen MNA

Job ID: 140-23157-1

Client Sample ID: Method Blank

Lab Sample ID: MB 140-50176/17-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	50176	05/27/21 08:00	JTB	EET KNX
Total/NA	Analysis	6010B		1			50709	06/10/21 11:30	KNC	EET KNX
Instrument ID: DUO										

Client Sample ID: Method Blank

Lab Sample ID: MB 140-50177/16-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	50177	05/26/21 08:00	JTB	EET KNX
Step 1	Prep	3010A			5 mL	50 mL	50219	05/27/21 08:00	KNC	EET KNX
Step 1	Analysis	6010B SEP		4			50418	06/02/21 11:27	KNC	EET KNX
Instrument ID: DUO										

Client Sample ID: Method Blank

Lab Sample ID: MB 140-50220/16-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 g	25 mL	50220	05/27/21 08:00	JTB	EET KNX
Step 2	Prep	3010A			5 mL	50 mL	50254	05/28/21 08:00	KNC	EET KNX
Step 2	Analysis	6010B SEP		3			50418	06/02/21 13:18	KNC	EET KNX
Instrument ID: DUO										

Client Sample ID: Method Blank

Lab Sample ID: MB 140-50257/16-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 g	25 mL	50257	05/28/21 08:00	JTB	EET KNX
Step 3	Prep	3010A			5 mL	50 mL	50291	06/01/21 08:00	KNC	EET KNX
Step 3	Analysis	6010B SEP		1			50418	06/02/21 15:12	KNC	EET KNX
Instrument ID: DUO										

Client Sample ID: Method Blank

Lab Sample ID: MB 140-50292/16-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	50292	06/01/21 08:00	KNC	EET KNX
Step 4	Prep	3010A			5 mL	50 mL	50364	06/02/21 08:00	KNC	EET KNX
Step 4	Analysis	6010B SEP		1			50529	06/05/21 10:52	KNC	EET KNX
Instrument ID: DUO										

Eurofins Knoxville

Lab Chronicle

Client: Sirem, div of Geosyntec Consultants
 Project/Site: Coffeen MNA

Job ID: 140-23157-1

Client Sample ID: Method Blank

Lab Sample ID: MB 140-50371/16-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	50371	06/02/21 08:00	KNC	EET KNX
Step 5	Prep	3010A			5 mL	50 mL	50451	06/04/21 08:00	JTB	EET KNX
Step 5	Analysis	6010B SEP		5			50529	06/05/21 12:44	KNC	EET KNX
Instrument ID: DUO										

Client Sample ID: Method Blank

Lab Sample ID: MB 140-50452/16-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 g	250 mL	50452	06/04/21 08:00	JTB	EET KNX
Step 6	Analysis	6010B SEP		1			50529	06/05/21 14:39	KNC	EET KNX
Instrument ID: DUO										

Client Sample ID: Method Blank

Lab Sample ID: MB 140-50497/16-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 g	50 mL	50497	06/07/21 08:00	JTB	EET KNX
Step 7	Analysis	6010B SEP		1			50662	06/09/21 11:46	KNC	EET KNX
Instrument ID: DUO										

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 140-50176/18-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	50176	05/27/21 08:00	JTB	EET KNX
Total/NA	Analysis	6010B		1			50709	06/10/21 11:35	KNC	EET KNX
Instrument ID: DUO										

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 140-50177/17-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	50177	05/26/21 08:00	JTB	EET KNX
Step 1	Prep	3010A			5 mL	50 mL	50219	05/27/21 08:00	KNC	EET KNX
Step 1	Analysis	6010B SEP		5			50418	06/02/21 17:24	KNC	EET KNX
Instrument ID: DUO										

Lab Chronicle

Client: Sirem, div of Geosyntec Consultants
 Project/Site: Coffeen MNA

Job ID: 140-23157-1

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 140-50220/17-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 g	25 mL	50220	05/27/21 08:00	JTB	EET KNX
Step 2	Prep	3010A			5 mL	50 mL	50254	05/28/21 08:00	KNC	EET KNX
Step 2	Analysis	6010B SEP		5			50418	06/02/21 13:23	KNC	EET KNX
Instrument ID: DUO										

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 140-50257/17-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 g	25 mL	50257	05/28/21 08:00	JTB	EET KNX
Step 3	Prep	3010A			5 mL	50 mL	50291	06/01/21 08:00	KNC	EET KNX
Step 3	Analysis	6010B SEP		1			50418	06/02/21 15:17	KNC	EET KNX
Instrument ID: DUO										

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 140-50292/17-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	50292	06/01/21 08:00	KNC	EET KNX
Step 4	Prep	3010A			5 mL	50 mL	50364	06/02/21 08:00	KNC	EET KNX
Step 4	Analysis	6010B SEP		1			50529	06/05/21 10:57	KNC	EET KNX
Instrument ID: DUO										

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 140-50371/17-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	50371	06/02/21 08:00	KNC	EET KNX
Step 5	Prep	3010A			5 mL	50 mL	50451	06/04/21 08:00	JTB	EET KNX
Step 5	Analysis	6010B SEP		5			50529	06/05/21 12:49	KNC	EET KNX
Instrument ID: DUO										

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 140-50452/17-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 g	250 mL	50452	06/04/21 08:00	JTB	EET KNX
Step 6	Analysis	6010B SEP		1			50529	06/05/21 14:43	KNC	EET KNX
Instrument ID: DUO										

Lab Chronicle

Client: Sirem, div of Geosyntec Consultants
 Project/Site: Coffeen MNA

Job ID: 140-23157-1

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 140-50497/17-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 g	50 mL	50497	06/07/21 08:00	JTB	EET KNX
Step 7	Analysis	6010B SEP		1			50662	06/09/21 11:51	KNC	EET KNX
Instrument ID: DUO										

Client Sample ID: Lab Control Sample Dup

Lab Sample ID: LCSD 140-50176/19-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	50176	05/27/21 08:00	JTB	EET KNX
Total/NA	Analysis	6010B		1			50709	06/10/21 11:40	KNC	EET KNX
Instrument ID: DUO										

Client Sample ID: Lab Control Sample Dup

Lab Sample ID: LCSD 140-50177/18-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	50177	05/26/21 08:00	JTB	EET KNX
Step 1	Prep	3010A			5 mL	50 mL	50219	05/27/21 08:00	KNC	EET KNX
Step 1	Analysis	6010B SEP		5			50418	06/02/21 11:37	KNC	EET KNX
Instrument ID: DUO										

Client Sample ID: Lab Control Sample Dup

Lab Sample ID: LCSD 140-50220/18-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 g	25 mL	50220	05/27/21 08:00	JTB	EET KNX
Step 2	Prep	3010A			5 mL	50 mL	50254	05/28/21 08:00	KNC	EET KNX
Step 2	Analysis	6010B SEP		5			50418	06/02/21 13:28	KNC	EET KNX
Instrument ID: DUO										

Client Sample ID: Lab Control Sample Dup

Lab Sample ID: LCSD 140-50257/18-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 g	25 mL	50257	05/28/21 08:00	JTB	EET KNX
Step 3	Prep	3010A			5 mL	50 mL	50291	06/01/21 08:00	KNC	EET KNX
Step 3	Analysis	6010B SEP		1			50418	06/02/21 15:21	KNC	EET KNX
Instrument ID: DUO										

Lab Chronicle

Client: Sirem, div of Geosyntec Consultants
 Project/Site: Coffeen MNA

Job ID: 140-23157-1

Client Sample ID: Lab Control Sample Dup

Lab Sample ID: LCSD 140-50292/18-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	50292	06/01/21 08:00	KNC	EET KNX
Step 4	Prep	3010A			5 mL	50 mL	50364	06/02/21 08:00	KNC	EET KNX
Step 4	Analysis	6010B SEP		1			50529	06/05/21 11:02	KNC	EET KNX
Instrument ID: DUO										

Client Sample ID: Lab Control Sample Dup

Lab Sample ID: LCSD 140-50371/18-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	50371	06/02/21 08:00	KNC	EET KNX
Step 5	Prep	3010A			5 mL	50 mL	50451	06/04/21 08:00	JTB	EET KNX
Step 5	Analysis	6010B SEP		5			50529	06/05/21 12:54	KNC	EET KNX
Instrument ID: DUO										

Client Sample ID: Lab Control Sample Dup

Lab Sample ID: LCSD 140-50452/18-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 g	250 mL	50452	06/04/21 08:00	JTB	EET KNX
Step 6	Analysis	6010B SEP		1			50529	06/05/21 14:48	KNC	EET KNX
Instrument ID: DUO										

Client Sample ID: Lab Control Sample Dup

Lab Sample ID: LCSD 140-50497/18-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 g	50 mL	50497	06/07/21 08:00	JTB	EET KNX
Step 7	Analysis	6010B SEP		1			50662	06/09/21 11:56	KNC	EET KNX
Instrument ID: DUO										

Laboratory References:

EET KNX = Eurofins Knoxville, 5815 Middlebrook Pike, Knoxville, TN 37921, TEL (865)291-3000

Accreditation/Certification Summary

Client: Sirem, div of Geosyntec Consultants
 Project/Site: Coffeen MNA

Job ID: 140-23157-1

Laboratory: Eurofins Knoxville

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
	AFCEE	N/A	
ANAB	Dept. of Defense ELAP	L2311	02-03-22
ANAB	Dept. of Energy	L2311.01	02-03-22
ANAB	ISO/IEC 17025	L2311	02-03-22
Arkansas DEQ	State	88-0688	06-16-21
California	State	2423	06-30-22
Colorado	State	TN00009	02-28-22
Connecticut	State	PH-0223	09-29-21
Florida	NELAP	E87177	06-30-21
Georgia (DW)	State	906	12-11-22
Hawaii	State	NA	12-11-21
Kansas	NELAP	E-10349	10-31-21
Kentucky (DW)	State	90101	12-31-21
Louisiana	NELAP	83979	06-30-21
Louisiana (DW)	State	LA019	12-31-21
Maryland	State	277	03-17-22
Michigan	State	9933	11-22-22
Nevada	State	TN00009	07-12-21
New Hampshire	NELAP	2999	01-17-22
New Jersey	NELAP	TN001	06-30-21
New York	NELAP	10781	03-31-22
North Carolina (DW)	State	21705	07-31-21
North Carolina (WW/SW)	State	64	12-31-21
Ohio VAP	State	CL0059	06-02-23
Oklahoma	State	9415	08-31-21
Oregon	NELAP	TNI0189	12-31-21
Pennsylvania	NELAP	68-00576	12-31-21
Tennessee	State	02014	08-21-22
Texas	NELAP	T104704380-22-17	08-31-21
US Fish & Wildlife	US Federal Programs	058448	07-31-21
USDA	US Federal Programs	525-22-279-18762	07-13-22
Utah	NELAP	TN00009	07-31-21
Virginia	NELAP	460176	09-14-21
Washington	State	C593	01-19-22
West Virginia (DW)	State	9955C	12-31-21
West Virginia DEP	State	345	03-03-22
Wisconsin	State	998044300	08-17-21

Method Summary

Client: Sirem, div of Geosyntec Consultants
Project/Site: Coffeen MNA

Job ID: 140-23157-1

Method	Method Description	Protocol	Laboratory
6010B	SEP Metals (ICP) - Total	SW846	EET KNX
6010B SEP	SEP Metals (ICP)	SW846	EET KNX
Moisture	Percent Moisture	EPA	EET KNX
3010A	Preparation, Total Metals	SW846	EET KNX
Acid/Sulfide	Sequential Extraction Procedure, Acid/Sulfide Fraction	TAL-KNOX	EET KNX
Carbonate	Sequential Extraction Procedure, Carbonate Fraction	TAL-KNOX	EET KNX
Exchangeable	Sequential Extraction Procedure, Exchangeable Fraction	TAL-KNOX	EET KNX
Metal Hydroxide	Sequential Extraction Procedure, Metal Hydroxide Fraction	TAL-KNOX	EET KNX
Non-Crystalline	Sequential Extraction Procedure, Non-crystalline Materials	TAL-KNOX	EET KNX
Organic-Bound	Sequential Extraction Procedure, Organic Bound Fraction	TAL-KNOX	EET KNX
Residual	Sequential Extraction Procedure, Residual Fraction	TAL-KNOX	EET KNX
Total	Preparation, Total Material	TAL-KNOX	EET 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:

EET KNX = Eurofins Knoxville, 5815 Middlebrook Pike, Knoxville, TN 37921, TEL (865)291-3000

Regulatory Program: DW NPDES RCRA Other:

Client Contact		Project Manager: Michael Healey	
SIREM Lab		Email: mhealey@siremlab.com	
130 Stone Road		Tel/Fax: 519-515-0852	
Guelph/ON/Canada/NTG 3Z2		Analysis Turnaround Time	
(519) 822-2265 Phone		<input checked="" type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS	
(519) 822-3151 FAX		TAT if different from Below _____	
Project Name: Coffeen MNA		<input checked="" type="checkbox"/> 2 weeks	
Site:		<input type="checkbox"/> 1 week	
P O # 800003210A		<input type="checkbox"/> 2 days	
		<input type="checkbox"/> 1 day	

Sample Identification	Sample Date	Sample Time	Sample Type (G=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)	SP
G1001-(6-11)	5/17/2021	10:00	G	Soil	1		X	
401B-(16-20)	5/17/2021	10:15	G	Soil	1		X	
270A-(12-16)	5/17/2021	10:30	G	Soil	1		X	
<p>NO CUSTODY SEALS</p> <p>RESERVED AT 11:00/CT 12:00</p> <p>BY 5-19-21</p> <p>1 COOLING FREEZE # 73740530453 INTS PD</p>								



Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other

Possible Hazard Identification: Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

Non-Hazard Flammable Skin Irritant Poison B Unknown

Special Instructions/QC Requirements & Comments:

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

Return to Client Disposal by Lab Archive for _____ Months

Custody Seals Intact:	<input type="checkbox"/> Yes <input type="checkbox"/> No
Relinquished by:	Company:
Relinquished by:	Company:
Relinquished by:	Company:

COC No.:	_____ of _____ COCS
TALS Project #:	_____
Sampler:	_____
For Lab Use Only:	_____
Walk-in Client:	_____
Lab Sampling:	_____
Job / SDG No.:	_____
Sample Specific Notes:	_____

Therm ID No.:	_____
Date/Time:	5-19-21 10:15
Company:	EPA TX X
Date/Time:	_____
Company:	_____
Date/Time:	_____
Company:	_____



EUROFINS/TESTAMERICA KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

Review Items	Yes	No	NA	If No, what was the problem?	Comments/Actions Taken
1. Are the shipping containers intact?	/			<input type="checkbox"/> Containers, Broken	4
2. Were ambient air containers received intact?		/		<input type="checkbox"/> Checked in lab	
3. The coolers/containers custody seal if present, is it intact?		/		<input type="checkbox"/> Yes <input type="checkbox"/> NA	10
4. Is the cooler temperature within limits? (> freezing temp. of water to 6°C, VOST: 10°C) Thermometer ID : <u>571</u> Correction factor: <u>+0.1°C</u>		/		<input checked="" type="checkbox"/> Cooler Out of Temp, Client Contacted, Proceed/Cancel <input type="checkbox"/> Cooler Out of Temp, Same Day Receipt	14
5. Were all of the sample containers received intact?	/			<input type="checkbox"/> Containers, Broken	
6. Were samples received in appropriate containers?	/			<input type="checkbox"/> Containers, Improper; Client Contacted; Proceed/Cancel	
7. Do sample container labels match COC? (IDs, Dates, Times)	/			<input type="checkbox"/> COC & Samples Do Not Match <input type="checkbox"/> COC Incorrect/Incomplete <input type="checkbox"/> COC Not Received	
8. Were all of the samples listed on the COC received?	/			<input type="checkbox"/> Sample Received, Not on COC <input type="checkbox"/> Sample on COC, Not Received	
9. Is the date/time of sample collection noted?	/			<input type="checkbox"/> COC; No Date/Time; Client Contacted	Labeling Verified by: _____ Date: _____
10. Was the sampler identified on the COC?	/			<input checked="" type="checkbox"/> Sampler Not Listed on COC	
11. Is the client and project name/# identified?	/			<input type="checkbox"/> COC Incorrect/Incomplete	
12. Are tests/parameters listed for each sample?	/			<input type="checkbox"/> COC No tests on COC	pH test strip lot number: _____
13. Is the matrix of the samples noted?	/			<input type="checkbox"/> COC Incorrect/Incomplete	
14. Was COC relinquished? (Signed/Dated/Timed)	/			<input checked="" type="checkbox"/> COC Incorrect/Incomplete	Box 16A: pH Preservation Box 18A: Residual Chlorine
15. Were samples received within holding time?	/			<input type="checkbox"/> Holding Time - Receipt	Preservative: _____
16. Were samples received with correct chemical preservative (excluding Encore)?	/			<input type="checkbox"/> pH Adjusted, pH Included (See box 16A) <input type="checkbox"/> Incorrect Preservative	Lot Number: _____ Exp Date: _____ Analyst: _____
17. Were VOA samples received without headspace?	/			<input type="checkbox"/> Headspace (VOA only) <input type="checkbox"/> Residual Chlorine	Date: _____ Time: _____
18. Did you check for residual chlorine, if necessary? (e.g. 1613B, 1668) Chlorine test strip lot number: _____	/				
19. For 1613B water samples is pH<9?	/			<input type="checkbox"/> If no, notify lab to adjust	
20. For rad samples was sample activity info. Provided?	/			<input type="checkbox"/> Project missing info	
Project #: _____				PM Instructions: _____	

Sample Receiving Associate: [Signature] Date: 5-19-21

QA026R32.doc, 062719



ATTACHMENT 8
X-Ray Diffraction Laboratory Analytical Report



Quantitative X-Ray Diffraction by Rietveld Refinement

Report Prepared for: Environmental Services

Project Number/ LIMS No. Custom XRD/MI4544-MAY21

Sample Receipt: May 27, 2021

Sample Analysis: May 31, 2021

Reporting Date: June 17, 2021

Instrument: BRUKER AXS D8 Advance Diffractometer

Test Conditions: Co radiation, 35 kV, 40 mA
Regular Scanning: Step: 0.02°, Step time: 1s, 2θ range: 3-80°

Interpretations : PDF2/PDF4 powder diffraction databases issued by the International Center for Diffraction Data (ICDD). DiffracPlus Eva and Topas software.

Detection Limit: 0.5-2%. Strongly dependent on crystallinity.

Contents:

- 1) Method Summary
- 2) Quantitative XRD Results
- 3) XRD Pattern(s)

Kim Gibbs, H.B.Sc., P.Geo.
Senior Mineralogist

Huyun Zhou, Ph.D., P.Geo.
Senior Mineralogist

ACCREDITATION: SGS Minerals Services Lakefield is accredited to the requirements of ISO/IEC 17025 for specific tests as listed on our scope of accreditation, including geochemical, mineralogical and trade mineral tests. To view a list of the accredited methods, please visit the following website and search SGS Canada - Minerals Services - Lakefield: <http://palcan.scc.ca/SpecsSearch/GLSearchForm.do>.



Method Summary

The Rietveld Method of Mineral Identification by XRD (ME-LR-MIN-MET-MN-D05) method used by SGS Minerals Services is accredited to the requirements of ISO/IEC 17025.

Mineral Identification and Interpretation:

Mineral identification and interpretation involves matching the diffraction pattern of an unknown material to patterns of single-phase reference materials. The reference patterns are compiled by the Joint Committee on Powder Diffraction Standards - International Center for Diffraction Data (JCPDS-ICDD) database and released on software as Powder Diffraction Files (PDF).

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:

Quantitative Rietveld Analysis is performed by using Topas 4.2 (Bruker AXS), a graphics based profile analysis program built around a non-linear least squares fitting system, to 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 until it matches the obtained experimental patterns.

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 0.05wt%. 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

Mineral/Compound	G1001-(6-11)	401B-(16-20)	270A-(12-16)
	MAY4544-01	MAY4544-02	MAY4544-03
	(wt %)	(wt %)	(wt %)
Quartz	46.3	68.9	60.6
Muscovite	10.3	6.8	9.0
Biotite	2.4	2.1	2.4
Microcline	7.8	7.8	9.8
Albite	10.4	8.6	9.1
Calcite	4.2	-	-
Dolomite	11.3	-	0.6
Ankerite	1.5	0.1	0.5
Chlorite	1.5	-	1.4
Pyrite	0.1	-	0.2
Stilpnomelane	2.6	2.7	2.0
Diopside	0.8	1.4	1.3
Actinolite	0.9	1.4	3.3
TOTAL	100	100	100

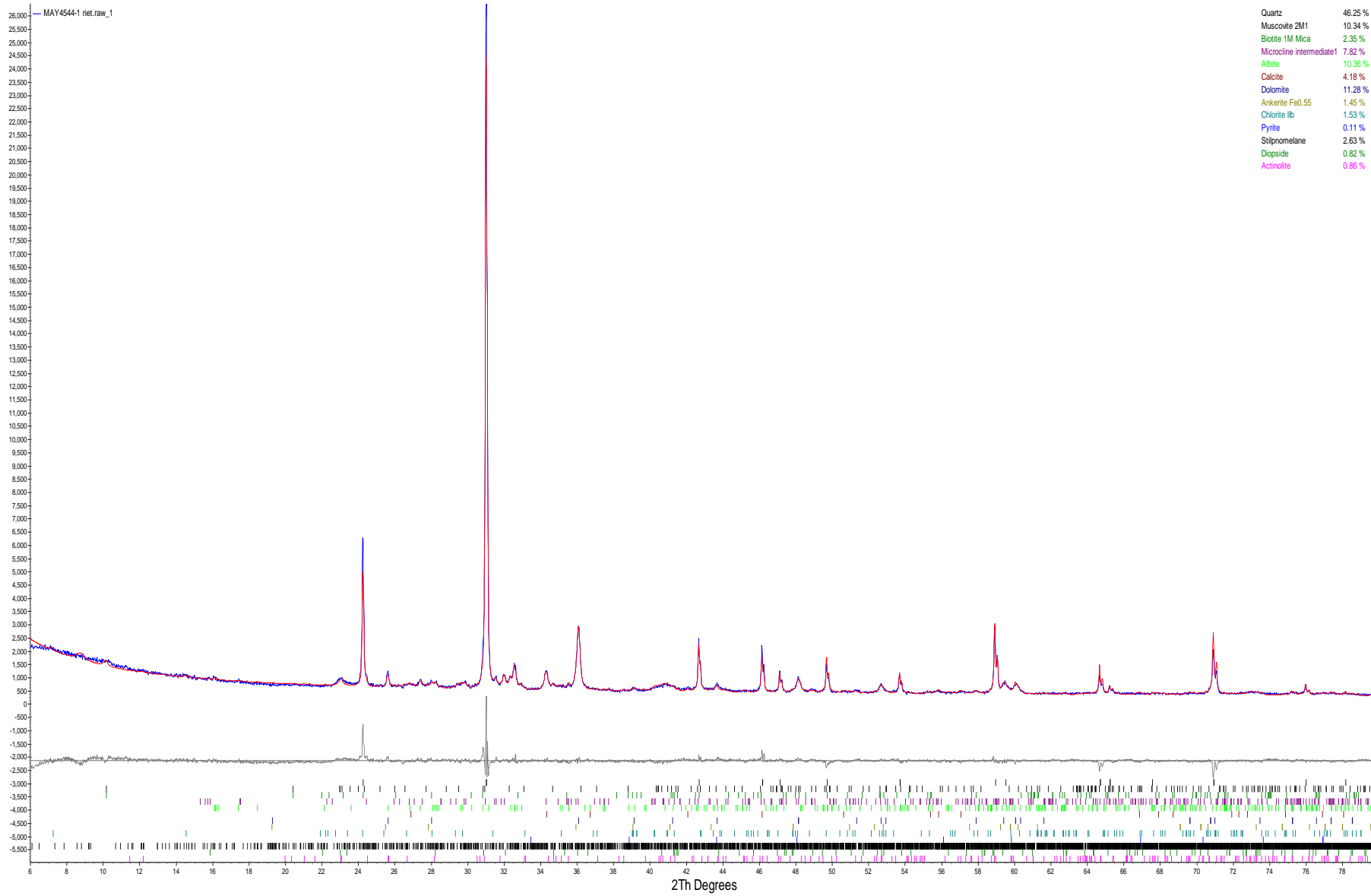
Zero values indicate that the mineral was included in the refinement, but the calculated concentration is below a measurable value.

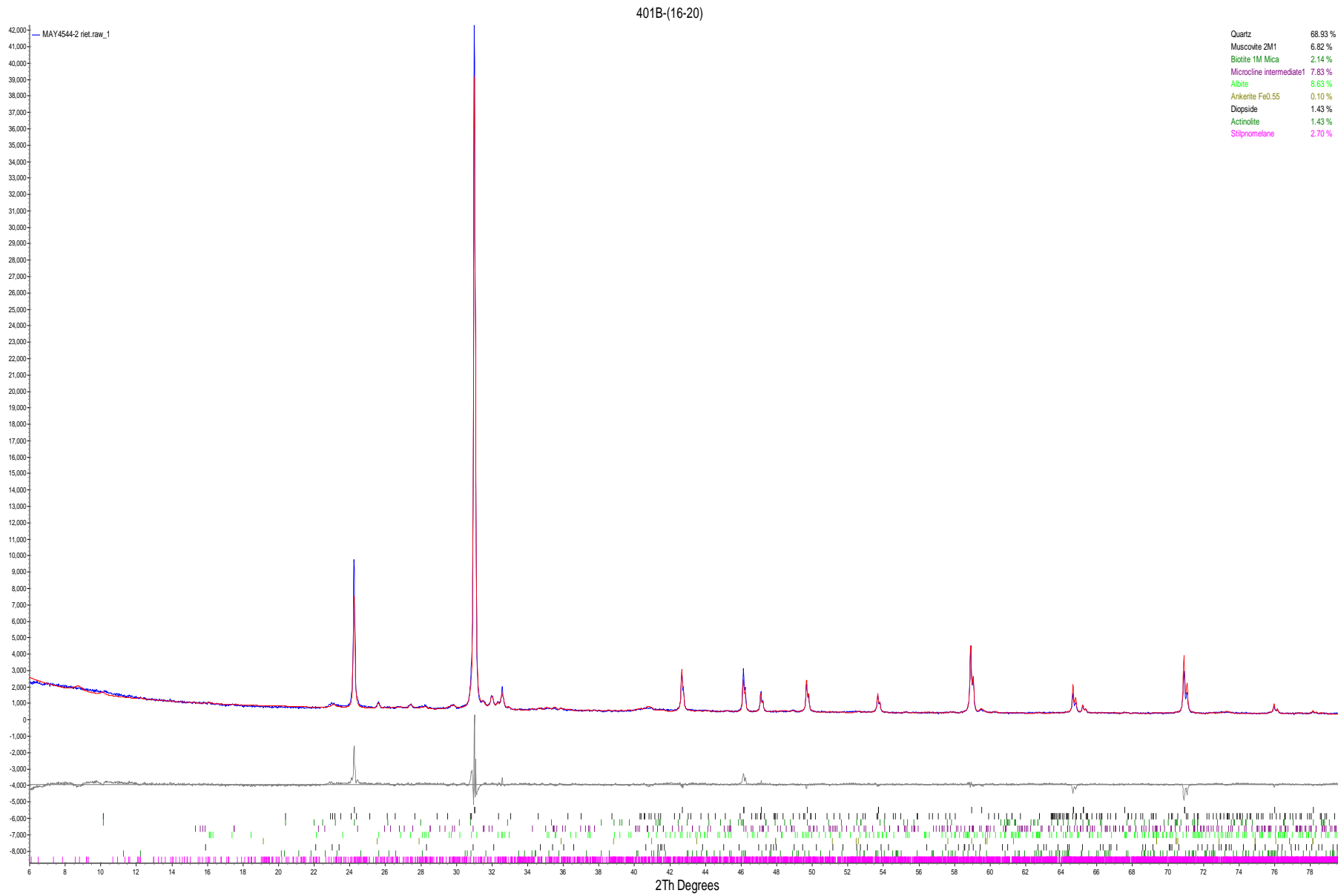
Dashes indicate that the mineral was not identified by the analyst and not included in the refinement calculation for the sample.

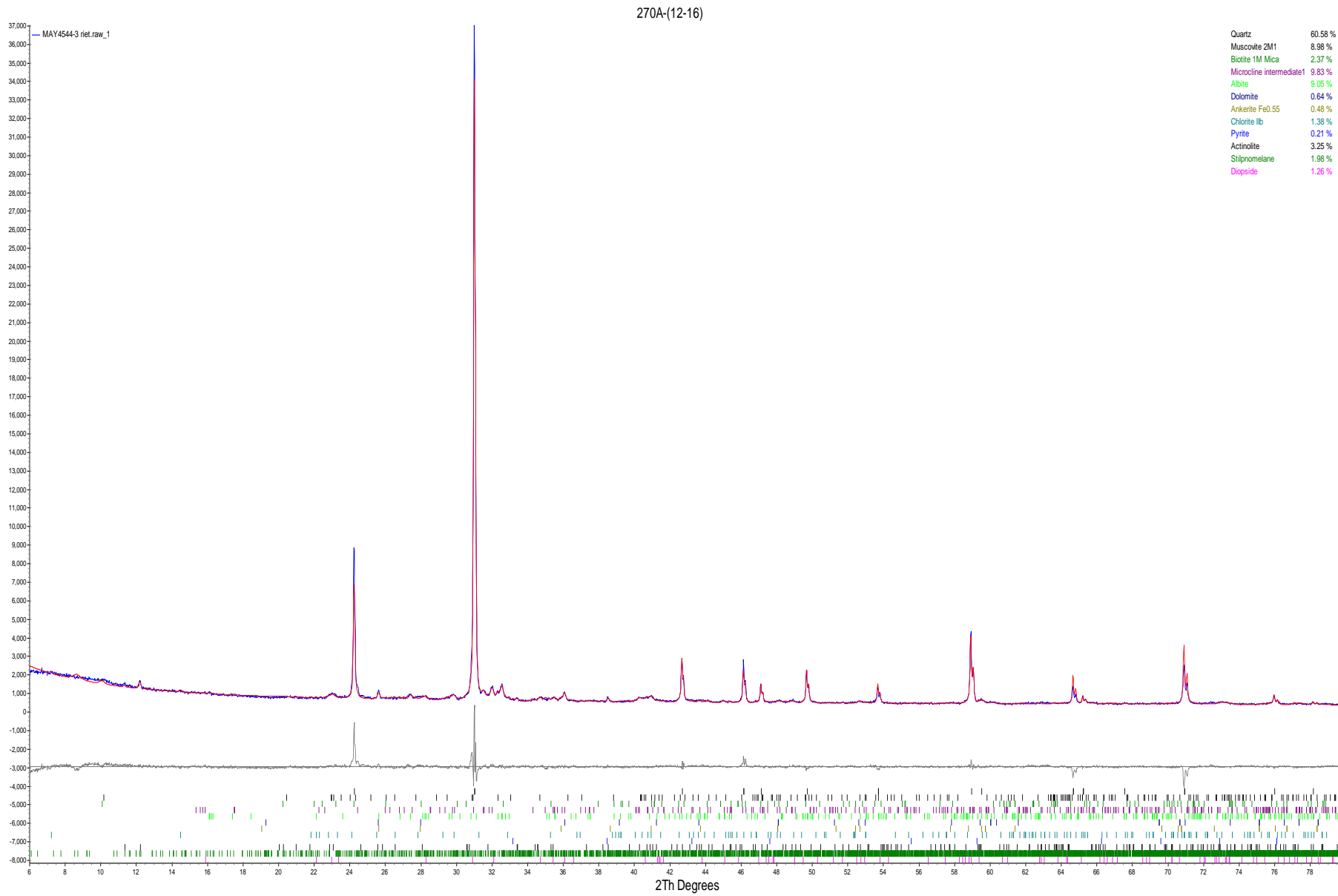
The weight percent quantities indicated have been normalized to a sum of 100%. The quantity of amorphous material has not been determined.

Mineral/Compound	Formula
Quartz	SiO ₂
Muscovite	KAl ₂ (AlSi ₃ O ₁₀)(OH) ₂
Biotite	K(Mg,Fe) ₃ (AlSi ₃ O ₁₀)(OH) ₂
Microcline	KAlSi ₃ O ₈
Albite	NaAlSi ₃ O ₈
Calcite	CaCO ₃
Dolomite	CaMg(CO ₃) ₂
Ankerite	CaFe(CO ₃) ₂
Chlorite	(Fe,(Mg,Mn) ₅ ,Al)(Si ₃ Al)O ₁₀ (OH) ₈
Pyrite	FeS ₂
Stilpnomelane	K(Fe ²⁺ ,Mg,Fe ³⁺) ₈ (Si,Al) ₁₂ (O,OH) ₂₇ ·n(H ₂ O)
Diopside	CaMgSi ₂ O ₆
Actinolite	Ca ₂ (Mg,Fe) ₅ Si ₈ O ₂₂ (OH) ₂

G1001-(6-11)







ATTACHMENT 9
Total Metals Laboratory Analytical Report



SGS Canada Inc.
P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - K0L 2H0
Phone: 705-652-2000 FAX: 705-652-6365

Project : Coffeen MNA

09-June-2021

SiREM Laboratory
Attn : Michael Healey

130 Stone Road W
Guelph, ON
N1G 3Z2, Canada

Phone: 519-822-2265
Fax: 519-822-3151

Date Rec. : 18 May 2021
LR Report: CA12646-MAY21
Reference: P.O# 800003210A

Copy: #1

CERTIFICATE OF ANALYSIS

Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: G1001-(6-11)	6: 401B-(16-20)	7: 270A-(12-16)
Sample Date & Time					17-May-21 10:00	17-May-21 10:15	17-May-21 10:30
Temp Upon Receipt [°C]	---	---	---	---	5.0	5.0	5.0
Sulphide1 [%]	03-Jun-21	15:12	03-Jun-21	16:31	0.05	< 0.04	< 0.04
TOC [%]	07-Jun-21	09:12	07-Jun-21	15:08	0.852	0.082	0.138
Ag [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	< 0.05	< 0.05	< 0.05
Al [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	8200	9700	9600
As [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	6.2	5.5	12
Ba [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	120	190	210
Be [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	0.45	0.35	0.48
B [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	6	4	5
Bi [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	0.23	0.25	0.18
Ca [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	42000	1900	5000
Cd [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	0.13	0.03	0.12
Co [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	8.8	6.1	10
Cr [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	15	14	16
Cu [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	11	7.8	12
Fe [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	16000	14000	22000
K [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	1100	770	1400
Li [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	9	7	11
Mg [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	18000	1600	4700
Mn [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	450	540	1200
Mo [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	1.5	0.4	0.8
Na [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	110	80	110
Ni [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	15	10	20
Pb [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	11	9.5	12
Sb [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	< 0.8	< 0.8	< 0.8
Se [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	< 0.7	< 0.7	< 0.7
Sn [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	0.6	< 0.5	< 0.5
Sr [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	35	9.1	10
Ti [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	170	65	230
Tl [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	0.16	0.12	0.16
U [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	0.82	0.39	0.46
V [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	19	14	22
W [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	0.07	0.04	0.13

Online LIMS

0002522990


SGS Canada Inc.

P.O. Box 4300 - 185 Concession St.
 Lakefield - Ontario - KOL 2H0
 Phone: 705-652-2000 FAX: 705-652-6365

Project : Coffeen MNA

LR Report : CA12646-MAY21

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: G1001-(6-11)	6: 401B-(16-20)	7: 270A-(12-16)
Y [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	8.1	8.2	9.4
Zn [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	35	28	50

Catharine Arnold

Catharine Arnold, B.Sc., C.Chem
 Project Specialist,
 Environment, Health & Safety