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

May 9, 2024
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: Coffeen Power Plant GMF Recycle Pond; IEPA ID # W1350150004-04

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 arsenic exceedance observed at well G275D from the Quarter 4 2023 sampling event at the Coffeen Power Plant GMF Recycle Pond, 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,

Dianna Tickner

Dianna Tickner
Sr. Director – Decommission and Demolition

Enclosures
Alternate Source Demonstration, Quarter 4 2023, GMF Pond Coffeen Power Plant, Coffeen Illinois

Geosyntec consultants

engineers | scientists | innovators

ALTERNATIVE SOURCE DEMONSTRATION

Coffeen Power Plant GMF Recycle Pond
(Unit ID #104)
IEPA ID: W1350150004-04
35 IAC 845.650

Prepared for

Dynegy Midwest Generation, LLC
1500 Eastport Plaza Drive
Collinsville, Illinois 62234

Prepared by

Geosyntec Consultants, Inc.
500 W. Wilson Bridge Road, Suite 250
Worthington, Ohio 43085

Project Number: GLP8078

May 2024

Geosyntec consultants

Alternative Source Demonstration

Coffeen Power Plant GMF Recycle Pond
(Unit ID #104)
IEPA ID: W1350150004-04
35 IAC 845.650

Prepared for

Dynegy Midwest Generation, LLC
1500 Eastport Plaza Drive
Collinsville, Illinois 62234

Prepared by

Geosyntec Consultants, Inc.
500 W. Wilson Bridge Road, Suite 250
Worthington, OH 43085

License No.: 062.040562
Expires: 11/30/2025

John Seymour, P.E.
Senior Principal

Project Number: GLP8078

May 7, 2024

Geosyntec consultants

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

ACRONYMS AND ABBREVIATIONS

ASD	alternative source demonstration
CCR	coal combustion residuals
CPP	Coffeen Power Plant
DA	deep aquifer
DCU	deep confining unit
EPRI	Electric Power Research Institute
GMF	Gypsum Management Facility
GSP	Gypsum Stack Pond
GWPS	groundwater protection standard
HSU	hydrostratigraphic unit
IAC	Illinois Administrative Code
IPGC	Illinois Power Generating Company
IEPA	Illinois Environmental Protection Agency
LCU	lower confining unit
LOE	line of evidence
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
PC	principal component
PCA	principal component analysis
PMP	potential migration pathway
UA	uppermost aquifer
UCU	upper confining unit
USEPA	United States Environmental Protection Agency

1. INTRODUCTION

Geosyntec Consultants, Inc. has prepared this alternative source demonstration (ASD) on behalf of Illinois Power Generating Company (IPGC), regarding the Gypsum Management Facility (GMF) Recycle Pond (RP) coal combustion residuals (CCR) unit at the Coffeen Power Plant (CPP) near Coffeen, Illinois. The ASD is completed pursuant to the Illinois Administrative Code (IAC) Title 35, Part 845 ("Standards for the Disposal of CCR in Surface Impoundments") and was completed by May 9, 2024, within 60 days of determination of the exceedances (March 10, 2024), as required by 35 I.A.C.§ 845.650(e). This report applies specifically to the CCR Unit referred to as the "GMF Recycle Pond", identification (ID) number (No.) 104, Illinois Environmental Protection Agency (IEPA) ID No. W1350150004-04, and National Inventory of Dams ID No. IL50578. This ASD 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 arsenic was identified above the site-specific groundwater protection standard (GWPS) of 0.010 milligrams per liter (mg/L) at downgradient monitoring well G275D following the Fourth Quarter 2023 sampling event (Ramboll 2024a).

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, or that the exceedance of the GWPS 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 GMF RP CCR unit was the cause of the GWPS exceedance for arsenic at downgradient monitoring well G275D. Natural variability associated with the lithology of the aquifer was identified as the alternative source for the elevated arsenic at G275D.

2. BACKGROUND

2.1 Site Location and Description

The CPP property is located approximately two miles south of the city of Coffeen, Illinois, and bordered by two lobes of Coffeen Lake to the west, east, and south, and by agricultural land to the north. The location of the CCR and non-CCR impoundments are shown in **Attachment 1**. The CPP GMF RP impoundment is located immediately to the south of the GMF Gypsum Stack Pond (GSP) CCR unit (Unit # 103).

2.2 Description of the CCR Unit

The GMF RP is an 18.3-acre lined surface impoundment that received decanted water from the GMF GSP from 2010 to 2021 to act as a polishing pond. Outflow from the GMF RP was pumped back to the CPP for use in the wet scrubber system, and the GMF RP also has an emergency spillway that discharges to the Unnamed Tributary via a National Pollutant Discharge Elimination System permitted outfall. The GMF RP was constructed in accordance with IEPA Water Pollution Control Permit No. 2008-EA-4661 and features a composite high-density polyethylene (HDPE) liner with three feet of recompacted soil and a groundwater underdrain system.

2.3 Geology and Hydrogeology

This section provides a summary of the site geology and hydrogeology; additional detail is provided in the Hydrogeologic Site Characterization Report (Ramboll 2021).

The hydrostratigraphic units (HSUs) present in the vicinity of the CPP GMF RP consist of an upper confining unit (UCU), uppermost aquifer (UA), lower confining unit (LCU), deep aquifer (DA), and deep confining unit (DCU). The UCU consists of the silty or clayey silt of the Loess Unit and the upper clayey portion of the Hagerstown Member. The UA is predominantly sandy to gravelly silts with thin sand beds, with lithology identified as the Hagarstown Member. The LCU is comprised primarily of sandy to silty till, with discontinuous sand lenses that have been identified as potential migration pathways (PMPs). The LCU includes lithologies identified as the Vandalia Member, Mulberry Grove Member, and Smithboro Member. The DA is predominantly sand and sandy silt/clay units of the Yarmouth Soil and is discontinuous beneath the CPP. A geologic cross-section originally included in the Hydrogeologic Site Characterization Report and locator map are provided as **Attachment 2**.

Vertical gradients measured near CPP indicate downward flow from the UA to the LCU and DA. Both the DA and the LCU have been identified as PMPs due to the presence of downward gradients and the higher hydraulic conductivities measured in the DA relative to the UA.

The groundwater monitoring network for the CPP GMF RP consists of 12 monitoring wells: 10 downgradient compliance monitoring wells (G271, G273, G275, G275D, G276, G277, G279, G283, G284, and G285) and 2 background monitoring wells (G270 and G280) (locations shown in **Attachment 3**). All network groundwater monitoring wells are screened in the UA except G283

and G285, which are screened in the LCU, and G275D, which is screened in the DA. The only other groundwater monitoring well screened within the DA in the vicinity of the GMF RP is well G206D, which is downgradient of the GMF GSP (location shown in **Attachment 3**).

The potentiometric groundwater contours and generalized groundwater flow directions at the site are shown in **Attachment 3**. Groundwater flow is generally east to southeast in the vicinity of the GMF RP in the direction of the unnamed tributary. Groundwater flow directions are generally consistent across seasons.

3. ALTERNATIVE SOURCE DEMONSTRATION LINES OF EVIDENCE

This ASD for the arsenic GWPS exceedance at G275D is based on three LOEs. These LOEs are described and supported below.

3.1 LOE #1: The GMF RP does not Contain Sufficient Arsenic in Solid or Aqueous Phases to Act as the Source of Arsenic in Groundwater.

Arsenic was not detected above the reporting limit for grab samples of CCR solids collected from two locations at the GMF GSP in 2021 (**Attachment 4**).[1] As noted in Section 2.2, the GMF RP served as a polishing pond for the GMF GSP and did not receive any other inputs of CCR solids. Therefore, analysis of the GMF GSP solids is representative of the CCR solids that would be expected to influence CCR source water composition at the GMF RP. The lack of detections of arsenic in the CCR solids provides evidence that the GMF RP is not the source of elevated arsenic in groundwater.

CCR source water samples have been collected for total arsenic from piezometer X201 since March 2021. The USEPA considers the use of CCR source water (which is often collected in the form of porewater) data as the most appropriate approach to estimate constituent fluxes to groundwater from CCR surface impoundments. As per USEPA, "…this is because porewater better represents the leachate seeping from the bottom of the impoundment than impoundment water samples" (USEPA 2015). The arsenic concentrations reported for this CCR source water sampling location are consistently below recent concentrations observed for arsenic at G275D, as shown in **Figure 1**. The arsenic concentrations in the CCR source water are typically more than four times lower than the concentrations observed at G275D since June 2021. The arsenic concentrations detected in the CCR source water samples are also less than the lower confidence limits of arsenic concentrations observed at downgradient well G275D (0.0144 mg/L) calculated using a confidence band around a linear regression (Ramboll 2024a). The aqueous arsenic concentrations observed at G275D are consistent with other samples collected from the shallow glacial drift materials within which G275D is screened, as documented by the United States Geological Survey's (USGS's) study of arsenic in Illinois groundwater (Warner 2001; Warner et al., 2003).

If the GMF RP were the source of arsenic in groundwater, CCR source water arsenic concentrations would be expected to be greater than the concentrations in downgradient wells, and arsenic would be expected to be present in the CCR solids. Because the concentrations in the GMF RP source water are lower than the concentrations of arsenic at monitoring well G275D and arsenic was not detected in the CCR solids, these exceedances cannot be attributed to impacts from the GMF RP unit.

[1] Borings were not advanced during the 2021 investigation in the GMF GSP due to safety concerns (Ramboll 2021).

A comparison of boron concentrations between background and compliance monitoring wells to source water was conducted to assess whether boron trends were similar or divergent relative to arsenic. Boron is a geochemically conservative parameter that is not significantly attenuated during advective flow. Concentrations of boron in groundwater are unlikely to be modified as a result of geochemical processes such as mineral precipitation/dissolution, ion exchange, or oxidation-reduction (redox); variations in aqueous arsenic concentrations are more likely to be affected from these processes given its higher redox sensitivity.

Boron concentrations in the CCR source water are approximately 100 times greater than those reported in groundwater at G275D (**Figure 2**). If a release from the GMF RP to groundwater had occurred, physical mixing would occur and boron concentrations in downgradient groundwater would be expected to increase due to the multiple orders of magnitude difference between boron concentrations in the CCR source water and the groundwater. Boron concentrations in groundwater at G275D appear stable since monitoring began in 2021 (**Figure 2**). The stability in boron concentrations at G275D provides additional evidence that the arsenic exceedance observed at this well is not attributable to the GMF RP unit.

While there is an apparent increasing trend for arsenic at G275D, this is likely reflective of gradual equilibration of the well with aquifer conditions (i.e., water levels in the well have been slowly rising since the monitoring well was installed into the DA due to low permeability of the soils). Groundwater elevations at G275D have increased approximately 10 feet between 2021 and 2023 (**Figure 3**); this increase is concurrent with the increase in arsenic concentrations observed at G275D. A similar increase in groundwater elevations (i.e., gradual equilibration) was also observed at G206D, which is also screened within the DA (**Figure 4**). G206D and G275D were installed in January 2021 and February 2021, respectively, and are both screened within the clay of the LCU and discontinuous sand seams of the DA.

Boring logs for G206D (previously identified in the boring log as 282D) and G275D are provided in **Attachment 5**. Groundwater elevations at wells screened within the UA were more stable since 2021, including for other monitoring wells that were also installed in early 2021 (i.e., G283, G284, and G285; **Figure 4**). Given that the first five samples at G275D (and G206D) were collected within six months of installation, the increase in arsenic concentrations is demonstrably associated with the equilibration period with the aquifer following well installation rather than an influence from the GMF RP.

3.2 LOE #2: Groundwater at G275D Has a Distinct Ionic Composition and is Different than the GMF RP Source Water.

The groundwater at G275D has a distinct ionic composition compared to the GMF RP source water and is geochemically stable, suggesting that G275D is not affected by the GMF RP. A Piper diagram, which illustrates the relative concentration of major cations and anions in groundwater samples, shows that the anion composition of groundwater at G275D appears to be predominantly

carbonate alkalinity, whereas the cation composition is relatively even between monovalent (sodium and potassium) and divalent (calcium and magnesium) species (**Figure 5**). This groundwater composition is different from the GMF RP source water composition (X201), which tends to have greater relative contributions of sulfate and magnesium. G275D, which is screened within the DA, is more similar in composition to background locations G270 and G280, which are screened in the UA.

Advanced statistical analyses were used to evaluate the similarity or dissimilarity among different groundwater samples or groups based on a broad suite of analytes. Dimensional reduction techniques, such as principal component analysis (PCA), are especially effective in identifying the analytes responsible for statistical differences between samples and revealing underlying patterns related to environmental factors, contamination sources, or other natural characteristics of the Site. Clustering methods were further utilized to group samples based on their combined chemical composition through maximizing intra-group similarity and minimizing inter-group similarity.

PCA is often used to simplify large datasets with multiple variables by creating new uncorrelated variables known as principal components (PCs). The PCs are linear combinations of the original variables; the first few PCs typically capture most of the variation within the dataset. Factor loadings are calculated based on the correlation between PCs and the original variables. Consequently, variables with notably higher positive or negative factor loadings are main drivers of similarity or dissimilarity and clustering of samples. Factor scores are calculated based on the correlation between the combined chemical composition of each sample and the PCs. Samples with similar chemical compositions show similar factor scores and tend to cluster together on a PCA plot.

In this evaluation, the dataset used for PCA included 50 groundwater samples collected between 2021 and 2023 from upgradient wells (G270 and G280), downgradient wells (G271, G273, G275, G275D, G276, G277, G279, G283, G284 and G285) and the source water sampling location (X201).[2] PCA requires that input variables have similar scales of measurement and variances. Consequently, data were standardized by mean-centering and scaling to unit variance prior to performing PCA. Data were further square transformed to reduce the skewness of the dataset. The fraction of total variation explained by each PC is shown in **Figure 6**, with the first two PCs accounting for approximately 91 percent [%] of the total variation in the datasets. Additionally, the quality of representation of each variable is presented in **Figure 7**. As illustrated in **Figure 7**, the first dimension is dominated by boron, fluoride, manganese, chloride, pH, TDS, sulfate, and alkalinity, while the second dimension is dominated by barium and iron. **Figure 7** further shows that the contribution of all variables to the first two principal components exceeded the anticipated value from uniform contributions, confirming that these PCs capture the majority of the variability in the dataset.

[2] Analytes included in this PCA include alkalinity, boron, pH, barium, chloride, iron, manganese, sulfate, TDS and fluoride. The complete dataset used for PCA analysis is provided with this submission as **Attachment 6**.

PCA results are often visualized using biplots where samples are projected onto the first two PCs (i.e., factor scores), and factor loadings are represented as vectors. The closer the data points are on the graph, the greater the similarity in their chemical composition. The result from this evaluation is shown on **Figure 8**, where the samples acquired from the UA are dark green, samples from the LCU are light green, samples from the DA are blue, and CCR source water samples are gray. The biplot shows that the CCR source water samples from X201 cluster separately from the UA, LCU, and DA samples.

Furthermore, the factor loadings, represented as vectors on the biplot, suggest that higher levels of constituents such as boron, sulfate, and chloride drive the chemical composition of CCR source water samples within that cluster. Barium is also one of the drivers for the distinct chemical composition of the DA samples from G275D. Clustering also supports the biplot, with the CCR aqueous phase samples clustered distinctively from the DA and UA, and LCU samples as shown in **Figure 9**.

An alternative PCA analysis was performed in which CCR source water and downgradient well G279 were excluded to minimize the impact of CCR-related signatures on total variability in dataset and to assess the variabilities due to the influence of the different HSUs.[3] In this scenario, the first two principal components captured about 56% of total variance (**Figure 10**), with barium, iron and manganese dominating the first dimension; and sulfate, TDS, and chloride dominating the second dimension (**Figure 11**). As expected for a dataset without CCR impacts, boron demonstrated lower loading on both principal components as compared to previous analysis that included CCR source water samples. The results of this analysis are presented on **Figure 12**, which shows that the three HSUs are relatively separated from each other. Barium and iron are responsible for shifting the chemical composition of the samples toward the LCU and the DA, compared to the UA. Therefore, the chemical composition of G275D is influenced by the native lithology rather than by impacts from the GMF Recycle Pond.

Clustering was also performed for the second scenario shown in **Figure 13**, with the results indicating the DA clustered separately from the UA and LCU. Overall, the results of the PCA and clustering analysis support the conclusion that the ionic composition of groundwater collected from G275D is inconsistent with any impacts from the CCR unit, nor is the ionic composition related to shallower groundwater present in the UA and to some extent the LCU. The geochemistry of G275D is instead influenced by native lithology.

[3] While an exceedance of sulfate above the GWPS was not identified at G279 during the Q4 2023 statistical evaluation, an exceedance of TDS was identified and the reported sulfate concentration of 3,390 mg/L appeared elevated above other wells in the network, suggesting likely influence from CCR source water (Ramboll 2024a).

3.3 LOE #3: Arsenic Occurs Naturally in the Glacial Till of the Deep Aquifer and is Mobilized to Groundwater.

Solid phase analyses identified arsenic within the glacial till of the deep aquifer at the Site, providing evidence of naturally occurring arsenic within the mineral matrix of the aquifer. The presence of arsenic within the solid phase of the deep aquifer (i.e., glacial till) likely contributes to geogenic arsenic in groundwater samples. The USGS identified mobilization of coprecipitated arsenic from aquifer solids as the buried glacial environment becomes more reducing as a potential source of elevated arsenic concentrations in Illinois groundwater (Warner et al, 2003; provided as **Attachment 7**).

Site-specific aquifer solids were analyzed to evaluate whether subsurface material in the vicinity of the GMF RP may account for reported arsenic concentrations in groundwater. Samples were submitted for analysis of total arsenic and arsenic distribution within the aquifer solids using sequential extraction procedure (SEP).

Geosyntec collected aquifer solids samples near DA wells G275D (downgradient of the GMF Recycle Pond) and G206D (downgradient of the GMF GSP) during a field event completed in March 2024. An additional aquifer solid sample was collected near well G200, which is screened in the UA and is located to the north (i.e., upgradient) of both the GMF RP and GSP (location shown on **Attachment 3**), in 2021.[4] Samples were obtained from depths reflective of the screened interval of the nearby well at each boring location. Boring logs and monitoring well construction information for the adjacent wells are provided in **Attachment 5.** Field observations of the sample lithologies (provided in **Table 1**) are also provided in the relevant boring logs (**Attachment 8**).

SEP is an analytical technique used to infer associations between constituents and different classes of solids (Tessier et al., 1979). SEP uses progressively stronger reagents to solubilize metals from specific phases within the solid matrix. These classes of solids are identified based on their solubility under different reagents and include the exchangeable fraction (i.e., the most labile), the carbonate-bound fraction, the fraction associated with amorphous metal oxides such as iron oxides, the iron/manganese oxide-bound fraction, the organic matter-bound fraction, the fraction assumed to be associated with sulfides, and the residual fraction (i.e., the most recalcitrant).

To evaluate data quality in an SEP analysis, first the sum of individual extraction steps from the SEP was compared to the total arsenic concentration to verify that total arsenic recovery from SEP methods is similar to total arsenic analytical results. 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.

[4]Aquifer solid samples were also collected from near wells G311, G306, G316, G313 and G215 during the August 2021 field effort. Results for these samples are excluded from subsequent results tables and discussion to emphasize relevant findings; however, SEP results for these locations are included in **Attachment 9**.

Results for total and SEP analyses of arsenic in these samples are presented in **Table 1**, and the analytical laboratory reports are provided as **Attachment 9**. The total arsenic concentrations ranged from 4.4 to 8.4 milligrams per kilograms of soil (mg/kg). The summed concentrations of arsenic from the SEP analyses ranged from 4.0 to 10 mg/kg. The results were generally consistent between the total metals analyses and the summed SEP steps with the exception of results from sample SB-275D (46-48') which reported 5.3 mg/kg total arsenic against a summed SEP total of 10 mg/kg. The total arsenic result reported for SB-275D (46-48') may be considered biased low; all other results indicate good metals recovery and data quality. These results indicate that arsenic is naturally present in both background and downgradient (compliance well) solid-phase samples at the Site. The highest total arsenic concentrations were observed in the aquifer solids sample from downgradient well G206D (8.4 mg/kg). Total arsenic concentrations at all locations were higher than those observed in the CCR solids materials (**Attachment 4**).

The largest fraction of arsenic in all five samples analyzed via SEP was associated with the fraction assumed to be sulfides (18-54%), which is more recalcitrant than the other reactive fractions (i.e., all fractions excluding residual metals) (**Table 1**). Additional arsenic fractions are associated with:

- the residual metals fraction (23-37%),
- the oxyhydroxide fraction (7-25%),
- the organic fraction (26-27%), and
- the non-crystalline metals fraction (6-23%).

Amorphous and crystalline iron oxides are assumed to be associated with the non-crystalline metals fraction and the oxyhydroxide fraction, respectively. Arsenic is known to become incorporated into the mineral structure of soils through co-precipitation with iron-bearing minerals and is commonly sorbed to organic matter, clay minerals, and iron oxyhydroxides in the aquifer (Thomas et al., 2005).

In soils and sediments, arsenic redox chemistry (and as a result, arsenic mobilization to groundwater) is well-studied and linked to iron cycling (Gubler and ThomasArrigo, 2021; Giménez et al., 2007). This relationship is supported by the general correlation between arsenic and iron at the site, where wells with higher arsenic concentrations (i.e., G206D and G275D, both of which are screened in the DA) also tend to have higher total aqueous iron concentrations (**Figure 14**).

Generally, arsenic and iron are both redox sensitive elements that tend to be mobilized under more reducing groundwater conditions (Smedley and Kinniburgh, 2002). Iron is mainly present in groundwater in two forms, reduced Fe(II) and oxidized Fe(III). In natural aqueous environments at pH 3 to 9, arsenic is primarily found as either the more oxidized species arsenate (As(V)) or the more reduced species arsenite (As(III)) (Smedley and Kinniburgh, 2002). Under more oxidizing conditions, arsenic is typically present as As(V), which shows a high sorption affinity to mixed

valence and/or Fe(III)-oxyhydroxides such as magnetite or ferrihydrite (Dixit and Hering, 2003; Sun et al., 2018). Both G275D and G206D tend to have more reducing conditions compared to wells screened in the shallower lithologies (**Figure 15**), which suggests a greater abundance of the less reactive (i.e., less prone to engaging in chemical attenuation) As(III) species within the DA compared to the UA.

Pourbaix diagrams were prepared for arsenic (**Figure 16**) and iron (**Figure 17)** using conditions at DA well G275D to illustrate the thermodynamic stability (range of conditions in which a species is stable) of different minerals or chemical species in an aqueous solution as a function of both pH and redox conditions.[5] Differences in the arsenic speciation between the DA wells (G275D and G206D) and the background UA wells (G270 and G280) were observed from the arsenic Pourbaix diagrams (**Figure 16**), with UA samples displaying a greater degree of As(V) (as $H_2AsO_4^-$ and $HAsO_4^{--}$) species stability. In contrast, the more mobile As(III) (as $As(OH)_3$) is much nearer to stable conditions within the DA wells where the redox conditions are more reducing. This observation suggests that redox conditions at G275D are more favorable for increased aqueous arsenic mobility due to the increased stability of the mobile $As(OH)_3$ species relative to background groundwater. This is supported by arsenic speciation analytical results of groundwater from DA well G206D, which found that 81% percent of the detected arsenic was present as the more reduced As(III) species (**Table 2; Attachment 10**).[6]

In addition to changes in arsenic speciation, dissolution of iron oxide minerals can result in a further contribution of arsenic to groundwater due to the release of coprecipitated and/or sorbed arsenic, consistent with the mechanism proposed by USGS (Warner et al., 2003). The iron Pourbaix diagram demonstrates that amorphous iron oxides ($Fe(OH)_3$) are less stable at DA locations (G206D and G275D) relative to background wells screened in the UA (G270 and G280; **Figure 17**). This predicted potential for dissolution of iron oxide mineral phases is consistent with the higher aqueous iron concentrations observed in the DA (**Figure 14**).

The greater likelihood of iron oxide mineral dissolution and desorption of arsenic from aquifer solids based on arsenic speciation, both of which are driven by the more reducing conditions of the DA, would contribute geogenic arsenic from the aquifer solids to groundwater in the DA.

[5] Redox conditions are expressed in Pourbaix diagrams as redox potential (Eh) in units of volts. Eh values for groundwater samples are calculated from ORP measures collected in the field. Field ORP measurements were converted to Eh by adding +200 millivolts to correct for the Ag/AgCl electrode.

[6] A groundwater sample could not be collected for arsenic speciation analysis at G275D as the well was dry during the March 2024 sampling event following redevelopment.

4. CONCLUSIONS

It has been demonstrated that the arsenic GWPS exceedance at G275D is not caused by a release from the GMF RP CCR unit, but instead is attributed to a source other than the GMF RP. The following summarizes the three LOEs used to support this demonstration:

1. The GMF RP does not appear to be the source of arsenic in groundwater at G275D, as arsenic was not detected in CCR solids and the concentration of total arsenic in CCR source water is lower than the concentrations observed at G275D. Additionally, boron concentrations at G275D do not display an increasing trend despite the higher concentrations observed in CCR source water, as would be expected from physical mixing of groundwater with GMF RP source water.

2. While minor differences in geochemical signatures between compliance monitoring location G275D and other GMF RP groundwater locations exist, all groundwater monitoring locations are geochemically distinct from GMF RP source water based on a statistical evaluation of groundwater and CCR source water composition. Consequently, if the geochemical signatures are different, then the source of arsenic is not the GMF RP.

3. Solid phase analysis of aquifer solids identified naturally occurring arsenic at comparable concentrations between the DA and the UA. This naturally occurring arsenic is mobilized to groundwater within the DA due to the DA's more reducing conditions, which result in changes in arsenic speciation and decreased stability for iron-bearing minerals which may contain coprecipitated and/or sorbed arsenic.

The alternative source of arsenic is the influence of the glacial till lithology on the groundwater composition. This demonstration meets the expectations in 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.

The information serves as the written ASD prepared in accordance with 35 IAC 845.650(e) demonstrating that the GWPS exceedance for arsenic at G275D is not due to the GMF RP CCR unit. Therefore, implementation of corrective measures is not required for arsenic at the GMF RP CCR unit.

5. REFERENCES

Dixit S. and Hering J.G. 2003. Comparison or arsenic(V) and arsenic(III) sorption onto iron oxide minerals: implications for arsenic mobility. Environ. Sci. Technol., 37 (2003), pp. 4182-4189.

EPRI. 2017. Guidelines for Development of Alternative Source Demonstrations at Coal Combustion Residual Sites. Electric Power Research Institute, Palo Alto, CA: 2017. 3002010920.

Giménez J, Martínez M, de Pablo J, Rovira M, Duro L. Arsenic sorption onto natural hematite, magnetite, and goethite. J Hazard Mater. 2007 Mar 22;141(3):575-80.

Gubler R. and ThomasArrigo L.K. Ferrous iron enhances arsenic sorption and oxidation by non-stoichiometric magnetite and maghemite, J Haz Mater. Vol 402, 2021, 123425.

Ramboll. 2021. *Hydrogeologic Site Characterization Report. Coffeen Power Plant GMF Recycle Pond*. Ramboll Americas Engineering Solutions, Inc. October.

Ramboll. 2024a. *35 I.A.C. § 845.610(b)(3)(D) Groundwater Monitoring Data and Detected Exceedances – Quarter 4, 2023. GMF Recycle Pond, Coffeen Power Plant, Coffeen, Illinois* Ramboll Americas Engineering Solutions, Inc. March.

Smedley P.L. and Kinniburgh D.G. 2002. A review of the source, behaviour and distribution of arsenic in natural waters. Appl, Geochem., 17 (2002), pp. 517-568.

Sun J, Prommer H, Siade AJ, Chillrud SN, Mailloux BJ, Bostick BC. Model-Based Analysis of Arsenic Immobilization via Iron Mineral Transformation under Advective Flows. Environ Sci Technol. 2018 Aug 21;52(16):9243-9253.

Tessier, A., P. G. C. Campbell, and M. Bisson. 1979. Sequential extraction procedure for the speciation of particulate trace metals. *Analytical Chemistry* 5(7):844–851.

Thomas, M.A., Schumann, T.L., and Pletsch, B.A., 2005, Arsenic in ground water in selected parts of southwestern Ohio, 2002–03: U.S. Geological Survey Scientific Investigations Report 2005–5138, 30 p.

USEPA. 1993. *Criteria for Solid Waste Disposal Facilities: A Guide for Owners/Operators.* United States Environmental Protection Agency. March.

USEPA. 2015. Federal Register, Vol. 80, No. 74, Rules and Regulations, April 17, 2015. United States Environmental Protection Agency.

Warner, K. L. 2001. Arsenic in glacial drift aquifers and the implication for drinking water – lower Illinois River Basin. *Ground Water*, 39, 3, 443-442.

Warner, K. L., Martin, A., & Arnold, T. L. 2003. Arsenic in Illinois ground water — community and private supplies. *Water-Resources Investigations Report*, *2003*-4103.

TABLES

Table 1. Arsenic SEP Results Summary
Coffeen Power Plant - GMF Recycle Pond

Geosyntec Consultants, Inc.

Soil Boring Location		SB-206D		SB-206D		SB-275D		SB-275D		SB200	
Sample Depth (ft bgs)		(45-47)		(56-57)		(46-48)		(50-53)		(14-15)	
Location		Downgradient		Downgradient		Downgradient		Downgradient		Background	
Aquifer		Deep Aquifer		Deep Aquifer		Deep Aquifer		Deep Aquifer		Upper Aquifer	
Adjacent Well		G206D		G206D		G275D		G275D		G200	
Field Boring Log Description		Stiff/Hard Dark Gray Clay		Dark Gray Clay, Staining		Stiff/Hard Dark Gray Clay		White/Gray Poorly Graded Sand		Gray Silty Clay	
Total Arsenic		4.4		8.4		5.3		4.5		7.5	
SEP Results											
SEP Fraction	**SEP Reagent**	**Concentration**	**% of Total**	**Concentration**	**% of Total**	**Concentration**	**% of Total**	**Concentration**	**% of Total**	**Concentration**	**% of Total**
Exchangeable Metals Fraction	$MgSO_4$	<2.3	--	<2.4	--	<2.3	--	<2.1	--	<2.4	--
Metals Bound to Carbonates Fraction	Sodium acetate, acetic acid	<1.7	--	<1.8	--	<1.7	--	<1.6	--	<1.8	--
Non-crystalline Materials Fraction	Ammonium oxalate (pH 3)	1.0	20%	0.55 J	6%	1.2	12%	0.92	23%	0.37 J	6%
Metals Bound to Metal Hydroxide Fraction	Hydroxylamine HCl and acetic acid	1.00	8%	2.2	25%	0.66	7%	0.41 J	10%	0.87	14%
Bound to Organic Material Fraction	5% sodium hypochlorite (pH 9.5)	<8.5	--	2.3 J	26%	2.7 J	27%	<7.8	--	<8.8	--
Metals Bound to Acid/Sulfide Fraction	HNO_3, HCl, and H_2O	1.7	35%	1.6	18%	3.2	32%	1.5	38%	3.3	54%
Residual Metals Fraction	HF, HNO_3, HCL, and H_3BO_3	1.8	37%	2.0	23%	2.3	23%	1.1	28%	1.6 B	26%
SEP Total		4.9	100%	8.7	100%	10	100%	4.0	100%	6.1	100%

Notes:
SEP - sequential extraction procedure
ft bgs - feet below ground surface
All results shown in miligram of arsenic per kilogram of soil (mg/kg).
Total arsenic was analyzed using aqua regia digest, ICP-MS.
Non-detect values are shown as less than the reporting limit.
The arsenic fraction associated with each SEP phase is shown.
% of total arsenic is calculated from the sum of the SEP fractions.
B data qualifier - compound was found in the blank and sample.

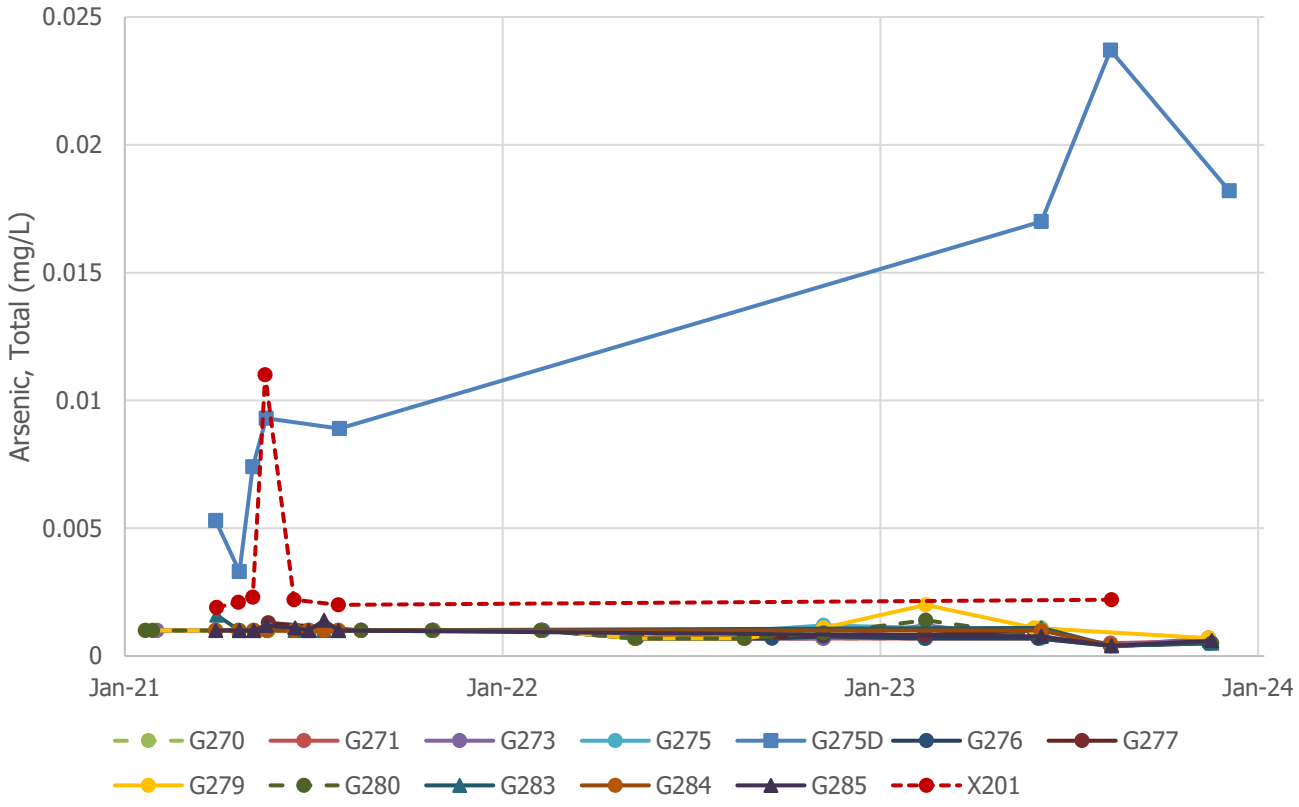
Table 2. Arsenic Groundwater Speciation Results Summary
Coffeen Power Plant - GMF Recycle Pond

Geosyntec Consultants, Inc.

Monitoring Well Location	G206D	
Location	Downgradient	
Sample Date	3/26/2024	
Arsenic Species	Concentration	% of Total
As(III) (Arsenite)	8.16	81%
As(V) (Arsenate)	0.905	9%
DMAs (Dimethylarsonate)	<0.050	--
MMAs (Monomethylarsenate)	<0.040	--
Unknown Arsenic Species	1.05	10%
Arsenic Total	10.1	100%

Notes:
All results shown in micrograms per liter (µg/L).
Non-detect values are shown as less than the method detection limit.
% of total arsenic is calculated from the sum of the arsenic speciation total.

FIGURES



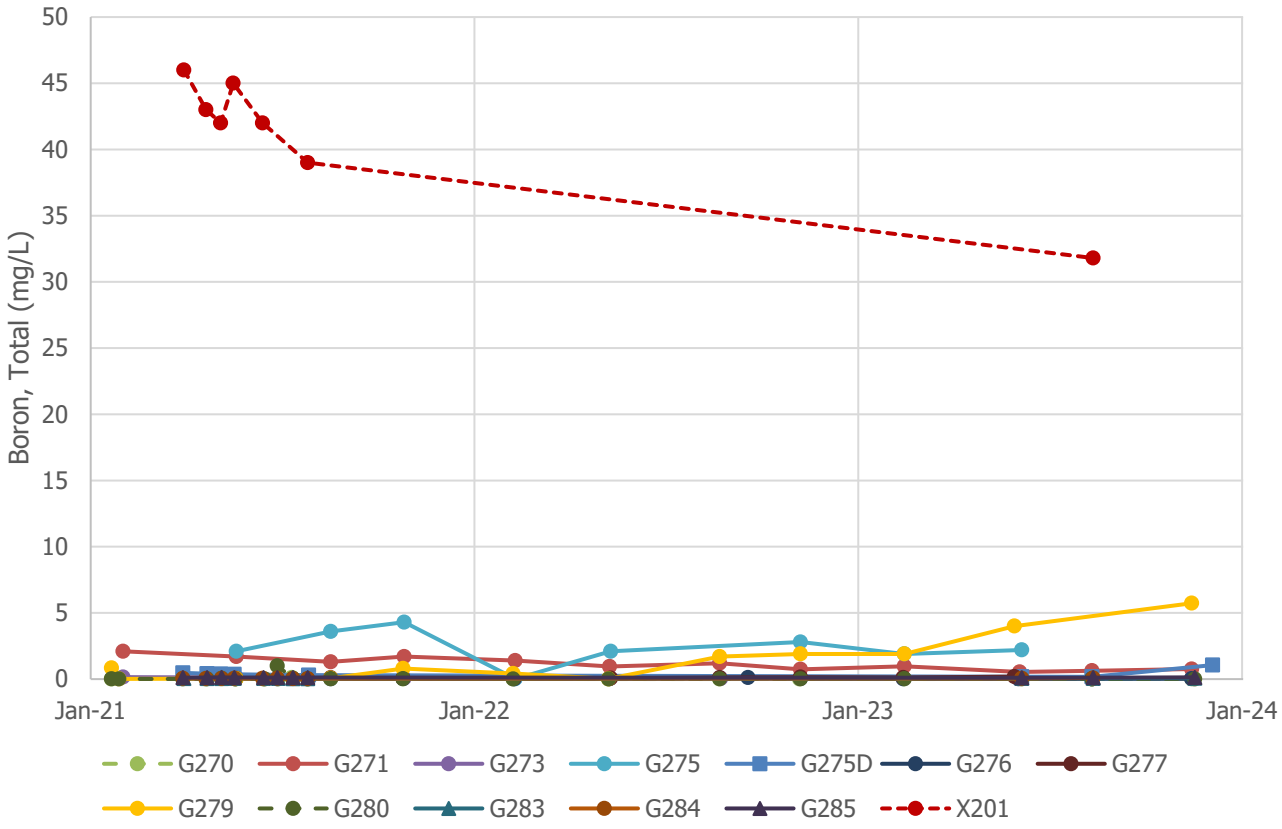
Notes: Arsenic concentrations are shown in milligrams per liter (mg/L). Upgradient wells G270 and G280 are shown as dashed lines. UA wells are represented with circles, LCU wells are represented with triangles, and DA well G275D are represented with square symbology.

Arsenic Time Series Graph
Coffeen GMF Recycle Pond

Geosyntec consultants

Columbus, Ohio | May 2024

Figure 1



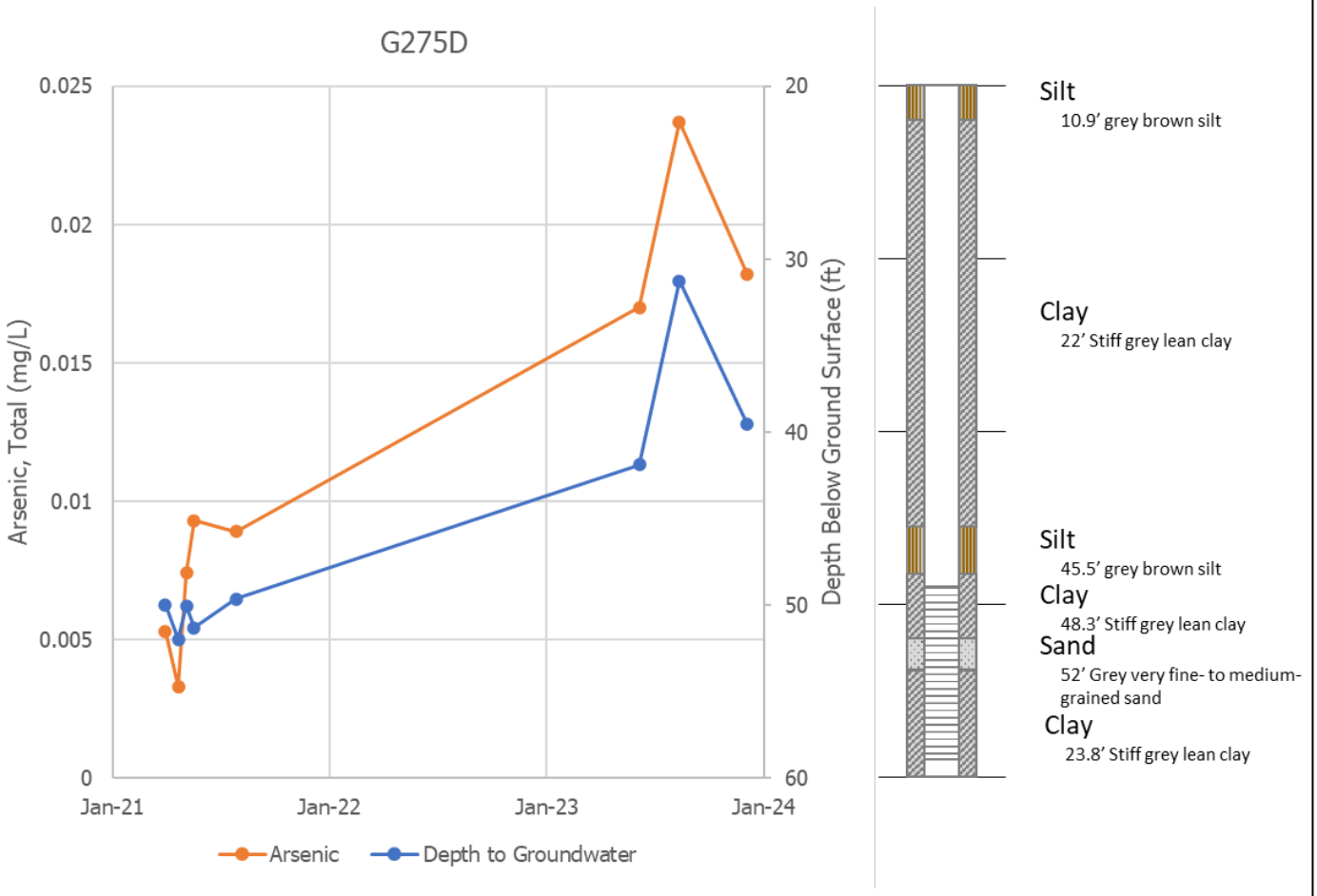
Notes: Boron concentrations are shown in milligrams per liter (mg/L). Upgradient wells G270 and G280 are shown as dashed lines. UA wells represented with circles, LCU wells represented with triangles, and DA well G275D represented with square symbology.

Boron Time Series Graph
Coffeen GMF Recycle Pond

Geosyntec consultants

Columbus, Ohio | May 2024

Figure 2



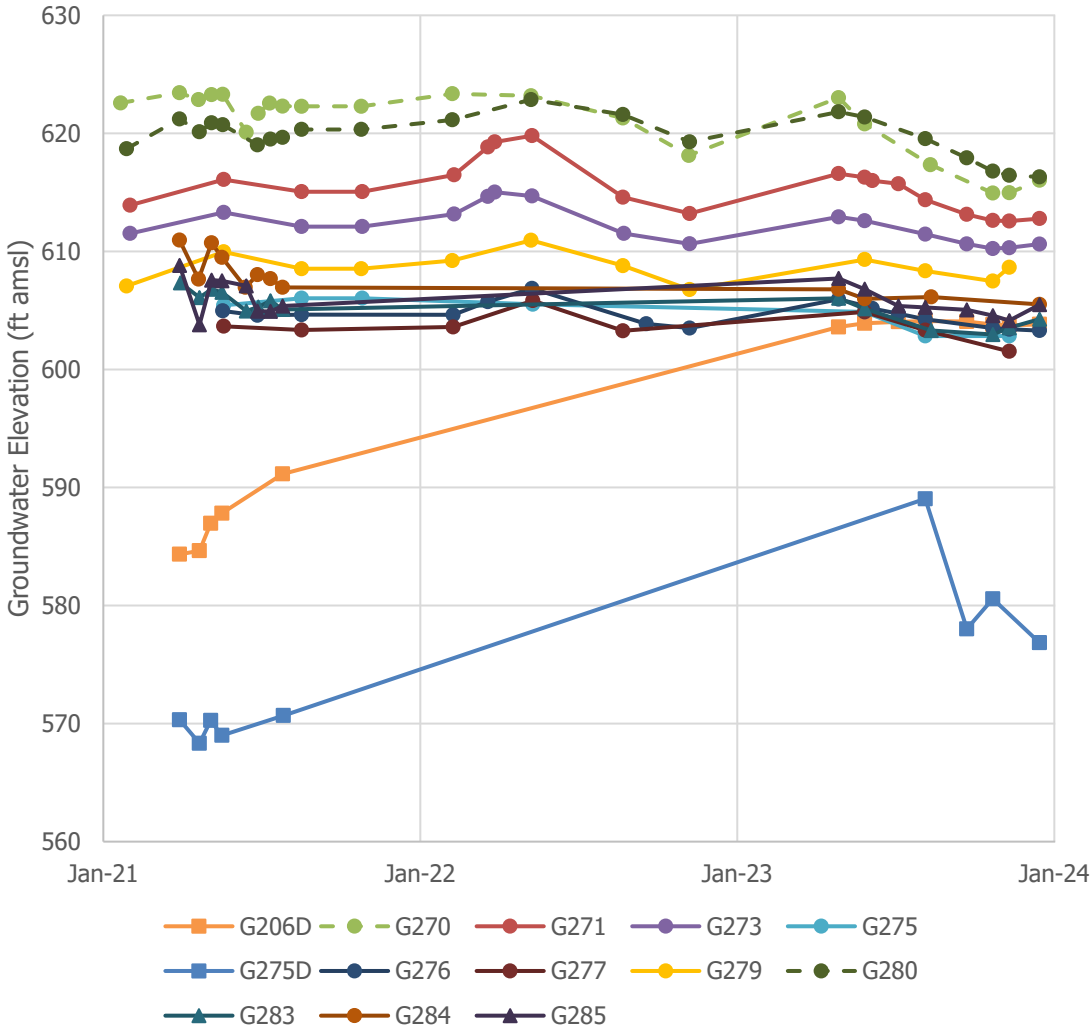
Notes: Arsenic concentrations are shown in milligrams per liter (mg/L), and depth to groundwater is show in feet (ft) below ground surface. This illustration represents the log for boring G275D. The full boring log is available in Attachment 5. Lithologic descriptions include interval start depth.

Arsenic and Depth to Groundwater Time Series Graph
Coffeen GMF Recycle Pond

Geosyntec consultants

Columbus, Ohio | May 2024

Figure 3



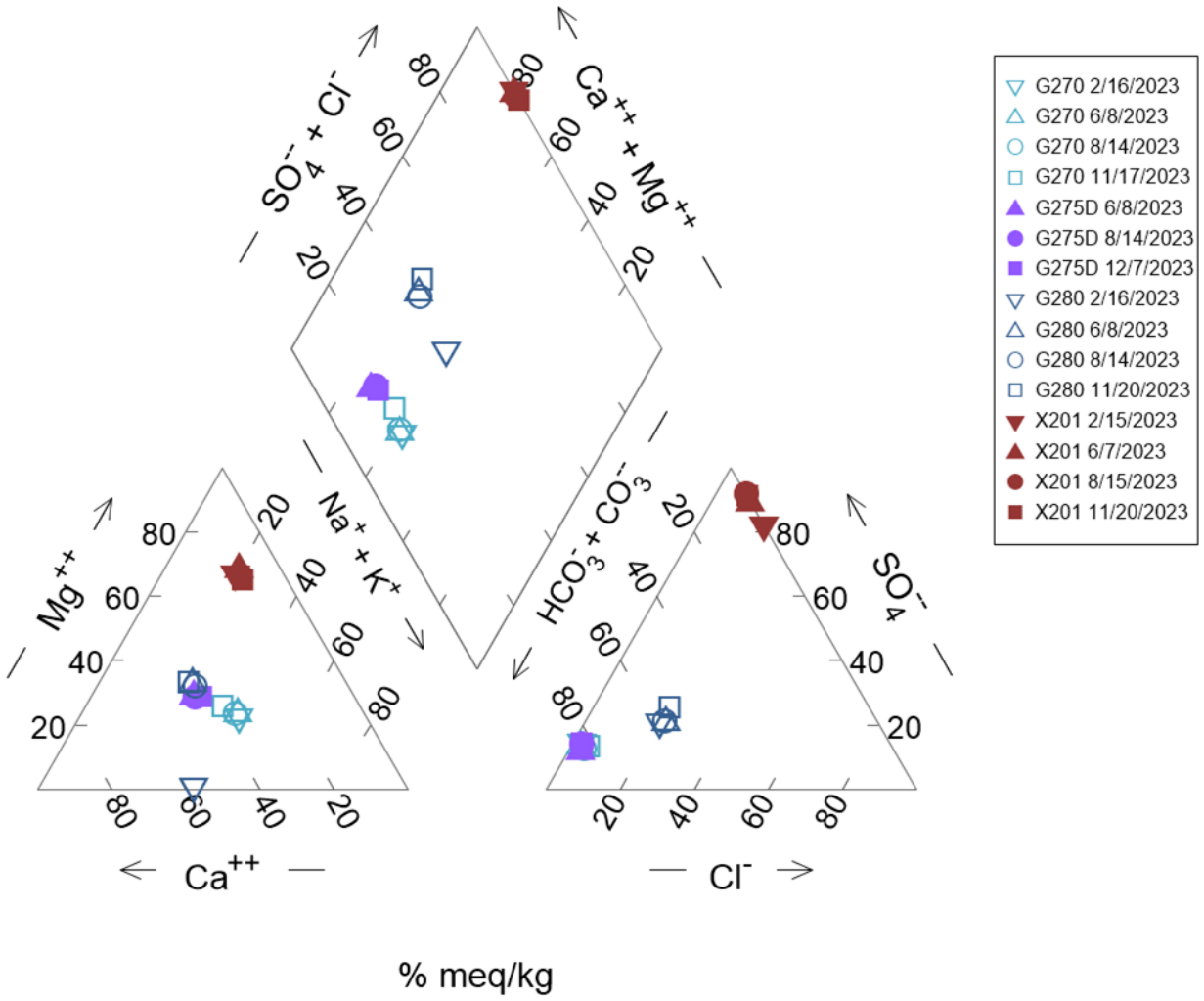
Notes: Groundwater elevations are shown in feet above mean sea level (ft amsl). Upgradient wells G270 and G280 are shown as dashed lines. UA wells are represented with circles, LCU wells are represented with triangles, and DA wells G275D and G206D are represented with square symbology.

Groundwater Elevation Time Series
Coffeen GMF Recycle Pond

Geosyntec consultants

Columbus, Ohio | May 2024

Figure 4



Notes: Upgradient UU wells G270 and G280 are shown as hollow symbols, DA well G275D is shown with purple symbology, and GMF RP source water (i.e., X201), is shown with red symbology.

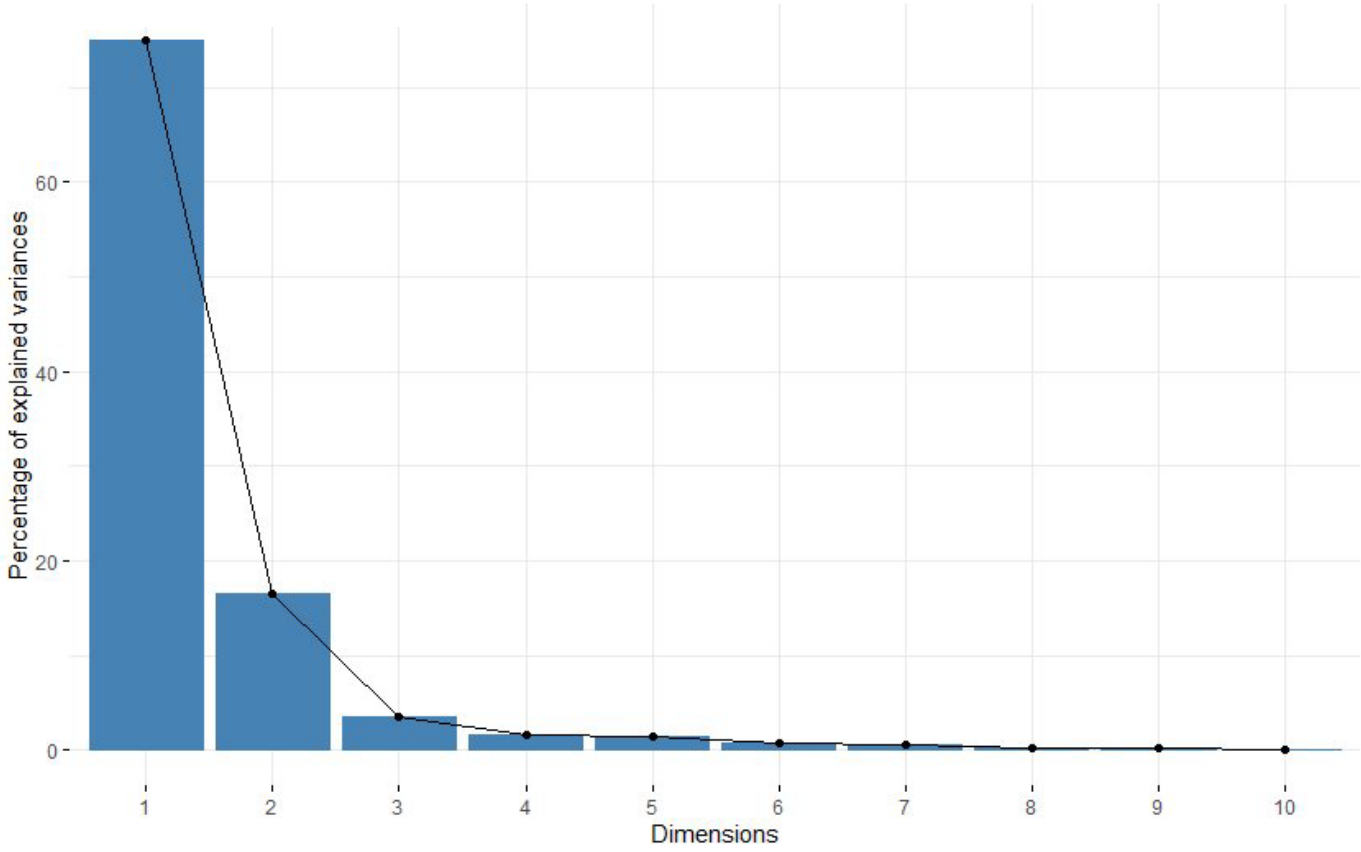
meq/kg: milliequivalents per kilogram

Piper Diagram
Coffeen GMF Recycle Pond

Geosyntec consultants

Columbus, Ohio | May 2024

Figure 5



Notes:

1. Samples collected from Uppermost Aquifer Unit wells G270, G271, G273, G275, G276, G277, G279, G280, G284; Deep Aquifer Unit well G275D; Lower Confining Unit wells G283 and G285; and Coal Combustion Residual Unit well X201.

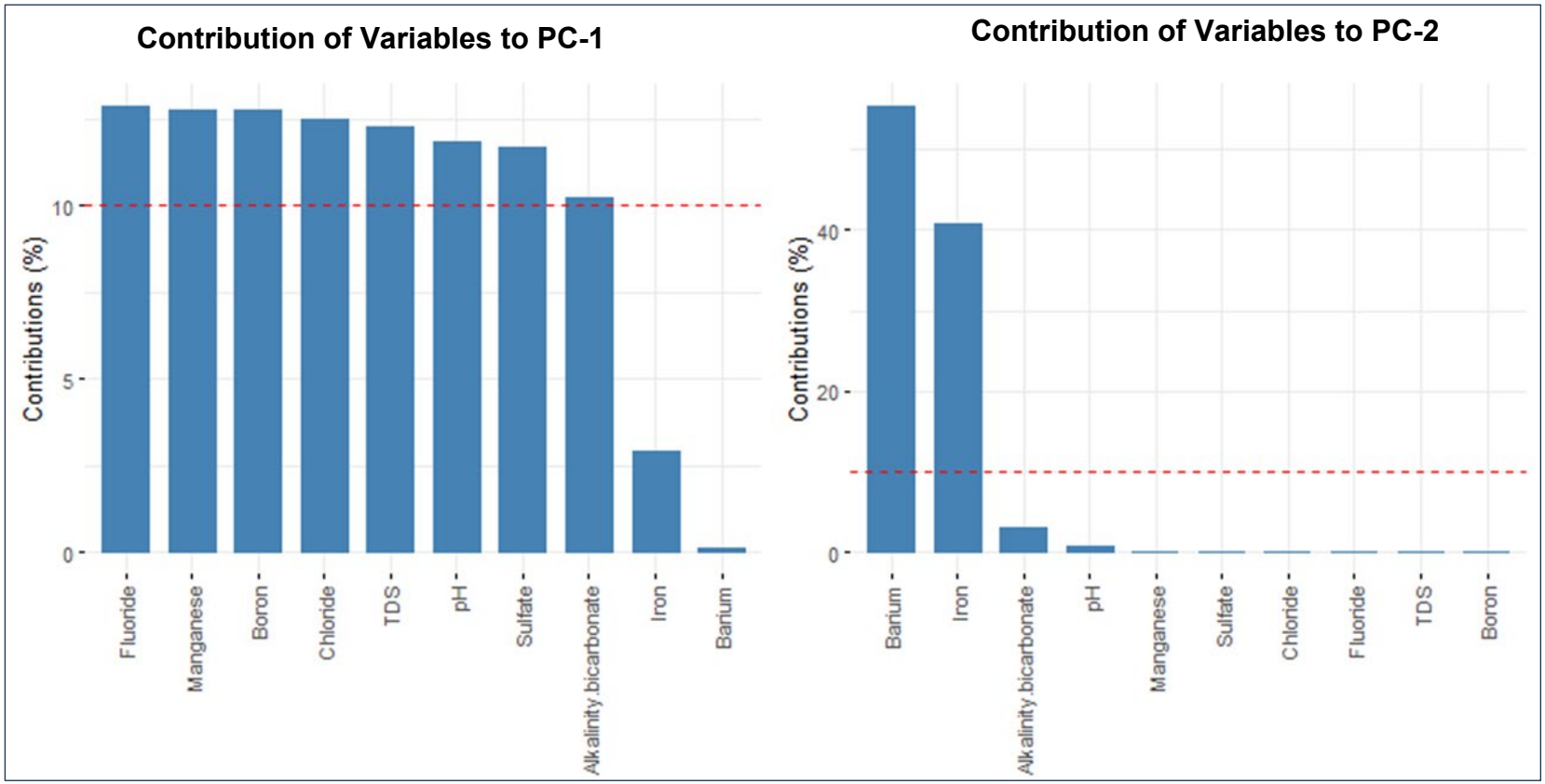
PCA Analysis – Quality of Representation of Principal Components

Coffeen GMF Recycle Pond

Geosyntec consultants

Columbus, Ohio | May 2024

Figure 6



Notes:
1. The dashed red line represents the anticipated value for uniform contribution. The constituents with a contribution exceeding the reference line are considered significant in its contribution to each PC (principal component).

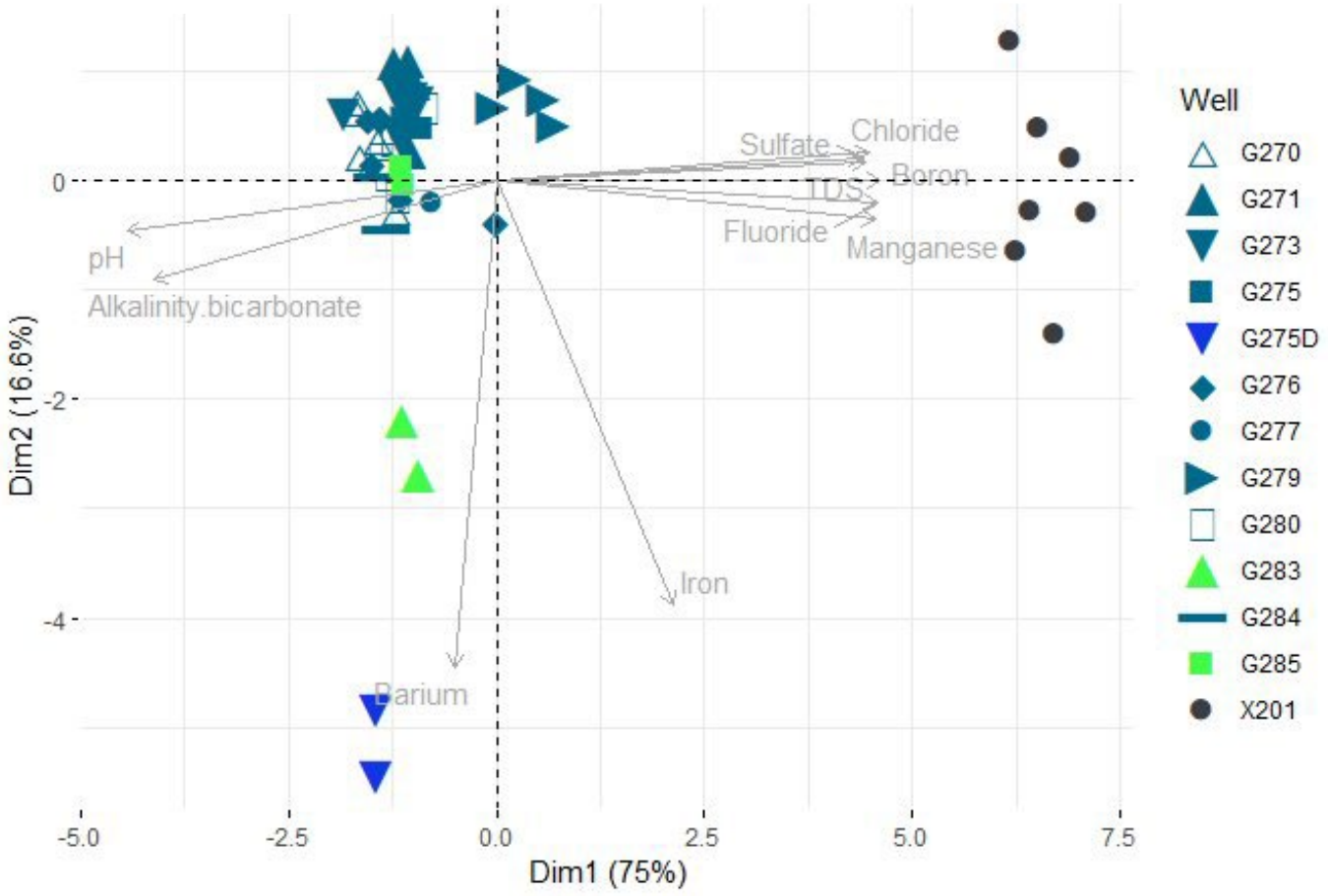
Contribution of Variables to First Two Principal Components

Coffeen GMF Recycle Pond

Geosyntec consultants

Columbus, Ohio | May 2024

Figure 7



Notes:

1. The arrows signify the correlations between the constituents and the principal components.
2. Deep Aquifer Unit = Blue
   Uppermost Aquifer Unit = Dark Green
   Lower Confining Unit = Light Green
   Coal Combustion Residual Unit = Gray

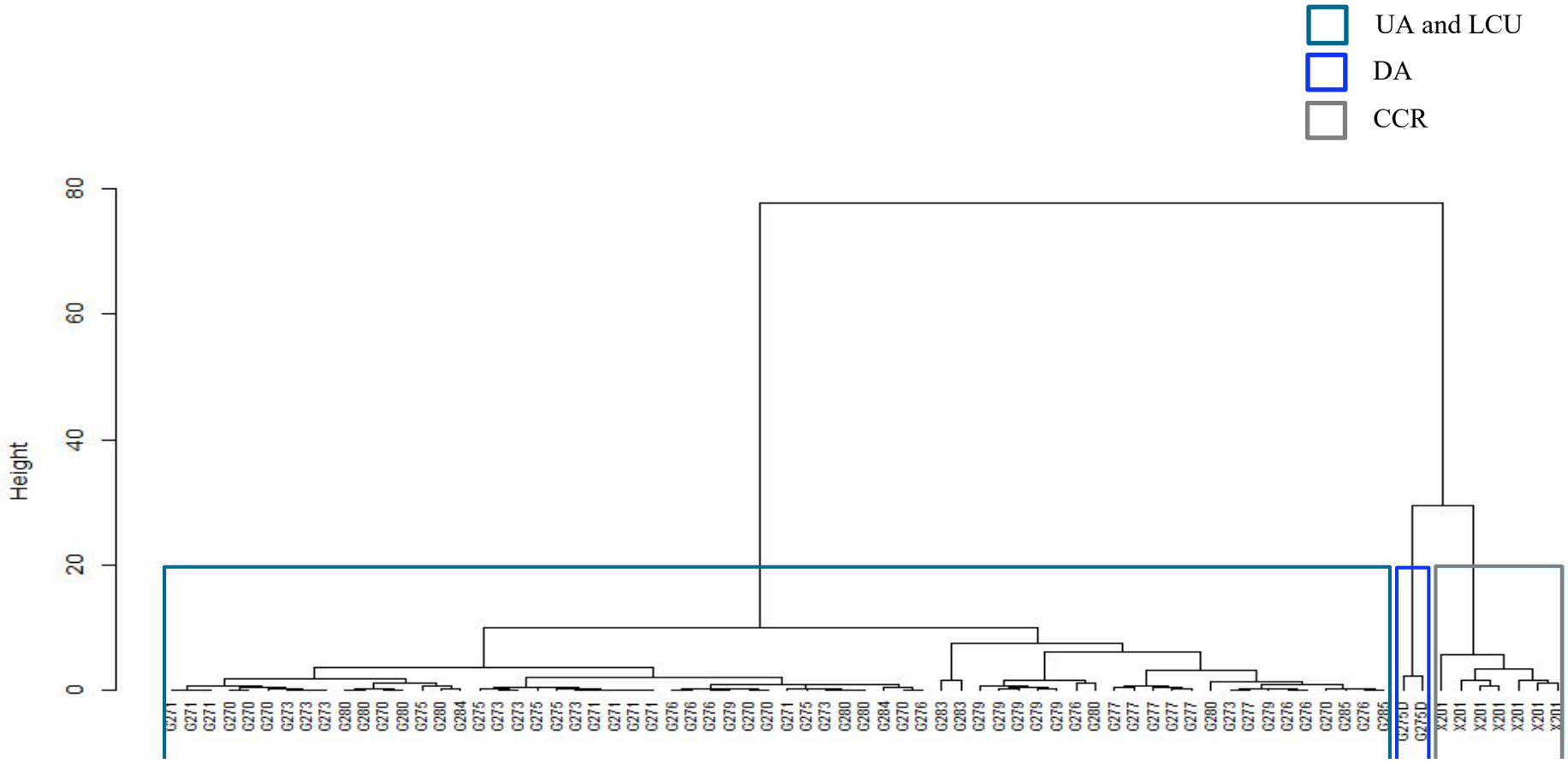
Principal Component Analysis Biplot

Coffeen GMF Recycle Pond

Geosyntec consultants

Columbus, Ohio | May 2024

Figure 8



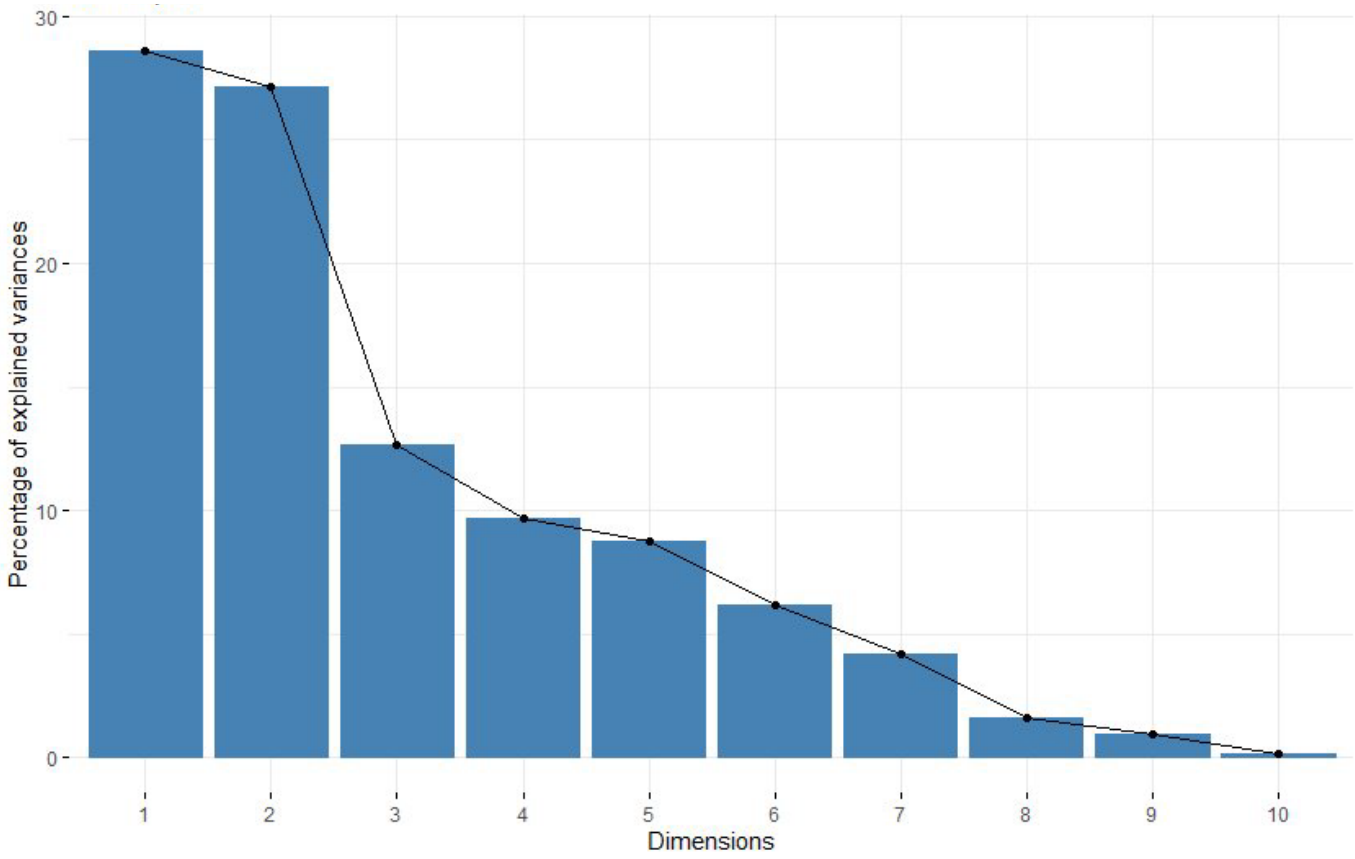
Notes:
1. The cluster analysis used Euclidean distances as the similarity measure and Ward's method as the clustering algorithm.
2. UA, DA, LCU and CCR refer to Uppermost Aquifer Unit, Deep Aquifer Unit, Lower Confining Unit, and Coal Combustion Residual respectively.
3. Samples collected from Uppermost Aquifer Unit wells G270, G271, G273, G275, G276, G277, G279, G280, G284; Deep Aquifer Unit well G275D; Lower Confining Unit wells G283 and G285; and Coal Combustion Residual Unit well X201.

Dendrogram Graph from Cluster Analysis
Coffeen GMF Recycle Pond

Geosyntec consultants

Columbus, Ohio | May 2024

Figure **9**



Notes:

1. Samples collected from Uppermost Aquifer Unit wells G270, G271, G273, G275, G276, G277, G280, G284; Deep Aquifer Unit well G275D; Lower Confining Unit wells G283 and G285.

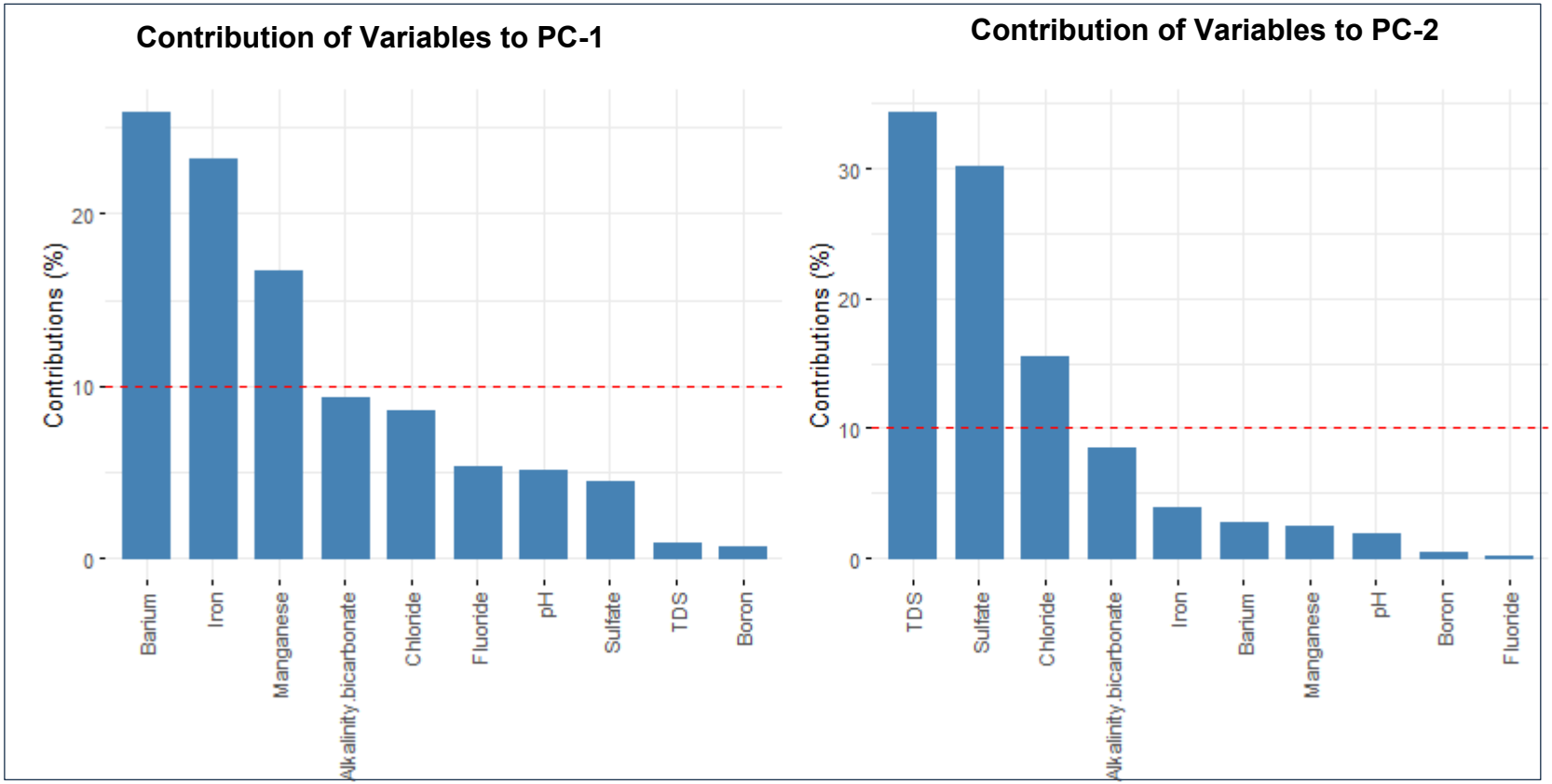
PCA Analysis – Quality of Representation of Principal Components (No CCR Source Water)

Coffeen GMF Recycle Pond

Geosyntec consultants

Columbus, Ohio | May 2024

Figure 10



Notes:
1. The dashed red line represents the anticipated value for uniform contribution. The constituents with a contribution exceeding the reference line are considered significant in its contribution to each PC (principal component).

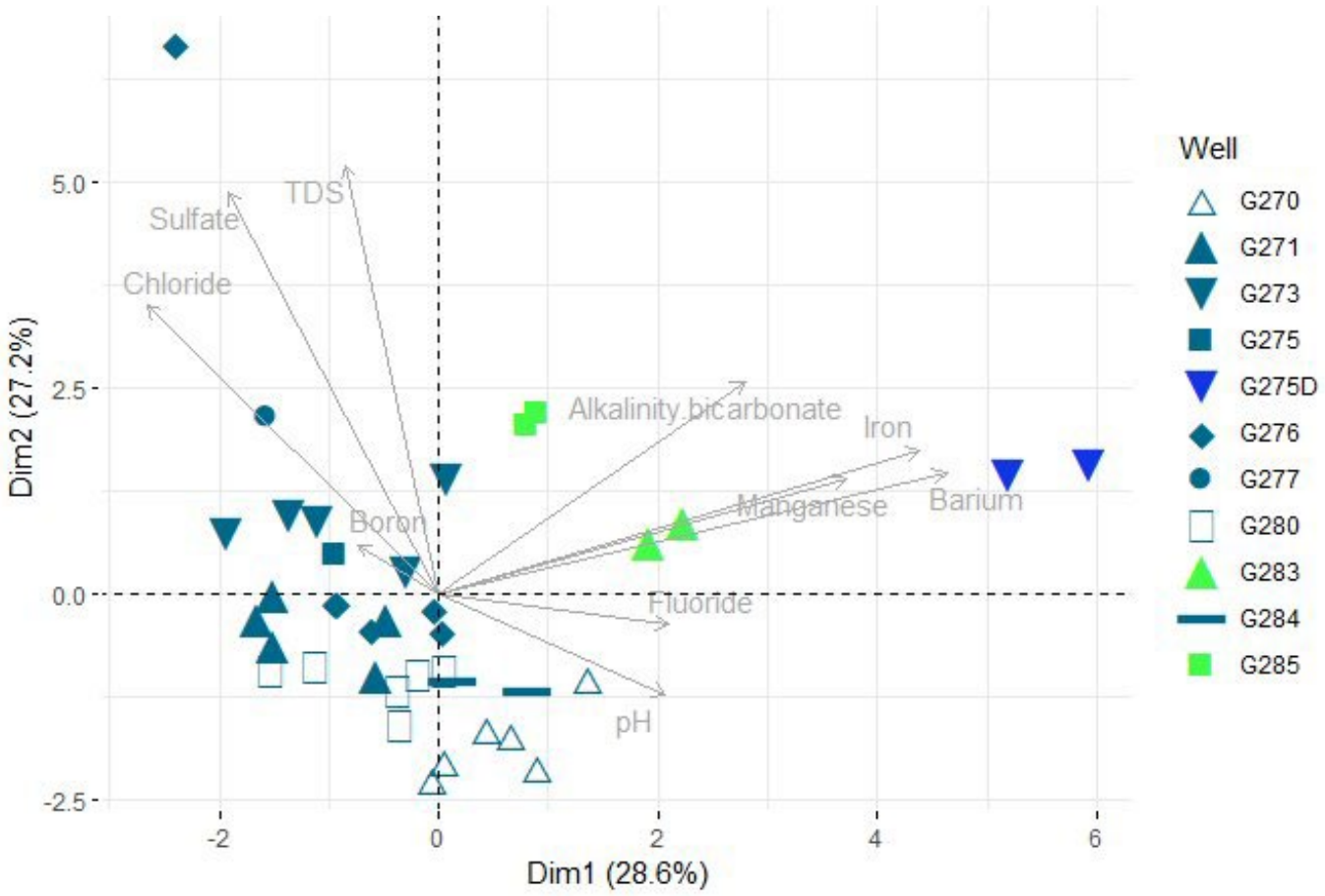
Contribution of Variables to First Two Principal Components (No CCR Source Water)

Coffeen GMF Recycle Pond

Geosyntec consultants

Columbus, Ohio | May 2024

Figure **11**



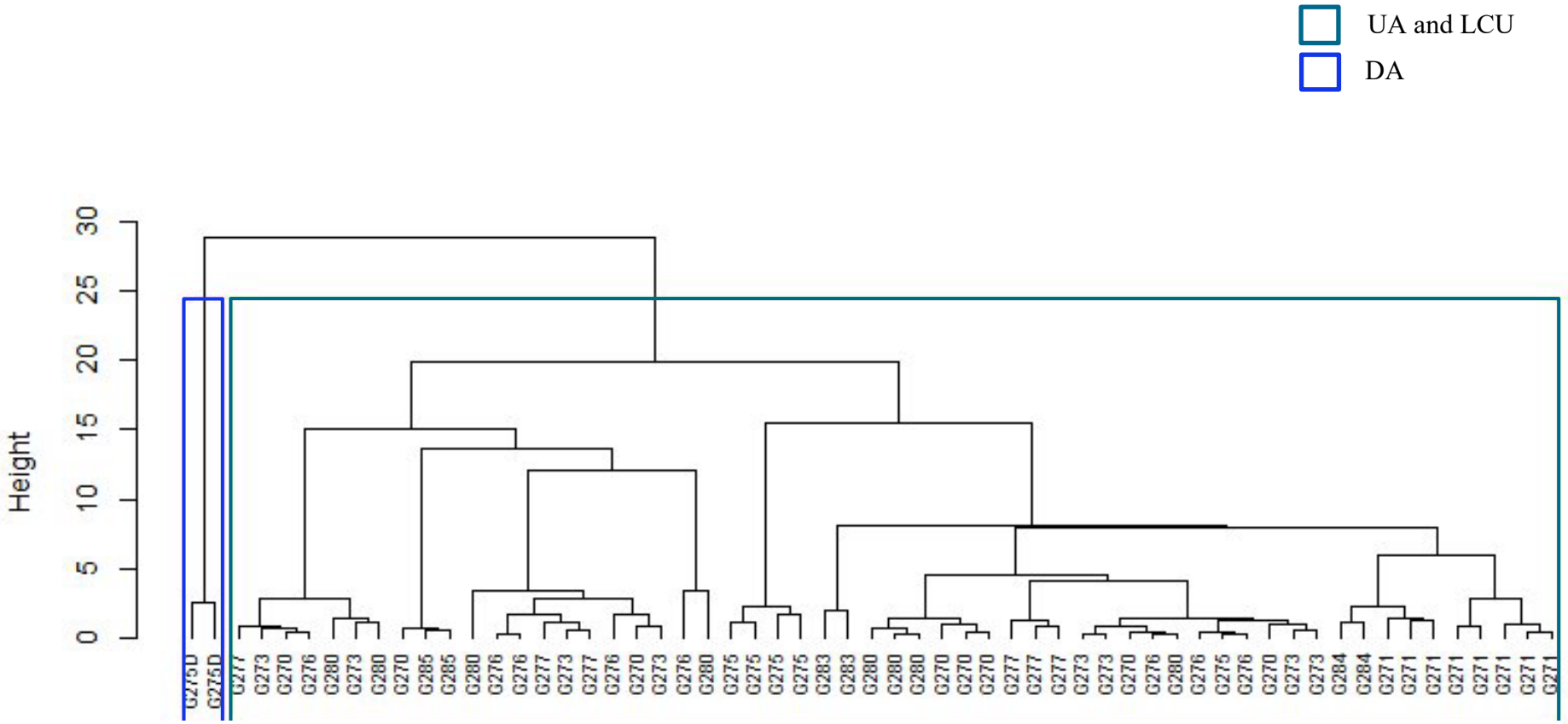
Notes:
1. The arrows signify the correlations between the constituents and the principal components.
2. Deep Aquifer Unit = Blue
   Uppermost Aquifer Unit = Dark Green
   Lower Confining Unit = Light Green

Principal Component Analysis Biplot
(No CCR Source Water)
Coffeen GMF Recycle Pond

Geosyntec consultants

Columbus, Ohio | May 2024

Figure 12



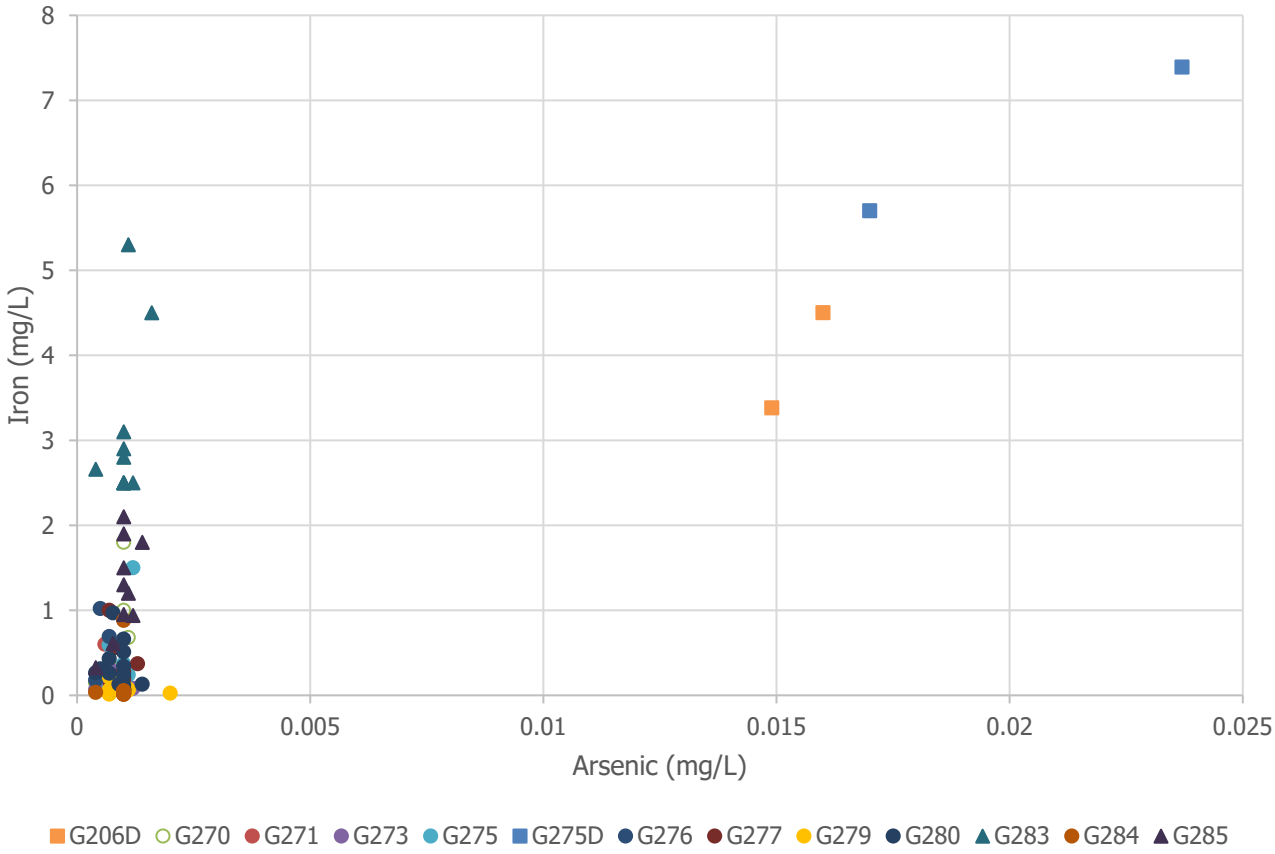
Notes:
1. The cluster analysis used Euclidean distances as the similarity measure and Ward's method as the clustering algorithm.
2. UA, DA, and LCU refer to Uppermost Aquifer Unit, Deep Aquifer Unit, and Lower Confining Unit respectively.
3. Samples collected from Uppermost Aquifer Unit wells G270, G271, G273, G275, G276, G277, G280, G284; Deep Aquifer Unit well G275D; Lower Confining Unit wells G283 and G285.

Dendrogram Graph from Cluster Analysis
(No CCR Source Water)
Coffeen GMF Recycle Pond

Geosyntec consultants

Columbus, Ohio | May 2024

Figure **13**



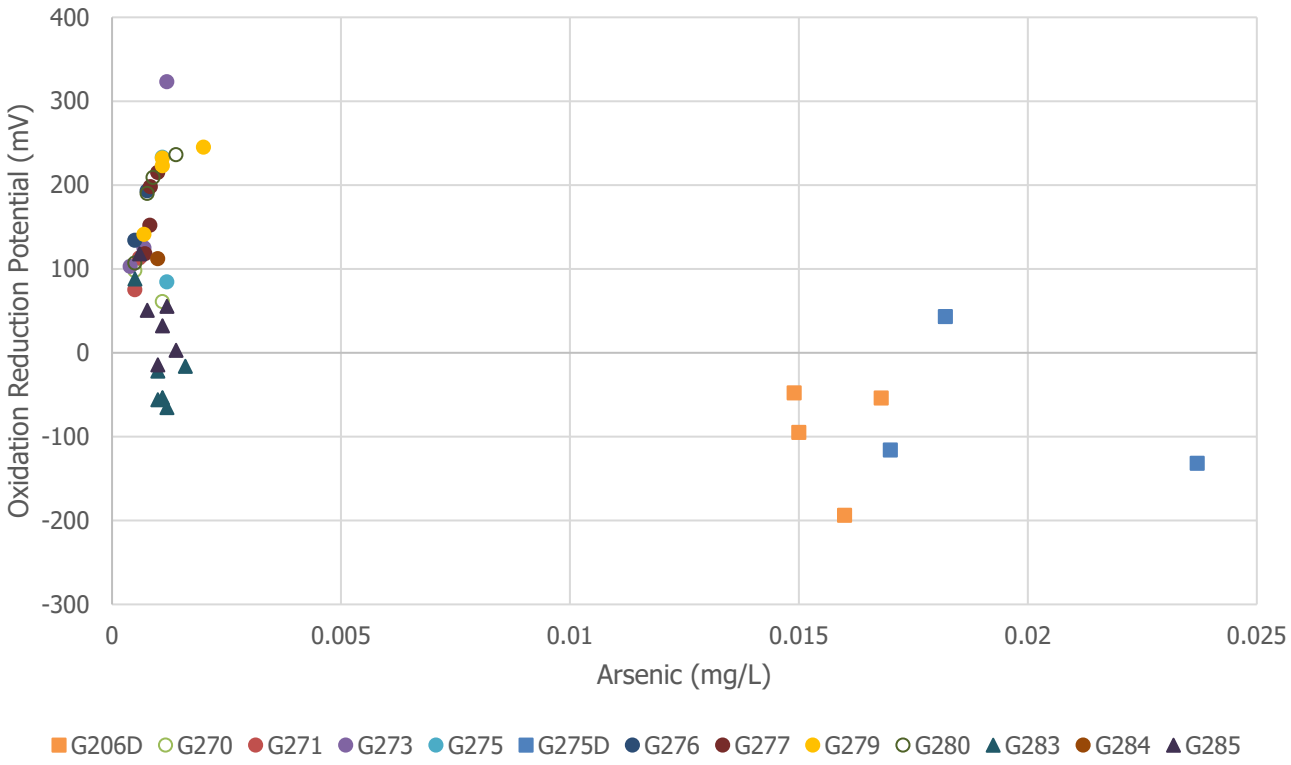
Notes: Arsenic and iron concentrations are shown in milligrams per liter (mg/L). UA wells are represented with circles, LCU wells are represented with triangles, and DA well G275D are represented with square symbology. Upgradient wells G270 and G280 represented with hollow circles.

Arsenic vs. Iron Scatter Plot
Coffeen GMF Recycle Pond

Geosyntec consultants

Columbus, Ohio | May 2024

Figure 14



Notes: Detected arsenic concentrations are shown in milligrams per liter (mg/L), and oxidation reduction potential (ORP) values are shown in millivolts (mV). UA wells are represented with circles, LCU wells are represented with triangles, and DA well G275D are represented with square symbology. Background wells G270 and G280 are represented with hollow circles.

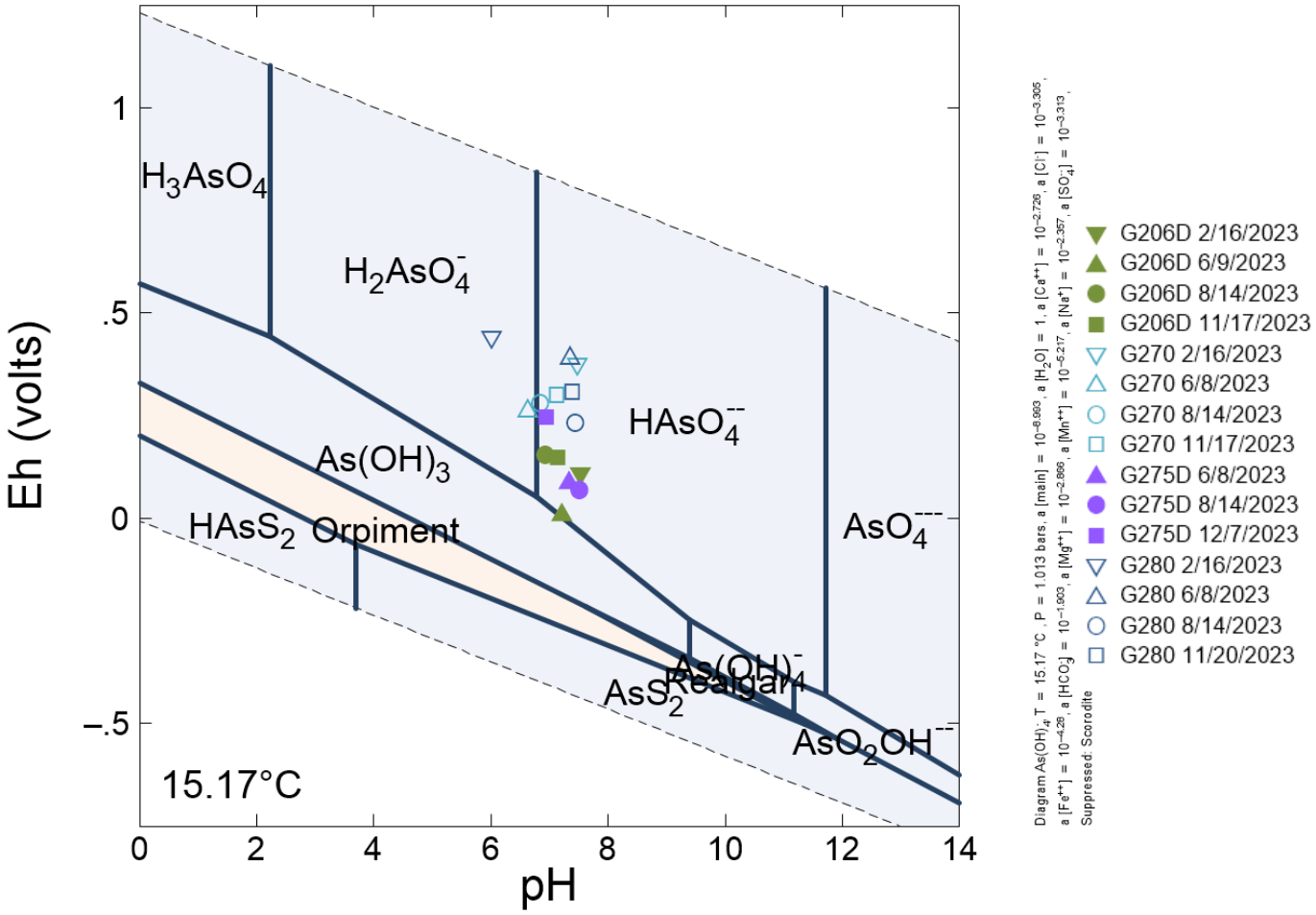
Arsenic vs. Oxidation Reduction Potential Scatter Plot

Coffeen GMF Recycle Pond

Geosyntec consultants

Columbus, Ohio | May 2024

Figure 15



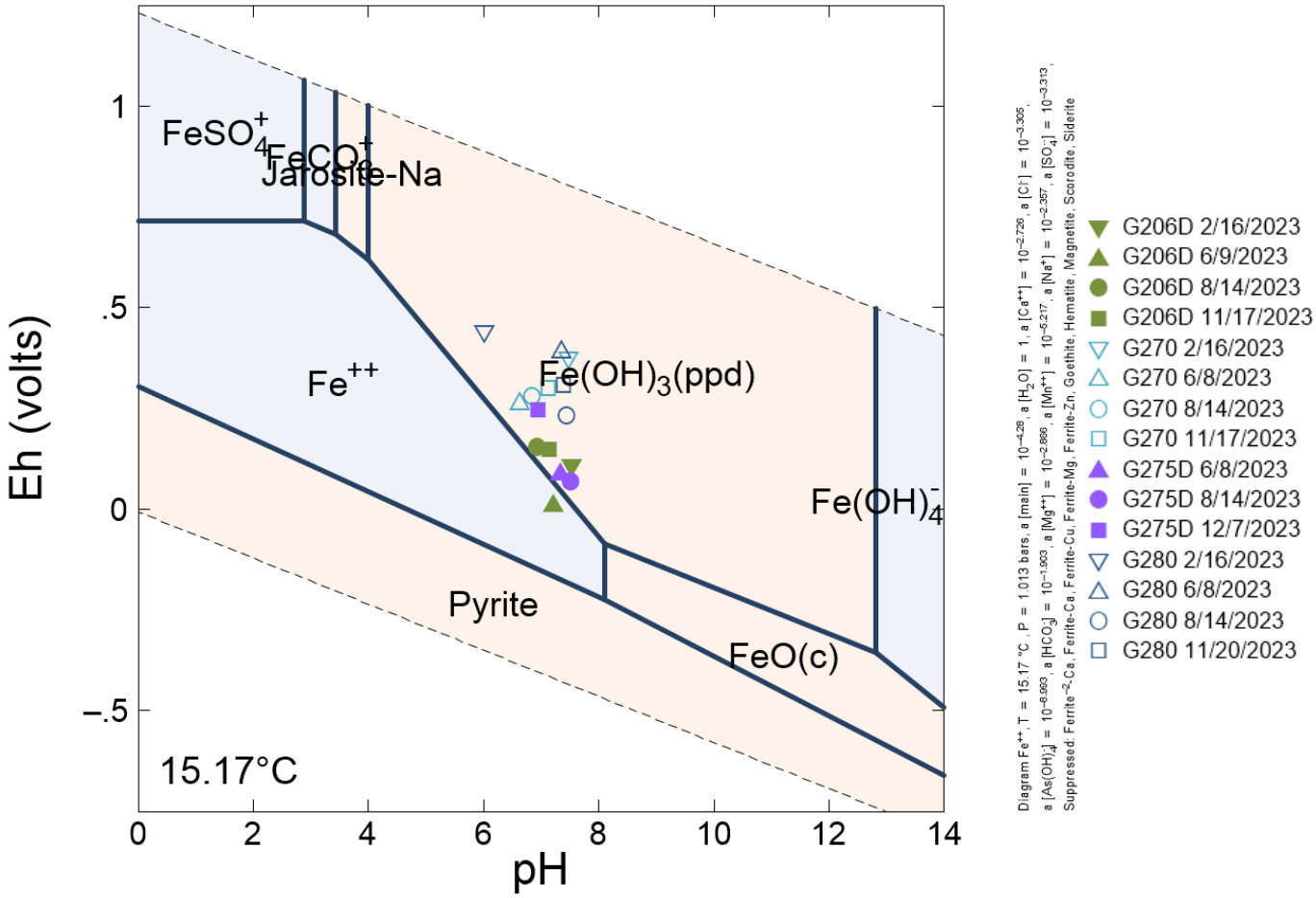
Notes: Groundwater concentrations of major cations and anions at G275D collected in 2023 were used to establish baseline conditions for the diagram. While G206 is located in the GMF Gypsum Stack Pond, it is screened within the deep aquifer, similar to G275D.

Arsenic Eh-pH Diagram
Coffeen GMF Recycle Pond

Geosyntec consultants

Columbus, Ohio | May 2024

Figure 16



Notes: Groundwater concentrations of major cations and anions at background wells G275D collected in 2023 were used to establish baseline conditions for the diagram. While G206 is located near the GMF Gypsum Stack Pond, it is screened within the deep aquifer, similar to G275D.

Iron Eh-pH Diagram
Coffeen GMF Recycle Pond

Geosyntec consultants

Columbus, Ohio | May 2024

Figure 17

ATTACHMENT 1
Site Map

- COAL MINE SHAFT
- PART 845 REGULATED UNIT (SUBJECT UNIT)
- SITE FEATURE
- LIMITS OF FINAL COVER
- PROPERTY BOUNDARY

0 275 550 Feet

SITE MAP

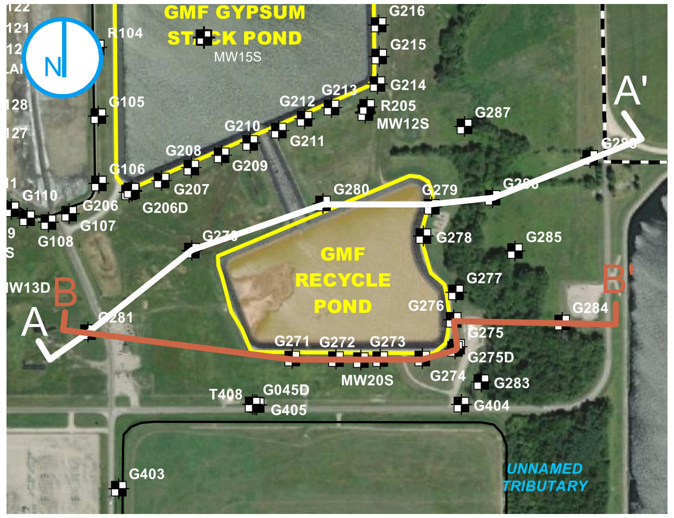
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
GMF RECYCLE POND
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

FIGURE 1-2

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

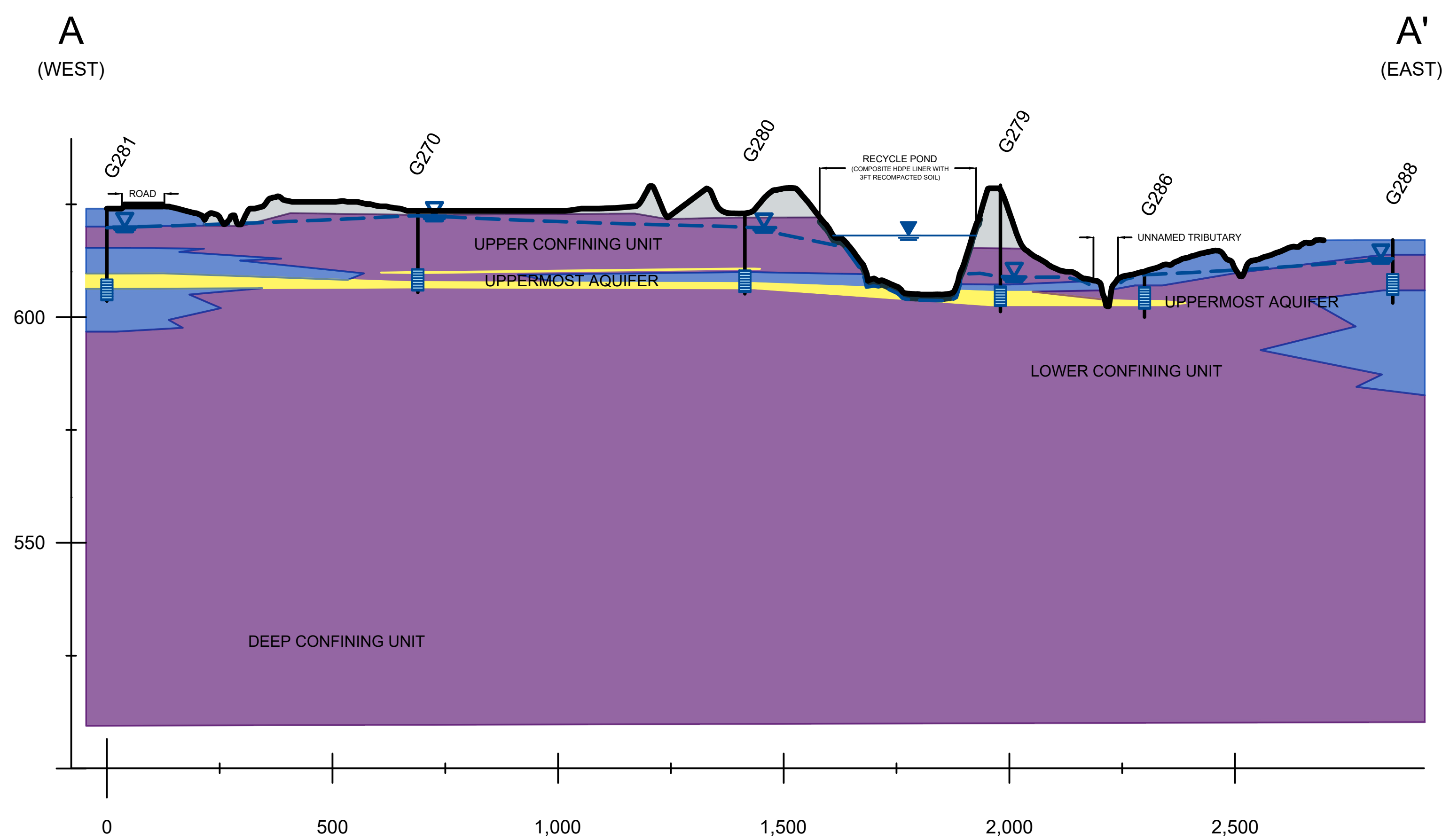
RAMBOLL

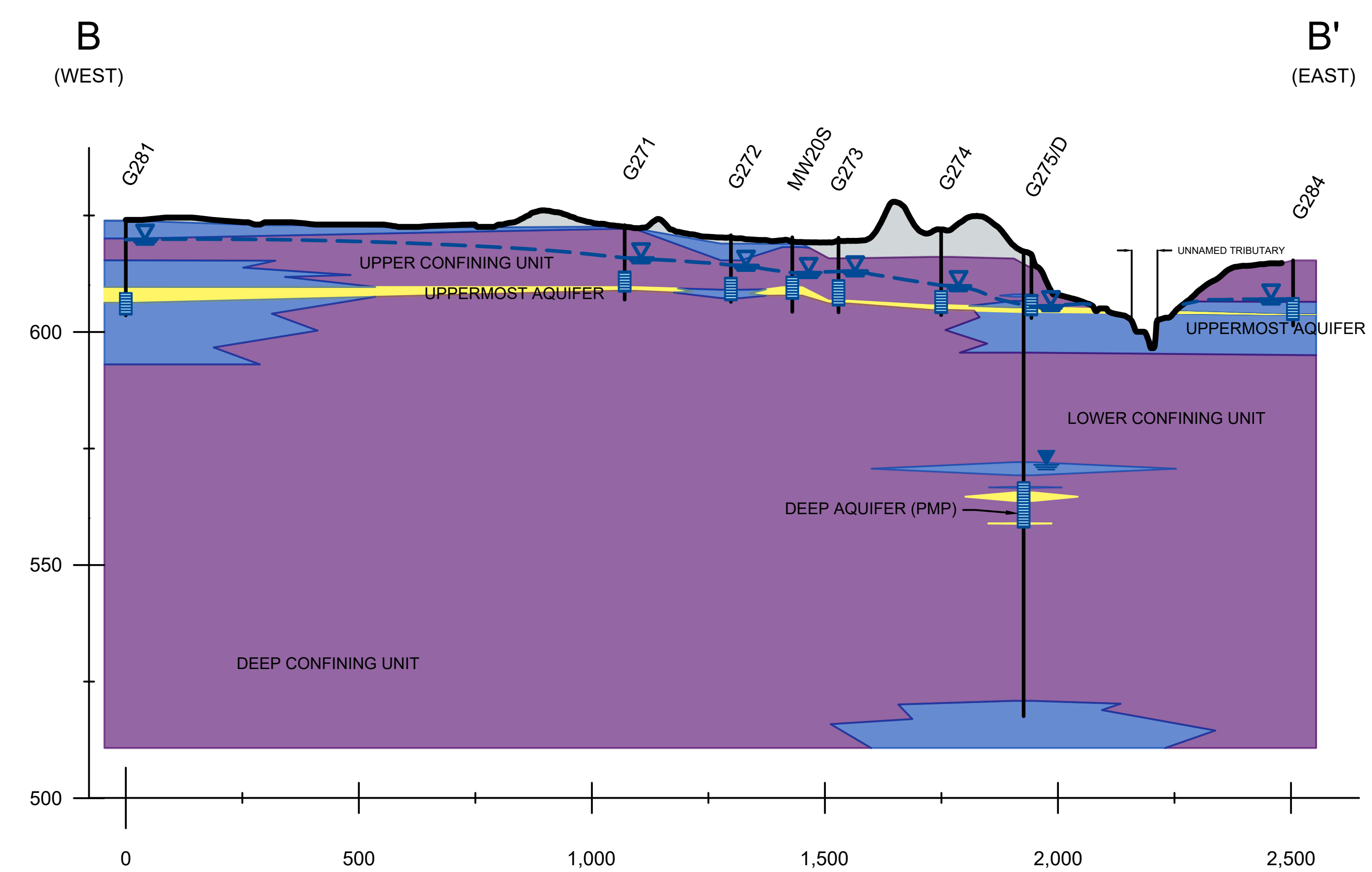
ATTACHMENT 2
Geologic Cross Section



NOTES

1. This profile was developed by interpolation between widely spaced boreholes. Only at the borehole location should it be considered as an approximately accurate representation and then only to the degree implied by the notes on the borehole logs.
2. Scale is approximate.
3. Vertical scale is exaggerated 10X.
4. Groundwater elevations measured on July 26, 2021.





LEGEND

- FILL
- CLAY (CL/CH)
- SILT (ML)
- SAND (SP/SM/SW)
- WELL SCREEN INTERVAL
- UPPERMOST AQUIFER POTENTIOMETRIC SURFACE
- UPPERMOST AQUIFER GROUNDWATER ELEVATION
- BEDROCK GROUNDWATER / OTHER GROUNDWATER / SURFACE WATER ELEVATION(S)
- SURFACE WATER

40'
0
400'

GEOLOGIC CROSS SECTIONS
A-A' & B-B'

HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
GMF RECYCLE POND
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

FIGURE 2-7

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL

ATTACHMENT 3

Uppermost Aquifer Potentiometric Surface Map – May 15-17, 2023

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

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

0 325 650 Feet

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

POTENTIOMETRIC SURFACE MAP NOVEMBER 13, 2023

FIGURE 12

2023 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
GMF RECYCLE POND
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.

RAMBOLL

ATTACHMENT 4

CCR Solids Data Summary Table and Laboratory Analytical Report

TABLE 2-2. CCR ANALYTICAL RESULTS
HYDROGEOLOGIC SITE CHARACTERIZATION REPORT
COFFEEN POWER PLANT
GMF GYPSUM STACK POND
COFFEEN, ILLINOIS

Sample Location	Sample Depth (ft BGS)	Sample Date	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Boron (mg/kg)	Cadmium (mg/kg)	Calcium (mg/kg)	Chloride (mg/kg)	Chromium (mg/kg)	Cobalt (mg/kg)	Fluoride (mg/kg)	Lead (mg/kg)	Lithium (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Selenium (mg/kg)	Sulfate (mg/kg)	Thallium (mg/kg)
GSP Gypsum 1	0-0	01/29/2021	<1.5	<0.51	6.6	<0.51	13	<0.51	--	25	<2	<1	13	0.67	<2.6	<0.1	1.2	<0.51	19000	<0.51
GSP Gypsum 2	0-0	03/09/2021	<3	<1	13	<1	<10	<1	130000	260	<4	<2	7.6	<1	<5	--	<1	<1	15000	<1

Notes:
< = concentration is less than the concentration shown, which corresponds to the reporting limit for the method.
-- = data not available
BGS = below ground surface
CCR = coal combustion residuals
ft = feet
mg/kg = milligrams per kilogram

generated 10/05/2021, 2:11:53 PM CDT

RAMBOLL

February 23, 2021

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

RE: HANSON VISTRA SOIL

Dear Rhonald Hasenyager:

Please find enclosed the analytical results for the **6** sample(s) the laboratory received on **1/29/21 4:12 pm** and logged in under work order **EA04870**. 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 J Schindler

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

SAMPLE RECEIPT CHECK LIST

Items not applicable will be marked as in compliance

Work Order EA04870

YES	Samples received within temperature compliance when applicable
YES	COC present upon sample receipt
YES	COC completed & legible
YES	Sampler name & signature present
YES	Unique sample IDs assigned
YES	Sample collection location recorded
YES	Date & time collected recorded on COC
YES	Relinquished by client signature on COC
YES	COC & labels match
YES	Sample labels are legible
YES	Appropriate bottle(s) received
YES	Sufficient sample volume received
YES	Sample containers recieved undamaged
NO	Zero headspace, <6 mm present in VOA vials
NO	Trip blank(s) received
YES	All non-field analyses received within holding times
NO	Short hold time analysis
YES	Current PDC COC submitted
NO	Case narrative provided

ANALYTICAL RESULTS

Sample: EA04870-01
Name: G275D - S1
Matrix: Soil - Composite

Sampled: 01/28/21 16:00
Received: 01/29/21 16:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - A & L Great Lakes Laboratory									
Cation Exchange Capacity - subcontracted	22.95	meq/100g			1	1			Subcontracted

Sample: EA04870-02
Name: G275D - S2
Matrix: Soil - Composite

Sampled: 01/28/21 16:30
Received: 01/29/21 16:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - A & L Great Lakes Laboratory									
Cation Exchange Capacity - subcontracted	7.93	meq/100g			1	1			Subcontracted

Sample: EA04870-03
Name: G275D - S3
Matrix: Soil - Composite

Sampled: 01/29/21 11:00
Received: 01/29/21 16:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - A & L Great Lakes Laboratory									
Cation Exchange Capacity - subcontracted	9.25	meq/100g			1	1			Subcontracted

Sample: EA04870-04
Name: G275D - S3
Matrix: Soil - Composite

Sampled: 01/29/21 11:00
Received: 01/29/21 16:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - A & L Great Lakes Laboratory									
Cation Exchange Capacity - subcontracted	9.63	meq/100g			1	1			Subcontracted

ANALYTICAL RESULTS

Sample: EA04870-06
Name: GYPSUM
Matrix: Soil - Composite

Sampled: 01/29/21 11:15
Received: 01/29/21 16:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - A & L Great Lakes Laboratory									
Cation Exchange Capacity - subcontracted	0.41	meq/100g			1	1			Subcontracted

ANALYTICAL RESULTS

Sample: EA04870-01
Name: G275D - S1
Matrix: Soil - Composite

Sampled: 01/28/21 16:00
Received: 01/29/21 16:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
General Chemistry - Eurofins Eaton Analytical, Inc. - Lancaster, PA									
Total Organic Carbon (TOC)	603	mg/kg			1.37	411	02/10/21 15:53		SM 5310C 2000

Sample: EA04870-02
Name: G275D - S2
Matrix: Soil - Composite

Sampled: 01/28/21 16:30
Received: 01/29/21 16:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
General Chemistry - Eurofins Eaton Analytical, Inc. - Lancaster, PA									
Total Organic Carbon (TOC)	11200	mg/kg			6.62	1990	02/11/21 18:38		SM 5310C 2000

Sample: EA04870-03
Name: G275D - S3
Matrix: Soil - Composite

Sampled: 01/29/21 11:00
Received: 01/29/21 16:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
General Chemistry - Eurofins Eaton Analytical, Inc. - Lancaster, PA									
Total Organic Carbon (TOC)	10900	mg/kg			10.08	3020	02/11/21 18:51		SM 5310C 2000

ANALYTICAL RESULTS

Sample: EA04870-04
Name: G275D - S3
Matrix: Soil - Composite

Sampled: 01/29/21 11:00
Received: 01/29/21 16:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
General Chemistry - Eurofins Eaton Analytical, Inc. - Lancaster, PA									
Total Organic Carbon (TOC)	13500	mg/kg			9.12	2740	02/11/21 19:04		SM 5310C 2000

Sample: EA04870-06
Name: GYPSUM
Matrix: Soil - Composite

Sampled: 01/29/21 11:15
Received: 01/29/21 16:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
General Chemistry - Eurofins Eaton Analytical, Inc. - Lancaster, PA									
Total Organic Carbon (TOC)	184 J	mg/kg	J		1.33	399	02/10/21 17:47		SM 5310C 2000

ANALYTICAL RESULTS

Sample: EA04870-01
Name: G275D - S1
Matrix: Soil - Composite

Sampled: 01/28/21 16:00
Received: 01/29/21 16:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - Pace Analytical - Mt Juliet, Tn									
Radium 226 - subcontracted	0.376	pCi/g dry wt			1	0.0478	02/20/21 11:20		Subcontracted
Radium 228 - subcontracted	0.653	pCi/g dry wt			1	0.401	02/17/21 10:35		Subcontracted

Sample: EA04870-02
Name: G275D - S2
Matrix: Soil - Composite

Sampled: 01/28/21 16:30
Received: 01/29/21 16:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - Pace Analytical - Mt Juliet, Tn									
Radium 226 - subcontracted	0.402	pCi/g dry wt			1	0.0888	02/20/21 11:20		Subcontracted
Radium 228 - subcontracted	1.34	pCi/g dry wt			1	0.383	02/17/21 10:35		Subcontracted

ANALYTICAL RESULTS

Sample: EA04870-03
Name: G275D - S3
Matrix: Soil - Composite

Sampled: 01/29/21 11:00
Received: 01/29/21 16:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - Pace Analytical - Mt Juliet, Tn									
Radium 226 - subcontracted	0.445	pCi/g dry wt			1	0.074	02/20/21 11:20		Subcontracted
Radium 228 - subcontracted	0.807	pCi/g dry wt			1	0.402	02/17/21 10:35		Subcontracted

Sample: EA04870-04
Name: G275D - S3
Matrix: Soil - Composite

Sampled: 01/29/21 11:00
Received: 01/29/21 16:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - Pace Analytical - Mt Juliet, Tn									
Radium 226 - subcontracted	0.606	pCi/g dry wt			1	0.0671	02/20/21 11:20		Subcontracted
Radium 228 - subcontracted	0.726	pCi/g dry wt			1	0.422	02/17/21 10:35		Subcontracted

Sample: EA04870-06
Name: GYPSUM
Matrix: Soil - Composite

Sampled: 01/29/21 11:15
Received: 01/29/21 16:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - Pace Analytical - Mt Juliet, Tn									
Radium 226 - subcontracted	0.212	pCi/g dry wt			1	0.0682	02/20/21 11:20		Subcontracted
Radium 228 - subcontracted	-0.226	pCi/g dry wt	U		1	0.388	02/17/21 10:35		Subcontracted

ANALYTICAL RESULTS

ANALYTICAL RESULTS

Sample: EA04870-01
Name: G275D - S1
Matrix: Soil - Composite

Sampled: 01/28/21 16:00
Received: 01/29/21 16:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	< 10	mg/kg		02/04/21 17:23	1	10	02/04/21 17:23	CRD	EPA 9056A
Sulfate	50	mg/kg		02/04/21 17:23	1	10	02/04/21 17:23	CRD	EPA 9056A
General Chemistry - PIA									
Fluoride	< 2.5	mg/kg		02/04/21 16:42	1	2.5	02/04/21 16:42	TTH	SM 4500F C 1997
Total Nitrogen	300	mg/kg dry		02/04/21 08:00	1	58	02/05/21 10:23	CRS1	(calc)
Metals by ICP-MS - PIA									
Iron as Fe2O3	22000	mg/kg		02/04/21 07:36	10	41	02/05/21 15:03	JMW	calculated
Manganese as MnO2	180	mg/kg		02/04/21 07:36	10	1.5	02/05/21 15:03	JMW	calculated
Nutrients - PIA									
Nitrate/Nitrite-N	1.4	mg/kg		02/03/21 13:42	1	0.20	02/03/21 13:42	CJP	EPA 353.2 REV 2
Total Kjeldahl Nitrogen (TKN)	260	mg/kg		02/04/21 08:00	1	50	02/05/21 10:23	CRS1	EPA 351.2 REV 2*
Total Metals - PIA									
Antimony	< 2.9	mg/kg		02/04/21 07:36	10	2.9	02/05/21 15:03	JMW	EPA 6020A
Arsenic	4.3	mg/kg		02/04/21 07:36	10	0.95	02/05/21 15:03	JMW	EPA 6020A
Barium	47	mg/kg		02/04/21 07:36	10	0.95	02/05/21 15:03	JMW	EPA 6020A
Beryllium	< 0.95	mg/kg		02/04/21 07:36	10	0.95	02/05/21 15:03	JMW	EPA 6020A
Boron	< 9.5	mg/kg		02/04/21 07:36	10	9.5	02/05/21 15:03	JMW	EPA 6020A*
Cadmium	< 0.95	mg/kg		02/04/21 07:36	10	0.95	02/05/21 15:03	JMW	EPA 6020A
Chromium	14	mg/kg		02/04/21 07:36	10	3.8	02/05/21 15:03	JMW	EPA 6020A
Cobalt	6.3	mg/kg		02/04/21 07:36	10	1.9	02/05/21 15:03	JMW	EPA 6020A
Iron	16000	mg/kg		02/04/21 07:36	10	29	02/05/21 15:03	JMW	EPA 6020A*
Lead	13	mg/kg		02/04/21 07:36	10	0.95	02/05/21 15:03	JMW	EPA 6020A
Manganese	110	mg/kg		02/04/21 07:36	10	0.95	02/05/21 15:03	JMW	EPA 6020A
Molybdenum	< 0.95	mg/kg		02/04/21 07:36	10	0.95	02/05/21 15:03	JMW	EPA 6020A
Selenium	0.96	mg/kg		02/04/21 07:36	10	0.95	02/05/21 15:03	JMW	EPA 6020A
Thallium	< 0.95	mg/kg		02/04/21 07:36	10	0.95	02/05/21 15:03	JMW	EPA 6020A
Mercury	< 0.19	mg/kg		02/04/21 07:36	10	0.19	02/05/21 15:03	JMW	EPA 6020A
Lithium	6.7	mg/kg		02/04/21 07:36	1	4.8	02/05/21 13:50	TJJ	EPA 6010B*
Sulfur	24	mg/kg		02/04/21 07:36	1	9.5	02/04/21 11:48	TJJ	EPA 6010B*

ANALYTICAL RESULTS

Sample: EA04870-02
Name: G275D - S2
Matrix: Soil - Composite

Sampled: 01/28/21 16:30
Received: 01/29/21 16:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	< 10	mg/kg		02/04/21 18:00	1	10	02/04/21 18:00	CRD	EPA 9056A
Sulfate	20	mg/kg		02/04/21 18:00	1	10	02/04/21 18:00	CRD	EPA 9056A
General Chemistry - PIA									
Fluoride	< 2.5	mg/kg		02/04/21 16:53	1	2.5	02/04/21 16:53	TTH	SM 4500F C 1997
Total Nitrogen	270	mg/kg dry		02/04/21 08:00	1	56	02/05/21 10:24	CRS1	(calc)
Metals by ICP-MS - PIA									
Iron as Fe2O3	14000	mg/kg		02/04/21 07:36	10	43	02/05/21 15:06	JMW	calculated
Manganese as MnO2	310	mg/kg		02/04/21 07:36	10	1.6	02/05/21 15:06	JMW	calculated
Nutrients - PIA									
Nitrate/Nitrite-N	< 0.20	mg/kg		02/03/21 13:41	1	0.20	02/03/21 13:41	CJP	EPA 353.2 REV 2
Total Kjeldahl Nitrogen (TKN)	240	mg/kg		02/04/21 08:00	1	50	02/05/21 10:24	CRS1	EPA 351.2 REV 2*
Total Metals - PIA									
Antimony	< 3.0	mg/kg		02/04/21 07:36	10	3.0	02/05/21 15:06	JMW	EPA 6020A
Arsenic	2.1	mg/kg		02/04/21 07:36	10	1.0	02/05/21 15:06	JMW	EPA 6020A
Barium	63	mg/kg		02/04/21 07:36	10	1.0	02/05/21 15:06	JMW	EPA 6020A
Beryllium	< 1.0	mg/kg		02/04/21 07:36	10	1.0	02/05/21 15:06	JMW	EPA 6020A
Boron	< 10	mg/kg		02/04/21 07:36	10	10	02/05/21 15:06	JMW	EPA 6020A*
Cadmium	< 1.0	mg/kg		02/04/21 07:36	10	1.0	02/05/21 15:06	JMW	EPA 6020A
Chromium	11	mg/kg		02/04/21 07:36	10	4.0	02/05/21 15:06	JMW	EPA 6020A
Cobalt	4.2	mg/kg		02/04/21 07:36	10	2.0	02/05/21 15:06	JMW	EPA 6020A
Iron	9900	mg/kg		02/04/21 07:36	10	30	02/05/21 15:06	JMW	EPA 6020A*
Lead	7.2	mg/kg		02/04/21 07:36	10	1.0	02/05/21 15:06	JMW	EPA 6020A
Manganese	190	mg/kg		02/04/21 07:36	10	1.0	02/05/21 15:06	JMW	EPA 6020A
Molybdenum	< 1.0	mg/kg		02/04/21 07:36	10	1.0	02/05/21 15:06	JMW	EPA 6020A
Selenium	< 1.0	mg/kg		02/04/21 07:36	10	1.0	02/05/21 15:06	JMW	EPA 6020A
Thallium	< 1.0	mg/kg		02/04/21 07:36	10	1.0	02/05/21 15:06	JMW	EPA 6020A
Mercury	< 0.20	mg/kg		02/04/21 07:36	10	0.20	02/05/21 15:06	JMW	EPA 6020A
Lithium	12	mg/kg		02/04/21 07:36	1	5.0	02/05/21 13:51	TJJ	EPA 6010B*
Sulfur	66	mg/kg		02/04/21 07:36	1	10	02/04/21 11:50	TJJ	EPA 6010B*

ANALYTICAL RESULTS

Sample: EA04870-03
Name: G275D - S3
Matrix: Soil - Composite

Sampled: 01/29/21 11:00
Received: 01/29/21 16:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	< 10	mg/kg		02/04/21 18:18	1	10	02/04/21 18:18	CRD	EPA 9056A
Sulfate	48	mg/kg		02/04/21 18:18	1	10	02/04/21 18:18	CRD	EPA 9056A
General Chemistry - PIA									
Fluoride	< 2.5	mg/kg		02/04/21 16:55	1	2.5	02/04/21 16:55	TTH	SM 4500F C 1997
Total Nitrogen	370	mg/kg dry		02/04/21 08:00	1	57	02/05/21 10:25	CRS1	(calc)
Metals by ICP-MS - PIA									
Iron as Fe2O3	12000	mg/kg		02/09/21 14:58	10	43	02/10/21 10:06	wjm	calculated
Manganese as MnO2	370	mg/kg		02/09/21 14:58	10	1.6	02/10/21 10:06	wjm	calculated
Nutrients - PIA									
Nitrate/Nitrite-N	0.29	mg/kg		02/03/21 13:43	1	0.20	02/03/21 13:43	CJP	EPA 353.2 REV 2
Total Kjeldahl Nitrogen (TKN)	330	mg/kg		02/04/21 08:00	1	50	02/05/21 10:25	CRS1	EPA 351.2 REV 2*
Total Metals - PIA									
Antimony	< 3.0	mg/kg		02/09/21 14:58	10	3.0	02/10/21 10:06	wjm	EPA 6020A
Arsenic	2.6	mg/kg		02/09/21 14:58	10	1.0	02/10/21 10:06	wjm	EPA 6020A
Barium	53	mg/kg		02/09/21 14:58	10	1.0	02/10/21 10:06	wjm	EPA 6020A
Beryllium	< 1.0	mg/kg		02/09/21 14:58	10	1.0	02/10/21 12:18	KMC	EPA 6020A
Boron	< 10	mg/kg		02/09/21 14:58	10	10	02/10/21 12:18	KMC	EPA 6020A*
Cadmium	< 1.0	mg/kg		02/09/21 14:58	10	1.0	02/10/21 10:06	wjm	EPA 6020A
Chromium	9.1	mg/kg		02/09/21 14:58	10	4.0	02/10/21 10:06	wjm	EPA 6020A
Cobalt	4.3	mg/kg		02/09/21 14:58	10	2.0	02/10/21 10:06	wjm	EPA 6020A
Iron	8200	mg/kg		02/09/21 14:58	10	30	02/10/21 10:06	wjm	EPA 6020A*
Lead	6.7	mg/kg		02/09/21 14:58	10	1.0	02/10/21 12:18	KMC	EPA 6020A
Manganese	240	mg/kg		02/09/21 14:58	10	1.0	02/10/21 10:06	wjm	EPA 6020A
Molybdenum	1.0	mg/kg		02/09/21 14:58	10	1.0	02/10/21 10:06	wjm	EPA 6020A
Selenium	< 1.0	mg/kg		02/09/21 14:58	10	1.0	02/10/21 10:06	wjm	EPA 6020A
Thallium	< 1.0	mg/kg		02/09/21 14:58	10	1.0	02/10/21 10:06	wjm	EPA 6020A
Mercury	< 0.20	mg/kg		02/09/21 14:58	10	0.20	02/10/21 10:06	wjm	EPA 6020A
Lithium	7.7	mg/kg		02/09/21 14:58	1	5.0	02/10/21 09:48	TJJ	EPA 6010B*
Sulfur	640	mg/kg		02/09/21 14:58	1	10	02/11/21 14:46	tjj	EPA 6010B*

ANALYTICAL RESULTS

Sample: EA04870-04
Name: G275D - S3
Matrix: Soil - Composite

Sampled: 01/29/21 11:00
Received: 01/29/21 16:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	< 10	mg/kg		02/04/21 19:30	1	10	02/04/21 19:30	CRD	EPA 9056A
Sulfate	42	mg/kg	Q4	02/04/21 19:30	1	10	02/04/21 19:30	CRD	EPA 9056A
General Chemistry - PIA									
Fluoride	3.1	mg/kg		02/04/21 16:56	1	2.5	02/04/21 16:56	TTH	SM 4500F C 1997
Total Nitrogen	410	mg/kg dry		02/04/21 08:00	1	56	02/05/21 10:26	CRS1	(calc)
Metals by ICP-MS - PIA									
Iron as Fe2O3	7400	mg/kg		02/09/21 14:58	10	43	02/10/21 10:10	wjm	calculated
Manganese as MnO2	400	mg/kg		02/09/21 14:58	10	1.6	02/10/21 10:10	wjm	calculated
Nutrients - PIA									
Nitrate/Nitrite-N	0.23	mg/kg		02/03/21 13:32	1	0.20	02/03/21 13:32	CJP	EPA 353.2 REV 2
Total Kjeldahl Nitrogen (TKN)	360	mg/kg	Q3	02/04/21 08:00	1	50	02/05/21 10:26	CRS1	EPA 351.2 REV 2*
Total Metals - PIA									
Antimony	< 3.0	mg/kg		02/09/21 14:58	10	3.0	02/10/21 10:10	wjm	EPA 6020A
Arsenic	< 1.0	mg/kg	Q3	02/09/21 14:58	10	1.0	02/10/21 10:10	wjm	EPA 6020A
Barium	16	mg/kg		02/09/21 14:58	10	1.0	02/10/21 10:10	wjm	EPA 6020A
Beryllium	< 1.0	mg/kg		02/09/21 14:58	10	1.0	02/10/21 12:22	KMC	EPA 6020A
Boron	< 10	mg/kg	R	02/09/21 14:58	10	10	02/10/21 12:22	KMC	EPA 6020A*
Cadmium	< 1.0	mg/kg	R	02/09/21 14:58	10	1.0	02/10/21 10:10	wjm	EPA 6020A
Chromium	5.6	mg/kg	R	02/09/21 14:58	10	4.0	02/10/21 10:10	wjm	EPA 6020A
Cobalt	3.9	mg/kg		02/09/21 14:58	10	2.0	02/10/21 10:10	wjm	EPA 6020A
Iron	5200	mg/kg	Q4	02/09/21 14:58	10	30	02/10/21 10:10	wjm	EPA 6020A*
Lead	6.7	mg/kg		02/09/21 14:58	10	1.0	02/10/21 12:22	KMC	EPA 6020A
Manganese	250	mg/kg	Q4	02/09/21 14:58	10	1.0	02/10/21 10:10	wjm	EPA 6020A
Molybdenum	< 1.0	mg/kg		02/09/21 14:58	10	1.0	02/10/21 10:10	wjm	EPA 6020A
Selenium	< 1.0	mg/kg	Q3	02/09/21 14:58	10	1.0	02/10/21 10:10	wjm	EPA 6020A
Thallium	< 1.0	mg/kg	R	02/09/21 14:58	10	1.0	02/10/21 10:10	wjm	EPA 6020A
Mercury	< 0.20	mg/kg		02/09/21 14:58	10	0.20	02/10/21 10:10	wjm	EPA 6020A
Lithium	5.1	mg/kg		02/09/21 14:58	1	5.0	02/10/21 09:50	TJJ	EPA 6010B*
Sulfur	390	mg/kg		02/09/21 14:58	1	10	02/11/21 14:48	tjj	EPA 6010B*

ANALYTICAL RESULTS

Sample: EA04870-06
Name: GYPSUM
Matrix: Soil - Composite

Sampled: 01/29/21 11:15
Received: 01/29/21 16:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	25	mg/kg		02/08/21 17:23	10	10	02/08/21 17:23	CRD	EPA 9056A
Sulfate	19000	mg/kg		02/12/21 14:49	250	2500	02/12/21 14:49	CRD	EPA 9056A
General Chemistry - PIA									
Fluoride	13	mg/kg	Q3	02/04/21 16:44	1	2.5	02/04/21 16:44	TTH	SM 4500F C 1997
Total Nitrogen	1400	mg/kg dry		02/04/21 08:00	1	87	02/05/21 10:29	CRS1	(calc)
Metals by ICP-MS - PIA									
Iron as Fe2O3	370	mg/kg		02/09/21 14:58	10	22	02/10/21 10:47	wjm	calculated
Manganese as MnO2	43	mg/kg		02/09/21 14:58	10	0.81	02/10/21 10:47	wjm	calculated
Nutrients - PIA									
Nitrate/Nitrite-N	6.3	mg/kg		02/03/21 13:44	1	0.20	02/03/21 13:44	CJP	EPA 353.2 REV 2
Total Kjeldahl Nitrogen (TKN)	820	mg/kg		02/04/21 08:00	1	50	02/05/21 10:29	CRS1	EPA 351.2 REV 2*
Total Metals - PIA									
Antimony	< 1.5	mg/kg		02/09/21 14:58	10	1.5	02/10/21 10:47	wjm	EPA 6020A
Arsenic	< 0.51	mg/kg		02/09/21 14:58	10	0.51	02/10/21 10:47	wjm	EPA 6020A
Barium	6.6	mg/kg		02/09/21 14:58	10	0.51	02/10/21 10:47	wjm	EPA 6020A
Beryllium	< 0.51	mg/kg		02/09/21 14:58	10	0.51	02/10/21 13:13	KMC	EPA 6020A
Boron	13	mg/kg		02/09/21 14:58	10	5.1	02/10/21 13:13	KMC	EPA 6020A*
Cadmium	< 0.51	mg/kg		02/09/21 14:58	10	0.51	02/10/21 10:47	wjm	EPA 6020A
Chromium	< 2.0	mg/kg		02/09/21 14:58	10	2.0	02/10/21 10:47	wjm	EPA 6020A
Cobalt	< 1.0	mg/kg		02/09/21 14:58	10	1.0	02/10/21 10:47	wjm	EPA 6020A
Iron	260	mg/kg		02/09/21 14:58	10	15	02/10/21 10:47	wjm	EPA 6020A*
Lead	0.67	mg/kg		02/09/21 14:58	10	0.51	02/10/21 13:13	KMC	EPA 6020A
Manganese	27	mg/kg		02/09/21 14:58	10	0.51	02/10/21 10:47	wjm	EPA 6020A
Molybdenum	1.2	mg/kg		02/09/21 14:58	10	0.51	02/10/21 10:47	wjm	EPA 6020A
Selenium	< 0.51	mg/kg		02/09/21 14:58	10	0.51	02/10/21 10:47	wjm	EPA 6020A
Thallium	< 0.51	mg/kg		02/09/21 14:58	10	0.51	02/10/21 13:13	KMC	EPA 6020A
Mercury	< 0.10	mg/kg		02/09/21 14:58	10	0.10	02/10/21 13:13	KMC	EPA 6020A
Lithium	< 2.6	mg/kg		02/09/21 14:58	1	2.6	02/10/21 09:51	TJJ	EPA 6010B*
Sulfur	30000	mg/kg		02/09/21 14:58	100	510	02/15/21 15:36	AMB	EPA 6010B*

NOTES

Specifications regarding method revisions and method modifications used for analysis are available upon request. Please contact your project manager.

* Not a TNI accredited analyte

Certifications

CHI - McHenry, IL - 4314-A W. Crystal Lake Road, McHenry, IL 60050
TNI Accreditation for Drinking Water and Wastewater Fields of Testing through IL EPA Accreditation No. 100279
Illinois Department of Public Health Bacterial 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, Solid and Hazardous Material Fields of Testing through IL EPA Accreditation No. 100230
Illinois Department of Public Health Bacterial Analysis in Drinking Water Approved Laboratory Registry No. 17553
Drinking Water Certifications/Accreditations: Iowa (240); Kansas (E-10338); Missouri (870)
Wastewater Certifications/Accreditations: Arkansas (88-0677); Iowa (240); Kansas (E-10338)
Solid and Hazardous Material Certifications/Accreditations: Arkansas (88-0677); Iowa (240); Kansas (E-10338)

SPMO - Springfield, MO - 1805 W Sunset Street, Springfield, MO 65807
USEPA DMR-QA Program

STL - Hazelwood, MO - 944 Anglum Rd, Hazelwood, MO 63042
TNI Accreditation for Wastewater, Solid and Hazardous Material Fields of Testing through KS KDHE Certification No. E-10389
TNI Accreditation for Wastewater, Solid and Hazardous Material Fields of Testing through IL EPA Accreditation No. - 200080
Illinois Department of Public Health Bacterial Analysis in Drinking Water Approved Laboratory, Registry No. 171050
Missouri Department of Natural Resources - Certificate of Approval for Microbiological Laboratory Service - No. 1050

Qualifiers

Q3	Matrix Spike/Matrix Spike Duplicate both failed % recovery acceptance limits. The associated blank spike recovery was acceptable.
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.
R	Matrix Spike/Matrix Spike Duplicate Failed %Relative Percent Difference criterion.

Gail J Schindler

Certified by: Gail Schindler, Project Manager

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins Lancaster Laboratories Env, LLC
2425 New Holland Pike
Lancaster, PA 17601
Tel: (717)656-2300

Laboratory Job ID: 410-28227-1
Client Project/Site: EA04870

For:
PDC Laboratories, Inc.
2231 W. Altorfer Drive
Peoria, Illinois 61615

Attn: Gail Schindler

Marrissa Williams

Authorized for release by:
2/12/2021 10:07:09 AM

Marrissa Williams, Project Manager
(717)556-7246
Marrissa.Williams@eurofinset.com

The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. 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.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Analytical test results meet all requirements of the associated regulatory program (e.g., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis. Data qualifiers are applied to note exceptions. Noncompliant quality control (QC) is further explained in narrative comments.
· QC results that exceed the upper limits and are associated with non-detect samples are qualified but further narration is not required since the bias is high and does not change a non-detect result. Further narration is also not required with QC blank detection when the associated sample concentration is non-detect or more than ten times the level in the blank.
· Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD is performed, unless otherwise specified in the method.
· Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.
Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Measurement uncertainty values, as applicable, are available upon request.

Test results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" and tested in the laboratory are not performed within 15 minutes of collection.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied, except as otherwise agreed. We disclaim any other warranties, expressed or implied, including a warranty of fitness for particular purpose and warranty of merchantability. In no event shall Eurofins Lancaster Laboratories Environmental, LLC be liable for indirect, special, consequential, or incidental damages including, but not limited to, damages for loss of profit or goodwill regardless of (A) the negligence (either sole or concurrent) of Eurofins Lancaster Laboratories Environmental and (B) whether Eurofins Lancaster Laboratories Environmental has been informed of the possibility of such damages. We accept no legal responsibility for the purposes for which the client uses the test results. Except as otherwise agreed, no purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

Marrissa Williams

Marrissa Williams
Project Manager
2/12/2021 10:07:10 AM

Table of Contents

Qualifiers

General Chemistry

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
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

Job ID: 410-28227-1

Laboratory: Eurofins Lancaster Laboratories Env, LLC

Narrative

Job Narrative
410-28227-1

Receipt
The samples were received on 2/2/2021 11:46 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 0.3°C

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

Detection Summary

Client: PDC Laboratories, Inc.
Project/Site: EA04870

Job ID: 410-28227-1

Client Sample ID: EA04870-1 G275D-S1 — Lab Sample ID: 410-28227-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Organic Carbon	603		411	137	mg/Kg	1.37		Lloyd Kahn	Total/NA

Client Sample ID: EA04870-2 G275D-S2 — Lab Sample ID: 410-28227-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Organic Carbon	11200		1990	662	mg/Kg	6.62		Lloyd Kahn	Total/NA

Client Sample ID: EA04870-3 G275D-S3 — Lab Sample ID: 410-28227-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Organic Carbon	10900		3020	1010	mg/Kg	10.08		Lloyd Kahn	Total/NA

Client Sample ID: EA04870-4 G275D-S1 — Lab Sample ID: 410-28227-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Organic Carbon	13500		2740	912	mg/Kg	9.12		Lloyd Kahn	Total/NA

Client Sample ID: EA04870-6 GYPSUM — Lab Sample ID: 410-28227-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Organic Carbon	184	J	399	133	mg/Kg	1.33		Lloyd Kahn	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: EA04870-1 G275D-S1

Lab Sample ID: 410-28227-1
Matrix: Solid
Date Collected: 01/28/21 16:00
Date Received: 02/02/21 11:46

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	603		411	137	mg/Kg			02/10/21 15:53	1.37
Percent Moisture	16.9		1.0	1.0	%			02/03/21 10:39	1
Percent Solids	83.1		1.0	1.0	%			02/03/21 10:39	1

Client Sample ID: EA04870-2 G275D-S2

Lab Sample ID: 410-28227-2
Matrix: Solid
Date Collected: 01/28/21 16:30
Date Received: 02/02/21 11:46

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	11200		1990	662	mg/Kg			02/11/21 18:38	6.62
Percent Moisture	18.6		1.0	1.0	%			02/03/21 10:39	1
Percent Solids	81.4		1.0	1.0	%			02/03/21 10:39	1

Client Sample ID: EA04870-3 G275D-S3

Lab Sample ID: 410-28227-3
Matrix: Solid
Date Collected: 01/28/21 11:00
Date Received: 02/02/21 11:46

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	10900		3020	1010	mg/Kg			02/11/21 18:51	10.08
Percent Moisture	18.3		1.0	1.0	%			02/03/21 10:39	1
Percent Solids	81.7		1.0	1.0	%			02/03/21 10:39	1

Client Sample ID: EA04870-4 G275D-S1

Lab Sample ID: 410-28227-4
Matrix: Solid
Date Collected: 01/28/21 11:00
Date Received: 02/02/21 11:46

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	13500		2740	912	mg/Kg			02/11/21 19:04	9.12
Percent Moisture	19.7		1.0	1.0	%			02/03/21 10:44	1
Percent Solids	80.3		1.0	1.0	%			02/03/21 10:44	1

Client Sample ID: EA04870-6 GYPSUM

Lab Sample ID: 410-28227-5
Matrix: Solid
Date Collected: 01/28/21 11:15
Date Received: 02/02/21 11:46

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	184	J	399	133	mg/Kg			02/10/21 17:47	1.33
Percent Moisture	39.4		1.0	1.0	%			02/03/21 10:39	1
Percent Solids	60.6		1.0	1.0	%			02/03/21 10:39	1

Method: Lloyd Kahn - Organic Carbon, Total (TOC)

Lab Sample ID: MB 410-93317/22
Matrix: Solid
Analysis Batch: 93317

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		300	100	mg/Kg			02/10/21 19:03	1

Lab Sample ID: MB 410-93317/3
Matrix: Solid
Analysis Batch: 93317

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		300	100	mg/Kg			02/10/21 15:02	1

Lab Sample ID: LCS 410-93317/23
Matrix: Solid
Analysis Batch: 93317

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	4300	4595		mg/Kg		107	47 - 143

Lab Sample ID: LCS 410-93317/4
Matrix: Solid
Analysis Batch: 93317

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	4300	3708		mg/Kg		86	47 - 143

Lab Sample ID: MB 410-93774/3
Matrix: Solid
Analysis Batch: 93774

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		300	100	mg/Kg			02/11/21 17:35	1

Lab Sample ID: MB 410-93774/31
Matrix: Solid
Analysis Batch: 93774

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		300	100	mg/Kg			02/11/21 23:30	1

Lab Sample ID: LCS 410-93774/32
Matrix: Solid
Analysis Batch: 93774

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	4300	3789		mg/Kg		88	47 - 143

Lab Sample ID: LCS 410-93774/4
Matrix: Solid
Analysis Batch: 93774

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	4300	3038		mg/Kg		71	47 - 143

General Chemistry

Analysis Batch: 90493

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-28227-1	EA04870-1 G275D-S1	Total/NA	Solid	Moisture	
410-28227-2	EA04870-2 G275D-S2	Total/NA	Solid	Moisture	
410-28227-3	EA04870-3 G275D-S3	Total/NA	Solid	Moisture	
410-28227-5	EA04870-6 GYPSUM	Total/NA	Solid	Moisture	

Analysis Batch: 90496

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-28227-4	EA04870-4 G275D-S1	Total/NA	Solid	Moisture	

Analysis Batch: 93317

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-28227-1	EA04870-1 G275D-S1	Total/NA	Solid	Lloyd Kahn	
410-28227-1	EA04870-1 G275D-S1	Total/NA	Solid	Lloyd Kahn	
410-28227-1	EA04870-1 G275D-S1	Total/NA	Solid	Lloyd Kahn	
410-28227-1	EA04870-1 G275D-S1	Total/NA	Solid	Lloyd Kahn	
410-28227-5	EA04870-6 GYPSUM	Total/NA	Solid	Lloyd Kahn	
MB 410-93317/22	Method Blank	Total/NA	Solid	Lloyd Kahn	
MB 410-93317/3	Method Blank	Total/NA	Solid	Lloyd Kahn	
LCS 410-93317/23	Lab Control Sample	Total/NA	Solid	Lloyd Kahn	
LCS 410-93317/4	Lab Control Sample	Total/NA	Solid	Lloyd Kahn	

Analysis Batch: 93774

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-28227-2	EA04870-2 G275D-S2	Total/NA	Solid	Lloyd Kahn	
410-28227-3	EA04870-3 G275D-S3	Total/NA	Solid	Lloyd Kahn	
410-28227-4	EA04870-4 G275D-S1	Total/NA	Solid	Lloyd Kahn	
MB 410-93774/3	Method Blank	Total/NA	Solid	Lloyd Kahn	
MB 410-93774/31	Method Blank	Total/NA	Solid	Lloyd Kahn	
LCS 410-93774/32	Lab Control Sample	Total/NA	Solid	Lloyd Kahn	
LCS 410-93774/4	Lab Control Sample	Total/NA	Solid	Lloyd Kahn	

Lab Chronicle

Client: PDC Laboratories, Inc.
Project/Site: EA04870

Job ID: 410-28227-1

Client Sample ID: EA04870-1 G275D-S1

Lab Sample ID: 410-28227-1

Date Collected: 01/28/21 16:00
Date Received: 02/02/21 11:46

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		1.38	93317	02/10/21 15:27	NKL9	ELLE
Total/NA	Analysis	Lloyd Kahn		1.38	93317	02/10/21 15:40	NKL9	ELLE
Total/NA	Analysis	Lloyd Kahn		1.37	93317	02/10/21 15:53	NKL9	ELLE
Total/NA	Analysis	Lloyd Kahn		1.37	93317	02/10/21 16:05	NKL9	ELLE
Total/NA	Analysis	Moisture		1	90493	02/03/21 10:39	UVJN	ELLE

Client Sample ID: EA04870-2 G275D-S2

Lab Sample ID: 410-28227-2

Date Collected: 01/28/21 16:30
Date Received: 02/02/21 11:46

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		6.62	93774	02/11/21 18:38	NKL9	ELLE
Total/NA	Analysis	Moisture		1	90493	02/03/21 10:39	UVJN	ELLE

Client Sample ID: EA04870-3 G275D-S3

Lab Sample ID: 410-28227-3

Date Collected: 01/28/21 11:00
Date Received: 02/02/21 11:46

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		10.08	93774	02/11/21 18:51	NKL9	ELLE
Total/NA	Analysis	Moisture		1	90493	02/03/21 10:39	UVJN	ELLE

Client Sample ID: EA04870-4 G275D-S1

Lab Sample ID: 410-28227-4

Date Collected: 01/28/21 11:00
Date Received: 02/02/21 11:46

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		9.12	93774	02/11/21 19:04	NKL9	ELLE
Total/NA	Analysis	Moisture		1	90496	02/03/21 10:44	USA6	ELLE

Client Sample ID: EA04870-6 GYPSUM

Lab Sample ID: 410-28227-5

Date Collected: 01/28/21 11:15
Date Received: 02/02/21 11:46

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		1.33	93317	02/10/21 17:47	NKL9	ELLE
Total/NA	Analysis	Moisture		1	90493	02/03/21 10:39	UVJN	ELLE

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Accreditation/Certification Summary

Client: PDC Laboratories, Inc.
Project/Site: EA04870

Job ID: 410-28227-1

Laboratory: Eurofins Lancaster Laboratories Env, LLC

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

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	1.01	11-30-22
Alaska	State	PA00009	06-30-21
Alaska (UST)	State	17-027	01-31-21 *
Arizona	State	AZ0780	03-12-21
Arkansas DEQ	State	19-053-0	08-09-21
California	State	2792	02-01-22
Colorado	State	PA00009	06-30-21
Connecticut	State	PH-0746	06-30-21
DE Haz. Subst. Cleanup Act (HSCA)	State	019-006 (PA cert)	01-31-22
Delaware (DW)	State	N/A	02-01-22
Florida	NELAP	E87997	07-01-21
Hawaii	State	N/A	01-31-22
Iowa	State	361	03-02-22
Kansas	NELAP	E-10151	10-31-21
Kentucky (DW)	State	KY90088	01-01-22
Kentucky (WW)	State	KY90088	12-31-21
Louisiana	NELAP	02055	06-30-21
Maine	State	2019012	03-12-21
Maryland	State	100	06-30-21
Massachusetts	State	M-PA009	06-30-21
Minnesota	NELAP	042-999-487	12-31-21
Missouri	State	450	01-31-22
Montana (DW)	State	0098	01-01-22
Montana (UST)	State	0098	01-01-22
Nebraska	State	NE-OS-32-17	01-31-20 *
Nevada	State	PA000092019-3	07-31-21
New Hampshire	NELAP	273019	01-10-22
New Jersey	NELAP	PA011	06-30-21
New York	NELAP	10670	04-01-21
North Carolina (DW)	State	42705	07-31-21
North Carolina (WW/SW)	State	521	12-31-21
North Dakota	State	R-205	01-31-20 *
Oklahoma	NELAP	R-205	08-31-21
Oregon	NELAP	PA200001-018	09-12-21
PALA	Canada	1978	05-08-21
Pennsylvania	NELAP	36-00037	01-31-22
Tennessee	State	02838	01-31-22
Texas	NELAP	T104704194-20-38	08-31-21
Utah	NELAP	PA000092019-16	02-28-21
Vermont	State	VT - 36037	10-29-21
Virginia	NELAP	10561	06-14-21
Washington	State	C457	04-11-21
West Virginia DEP	State	055	06-30-21
Wyoming	State	8TMS-L	01-31-22
Wyoming (UST)	A2LA	1.01	11-30-22

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: PDC Laboratories, Inc.
Project/Site: EA04870

Job ID: 410-28227-1

Method	Method Description	Protocol	Laboratory
Lloyd Kahn	Organic Carbon, Total (TOC)	EPA	ELLE
Moisture	Percent Moisture	EPA	ELLE

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Sample Summary

Client: PDC Laboratories, Inc.
Project/Site: EA04870

Job ID: 410-28227-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
410-28227-1	EA04870-1 G275D-S1	Solid	01/28/21 16:00	02/02/21 11:46	
410-28227-2	EA04870-2 G275D-S2	Solid	01/28/21 16:30	02/02/21 11:46	
410-28227-3	EA04870-3 G275D-S3	Solid	01/28/21 11:00	02/02/21 11:46	
410-28227-4	EA04870-4 G275D-S1	Solid	01/28/21 11:00	02/02/21 11:46	
410-28227-5	EA04870-6 GYPSUM	Solid	01/28/21 11:15	02/02/21 11:46	

SUBCONTRACT ORDER
Transfer Chain of Custody

PDC Laboratories, Inc.

EA04870

410-28227 Chain of Custody

SENDING LABORATORY

PDC Laboratories, Inc.
2231 W Altorfer Dr
Peoria, IL 61615
(800) 752-6651

RECEIVING LABORATORY

Eurofins Eaton Analytical, Inc. - Lancaster, PA
2425 New Holland Pike
Lancaster, PA 17601
(717) 656-2300

Sample: EA04870-01
Name: G275D - S1

Sampled: 01/28/21 16:00
Matrix: Soil
Preservative: H2SO4, cool <6

Analysis	Due	Expires	Comments
01-TOC-STL	02/09/21 16:00	02/25/21 16:00	

Sample: EA04870-02
Name: G275D - S2

Sampled: 01/28/21 16:30
Matrix: Soil
Preservative: H2SO4, cool <6

Analysis	Due	Expires	Comments
01-TOC-STL	02/09/21 16:00	02/25/21 16:30	

Sample: EA04870-03
Name: G275D - S3

Sampled: 01/29/21 11:00
Matrix: Soil
Preservative: H2SO4, cool <6

Analysis	Due	Expires	Comments
01-TOC-STL	02/09/21 16:00	02/26/21 11:00	

Sample: EA04870-04
Name: G275D - S3

Sampled: 01/29/21 11:00
Matrix: Soil
Preservative: H2SO4, cool <6

Analysis	Due	Expires	Comments
01-TOC-STL	02/09/21 16:00	02/26/21 11:00	

Sample: EA04870-06
Name: GYPSUM

Sampled: 01/29/21 11:15
Matrix: Soil
Preservative: H2SO4, cool <6

Analysis	Due	Expires	Comments
01-TOC-STL	02/09/21 16:00	02/26/21 11:15	

SUBCONTRACT ORDER
Transfer Chain of Custody

PDC Laboratories, Inc.

EA04870

Please email results to Gail Schindler at gschindler@pdclab.com

Date Shipped: 2/1/21 Total # of Containers: 5 Sample Origin (State): IL PO #: 11506

Turn-Around Time Requested ☒ NORMAL ☐ RUSH Date Results Needed: _____

Relinquished By	Date/Time	Received By	Date/Time
[signature]	2/1/21 1434		
		[signature]	2/2/21 1146

Sample Temperature Upon Receipt	____ °C
Sample(s) Received on Ice	Y or N
Proper Bottles Received in Good Condition	Y or N
Bottles Filled with Adequate Volume	Y or N
Samples Received Within Hold Time	Y or N
Date/Time Taken From Sample Bottle	Y or N

Login Sample Receipt Checklist

Client: PDC Laboratories, Inc.

Job Number: 410-28227-1

Login Number: 28227
List Number: 1
Creator: Jeremiah, Cory T

List Source: Eurofins Lancaster Laboratories Env

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable (</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	N/A	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample Preservation Verified.	N/A	
Residual Chlorine Checked.	N/A	
Sample custody seals are intact.	N/A	

Report Number
F21034-0049
Account Number
67045

3505 Conestoga Dr.
Fort Wayne, IN 46808
260.483.4759
algreatlakes.com

To: PDC LABORATORIES, INC.
2231 W ALTORFER DR
PEORIA, IL 61615-1807

For: EA04870

Attn: JANET CLUTTERS

REPORT OF ANALYSIS

Date Received: 02/03/2021
Date Reported: 02/18/2021 **Page:** 1 of 1

Lab Number	Sample ID	Analysis	Result	Unit	Method
19134	01	Cation Exchange Capacity (NH4-Sat.)	22.95	meq/100g	MSA Part 3 (1996) pp 1220-1221
19135	02	Cation Exchange Capacity (NH4-Sat.)	7.93	meq/100g	MSA Part 3 (1996) pp 1220-1221
19136	03	Cation Exchange Capacity (NH4-Sat.)	9.25	meq/100g	MSA Part 3 (1996) pp 1220-1221
19137	04	Cation Exchange Capacity (NH4-Sat.)	9.63	meq/100g	MSA Part 3 (1996) pp 1220-1221
19138	06	Cation Exchange Capacity (NH4-Sat.)	0.41	meq/100g	MSA Part 3 (1996) pp 1220-1221

Report reviewed and approved by our professional agronomy staff.

SOILMISC

Report Number
F21034-0049
Account Number
67045

3505 Conestoga Dr.
Fort Wayne, IN 46808
260.483.4759
algreatlakes.com

To: PDC LABORATORIES, INC.
2231 W ALTORFER DR
PEORIA, IL 61615-1807

For: EA04870

Attn: JANET CLUTTERS

REPORT OF ANALYSIS

Date Received: 02/03/2021
Date Reported: 02/18/2021 **Page:** 1 of 1

Lab Number	Sample ID	Analysis	Result	Unit	Method
19134	01	Cation Exchange Capacity (NH4-Sat.)	22.95	meq/100g	MSA Part 3 (1996) pp 1220-1221
19135	02	Cation Exchange Capacity (NH4-Sat.)	7.93	meq/100g	MSA Part 3 (1996) pp 1220-1221
19136	03	Cation Exchange Capacity (NH4-Sat.)	9.25	meq/100g	MSA Part 3 (1996) pp 1220-1221
19137	04	Cation Exchange Capacity (NH4-Sat.)	9.63	meq/100g	MSA Part 3 (1996) pp 1220-1221
19138	06	Cation Exchange Capacity (NH4-Sat.)	0.41	meq/100g	MSA Part 3 (1996) pp 1220-1221

Report reviewed and approved by our professional agronomy staff.

SOILMISC

National Center for Testing & Innovation

ANALYTICAL REPORT

February 22, 2021

PDC Laboratory, Inc.

Sample Delivery Group:	L1313806
Samples Received:	02/04/2021
Project Number:	EA04863
Description:	

Report To: Gail Schindler
2231 W. Altorfer Drive
Peoria, IL 61615

Entire Report Reviewed By:

Mark W. Beasley
Project Manager

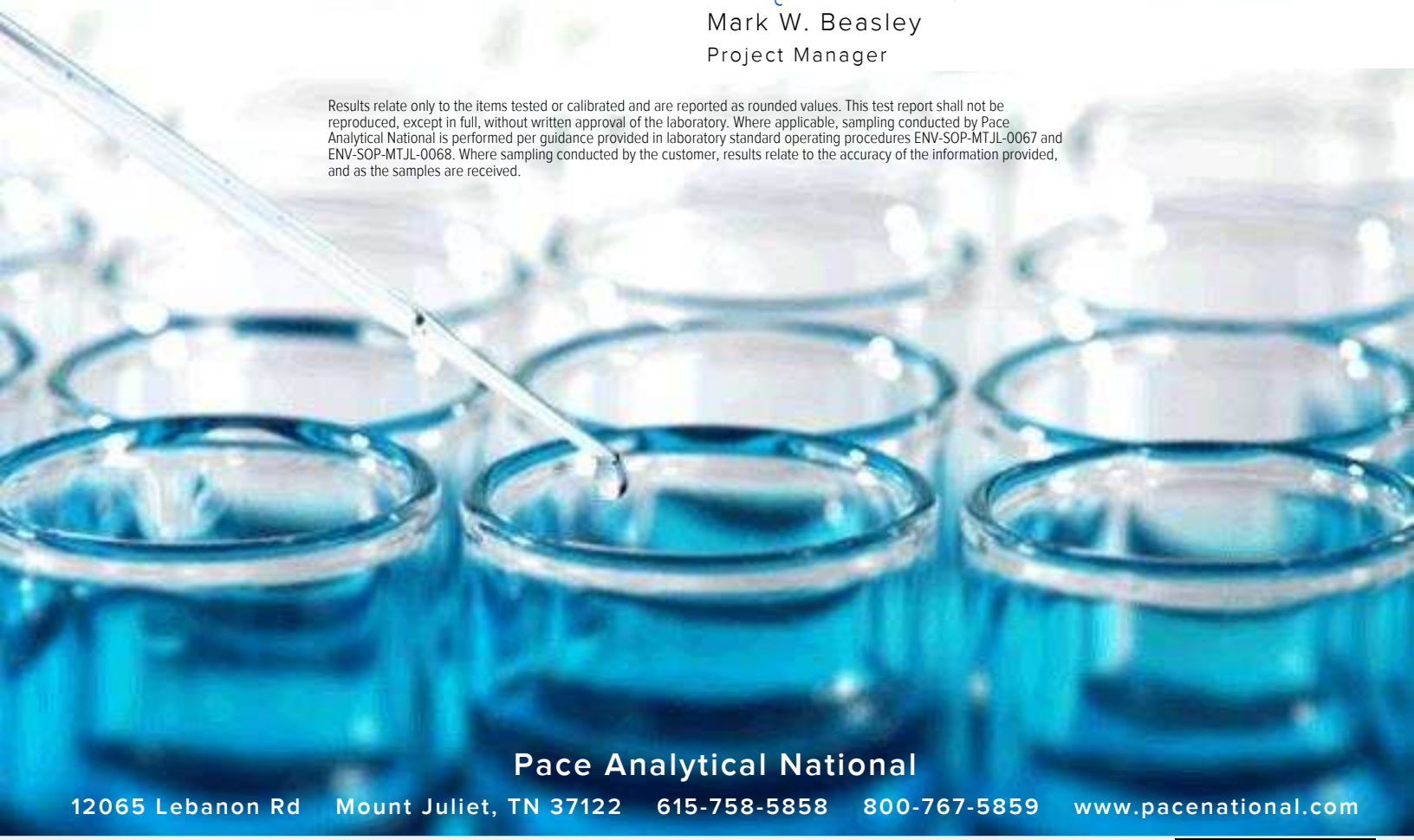


TABLE OF CONTENTS

EA04870-01 L1313806-01 Solids and Chemical Materials

Collected by | Collected date/time 01/28/21 16:00 | Received date/time 02/04/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 9320	WG1617956	1	02/08/21 11:32	02/17/21 10:35	SNR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1617957	1	02/11/21 09:30	02/20/21 11:20	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1617957	1	02/11/21 09:30	02/20/21 11:20	RGT	Mt. Juliet, TN

EA04870-02 L1313806-02 Solids and Chemical Materials

Collected by | Collected date/time 01/28/21 16:30 | Received date/time 02/04/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 9320	WG1617956	1	02/08/21 11:32	02/17/21 10:35	SNR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1617957	1	02/11/21 09:30	02/20/21 11:20	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1617957	1	02/11/21 09:30	02/20/21 11:20	RGT	Mt. Juliet, TN

EA04870-03 L1313806-03 Solids and Chemical Materials

Collected by | Collected date/time 01/29/21 11:00 | Received date/time 02/04/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 9320	WG1617956	1	02/08/21 11:32	02/17/21 10:35	SNR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1617957	1	02/11/21 09:30	02/20/21 11:20	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1617957	1	02/11/21 09:30	02/20/21 11:20	RGT	Mt. Juliet, TN

EA04870-04 L1313806-04 Solids and Chemical Materials

Collected by | Collected date/time 01/29/21 11:00 | Received date/time 02/04/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 9320	WG1617956	1	02/08/21 11:32	02/17/21 10:35	SNR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1617957	1	02/11/21 09:30	02/20/21 11:20	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1617957	1	02/11/21 09:30	02/20/21 11:20	RGT	Mt. Juliet, TN

EA04870-06 L1313806-05 Solids and Chemical Materials

Collected by | Collected date/time 01/29/21 11:15 | Received date/time 02/04/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 9320	WG1617956	1	02/08/21 11:32	02/17/21 10:35	SNR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1617957	1	02/11/21 09:30	02/20/21 11:20	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1617957	1	02/11/21 09:30	02/20/21 11:20	RGT	Mt. Juliet, TN

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

Mark W. Beasley
Project Manager

Radiochemistry by Method 9320

Analyte	Result pCi/g	Qualifier	Uncertainty + / -	MDA pCi/g	Analysis Date date / time	Batch
RADIUM-228	0.653		0.231	0.401	02/17/2021 10:35	WG1617956
(T) Barium	*103*			*62.0-143*	*02/17/2021 10:35*	WG1617956
(T) Yttrium	*99.0*			*79.0-136*	*02/17/2021 10:35*	WG1617956

Radiochemistry by Method Calculation

Analyte	Result pCi/g	Qualifier	Uncertainty + / -	MDA pCi/g	Analysis Date date / time	Batch
Combined Radium	1.03		0.346	0.449	02/20/2021 11:20	WG1617957

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/g	Qualifier	Uncertainty + / -	MDA pCi/g	Analysis Date date / time	Batch
RADIUM-226	0.376		0.115	0.0478	02/20/2021 11:20	WG1617957
(T) Barium-133	*97.0*			*30.0-143*	*02/20/2021 11:20*	WG1617957

Radiochemistry by Method 9320

Analyte	Result pCi/g	Qualifier	Uncertainty + / -	MDA pCi/g	Analysis Date date / time	Batch
RADIUM-228	1.34		0.232	0.383	02/17/2021 10:35	WG1617956
(T) Barium	*112*			*62.0-143*	*02/17/2021 10:35*	WG1617956
(T) Yttrium	*97.6*			*79.0-136*	*02/17/2021 10:35*	WG1617956

Radiochemistry by Method Calculation

Analyte	Result pCi/g	Qualifier	Uncertainty + / -	MDA pCi/g	Analysis Date date / time	Batch
Combined Radium	1.74		0.367	0.472	02/20/2021 11:20	WG1617957

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/g	Qualifier	Uncertainty + / -	MDA pCi/g	Analysis Date date / time	Batch
RADIUM-226	0.402		0.135	0.0888	02/20/2021 11:20	WG1617957
(T) Barium-133	*92.0*			*30.0-143*	*02/20/2021 11:20*	WG1617957

Radiochemistry by Method 9320

Analyte	Result pCi/g	Qualifier	Uncertainty + / -	MDA pCi/g	Analysis Date date / time	Batch
RADIUM-228	0.807		0.234	0.402	02/17/2021 10:35	WG1617956
(T) Barium	*114*			*62.0-143*	*02/17/2021 10:35*	WG1617956
(T) Yttrium	*95.4*			*79.0-136*	*02/17/2021 10:35*	WG1617956

Radiochemistry by Method Calculation

Analyte	Result pCi/g	Qualifier	Uncertainty + / -	MDA pCi/g	Analysis Date date / time	Batch
Combined Radium	1.25		0.373	0.476	02/20/2021 11:20	WG1617957

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/g	Qualifier	Uncertainty + / -	MDA pCi/g	Analysis Date date / time	Batch
RADIUM-226	0.445		0.139	0.074	02/20/2021 11:20	WG1617957
(T) Barium-133	*92.0*			*30.0-143*	*02/20/2021 11:20*	WG1617957

Radiochemistry by Method 9320

Analyte	Result pCi/g	Qualifier	Uncertainty + / -	MDA pCi/g	Analysis Date date / time	Batch
RADIUM-228	0.726		0.244	0.422	02/17/2021 10:35	WG1617956
(T) Barium	*113*			*62.0-143*	*02/17/2021 10:35*	WG1617956
(T) Yttrium	*99.7*			*79.0-136*	*02/17/2021 10:35*	WG1617956

Radiochemistry by Method Calculation

Analyte	Result pCi/g	Qualifier	Uncertainty + / -	MDA pCi/g	Analysis Date date / time	Batch
Combined Radium	1.33		0.405	0.489	02/20/2021 11:20	WG1617957

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/g	Qualifier	Uncertainty + / -	MDA pCi/g	Analysis Date date / time	Batch
RADIUM-226	0.606		0.161	0.0671	02/20/2021 11:20	WG1617957
(T) Barium-133	*91.0*			*30.0-143*	*02/20/2021 11:20*	WG1617957

Radiochemistry by Method 9320

Analyte	Result pCi/g	Qualifier	Uncertainty + / -	MDA pCi/g	Analysis Date date / time	Batch
RADIUM-228	-0.226	U	0.210	0.388	02/17/2021 10:35	WG1617956
(T) Barium	*97.9*			*62.0-143*	*02/17/2021 10:35*	WG1617956
(T) Yttrium	*99.3*			*79.0-136*	*02/17/2021 10:35*	WG1617956

Radiochemistry by Method Calculation

Analyte	Result pCi/g	Qualifier	Uncertainty + / -	MDA pCi/g	Analysis Date date / time	Batch
Combined Radium	0.202	J	0.299	0.456	02/20/2021 11:20	WG1617957

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/g	Qualifier	Uncertainty + / -	MDA pCi/g	Analysis Date date / time	Batch
RADIUM-226	0.202		0.0894	0.0682	02/20/2021 11:20	WG1617957
(T) Barium-133	*99.2*			*30.0-143*	*02/20/2021 11:20*	WG1617957

Method Blank (MB)

(MB) R3623477-1 02/17/21 10:35

Analyte	MB Result pCi/g	MB Qualifier	MB MDA pCi/g
Radium-228	-0.305	U	0.492
(T) Barium	*106*		
(T) Yttrium	*90.3*		

Original Sample (OS) • Duplicate (DUP)

(OS) • (DUP) R3623477-5 02/17/21 10:35

Analyte	Original Result	DUP Result pCi/g	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-228		0.756	1	37.2	0.918		20	3
(T) Barium		*103*						
(T) Yttrium		*99.2*						

Laboratory Control Sample (LCS)

(LCS) R3623477-2 02/17/21 10:35

Analyte	Spike Amount pCi/g	LCS Result pCi/g	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	4.42	88.4	80.0-120	
(T) Barium			*105*		
(T) Yttrium			*94.8*		

Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) • (MS) R3623477-3 02/17/21 10:35 • (MSD) R3623477-4 02/17/21 10:35

Analyte	Spike Amount pCi/g	Original Result	MS Result pCi/g	MSD Result pCi/g	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	4.75		4.90	4.96	91.5	92.9	1	70.0-130			1.32		20
(T) Barium					*101*	*103*							
(T) Yttrium					*105*	*101*							

Method Blank (MB)

(MB) R3623849-1 02/20/21 11:20

Analyte	MB Result pCi/g	MB Qualifier	MB MDA pCi/g
Radium-226	0.0275	J	0.0453
(T) Barium-133	*91.5*		

L1313806-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1313806-05 02/20/21 11:20 • (DUP) R3623849-5 02/20/21 11:20

Analyte	Original Result pCi/g	DUP Result pCi/g	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-226	0.202	0.138	1	37.8	0.564		20	3
(T) Barium-133	*99.2*	*103*						

Laboratory Control Sample (LCS)

(LCS) R3623849-2 02/20/21 11:20

Analyte	Spike Amount pCi/g	LCS Result pCi/g	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-226	5.02	5.51	110	60.0-144	
(T) Barium-133			*94.7*		

L1313791-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1313791-01 02/20/21 11:20 • (MS) R3623849-3 02/20/21 11:20 • (MSD) R3623849-4 02/20/21 11:20

Analyte	Spike Amount pCi/g	Original Result pCi/g	MS Result pCi/g	MSD Result pCi/g	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-226	5.01	0.619	5.53	5.79	98.0	103	1	65.0-135			4.61		20
(T) Barium-133		*99.4*			*99.7*	*102*							

Guide to Reading and Understanding Your Laboratory Report

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

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

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

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
U	Below Detectable Limits: Indicates that the analyte was not detected.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN, 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

Pace Analytical National 1313 Point Mallard Parkway SE Suite B Decatur, AL, 35601

Alabama	40160
ANSI National Accreditation Board	L2239

Pace Analytical National 660 Bercut Dr. Ste. C Sacramento, CA, 95811

California	2961	Oregon	CA300002
Minnesota	006-999-465	Washington	C926
North Dakota	R-214		

Pace Analytical National 6000 South Eastern Avenue Ste 9A Las Vegas, NV, 89119

Nevada	NV009412021-1

Pace Analytical National 1606 E. Brazos Street Suite D Victoria, TX, 77901

Texas	T104704328-20-18

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

SUBCONTRACT ORDER
Transfer Chain of Custody

H044

13 13806

PDC Laboratories, Inc.

EA04870

SENDING LABORATORY

PDC Laboratories, Inc.
2231 W Altorfer Dr
Peoria, IL 61615
(800) 752-6651

RECEIVING LABORATORY

Pace Analytical - Mt Juliet, Tn
12065 Lebanon Rd
Mt Juliet, TN 37122
(615) 758-5858

-01

Sample: EA04870-01
Name: G275D - S1

Sampled: 01/28/21 16:00
Matrix: Soil
Preservative: Cool <6

Analysis	Due	Expires	Comments
01-Radium 226/228 combined	02/09/21 16:00	07/27/21 16:00	

02

Sample: EA04870-02
Name: G275D - S2

Sampled: 01/28/21 16:30
Matrix: Soil
Preservative: Cool <6

Analysis	Due	Expires	Comments
01-Radium 226/228 combined	02/09/21 16:00	07/27/21 16:30	

03

Sample: EA04870-03
Name: G275D - S3

Sampled: 01/29/21 11:00
Matrix: Soil
Preservative: Cool <6

Analysis	Due	Expires	Comments
01-Radium 226/228 combined	02/09/21 16:00	07/28/21 11:00	

04

Sample: EA04870-04
Name: G275D - S3

Sampled: 01/29/21 11:00
Matrix: Soil
Preservative: Cool <6

Analysis	Due	Expires	Comments
01-Radium 226/228 combined	02/09/21 16:00	07/28/21 11:00	

05

Sample: EA04870-06
Name: GYPSUM

Sampled: 01/29/21 11:15
Matrix: Soil
Preservative: Cool <6

Analysis	Due	Expires	Comments
-Radium 226/228 combined	02/09/21 16:00	07/28/21 11:15	

1313806

SUBCONTRACT ORDER
Transfer Chain of Custody

PDC Laboratories, Inc.

EA04870

5 total

7727 9603 7950

Sample Receipt Checklist

COC Seal Present/Intact:	Y X N	If Applicable	
COC Signed/Accurate:	X Y N	VOA Zero Headspace:	Y N
Bottles arrive intact:	X Y N	Pres.Correct/Check:	Y N
Correct bottles used:	X Y N		
Sufficient volume sent:	X Y N		
RAD Screen <0.5 mR/hr:	X Y N		

All Cont <500 cpm

Please email results to Gail Schindler at gschindler@pdclab.com

Date Shipped: 2-2-21 Total # of Containers: 5 Sample Origin (State): IL PO #: 11508

Turn-Around Time Requested ☑ NORMAL ☐ RUSH Date Results Needed: _____

12

Relinquished By	Date/Time	Received By	Date/Time
[signature]	2-2-21 11:00	NPappas	2-4-21 900

Sample Temperature Upon Receipt 5/2.7/2.5 °C

Sample(s) Received on Ice	Y or N
Proper Bottles Received in Good Condition	Y or N
Bottles Filled with Adequate Volume	Y or N
Samples Received Within Hold Time	Y or N
Date/Time Taken From Sample Bottle	Y or N

PDC LABORATORIES, INC.
WWW.PDCLAB.COM

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

CHAIN OF CUSTODY RECORD

STATE WHERE SAMPLE COLLECTED IL

EA04870-07

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

1 CLIENT: HANSON PROFESSIONAL SERVICES
PROJECT NUMBER: COFFEEN GMF
PROJECT LOCATION:
PURCHASE ORDER #:
ADDRESS: 1525 S 6TH STREET
PHONE NUMBER:
E-MAIL:
DATE SHIPPED:
CITY / STATE / ZIP: SPRINGFIELD IL 62703-6801
SAMPLER (PLEASE PRINT): COLIN WINTER
CONTACT PERSON: MR RHON HASENYAGER
SAMPLER'S SIGNATURE:

MATRIX TYPES:
WW- WASTEWATER
DW- DRINKING WATER
GW- GROUND WATER
WWSL- SLUDGE
NAS- NON AQUEOUS SOLID
LCHT-LEACHATE
OIL-OIL
SO-SOIL
SOL-SOLID

3 ANALYSIS REQUESTED

4 (FOR LAB USE ONLY)
LOGIN # EA04870-07
LOGGED BY: KEG
CLIENT: HANSON PROFESSIONAL SERVICES
PROJECT: HANSON VISTRA COFFEEN GMF SOIL
PRJ. MGR.: GJ SCHINDLER

2 SAMPLE DESCRIPTION (UNIQUE DESCRIPTION AS IT WILL APPEAR ON THE ANALYTICAL REPORT)	DATE COLLECTED	TIME COLLECTED	SAMPLE TYPE GRAB	SAMPLE TYPE COMP	MATRIX TYPE	BOTTLE COUNT	PRES CODE CLIENT PROVIDED	SB, AS, BA, BE, B, CD, CA, CR,	CO, FE, PB, LI, MG, MN, MO, K	SE, NA, S, TL, CL, F, SO4, TN	FE OXIDE, MN OXIDE	RAD 226/228	TOC	CEC	REMARKS
G275D-S1	1/28/21	SEE JARS		X	SO	3									3-4pm 1/29/21 DCW
G275D-S2	〃	〃		X	〃	3									4-4:30pm 1/29/21 DCW
G275D-S3	1/28+29/21	3:5PM/8-11AM		X	〃	4									8-11am 1/29/21 DCW
G275D-S3 (MS/MSD/~~FIELD BLANK~~ FIELD DUP)	〃	〃		X	〃	3									8-11am 1/29/21 DCW
G275D-S21 (EQUIP BLANK)	1/29/21	~~SEE JARS~~ 9AM	X		N/A	8									9am 1/29/21 DCW
															11:15am 1/29/21 DCW
GYPSUM	1/29/21	11AM	X		SOL	4									

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 TAT IS SUBJECT TO PDC LABS APPROVAL AND SURCHARGE)
DATE RESULTS NEEDED:
RUSH RESULTS VIA (PLEASE CIRCLE) EMAIL PHONE
EMAIL IF DIFFERENT FROM ABOVE:
PHONE # IF DIFFERENT FROM ABOVE:

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	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
RELINQUISHED BY: (SIGNATURE)	1/29/21	12:30PM		1/29/21	12:30PM
RELINQUISHED BY: (SIGNATURE)	1/29/21	16:12	RECEIVED BY: (SIGNATURE)		
RELINQUISHED BY: (SIGNATURE)			RECEIVED BY: (SIGNATURE)	1/29/21	1612

8 COMMENTS: (FOR LAB USE ONLY)

SAMPLE TEMPERATURE UPON RECEIPT 9.1 °C
CHILL PROCESS STARTED PRIOR TO RECEIPT Y OR N
SAMPLE(S) RECEIVED ON ICE Y OR N
SAMPLE ACCEPTANCE NONCONFORMANT REPORT IS NEEDED Y OR N
DATE AND TIME TAKEN FROM SAMPLE BOTTLE

ANALYTICAL RESULTS

Sample: EC02226-02
Name: Coffeen Gypsum
Matrix: Soil - Grab

Sampled: 03/09/21 13:15
Received: 03/10/21 17:00

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	260	mg/kg		03/15/21 22:53	10	100	03/15/21 22:53	CRD	EPA 9056A
Fluoride	7.6	mg/kg		03/17/21 02:20	1	2.5	03/17/21 02:20	CRD	EPA 9056A
Sulfate	15000	mg/kg		03/17/21 02:39	250	2500	03/17/21 02:39	CRD	EPA 9056A
General Chemistry - PIA									
Solids - total solids (TS)	59	%		03/15/21 13:46	1	0.050	03/15/21 14:23	BMA	SM 2540G*
Total Nitrogen	880	mg/kg dry		03/17/21 12:57	1	84	03/17/21 13:28	BMS	(calc)
Nutrients - PIA									
Nitrate/Nitrite-N	8.6	mg/kg		03/17/21 12:57	1	0.20	03/17/21 13:28	CRS1	EPA 353.2 REV 2
Total Kjeldahl Nitrogen (TKN)	510	mg/kg		03/11/21 07:57	1	50	03/12/21 09:11	BMS	EPA 351.2 REV 2*
Total Metals - PIA									
Antimony	< 3.0	mg/kg		03/17/21 13:02	10	3.0	03/18/21 16:07	KMC	EPA 6020A
Arsenic	< 1.0	mg/kg		03/17/21 13:02	10	1.0	03/18/21 16:07	KMC	EPA 6020A
Barium	13	mg/kg		03/17/21 13:02	10	1.0	03/18/21 16:07	KMC	EPA 6020A
Beryllium	< 1.0	mg/kg		03/17/21 13:02	10	1.0	03/19/21 11:10	JMW	EPA 6020A
Boron	< 10	mg/kg		03/17/21 13:02	10	10	03/18/21 16:07	KMC	EPA 6020A*
Cadmium	< 1.0	mg/kg		03/17/21 13:02	10	1.0	03/18/21 16:07	KMC	EPA 6020A
Calcium	130000	mg/kg		03/17/21 13:02	20	200	03/30/21 12:38	JMW	EPA 6020A*
Chromium	< 4.0	mg/kg		03/17/21 13:02	10	4.0	03/18/21 16:07	KMC	EPA 6020A
Cobalt	< 2.0	mg/kg		03/17/21 13:02	10	2.0	03/18/21 16:07	KMC	EPA 6020A
Iron	380	mg/kg		03/17/21 13:02	20	60	03/30/21 12:38	JMW	EPA 6020A*
Lead	< 1.0	mg/kg		03/17/21 13:02	10	1.0	03/18/21 16:07	KMC	EPA 6020A
Magnesium	320	mg/kg		03/17/21 13:02	20	200	03/30/21 12:38	JMW	EPA 6020A*
Manganese	17	mg/kg		03/17/21 13:02	20	2.0	03/30/21 12:38	JMW	EPA 6020A
Molybdenum	< 1.0	mg/kg		03/17/21 13:02	10	1.0	03/18/21 16:07	KMC	EPA 6020A
Potassium	< 200	mg/kg		03/17/21 13:02	20	200	03/30/21 12:38	JMW	EPA 6020A*
Selenium	< 1.0	mg/kg		03/17/21 13:02	10	1.0	03/18/21 16:07	KMC	EPA 6020A
Sodium	240	mg/kg		03/17/21 13:02	20	200	03/31/21 10:23	JMW	EPA 6020A*
Thallium	< 1.0	mg/kg		03/17/21 13:02	10	1.0	03/18/21 16:07	KMC	EPA 6020A
Lithium	< 5.0	mg/kg		03/17/21 13:02	1	5.0	03/18/21 11:38	TJJ	EPA 6010B*
Sulfur	86000	mg/kg		03/17/21 13:02	100	1000	03/18/21 14:24	TJJ	EPA 6010B*

ATTACHMENT 5
Monitoring Well Boring Logs

FIELD BORING LOG

Installed near G206.
Re-identified as G206D.

HANSON

CLIENT: Illinois Power Generating Co.
Site: Coffeen Part 845 Groundwater
Location: Coffeen, Illinois
Project: 20E0111A
DATES: **Start:** 1/25/2021
Finish: 1/25/2021
WEATHER: Rain, cold (30s)

CONTRACTOR: Roberts
Rig mfg/model: CME-75 Track Rig
Drilling Method: 4.25" HSA w/SS sampler
FIELD STAFF: **Driller:** Matt
Helper: Corey
Eng/Geo: C. Colin Winter

BOREHOLE ID: G206D
Well ID: G206D
Surface Elev: ft. MSL
Completion: 60.00 ft. BGS
Station: N
E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Coffeen, IL
Township: East Fork Township
Section 11, **Tier** 7N; **Range** 3W

WATER LEVEL INFORMATION:
▼ = 18.80 - During Drilling
▼ = 55.90 - During Drilling
▼ =

SAMPLE Number	Recov / Total (in) % Recovery	Type	TESTING Blows / 6 in N - Value RQD	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) Qp (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
1A	15/24 63%	SS	3-3 3-4 N=6				0	Gray (10YR6/1), wet, loose, GRAVEL, with some sand. [FILL]			
							1	Brown (10YR5/3), moist, stiff, lean CLAY, with some silt, trace very fine- to fine-grained sand. [FILL]			
2A	17/24 71%	SS	3-4 4-5 N=8				2	Yellowish brown (10YR5/4) with 10% gray (10YR6/1) mottles, moist, stiff, lean CLAY, with some silt, trace very fine- to fine-grained sand and small gravel. [FILL]			
3A	22/24 92%	SS	2-3 5-6 N=8				4	Grayish brown (10YR5/2), moist, stiff, lean CLAY, with some silt, trace small gravel.			
4A	20/24 83%	SS	3-4 4-5 N=8				6	Grayish brown (10YR5/2) with 10% yellowish brown (10YR5/4) mottles, moist, stiff, lean CLAY, with some silt, trace small gravel.			
5A	22/24 92%	SS	2-3 5-7 N=8				8	Grayish brown (10YR5/2) with 10% yellowish brown (10YR5/4) and 5% gray (10YR5/1) mottles, moist, stiff, lean CLAY, with some silt, trace small gravel.			
6A	20/24 83%	SS	3-4 4-7 N=8				10	Grayish brown (10YR5/2) with 20% yellowish brown (10YR5/4) and 5% gray (10YR5/1) mottles, moist, stiff, lean CLAY, with some silt, trace small gravel.			
7A	20/24 83%	SS	2-3 4-5 N=7				12	Gray (10YR6/1) with 20% yellowish brown (10YR5/6) mottles, moist, stiff, lean CLAY, with some silt, little very fine- to fine-grained sand, trace small gravel.			
8A	20/24 83%	SS	1-2 3-4 N=5				14	Dark gray (10YR4/1), moist, stiff, lean CLAY, with some silt.			
							16	Gray (10YR6/1) with 20% yellowish brown (10YR5/6) mottles, moist, stiff, lean CLAY, with some silt, little very fine- to fine-grained sand, trace small gravel.			
9A	21/24 88%	SS	1-2 2-3 N=4				18	Gray (10YR6/1) with 30% yellowish brown (10YR5/6) mottles, moist, stiff, lean CLAY, with some silt, little very fine- to fine-grained sand, trace small gravel.			
10A							▼				
10B	24/24 100%	SS	0-1 1-0 N=2				20	Yellowish brown (10YR5/6) with 10% gray (10YR6/1) mottles, wet, very loose, SILT, with some very fine- to fine-grained sand, few small gravel, trace clay.			

NOTE(S): G282D installed in borehole.

FIELD BORING LOG

CLIENT: Illinois Power Generating Co.
Site: Coffeen Part 845 Groundwater
Location: Coffeen, Illinois
Project: 20E0111A
DATES: **Start:** 1/25/2021
Finish: 1/25/2021
WEATHER: Rain, cold (30s)

CONTRACTOR: Roberts
Rig mfg/model: CME-75 Track Rig
Drilling Method: 4.25" HSA w/SS sampler
FIELD STAFF: **Driller:** Matt
Helper: Corey
Eng/Geo: C. Colin Winter

BOREHOLE ID: G282D
Well ID: 282D
Surface Elev: ft. MSL
Completion: 60.00 ft. BGS
Station: N
E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Coffeen, IL
Township: East Fork Township
Section 11, **Tier** 7N; **Range** 3W

WATER LEVEL INFORMATION:
▼ = 18.80 - During Drilling
▼ = 55.90 - During Drilling
▼ =

SAMPLE Number	Recov / Total (in) / % Recovery	Type	TESTING Blows / 6 in / N - Value / RQD	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) Qp (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
11A	24/24 100%	SS	3-7 11-16 N=18					Yellowish brown (10YR5/4) with 20% yellowish brown (10YR5/6) and 5% yellowish red (5YR4/6) mottles, moist, hard, SILT, with some very fine- to fine-grained sand, little clay, few small gravel.			
							22	Yellowish brown (10YR5/4), wet, fine- to medium-grained SAND.			
12A	24/24 100%	SS	7-12 17-24 N=29					Yellowish brown (10YR5/4) with 20% yellowish brown (10YR5/6) and 5% yellowish red (5YR4/6) mottles, moist, hard, SILT, with some very fine- to fine-grained sand, little clay, few small gravel, trace medium gravel.			
							24				
13A	24/24 100%	SS	9-15 22-22 N=37								
							26				
14A	22/24 92%	SS	8-17 16-22 N=33					Dark gray (10YR4/1), moist, hard, SILT, with some very fine- to fine-grained sand, little clay, few small gravel, trace medium gravel.			
							28				
15A	21/24 88%	SS	5-11 15-19 N=26								
							30				
16A	22/22 100%	SS	5-25 33-50/4" N=58					Dark gray (10YR4/1), moist, SAND, little silt and clay.			
								Dark gray (10YR4/1), moist, hard, SILT, with some very fine- to fine-grained sand, little clay, few small gravel, trace medium gravel.			
							32				
17A	22/24 92%	SS	7-10 15-20 N=25								
							34				
18A	24/24 100%	SS	4-8 10-16 N=18								
							36	Dark gray (10YR4/1), moist, hard, lean CLAY, with some silt, few very fine- to fine-grained sand, little small gravel.			
19A	24/24 100%	SS	5-8 13-15 N=21								
							38				
20A	21/24 88%	SS	2-4 8-11 N=12								
							40				

NOTE(S): G282D installed in borehole.

FIELD BORING LOG

CLIENT: Illinois Power Generating Co.
Site: Coffeen Part 845 Groundwater
Location: Coffeen, Illinois
Project: 20E0111A
DATES: **Start:** 1/25/2021
Finish: 1/25/2021
WEATHER: Rain, cold (30s)

CONTRACTOR: Roberts
Rig mfg/model: CME-75 Track Rig
Drilling Method: 4.25" HSA w/SS sampler
FIELD STAFF: **Driller:** Matt
Helper: Corey
Eng/Geo: C. Colin Winter

BOREHOLE ID: G282D
Well ID: 282D
Surface Elev: ft. MSL
Completion: 60.00 ft. BGS
Station: N
E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Coffeen, IL
Township: East Fork Township
Section 11, **Tier** 7N; **Range** 3W

WATER LEVEL INFORMATION:
▼ = 18.80 - During Drilling
▼ = 55.90 - During Drilling
▼ =

SAMPLE Number	Recov / Total (in) / % Recovery	Type	TESTING Blows / 6 in / N - Value / RQD	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) Qp (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
21A	24/24 100%	SS	4-8 11-14 N=19				42				
22A	22/24 92%	SS	3-7 8-12 N=15				44				
23A	24/24 100%	SS	3-6 9-13 N=15				46				Trace wood fragments below 45.7 ft.
24A	24/24 100%	SS	4-6 9-12 N=15					Dark gray (10YR4/1), moist, hard, lean CLAY, with some silt, few very fine- to fine-grained sand, little small gravel. *[Continued from previous page]*			
25A	24/24 100%	SS	4-6 12-13 N=18				48				0.5" gravel seam at 48.5 ft.
26A	24/24 100%	SS	2-7 9-13 N=16				50				
27A	24/24 100%	SS	4-7 11-14 N=18				52				
28A 28B	24/24 100%	SS	6-12 9-18 N=21				54	Light yellowish brown (10YR6/5), moist, very fine- to medium-grained SAND, with some silt, little small to medium gravel.			
							▼ 56	Dark gray (10YR4/1), moist, hard, lean CLAY, with some silt, few very fine- to fine-grained sand, little small gravel, trace wood fragments.			
29A	24/24 100%	SS	6-10 11-11 N=21					Light yellowish brown (10YR6/5), wet, medium dense, very fine- to coarse-grained SAND, little small gravel, few silt.			
30A	24/24 100%	SS	4-5 8-9 N=13				58	Dark gray (10YR4/1) with 5% dark yellowish brown (10YR3/6) mottles, moist, stiff, lean CLAY, with some silt.			
							60				

NOTE(S): G282D installed in borehole.

FIELD BORING LOG

HANSON

CLIENT: Illinois Power Generating Co.
Site: Coffeen Part 845 Groundwater
Location: Coffeen, Illinois
Project: 20E0111A
DATES: **Start:** 1/25/2021
Finish: 1/25/2021
WEATHER: Rain, cold (30s)

CONTRACTOR: Roberts
Rig mfg/model: CME-75 Track Rig
Drilling Method: 4.25" HSA w/SS sampler
FIELD STAFF: **Driller:** Matt
Helper: Corey
Eng/Geo: C. Colin Winter

BOREHOLE ID: G282D
Well ID: 282D
Surface Elev: ft. MSL
Completion: 60.00 ft. BGS
Station: N
E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Coffeen, IL
Township: East Fork Township
Section 11, **Tier** 7N; **Range** 3W

WATER LEVEL INFORMATION:
▼ = 18.80 - During Drilling
▼ = 55.90 - During Drilling
▼ =

SAMPLE			TESTING						
Number	Recov / Total (in) *% Recovery*	Type	*Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft^3)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail / Elevation ft. MSL / Remarks
								End of boring = 60.0 feet	

NOTE(S): G282D installed in borehole.

FIELD BORING LOG

HANSON

CLIENT: Illinois Power Generating Co.
Site: Coffeen Part 845 Groundwater
Location: Coffeen, Illinois
Project: 20E0111A
DATES: **Start:** 1/28/2021
Finish: 2/3/2021
WEATHER: Clear, cold (20s)

CONTRACTOR: Roberts
Rig mfg/model: CME-75 Track Rig
Drilling Method: 4.25" HSA w/SS sampler
FIELD STAFF: **Driller:** Matt
Helper: Corey
Eng/Geo: C. Colin Winter

BOREHOLE ID: G275D
Well ID: G275
Surface Elev: 617.52 ft. MSL
Completion: 99.70 ft. BGS
Station: 874,285.30N
2,516,366.50E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Coffeen, IL
Township: East Fork Township
Section 11, **Tier** 7N; **Range** 3W

WATER LEVEL INFORMATION:
▼ = 10.90 - During Drilling
▼ =
▼ =

SAMPLE Number	Recov / Total (in) / % Recovery	Type	TESTING Blows / 6 in N - Value RQD	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) Qp (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
1A	21/24 88%	SS	3-4 5-10 N=9				0	Dark yellowish brown (10YR4/4), moist, stiff, lean CLAY, with some silt, few very fine- to fine-grained sand and small gravel, trace roots. [FILL]		616	
2A	22/24 92%	SS	3-4 6-9 N=10				2	Gray (10YR5/1) with 15% yellowish brown (10YR5/6) mottles, moist, very stiff, lean CLAY, with some silt, few very fine- to fine-grained sand, trace small gravel.		614	
3A	19/24 79%	SS	2-4 6-8 N=10				4	Gray (10YR5/1) with 10% yellowish brown (10YR5/6) mottles, moist, very stiff, lean CLAY, with some silt, few very fine- to fine-grained sand, trace small gravel.		612	
4A	23/24 96%	SS	2-5 5-6 N=10				6	Gray (10YR5/1) with 20% yellowish brown (10YR5/6) and 5% yellowish red (5YR4/6) mottles, moist, very stiff, lean CLAY, with some silt, few very fine- to fine-grained sand, trace small gravel.		610	
5A	24/24 100%	SS	2-3 5-6 N=8				8	Dark yellowish brown (10YR3/6), moist, stiff, SILT, with some very fine- to medium-grained sand, few clay and small gravel.		608	
5B											
6A	24/24 100%	SS	0-1 2-2 N=3				10	Gray (10YR6/1) with 10% dark yellowish brown (10YR3/6) mottles, moist, stiff, lean CLAY, with some silt, little very fine- to fine-grained sand, few small gravel.		606	
6B											
7A	18/24 75%	SH					12	Dark yellowish brown (10YR3/6), wet, loose, SILT, with some very fine- to fine-grained sand, few clay and small gravel.		604	
8A	14/14 100%	SS	26-43 50/2"				14	Gray (10YR6/1) with 20% yellowish brown (10YR5/6) mottles, moist, hard, SILT, with some very fine- to fine-grained sand, few clay and small gravel.		602	
9A	24/24 100%	SS	5-12 18-22 N=30				16	Grayish brown (10YR5/2) with 10% yellowish brown (10YR5/6) mottles, moist, hard, SILT, with some very fine- to fine-grained sand, few clay and small gravel.		600	
10A	24/24 100%	SS	4-11 13-20 N=24				18	Brown (10YR5/3) with 10% yellowish brown (10YR5/6) mottles, moist, hard, SILT, with some clay and very fine- to fine-grained sand, few small gravel.		598	
							20				

NOTE(S): G275 installed in adjacent blind drill borehole.

FIELD BORING LOG

CLIENT: Illinois Power Generating Co.
Site: Coffeen Part 845 Groundwater
Location: Coffeen, Illinois
Project: 20E0111A
DATES: **Start:** 1/28/2021
Finish: 2/3/2021
WEATHER: Clear, cold (20s)

CONTRACTOR: Roberts
Rig mfg/model: CME-75 Track Rig
Drilling Method: 4.25" HSA w/SS sampler
FIELD STAFF: **Driller:** Matt
Helper: Corey
Eng/Geo: C. Colin Winter

BOREHOLE ID: G275D
Well ID: G275
Surface Elev: 617.52 ft. MSL
Completion: 99.70 ft. BGS
Station: 874,285.30N
2,516,366.50E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Coffeen, IL
Township: East Fork Township
Section 11, **Tier** 7N; **Range** 3W

WATER LEVEL INFORMATION:
▼ = 10.90 - During Drilling
▼ =
▼ =

SAMPLE Number	Recov / Total (in) / % Recovery	Type	TESTING Blows / 6 in / N - Value / RQD	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) Qp (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
11A	24/24 100%	SS	3-9 13-22 N=22				22	Brown (10YR5/3) with 10% yellowish brown (10YR5/6) mottles, moist, hard, SILT, with some clay and very fine- to fine-grained sand, few small gravel. *[Continued from previous page]*		596	
12A	24/24 100%	SS	7-14 20-24 N=34				24			594	Vertical fractures with oxidation from 22 to 24 ft, no oxidation below 24 ft.
13A	24/24 100%	SS	6-11 15-21 N=26				26			592	Occasional thin SILT and SAND lenses from 25.3 to 25.8 ft.
14A	18/24 75%	SS	4-8 12-10 N=20				28			590	Trace wood fragments below 28 ft.
15A	24/24 100%	SS	5-7 13-17 N=20				30	Dark gray (10YR4/1) with frequent dark yellowish brown (10YR3/6) oxidation along fractures, moist, hard, lean CLAY, with some silt, few very fine- to fine-grained sand and small gravel.		588	
16A	23/24 96%	SS	4-7 12-16 N=19				32			586	
17A	2/24 8%	SS	4-10 13-17 N=23				34			584	
18A	21/24 88%	SH					36			582	
19A	24/24 100%	SS	3-6 10-14 N=16				38			580	
20A	4/24 17%	SS	3-8 11-17 N=19				40			578	

NOTE(S): G275 installed in adjacent blind drill borehole.

FIELD BORING LOG

CLIENT: Illinois Power Generating Co.
Site: Coffeen Part 845 Groundwater
Location: Coffeen, Illinois
Project: 20E0111A
DATES: **Start:** 1/28/2021
Finish: 2/3/2021
WEATHER: Clear, cold (20s)

CONTRACTOR: Roberts
Rig mfg/model: CME-75 Track Rig
Drilling Method: 4.25" HSA w/SS sampler
FIELD STAFF: **Driller:** Matt
Helper: Corey
Eng/Geo: C. Colin Winter

BOREHOLE ID: G275D
Well ID: G275
Surface Elev: 617.52 ft. MSL
Completion: 99.70 ft. BGS
Station: 874,285.30N
2,516,366.50E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Coffeen, IL
Township: East Fork Township
Section 11, **Tier** 7N; **Range** 3W

WATER LEVEL INFORMATION:
▼ = 10.90 - During Drilling
▼ =
▼ =

SAMPLE Number	Recov / Total (in) / % Recovery	Type	TESTING Blows / 6 in / N - Value / RQD	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) Qp (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
21A	24/24 100%	SS	4-8 11-15 N=19				42	Dark gray (10YR4/1) with frequent dark yellowish brown (10YR3/6) oxidation along fractures, moist, hard, lean CLAY, with some silt, few very fine- to fine-grained sand and small gravel. *[Continued from previous page]*		576	
22A	24/24 100%	SS	7-8 11-17 N=19				44			574	0.5" lignite fragment seam at 42.8 ft.
23A	24/24 100%	SS	5-8 13-40 N=21				46	Dark gray (10YR4/1), moist, hard, SILT, with some to little clay and very fine- to fine-grained sand, few small to medium gravel.		572	
24A	23/24 96%	SS	22-45 35-23 N=80				48	Dark gray (10YR4/1), moist, hard, lean CLAY, with some silt, few very fine- to fine-grained sand and small gravel.		570	
25A	24/24 100%	SS	7-9 14-21 N=23				50	Very dark gray (10YR3/1), moist, hard, lean CLAY, with some silt, few very fine- to fine-grained sand and small gravel, trace wood fragments.		568	
26A	24/24 100%	SS	3-8 15-15 N=23				52	Dark gray (10YR3/1), moist, SILT, with some very fine-grained sand seams. Dark gray (10YR4/1) with 15% dark grayish brown (10YR4/2) mottles, moist, stiff, lean CLAY, with some silt, trace very fine-grained sand, small gravel and wood fragments.		566	Methane deposit encountered at approx. 51 ft.
27A	17/24 71%	SS	12-27 13-15 N=40				54	Gray (10YR5/1), moist, dense, very fine- to medium-grained SAND, with some silt, trace small gravel.		564	
28A	24/24 100%	SS	4-9 11-13 N=20				56	Very dark grayish brown (10YR3/2), moist, hard, lean CLAY, with some silt, trace very fine-grained sand and organics.		562	
29A	24/24 100%	SS	5-9 13-12 N=22				58	Very dark grayish brown (10YR3/2) with 10% dark yellowish brown (10YR4/6) mottles, moist, hard, lean CLAY, with some silt, trace very fine-grained sand and organics.		560	
30A	24/24 100%	SS	3-4 7-14 N=11				60	Very dark grayish brown (10YR3/2), wet, SAND, with some silt. Gray (GLEY15/1) with 20% dark yellowish brown (10YR4/6) mottles, moist, hard, lean CLAY, with some silt, few very fine- to fine-grained sand and small gravel.		558	

NOTE(S): G275 installed in adjacent blind drill borehole.

FIELD BORING LOG

CLIENT: Illinois Power Generating Co.
Site: Coffeen Part 845 Groundwater
Location: Coffeen, Illinois
Project: 20E0111A
DATES: **Start:** 1/28/2021
Finish: 2/3/2021
WEATHER: Clear, cold (20s)

CONTRACTOR: Roberts
Rig mfg/model: CME-75 Track Rig
Drilling Method: 4.25" HSA w/SS sampler
FIELD STAFF: **Driller:** Matt
Helper: Corey
Eng/Geo: C. Colin Winter

BOREHOLE ID: G275D
Well ID: G275
Surface Elev: 617.52 ft. MSL
Completion: 99.70 ft. BGS
Station: 874,285.30N
2,516,366.50E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Coffeen, IL
Township: East Fork Township
Section 11, **Tier** 7N; **Range** 3W

WATER LEVEL INFORMATION:
▼ = 10.90 - During Drilling
▼ =
▼ =

SAMPLE Number	Recov / Total (in) % Recovery	Type	TESTING Blows / 6 in N - Value RQD	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) Qp (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
31A	24/24 100%	SS	0-4 5-7 N=9					Gray (GLEY15/) with 30% dark yellowish brown (10YR4/6) mottles, moist, hard, lean CLAY, with some silt, few very fine- to fine-grained sand and small gravel.		556	
32A	24/24 100%	SS	4-6 8-11 N=14				62				
33A	24/24 100%	SH					64	Greenish gray (GLEY15/1) with 15% very dark gray (10YR3/1) mottles, moist, hard, lean CLAY, with some silt, few very fine- to fine-grained sand and small gravel.		554	
34A	24/24 100%	SS	5-10 22-41 N=32				66			552	
35A	24/24 100%	SS	12-24 33-45 N=57				68			550	
36A	23/24 96%	SS	6-14 25-30 N=39				70	Yellowish brown (10YR5/4) with occasional thin greenish gray (GLEY15/1) seams, moist, hard, lean CLAY, with some silt, few small gravel, trace very fine-grained sand.		548	Trace medium gravel at 70 ft.
37A	24/24 100%	SS	8-18 24-32 N=42				72			546	
38A	24/24 100%	SS	7-16 25-29 N=41				74			544	
39A	24/24 100%	SS	7-15 20-21 N=35				76	Yellowish brown (10YR5/4) with 15% gray (10YR6/1) mottles, moist, hard, lean CLAY, with some silt, few small gravel, trace very fine-grained sand.		542	
40A	19/24 79%	SS	3-5 7-10 N=12				78			540	
							80	Greenish gray (GLEY15/1) with 5% yellowish brown (10YR5/6) mottles, moist, stiff, lean CLAY, with some silt, trace very		538	

NOTE(S): G275 installed in adjacent blind drill borehole.

FIELD BORING LOG

HANSON

CLIENT: Illinois Power Generating Co.
Site: Coffeen Part 845 Groundwater
Location: Coffeen, Illinois
Project: 20E0111A
DATES: **Start:** 1/28/2021
Finish: 2/3/2021
WEATHER: Clear, cold (20s)

CONTRACTOR: Roberts
Rig mfg/model: CME-75 Track Rig
Drilling Method: 4.25" HSA w/SS sampler
FIELD STAFF: **Driller:** Matt
Helper: Corey
Eng/Geo: C. Colin Winter

BOREHOLE ID: G275D
Well ID: G275
Surface Elev: 617.52 ft. MSL
Completion: 99.70 ft. BGS
Station: 874,285.30N
2,516,366.50E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Coffeen, IL
Township: East Fork Township
Section 11, **Tier** 7N; **Range** 3W

WATER LEVEL INFORMATION:
▼ = 10.90 - During Drilling
▼ =
▼ =

SAMPLE Number	Recov / Total (in) / % Recovery	Type	TESTING Blows / 6 in / N - Value / RQD	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) Qp (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
								fine-grained sand.			
41A	22/24 92%	SS	1-5 7-11 N=12					Greenish gray (GLEY15/1) with 5% yellowish brown (10YR5/6) mottles, moist, stiff, lean CLAY, with some silt, trace very fine-grained sand. *[Continued from previous page]*			
								Very dark gray (10YR3/1), moist, stiff, lean CLAY, with some silt, trace very fine-grained sand.		536	
42A	24/24 100%	SS	4-14 19-20 N=33				82	Greenish gray (GLEY15/1) with 5% yellowish brown (10YR5/6) mottles, moist, stiff, lean CLAY, with some silt, trace very fine-grained sand.			
										534	
43A	8/24 33%	SS	6-20 22-23 N=42				84	Greenish gray (GLEY15/1) with 20% yellowish brown (10YR5/6) mottles, moist, stiff, lean CLAY, with some silt, trace very fine-grained sand and small gravel.			
										532	
44A	24/24 100%	SS	7-8 16-17 N=24				86	Greenish gray (GLEY15/1) with 5% yellowish brown (10YR5/6) mottles, moist, stiff, lean CLAY, with some silt, trace very fine-grained sand and small gravel.			
								Brown (10YR4/3) with 5% dark yellowish brown (10YR4/6) mottles, moist, hard, lean CLAY, with some silt, trace very fine-grained sand and small gravel.		530	
45A	24/24 100%	SS	5-13 16-21 N=29				88	Brown (10YR4/3) with 5% dark yellowish brown (10YR4/6) mottles, moist, hard, lean CLAY, with some silt, few small gravel, trace very fine-grained sand, medium gravel and black (10YR2/1) organics.			
										528	
46A	24/24 100%	SS	4-8 15-9 N=23				90	Brown (10YR4/3) with 5% dark yellowish brown (10YR4/6) mottles, moist, hard, lean CLAY, with some silt, few small gravel and wood fragments, trace very fine-grained sand, medium gravel and black (10YR2/1) organics.			
										526	
47A							92	Very dark grayish brown (10YR3/2), moist, stiff, fat CLAY, with some silt.			
47B	24/24 100%	SS	5-6 8-10 N=14							524	
							94	Dark grayish brown (10YR4/2), moist, stiff, fat CLAY, with some silt.			
48A	24/24 100%	SS	2-4 7-8 N=11							522	
							96				
49A	24/24 100%	SS	2-6 7-11 N=13							520	
							98	Greenish gray (GLEY15/1) with 5% yellowish brown (10YR5/6) mottles, moist, stiff, lean CLAY, with some silt, little to trace very fine-grained sand, trace small gravel.			
50A	18/20 90%	SS	3-15 28-50/2" N=43							518	
								Greenish gray (GLEY15/1) with 5% yellowish brown (10YR5/6) mottles, moist, stiff, lean CLAY, with some silt and very			

NOTE(S): G275 installed in adjacent blind drill borehole.

FIELD BORING LOG

HANSON

CLIENT: Illinois Power Generating Co.
Site: Coffeen Part 845 Groundwater
Location: Coffeen, Illinois
Project: 20E0111A
DATES: **Start:** 1/28/2021
Finish: 2/3/2021
WEATHER: Clear, cold (20s)

CONTRACTOR: Roberts
Rig mfg/model: CME-75 Track Rig
Drilling Method: 4.25" HSA w/SS sampler
FIELD STAFF: **Driller:** Matt
Helper: Corey
Eng/Geo: C. Colin Winter

BOREHOLE ID: G275D
Well ID: G275
Surface Elev: 617.52 ft. MSL
Completion: 99.70 ft. BGS
Station: 874,285.30N
2,516,366.50E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Coffeen, IL
Township: East Fork Township
Section 11, **Tier** 7N; **Range** 3W

WATER LEVEL INFORMATION:
▽ = 10.90 - During Drilling
▽ =
▽ =

SAMPLE			TESTING					
Number	Recov / Total (in) *% Recovery*	Type	*Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft^3)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
								fine-grained sand, trace small gravel.			
								End of boring = 99.7 feet			

NOTE(S): G275 installed in adjacent blind drill borehole.

FIELD BORING LOG

HANSON

CLIENT: AEG Coffeen Power Station
Site: CCB Management Facility
Location: Coffeen, Illinois
Project: 05S3004A
DATES: **Start:** 2/25/2008
Finish: 2/25/2008
WEATHER: Overcast, cold

CONTRACTOR: Testing Service Corp.
Rig mfg/model: CME-650 Track Drill
Drilling Method: 3¼" HSA w/SS & CME samplers
FIELD STAFF: **Driller:** B. Williamson
Helper: R. Keedy
Eng/Geo: .

BOREHOLE ID: G200
Well ID: G200
Surface Elev: 624.20 ft. MSL
Completion: 18.00 ft. BGS
Station: 877,930.59N
2,515,649.96E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Coffeen, IL
Township: East Fork
Section 2, **Tier** 7N; **Range** 3W

WATER LEVEL INFORMATION:
▼ = 13.50 - While drilling
▼ = 2.75 - 3/12/08
▽ =

SAMPLE Number	Recov / Total (in) % Recovery	Type	TESTING Blows / 6 in N - Value RQD	Moisture (%)	Dry Den. (lb/ft³)	Qu (tsf) Qp (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
	24/24 100%	ss	3-2 3-3 N=5					Very dark grayish brown (10YR3/2), moist, firm, friable, clayey SILT		624	
1A				31		1.36 B	2	Dark gray (10YR4/1) with 5% yellowish brown (10YR5/6) mottles, moist, firm, silty CLAY		622	
2A	19/24 79%	ss	3-3 6-6 N=9	26		1.94 BSh					
2B				26		2.33 Sh	4	Dark gray (10YR4/1) with 70% yellowish brown (10YR5/8) mottles, moist, firm, silty CLAY		620	
3A	19/24 79%	ss	3-3 4-5 N=7	26		1.59 B		Dark gray (10YR4/1) with 70% yellowish brown (10YR5/8) mottles, moist, firm, silty CLAY, slight trace sand			
3B				23		1.55 B	6	Very dark gray (10YR3/1), moist, firm, silty CLAY, slight trace sand		618	
4A	22/24 92%	ss	5-5 5-5 N=10	29		0.31 B		Dark gray (10YR4/1) with 10% yellowish brown (10YR5/8) mottles, moist, firm, silty CLAY, trace coarse sand			
5A	20/24 83%	ss	2-2 3-5 N=5	25		1.09 B	8			616	
6A	22/24 92%	ss	1-3 2-3 N=5	22		1.01	10	Dark gray (10YR4/1) with 10% yellowish brown (10YR5/8) mottles, moist, firm, silty CLAY, sand and slight trace gravel		614	
7A	24/24 100%	ss	3-3 5-6 N=8	15		0.50 B	12	Yellowish brown (10YR5/8), moist, soft, sandy CLAY		612	
7B				18				Gray (10YR5/1), wet, soft, fine- to coarse-grained SAND			
8A	19/24 79%	ss	0-3 5-8 N=8	24		0.27 B	14	Gray (10YR5/1), wet, soft, silty CLAY, trace sand and gravel		610	
8B				17				Yellowish brown (10YR5/4), wet, soft, fine- to coarse-grained SAND, trace gravel			
9A	24/24 100%	ss	8-15 30-50 N=45	13			16			608	
9B				8			18	Gray (10YR5/1), moist, hard, silty CLAY, trace sand and gravel			

End of Boring = 18.0 ft. BGS

NOTE(S):

ATTACHMENT 6
PCA Data Input Summary

ELECTRONIC PCA DATA FOR ATTACHMENT 6
35 I.A.C. § 845.650(e): ALTERNATIVE SOURCE DEMONSTRATION
COFFEEN POWER PLANT
GYPSUM MANAGEMENT FACILITY (GMF) RECYCLE POND
COFFEEN, IL

Well	HSU	Date	Location	pH (SU)	Alkalinity, bicarbonate (mg/L)	Barium (mg/L)	Boron (mg/L)	Chloride (mg/L)	Fluoride (mg/)	Iron (mg/L)	Manganese (mg/L)	Sulfate (mg/L)	TDS (mg/L)
G270	UA	2/8/2022	Upgradient	7.2	340	0.033	0.012	8.7	0.378	0.06	0.0083	53	410
G270	UA	8/24/2022	Upgradient	7.29	340	0.036	0.0071	9.7	0.325	0.076	0.032	53	500
G270	UA	2/16/2023	Upgradient	7.48	320	0.041	0.0071	7.8	0.344	0.38	0.17	50	410
G270	UA	6/8/2023	Upgradient	6.63	350	0.064	0.014	8.3	0.298	0.68	0.85	54	500
G270	UA	8/14/2023	Upgradient	6.84	347	0.0467	0.0092	13	0.35	0.147	0.244	48	426
G270	UA	11/17/2023	Upgradient	7.12	325	0.0649	0.0125	15	0.38	0.119	0.197	50	460
G271	UA	8/24/2022	Downgradient	7.37	300	0.02	1.2	64	0.27	0.047	0.0035	230	680
G271	UA	2/16/2023	Downgradient	7.01	290	0.021	0.97	59	0.315	0.047	0.0038	250	840
G271	UA	6/6/2023	Downgradient	6.94	300	0.021	0.54	69	0.264	0.19	0.024	280	850
G271	UA	8/14/2023	Downgradient	6.97	281	0.0254	0.633	35	0.52	0.273	0.0191	177	594
G271	UA	11/17/2023	Downgradient	7.18	299	0.035	0.756	60	0.41	0.6	0.0297	251	690
G273	UA	8/25/2022	Downgradient	7.02	1100	0.029	0.041	74	0.36	0.036	0.056	410	940
G273	UA	2/16/2023	Downgradient	7.12	350	0.03	0.033	77	0.04	0.081	0.076	440	1100
G273	UA	6/5/2023	Downgradient	6.57	360	0.032	0.035	73	0.254	0.14	0.11	470	1100
G273	UA	8/14/2023	Downgradient	6.76	366	0.0347	0.0558	68	0.33	0.0679	0.111	465	1180
G273	UA	11/17/2023	Downgradient	7.05	353	0.041	0.0376	63	0.4	0.31	0.117	333	936
G275	UA	6/8/2023	Downgradient	6.97	350	0.024	2.2	24	0.31	0.59	0.036	440	1100
G275D	DA	6/8/2023	Downgradient	7.34	750	0.45	0.18	23	0.392	5.7	0.72	99	980
G275D	DA	8/14/2023	Downgradient	7.51	770	0.506	0.174	20	0.5	7.39	0.67	123	1000
G276	UA	2/9/2022	Downgradient	7.02	460	0.048	0.021	23	0.329	0.013	0.001	270	860
G276	UA	9/20/2022	Downgradient	6.77	380	0.056	0.11	23	0.474	0.69	0.0068	260	680
G276	UA	2/15/2023	Downgradient	6.64	490	0.046	0.019	25	0.284	0.026	0.00085	230	960
G276	UA	6/5/2023	Downgradient	6.54	510	0.046	0.016	24	0.29	0.029	0.00085	260	860
G276	UA	8/14/2023	Downgradient	7.16	481	0.0553	0.02	31	0.37	0.178	0.0118	249	908
G276	UA	11/17/2023	Downgradient	6.93	377	0.0683	0.0327	387	0.4	1.02	0.0193	2610	4260
G277	UA	6/1/2023	Downgradient	6.58	380	0.094	0.19	150	0.277	0.18	0.012	540	1600
G279	UA	2/8/2022	Downgradient	6.7	400	0.056	0.42	76	0.393	0.014	0.0032	370	1100
G279	UA	8/24/2022	Downgradient	6.64	360	0.046	1.7	370	0.373	0.062	0.063	1600	3300
G279	UA	2/16/2023	Downgradient	6.37	340	0.039	1.9	320	0.395	0.024	0.052	1800	5200
G279	UA	6/1/2023	Downgradient	6.62	340	0.043	4	490	0.322	0.074	0.18	2900	6000
G279	UA	11/17/2023	Downgradient	6.76	357	0.046	5.73	485	0.4	0.209	0.368	3390	6260
G280	UA	2/8/2022	Upgradient	7.17	220	0.042	0.01	51	0.383	0.34	0.027	82	440
G280	UA	8/24/2022	Upgradient	7.15	260	0.045	0.023	93	0.169	0.26	0.019	82	580
G280	UA	2/16/2023	Upgradient	6.01	250	0.042	0.029	63	0.341	0.13	0.015	81	470
G280	UA	6/8/2023	Upgradient	7.35	260	0.049	0.02	71	0.339	0.97	0.043	91	590
G280	UA	8/14/2023	Upgradient	7.45	262	0.0531	0.0092	70	0.31	0.264	0.0159	91	594
G280	UA	11/20/2023	Upgradient	7.39	254	0.0611	0.01	70	0.33	0.31	0.0452	113	608
G283	LCU	6/8/2023	Downgradient	7.08	410	0.16	0.054	36	0.307	5.3	0.19	250	930
G283	LCU	8/15/2023	Downgradient	7.07	438	0.174	0.0545	39	0.37	2.66	0.177	250	825
G284	UA	6/8/2023	Downgradient	7.24	340	0.069	0.05	42	0.51	0.88	0.034	71	520
G284	UA	8/15/2023	Downgradient	7.16	322	0.0875	0.084	32	0.62	0.0329	0.0017	174	656
G285	LCU	6/8/2023	Downgradient	6.79	640	0.043	0.099	25	0.334	0.61	0.83	640	1700
G285	LCU	8/15/2023	Downgradient	6.72	638	0.0455	0.114	24	0.32	0.326	0.937	586	1640
X201	CCR	3/31/2021	CCR	4.5	2	0.046	46	1100	37.2	4.3	73	1600	15000
X201	CCR	4/21/2021	CCR	4.8	2	0.043	43	1700	37.1	3.5	62	17000	16000
X201	CCR	5/5/2021	CCR	4.66	10	0.044	42	1200	34.7	3.1	57	16000	9700
X201	CCR	5/17/2021	CCR	4.68	10	0.066	45	1300	36.9	6.9	59	17000	8700
X201	CCR	6/14/2021	CCR	4.55	2	0.044	42	1300	36.9	1.7	65	16000	17000
X201	CCR	7/27/2021	CCR	4.69	2	0.044	39	1200	34.4	1	57	15000	16000
X201	CCR	8/15/2023	CCR	4.39	9	0.0379	31.8	1010	31.2	0.068	53.3	14900	17800

Notes:
mg/L = milligrams per liter
TDS= Total Dissolved Solids
SU= standard units
HSU = hydrostratigraphic unit
CCR = coal combustion residual
UA = Uppermost Aquifer
LCU = Lower Confining Unit
DA = Deep Aquifer
Non-detect values were replaced with half of detection limit.

ATTACHMENT 7

Arsenic in Illinois Ground Water – Community and Private Supplies. Warner et al., 2003.

WRIR 03-4103

USGS
science for a changing world

In cooperation with the Illinois Environmental Protection Agency

Arsenic in Illinois Ground Water–Community and Private Supplies

By Kelly L. Warner, Angel Martin, Jr., and Terri L. Arnold

Introduction

Assessing the distribution of arsenic in ground water from community-water supplies, private supplies, or monitoring wells is part of the process of determining the risk of arsenic contamination of drinking water in Illinois. Lifestyle, genetic, and environmental factors make certain members of the population more susceptible to adverse health effects from repeated exposure to drinking water with high arsenic concentrations (Ryker, 2001). In addition, such factors may have geographic distribution patterns that complicate the analysis of the relation between arsenic in drinking water and health effects. For example, arsenic may not be the only constituent affecting the quality of drinking water in a region (Ryker, 2001); however, determining the extent and distribution of arsenic in ground water is a starting place to assess the potential risk for persons drinking from a community or private supply. Understanding the potential sources and pathways that mobilize arsenic in ground water is a necessary step in protecting the drinking-water supply in Illinois (fig. 1).

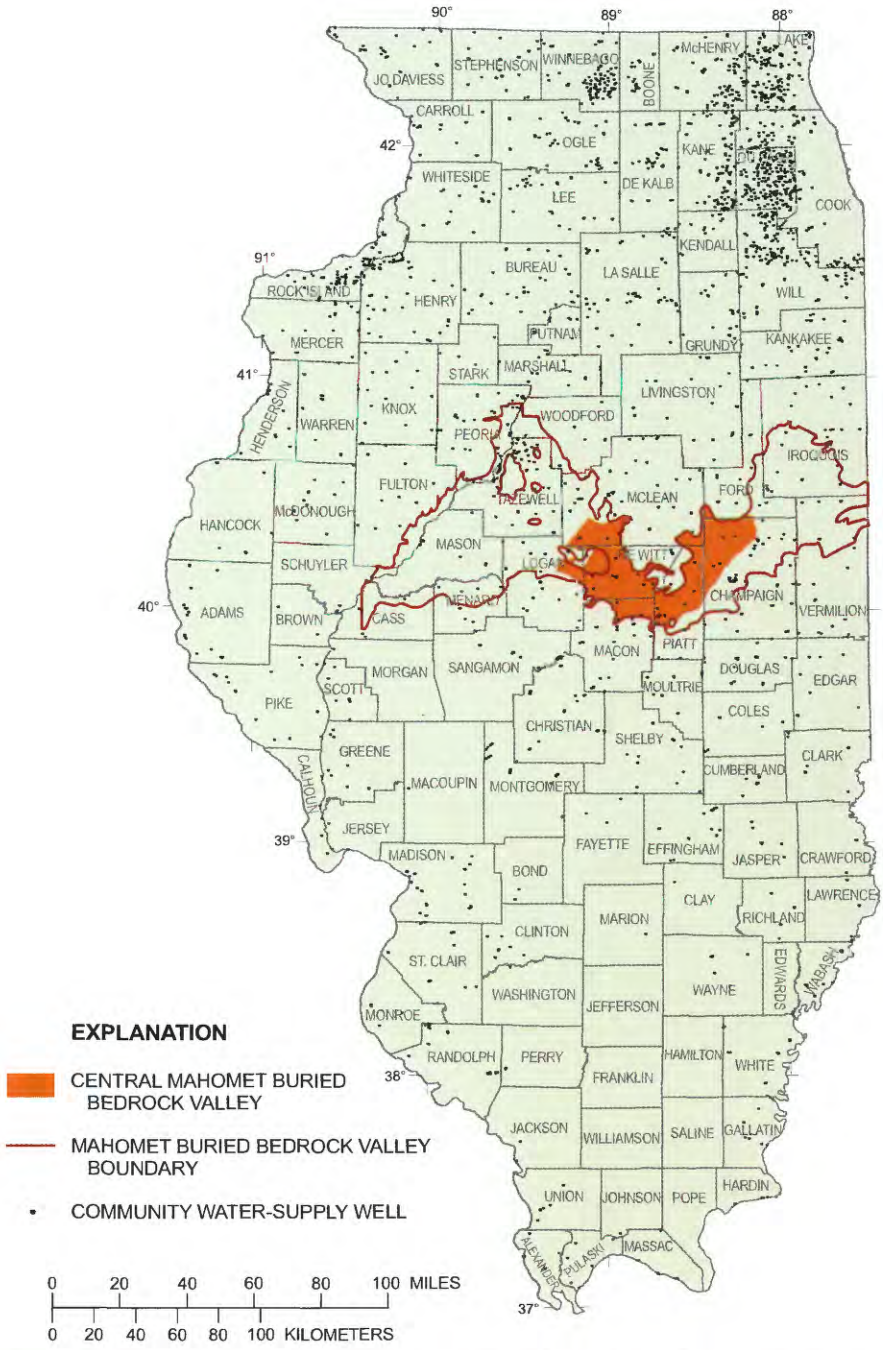


Figure 1. Location of community water-supply wells and the Mahomet Buried Bedrock Valley in Illinois.

Relation Between High Arsenic Concentrations and Health Effects

The metallic element arsenic has a long history as a poison. Albertus Magnus (Albert the Great), in approximately 1250, is the first to have recorded producing pure arsenic (MacRae, 2002), which usually was found in a mixed mineral. It is believed that Napoleon was poisoned with arsenic (Weider and Forshufvud, 1995). In the early 1800s in Italy, there were over a thousand unexplained deaths of young children who died in their living rooms. The deaths were determined to be the result of the release of poisonous arsenic gas from Paris green wallpaper that lined the living rooms and this heavier-than-air gas accumulated at lower levels where young children were more likely to breathe (King, 2002). Up to the 1940s, arsenic successfully was used to treat syphilis and leprosy. Arsenic was popularized as the poison of choice in many murder-mystery novels and movies, such as Arsenic and Old Lace, released in 1944. Today, the threat of arsenic poisoning is real in many parts of the world, such as Bangladesh, India, and China, where in the late 1990s many people consumed or inhaled toxic amounts of arsenic (West Bengal and Bangladesh, 2002). Arsenic in ground water also is a public-health issue in Illinois (fig. 1) and other parts of the Nation. Understanding the distribution, fate, and transport of arsenic in ground water and defining susceptible areas needing further investigation helps water-resource managers assess the risk of arsenic contamination of wells, perhaps, by geographic location and aquifer.

Dissolved arsenic is found in ground water across Illinois. The U.S. Environmental Protection Agency (USEPA) drinking-water standard for arsenic has been 50 micrograms per liter (µg/L) since 1942 (U.S. Environmental Protection Agency, 2002). In January 2001, the standard for arsenic in drinking water was lowered by USEPA to 10 µg/L and must be implemented at all community-supply facilities by 2006 (U.S. Environmental Protection Agency, 2002; Dawn Shellenberger, U.S. Environmental Protection Agency, written commun., 2002). The cost is substantial for remediating high arsenic concentrations. The Illinois Environmental Protection Agency (IEPA) has estimated that the total cost to reduce arsenic concentrations to below 10 µg/L for 50 selected community-water supplies with elevated arsenic concentrations in Illinois (fig. 2) could reach 40 million dollars, with the highest costs associated with small community supplies (Illinois State Water Survey, 2002). Private wells are not regulated for arsenic concentration.

The purpose of this report, prepared by the U.S. Geological Survey (USGS), in cooperation with the IEPA, is to describe the known distribution of arsenic in ground water in Illinois and to

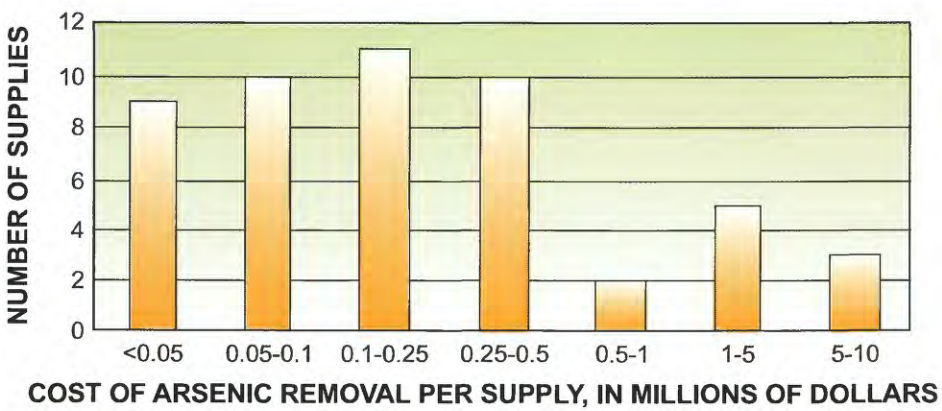


Figure 2. Projected number and cost of remediating arsenic from community-water supplies in Illinois (<, less than) (Modified from Illinois State Water Survey, 2002; oral commun., Rick Cobb, Illinois Environmental Protection Agency, 2002).

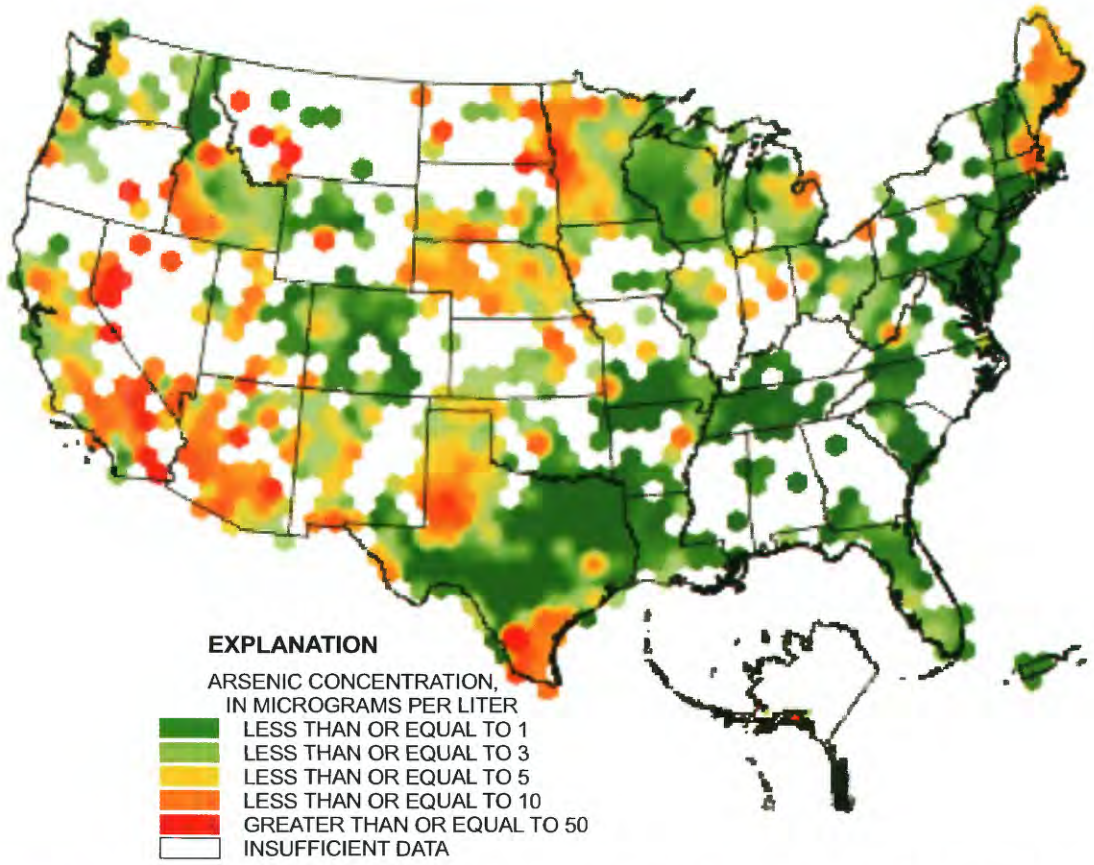


Figure 3. Areas of equal arsenic concentrations in ground water, United States (from Ryker, 2001). In 2001, the U.S. Geological Survey database included trace-element data from 31,000 wells and springs.

describe use of a geostatistical technique to estimate arsenic concentrations in areas where little or no data are available. In addition, potential sources of arsenic in Illinois are described. In Illinois, the most abundant data on arsenic in ground water are from community supplies (fig. 1). Assessment of the spatial distribution of arsenic in community supplies and comparison to other water-quality data available from private supplies can allow inferences to be made about the extent and distribution of arsenic in private supplies.

Because arsenic is common in ground water in Illinois, the patterns and correlations of arsenic with other constituents can be used to identify areas of concern, highlight potential indicators of high arsenic concentrations, and determine where additional research is needed to understand the fate and transport of arsenic in ground water. In addition, the study of community-water supplies will help the owners of private, unregulated wells make informed decisions on whether to have their well tested for arsenic.

Arsenic Concentrations on a National and Regional Scale

Elevated arsenic concentrations (above drinking-water standards) are a national and regional concern. An environmental research program by the USGS (Ryker, 2001) compiled arsenic analyses from 31,000 wells and springs in 49 States for the national map (fig. 3). Scientists with the USGS and State agencies collected and analyzed these data mainly from

private wells, monitoring wells, and community-supply wells. These samples were collected for studies on the quality of the Nation's potable ground-water resources. The data set contains no explicit information on the rural population that does not use ground water from public supply. The national map includes arsenic concentrations in drinking-water data from monitoring and research programs in the United States. Monitoring of community-supply systems is required for compliance with State and Federal water-quality standards. The national map data set provides an important basis for estimating how many community-supply systems have arsenic concentrations above the present standard, or what proportion of the urban population obtains water from community-supply systems with arsenic concentrations above the drinking-water standard (Ryker, 2001).

More than 99 percent of the Nation's rural population relies on ground water for drinking water. Approximately 50 percent of community supplies in Illinois are from ground water; approximately 90 percent of private supplies are from ground water. Because private wells are unregulated, no national regulatory database is available to fill this data gap on rural private wells.

Additional data often are available at statewide or local scales for more specific comparison. Although the national map shows that Illinois has three areas with arsenic concentrations at or above 5 µg/L in ground water (central, northeastern, and northwestern Illinois), larger areas with appreciably higher arsenic concentrations are present in other parts of the Nation.

Arsenic Concentrations in Ground Water in Illinois

Known Distribution

The most extensive data set of arsenic concentrations in ground water in Illinois has been collected by the IEPA as part of compliance monitoring programs. Approximately 8,200 samples collected by IEPA from 2,771 community-water supplies in Illinois provide a detailed picture of the arsenic distribution in most of the aquifers underlying Illinois. The USGS National Water-Quality Assessment (NAWQA) program has collected data from 225 monitoring and private wells screened in the glacial and alluvial aquifer system. The glacial and alluvial aquifer system, as defined in this report, includes all aquifers above bedrock (fig. 4). In the central Mahomet Buried Bedrock Valley (fig. 1), the aquifer of concern is the deep portions of the glacial and alluvial aquifer system (Mahomet aquifer) (fig. 4). NAWQA samples are collected for studies of the quality of the Nation's surface- and ground-water resources. This program uses a nationally consistent network design, sampling program, and methods of data analyses for low levels of over 300 chemical constituents. The Illinois State Water Survey (ISWS) also collects arsenic data for studies in the State. In a study by the ISWS, in cooperation with the Illinois Waste Management and Research Center, the variability of arsenic concentrations with depth is being studied in the glacial and alluvial aquifer system in central Illinois. In another study, approximately 30 small community-water supplies are being sampled for arsenic and arsenic species concentrations by the ISWS. In addition, 150 non-community wells are being sampled for arsenic and other chemical constituents. All these programs and studies provide useful information, but it also is important to combine the available data sets. IEPA and USGS provide data on arsenic concentrations in community and private wells.

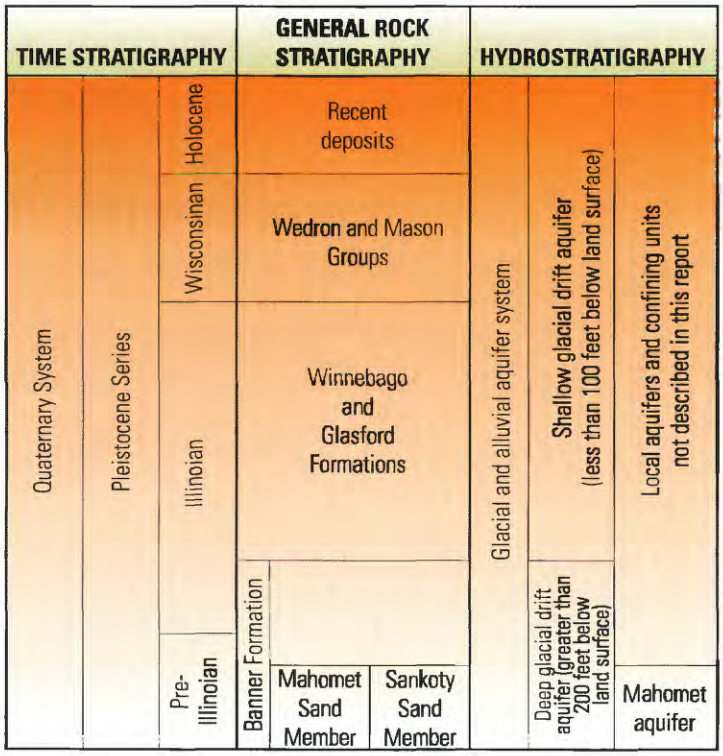


Figure 4. Relation of time stratigraphy, general rock stratigraphy, and hydrostratigraphy of glacial deposits in central Illinois (modified from Willman and Frye, 1970; Hansel and Johnson, 1996; and Warner, 2001).

Concentrations of total (dissolved and suspended) arsenic samples collected from community supplies and concentrations of dissolved arsenic in samples collected from monitoring and private wells may not be comparable. Two major issues concerning these data sets are: (1) the difference in pumping volumes; (2) the difference in filtering procedures; samples from community-supply wells are unfiltered, whereas samples from monitoring and private wells are filtered. Because community-supply wells generally pump larger amounts than monitoring or private wells, water flows from a larger area in an aquifer (capture zone) to community-supply wells; therefore, resulting arsenic concentrations may differ even when community-supply, and monitoring or private wells are close to each other (Ohio Environmental Protection Agency, 2002). The filtering issue is well documented (Horowitz and others, 1996). Comparing arsenic concentrations from filtered and unfiltered samples is complicated by the adsorption of arsenic to clay particles and colloids within the water sample. Filtration will remove these particles and the adsorbed arsenic, decreasing the apparent concentration of arsenic in the sample. Turbidity is a rough estimate of the amount of particles in a water sample. When it is low, few particulates are present in samples, and dissolved and total arsenic concentrations should be similar. Turbidity in both the community- and private-supply samples was low, so comparing arsenic concentrations in ground water from these two well types should not be biased because of turbidity.

Arsenic concentrations in ground water usually are the result of the interaction between water and geologic materials. The geochemical environment in the aquifer is one of the biggest factors affecting arsenic concentrations. Factors such as ground-water age, depth to water, and land use affect the fate and transport of constituents introduced by humans, but have limited effects on the concentration of arsenic in ground water. Arsenic data from community and private supplies were compared in Illinois and other parts of the country (Warner, 2001; Bruce and Oelsner, 2001). Comparison of arsenic concentrations in private supplies (filtered) and arsenic concentrations in community-water supplies (unfiltered) in the deep por-

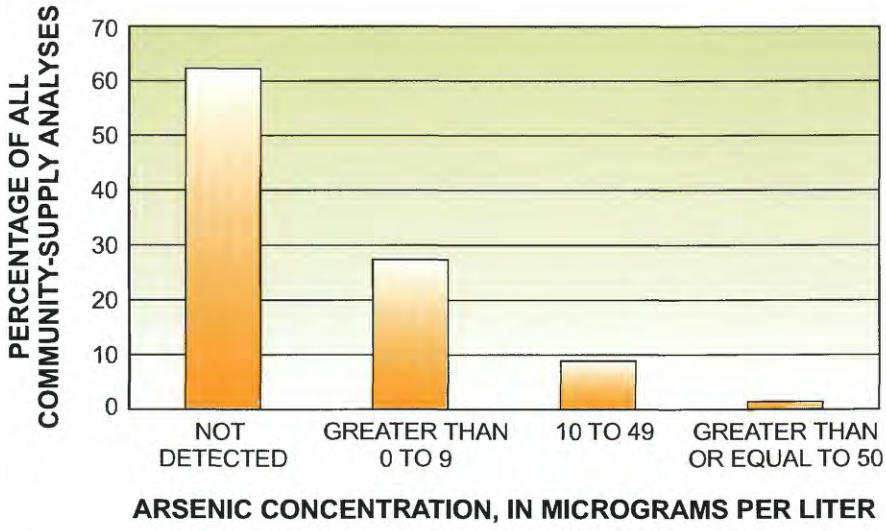


Figure 5. Arsenic concentrations in community-supply well samples in Illinois, 1978-2001.

tions of the glacial and alluvial aquifer system in Illinois were similar for a data set containing less than 100 samples (Warner, 2001). The deep portions of the glacial and alluvial aquifer system are defined as the deep glacial drift aquifer (fig. 4) by Warner (2001). In the deep portions of the glacial and alluvial aquifer system, filtered arsenic concentrations for ground-water samples from private wells ranged from less than 1.0 to 84 µg/L, with a median concentration of 1.5 µg/L; whereas the range of unfiltered arsenic concentrations for ground water from community-water supplies ranged from less than 1 to 110 µg/L, with a median of 1.0 µg/L (Warner, 2001). A study comparing filtered private and unfiltered community supplies in the High Plains aquifer in central Colorado did not show a statistical difference in arsenic concentration (Bruce and Oelsner, 2001). The median concentration in the High Plains aquifer from private and community supplies was 2.04 and 1.55 µg/L, respectively. On a national basis, arsenic concentrations in samples not from community-supply wells tended to be higher than concentrations in samples from community-supply samples (Welch and others, 1999).

The IEPA collected arsenic data at 2,771 community-water supply wells (prior to treatment) in various aquifers in Illinois from 1978 through 2001. Some wells were sampled multiple times. Arsenic was not detected in 60 percent of samples (5031 of 8180 samples; fig. 5).

Table 1. Comparison of arsenic concentrations in ground water from private and monitoring wells within the glacial and alluvial aquifer system, all routinely sampled community-supply wells, and community-supply wells within the glacial and alluvial aquifer system.
[NAWQA, National Water-Quality Assessment; IEPA, Illinois Environmental Protection Agency; µg/L, micrograms per liter; <, less than]

	NAWQA program wells in the glacial and alluvial aquifer system	All IEPA routine samples from community supplies in all aquifers	All IEPA routine samples from community-supply wells in the glacial and alluvial aquifer system
Number of analyses	268	2036	886
Minimum concentration (µg/L)	< .2	< 1	< 1
Maximum concentration (µg/L)	128	100	100
25 percent of analyses above this concentration (µg/L)	< .2	< 1	< 1
75 percent of analyses above this concentration (µg/L)	3.9	2	6
Median concentration (µg/L)	.5	< 1	< 1
Percent arsenic detections	58	43	47
Percent above 10 µg/L	14	11	19

As previously discussed, community-supply well samples are collected routinely or as part of special studies within the IEPA (table 1). Routine samples (2,036 samples in the data set) are samples collected by the community-supply well operator before any treatment for compliance. Samples for arsenic generally are collected every 5 years unless there are compliance issues requiring more sampling. Special studies can include a wide variety of programs from ambient monitoring to compliance. Of the community- and private-supply samples, 11 and 14 percent, respectively, exceeded the 10 µg/L arsenic standard. The highest arsenic concentrations and most frequent detections in samples from community-supply wells were from the deep portions of the glacial and alluvial aquifer system underlying central Illinois (Mahomet aquifer) (fig. 4).

With large water-quality data sets (for example, the community-supply data set from IEPA), there can be statistical bias because of the number of samples in any given year and the laboratory methods used for analysis. The largest number of samples from community-water supplies in Illinois was collected each year from 1982 to 1987 (fig. 6) after the implementation of the Clean Water Act in 1980. The percentage of samples each year with concentrations greater than or equal to 10 µg/L and less than 50 µg/L remained relatively constant at 9 percent across these years, and samples greater than 50 µg/L ranged from 1 to 2 percent over this time period. Laboratory reporting levels (lrl) have ranged from 0.001 to 5 µg/L. Generally, the lower reporting levels are for more recent samples because analytical machines and methods with higher precision were used in more recent years. If all the samples were screened to the highest reporting level of 5 µg/L, then only 15 percent of all wells would have arsenic detections.

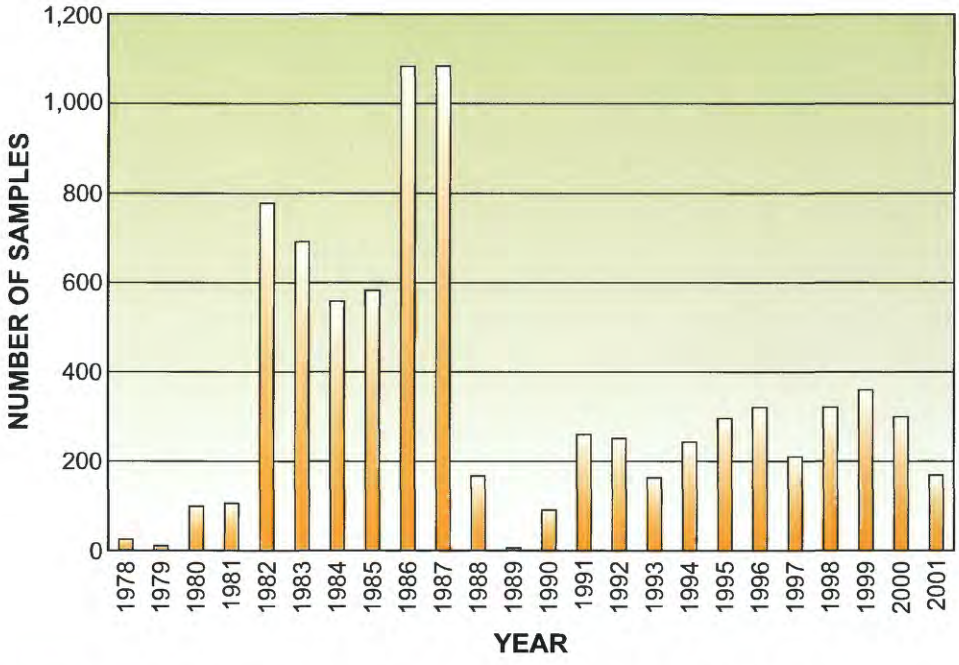


Figure 6. Sampling program for community-supply wells in Illinois, 1978-2001

The glacial and alluvial aquifer system, which is the primary aquifer system used for community-water supplies in Illinois, had the greatest number of arsenic samples. Almost 50 percent of the community-supply wells in Illinois are open to this aquifer system (fig. 7). Similar ranges and arsenic detections are present for samples taken from either community-supply (less than 1.0-100 µg/L) or private/monitoring (less than 0.2-128 µg/L) wells open to this aquifer system (table 1).

Estimated Distribution

Possible arsenic sources may be determined by establishing a relation between arsenic

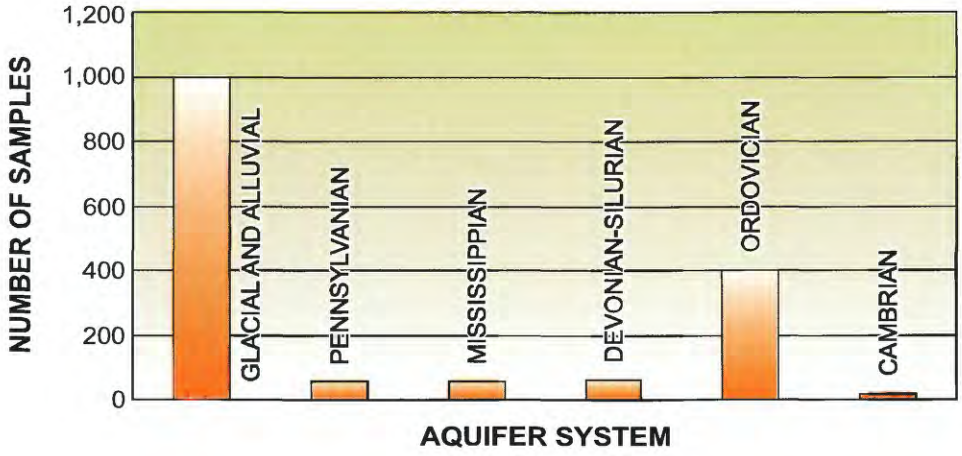


Figure 7. Number of community-supply samples analyzed for arsenic by aquifer system in Illinois.

concentration and concentrations of other chemical constituents and/or physical properties (such as well depth). The relation of arsenic with depth is not straightforward. Arsenic sources may be at various depths and geochemical conditions affecting arsenic mobilization also vary with depth. A study by the USGS in the central Mahomet Buried Bedrock Valley in Illinois (fig. 1) found arsenic concentrations and frequency of detection to be highest in the deep glacial drift aquifer (fig. 4) (median depth of 256 feet) compared to the shallow drift aquifer (fig. 4) (median depth of 33 feet) (Warner, 2001). A comparison of private supplies in this same area found concentrations to be similar for comparable depths (Warner, 2001). In contrast, the ISWS found, in general, higher arsenic concentrations in samples from the shallow portions than in the deep portions of the glacial and alluvial aquifer system in Tazewell County (Illinois State Water Survey, 2002). This result is based on 590 samples collected by the Tazewell County Health Department and interpolated well-depth information.

In Illinois, many groundwater supplies are hard (hardness as $CaCO_3$ greater than 120 milligrams per liter (mg/L); Heath, 1984). Therefore, most community and some private supplies treat the drinking water to remove calcium and magnesium, as well as iron, manganese, and other constituents. The removal of these constituents from drinking water also may reduce arsenic concentrations because arsenic adsorbs to iron and manganese oxides (Illinois State Water Survey, 2002). Data from 1,449 community-water supplies that utilize the glacial and alluvial aquifer system were analyzed for arsenic, iron, and manganese concentrations. Co-kriging, a geostatistical method, was used to estimate arsenic concentrations in ground water across the State by interpolating between data points with known arsenic, iron, and manganese concentrations (figs. 8a, b). More information on these methods can be found in Isaaks and Srivastava (1989) and Kitanidis (1997). Where the estimates are based on relatively few data points (compared to other parts of the State), there is more uncertainty in the estimated arsenic concentrations (fig. 8b). The geostatistical methods provide a good estimate when compared to known arsenic concentrations but tend to underestimate the highest concentrations and tend slightly to underestimate the variability of the concentrations (the multiple R^2 coefficient of determination was 0.64 between measured and estimated values). The darker shaded areas on figure 8a indicate the highest estimated arsenic concentrations in association with iron and manganese. These areas also may indicate where community and some private supplies likely are treating for iron and manganese, which may remove some of the arsenic. The area of high arsenic, iron, and manganese

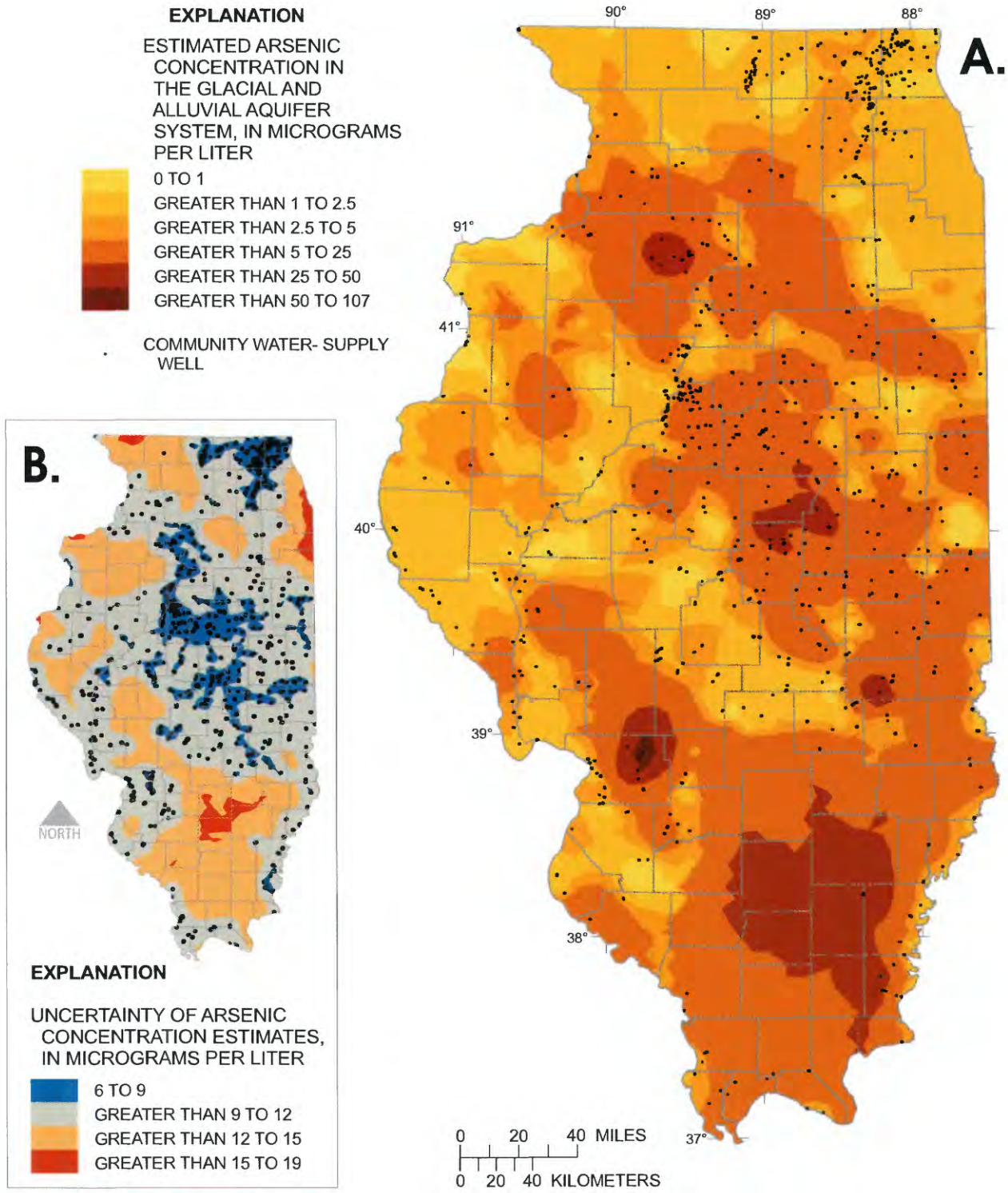


Figure 8. (A) Estimated arsenic concentrations in association with iron and manganese and (B) uncertainty of arsenic concentration estimates, Illinois.

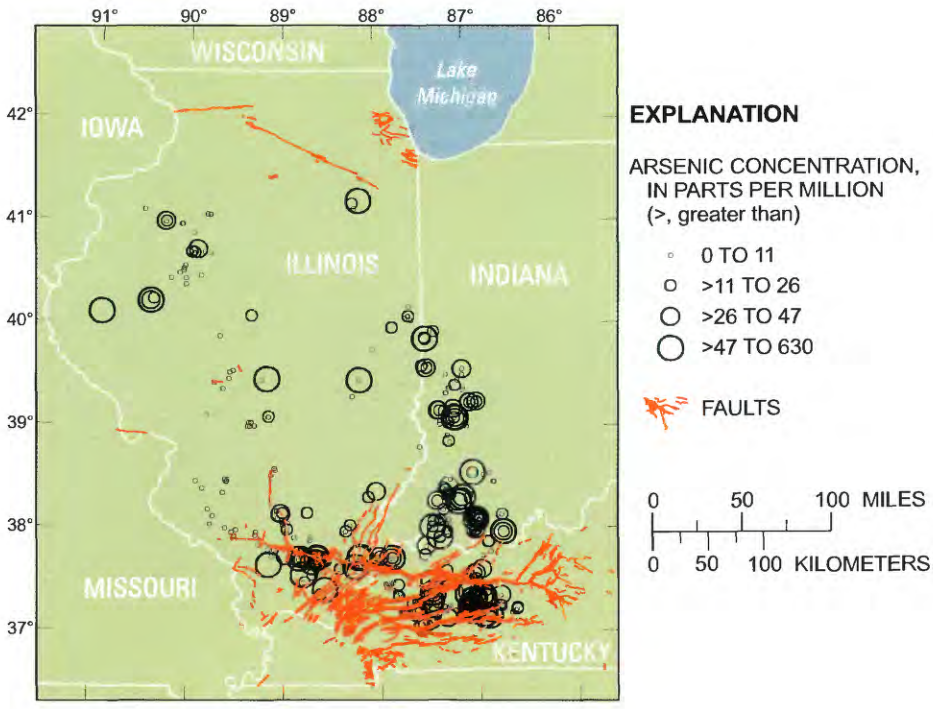


Figure 9. Arsenic concentrations in coal from Illinois, Indiana, and Kentucky (from Goldhaber and others, 2002).

concentrations in central Illinois is associated with part of the Mahomet Buried Bedrock Valley (fig. 1). Water-quality data from private and monitoring wells also indicated high arsenic concentrations in this area.

Potential Sources of Arsenic in Illinois

In most of Illinois, arsenic sources are natural. Three potential sources considered here for high arsenic concentrations in Illinois are: 1) dissolution from geologic material; 2) mobilization of adsorbed or coprecipitated arsenic; and/or 3) bedrock recharge.

The dissolution and mobilization of arsenic from geologic materials will occur if there is a source of arsenic in the geologic materials and if the geochemical conditions are conducive to arsenic transport. There are geographically extensive geologic and geochemical conditions that produced widespread arsenic enrichments in the earth's crust in the formation of arsenic-rich pyrite (Goldhaber and others, 2002). These bedrock deposits usually are in contact with overlying glacial sediments and structural features in the bedrock may provide conduits for arsenic transport. Another source of arsenic is dark shale and coal containing pyrite. Some coal deposits in Illinois, Indiana, and Kentucky contain high arsenic concentration (fig. 9).

Geochemical rock analyses done on the glacial deposits and underlying bedrock in the Central Mahomet Buried Bedrock Valley indicate that the highest arsenic concentrations are in the organic-rich bedrock underlying the valley. This organic-rich bedrock usually is shale or dark limestone. The sand and gravel making up the deep portions of the glacial and alluvial aquifer system had the lowest arsenic concentration of the sediments above the bedrock. The till overlying the aquifer in this area had arsenic concentrations higher than the sand and gravel, but substantially less than the organic-rich bedrock (Jeff Catalano, U.S. Geological Survey, written commun., 1999). Thus, there is an arsenic source in the geologic materials of the sediments and bedrock composing the aquifers, but the organic-rich bedrock has the highest concentration of arsenic.

The second possible source for the high arsenic concentrations considered here is the mobilization of coprecipitated arsenic. Consideration of this possible source is based on the premise that during glacial peri-

ods, waters with high arsenic concentration were in contact with clay within the till and the arsenic adsorbed onto these clay particles. As the glacial materials were buried, the geochemical environment became more reducing and the arsenic associated with the iron oxides and hydroxides was mobilized.

The third possible source for high arsenic concentrations considered here is bedrock recharge. This possible source was proposed by Panno and others (1994). Most of the work on arsenic in ground water in Illinois primarily has been in the deep portions of the glacial and alluvial aquifer system, where high arsenic concentrations are present in some areas and depths. In Piatt County in central Illinois (fig. 1), there are many bedrock structural features, such as faults and folds, which could provide direct pathways for ground water to flow from the deep bedrock to the deep portions of the glacial and alluvial aquifer system. Arsenic concentrations in the deep portions of the glacial and alluvial aquifer system increase along the ground-water-flow path just west of Piatt County (Warner, 2001). Ground water from the bedrock may be recharging the aquifer with arsenic or may be altering geochemical conditions so that arsenic is mobilized in this area.

Summary and Conclusions

Dissolved arsenic is found in ground water across Illinois. Determining the extent and distribution of arsenic in ground water is a starting place to assess the potential risk for persons drinking from a community or private supply. Understanding the potential sources and pathways that mobilize arsenic in ground water is necessary in protecting the drinking-water supply in Illinois.

Arsenic was not detected in 60 percent of samples from community supplies considered in this study. The highest arsenic concentrations and most frequent detections in samples from community-supply wells were from the deep portions of the glacial and alluvial aquifer system underlying central Illinois (Mahomet aquifer). Of the community- and private-supply samples, 11 and 14 percent, respectively, exceeded the 10 µg/L arsenic standard; but, private-supply wells are not regulated for arsenic concentrations in ground water.

Arsenic sources may be at various depths and geochemical conditions affecting arsenic mobilization also vary with depth. Estimates of arsenic, iron, and manganese have been exptrapolated from measured concentrations. An area of high estimated arsenic concentration in ground water in central Illinois appears to be associated with the Mahomet Buried Bedrock Valley. Where the estimates are based on relatively few data points (compared to other parts of the State), there is more uncertainty in the estimated arsenic concentrations. The geostatistical methods provide a good estimate when compared to known arsenic concentrations but tend to underestimate the highest concentrations and tend slightly to underestimate the variability of the concentrations.

In most of Illinois, arsenic sources are natural. Limited geochemical rock analyses done on the glacial deposits and underlying bedrock in the Central Mahomet Buried Bedrock Valley indicate that the highest arsenic concentrations are in the organic-rich bedrock underlying the valley. Understanding the fate and transport of arsenic from the source to a community-supply well will need to involve simulation of the ground-water flow and chemical conditions of the glacial and alluvial aquifer system.

References

Bruce, B.W. and Oelsner, G.P., 2001, Contrasting water quality from paired domestic/community supply wells, central High Plains: Journal of American Water Resources Association, v. 37, no. 5, p. 1389-1403.

Goldhaber, M.B. and others, 2002, Role of large-scale fluid flow in subsurface enrichment, in Welch, A.H., and Stollenwerk, K.G., eds., Arsenic in ground water: geochemistry and occurrence, chap. 5: Boston, Mass., Kluwer Academic Publishers, p. 127-176.

Hansel, A.K. and Johnson, W.H., 1996, Wedron and Mason Groups—lithostratigraphic reclassification of deposits of the Wisconsin Episode, Lake Michigan lobe area: Illinois State Geological Survey Bulletin 104, 116 p.

Heath, R.C., 1984, Basic ground-water hydrology: U.S. Geological Survey Water-Supply Paper 2220, 84 p.

Horowitz, A.J., Lum, K.R., Garbarino, J.R., Hall, G.E.M., Lemieux, C., and Demas, C.R., 1996, Problems associated with using filtration to define dissolved trace element concentrations in natural water samples: Environmental Science and Technology, 30, 954-963.

Illinois State Water Survey, 2002, Arsenic in Illinois groundwater: accessed October 18, 2002, at URL http://www.sws.uiuc.edu/gws/arsenic/ilsources.asp

Isaaks, E.H., and Srivastava, R.M., 1989, An introduction to applied geostatistics: Oxford University Press, New York, 561 p.

King, Victoria, 2002, Arsenic; History Magazine (original article appeared in the October-November 2001 issue): accessed October 12, 2002, at URL http://www.history-magazine.com/arsenic.html

Kitanidis, P.K., 1997, Introduction to geostatistics—applications in hydrogeology: Cambridge University Press, New York, 249 p.

MacRae, J.D., 2002, University of Maine, Department of Civil Engineering: accessed October 18, 2002, at URL http://www.umeciv.maine.edu/MacRae/arsenic_history.htm

Ohio Environmental Protection Agency, 2002, Ohio's Ground Water Quality; 2002, 305(b) report: Ohio Environmental Protection Agency, Columbus, Ohio, in press.

Panno, S.V., Hackley, K.C., Cartwright, K., and Liu, C.L., 1994, Hydrochemistry of the Mahomet Bedrock Valley Aquifer, east-central Illinois—indicators of recharge and ground-water flow: Ground Water, v. 32, no. 4, p. 591-604.

Ryker, S.J., 2001, Mapping arsenic in ground water: Geotimes, v. 46, no. 11, p. 34-36.

U.S. Environmental Protection Agency, 2002, Ground water and drinking water: accessed November 8, 2002, at URL http://www.epa.gov/safewater/arsenic.html

Warner, K.L., 2001, Arsenic in glacial drift aquifers and the implication for drinking water—lower Illinois River basin: Ground Water, v. 39, no. 3, p. 433-442.

Weider, Ben and Forshufvud, Sten, 1995, Assassination at St. Helena revisited: New York, N.Y., John Wiley & Sons, 555 p.

Welch, A.H., Helsel, D.R., Focazio, M.J., and Watkins, S.A., 1999, Arsenic in ground water supplies of the United States, in W.R. Chappell, C.O. Abernathy and R.L. Calderon, eds., Arsenic exposure and health effects: Elsevier Science, New York, p. 9-17.

West Bengal and Bangladesh, 2002, Arsenic crisis information center: accessed October 11, 2002, at URL http://bicn.com/acic/

Willman, H.B. and Frye, J.C., 1970, Pleistocene stratigraphy of Illinois: Illinois State Geological Survey Bulletin 94, 204 p.

For further information, please contact:

District Chief

U.S. Geological Survey

221 N. Broadway Avenue

Urbana, Illinois 61801

Telephone: 217-344-0037

Email: dc_il@usgs.gov

or visit the Illinois District Web site:

il.water.usgs.gov

ATTACHMENT 8
Field Soil Boring Logs

DRAFT - PENDING SURVEY INFORMATION

RAMBOLL

SOIL BORING LOG INFORMATION

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Coffeen 2024 Nature & Extent Investigation		G206D_SB

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Ethan Orange Cascade Drilling LP	3/19/2024	3/19/2024	Sonic

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
	Feet (NAVD88)	628.91 Feet (NAVD88)	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒

State Plane 875,105.43 N, 2,514,689.68 E E/W

1/4 of 1/4 of Section , T N, R

Lat ° ' "

Long ° ' "

Local Grid Location

Feet ☐ N ☐ S Feet ☐ E ☐ W

Facility ID	County	State	Civil Town/City/ or Village
	Montgomery	Illinois	Coffeen

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	120 120		0	0 - 0.3' **CLAYEY SILT:** ML/CL, dark brown (10YR 3/3), organic material, roots, soft, low plasticity, moist.	ML/CL									
			1	0.3 - 19.5' **FAT CLAY:** to **LEAN CLAY:** CH, yellowish brown (10YR 5/6), silt (5-15%), sand (0-5%), very stiff, high plasticity, moist.										
			2											
			3											
			4											
			5											
			6		CH									
			7											
			8											
			9											
2 CS	120 120		10	10' dark gray (10YR 4/1), strong brown (7.5YR 5/6) mottling (10-20%).										
			11											
			12											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	
DRAFT - KLT	Ramboll 234 W Florida Street, 5th Floor, Milwaukee, WI 53204	Tel: (414)837-3607 Fax: (414)837-3608

RAMBOLL

Boring Number G206D_SB

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength (tsf)	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			13	0.3 - 19.5' **FAT CLAY:** to **LEAN CLAY:** CH, yellowish brown (10YR 5/6), silt (5-15%), sand (0-5%), very stiff, high plasticity, moist. *(continued)*										Water daylighting from annular space of adjacent monitoring wells. Stopped using water for drilling.
			14											
			15											
			16		CH									
			17	17' layer of sandy clay, stiff, medium plasticity.										
			18											
			19											
3 CS	120 120		20	19.5 - 20' **LEAN CLAY WITH SAND:** (CL)s, dark yellowish brown (10YR 4/6), fine to medium sand, silt (5-15%), soft, medium plasticity, moist.	(CL)s									
			21	20 - 70' **SILTY CLAY:** CL/ML, dark gray (5YR 4/1), very stiff to hard, fine sand (0-15%), low plasticity, dry to moist.										
			22	22' layer of sandy clay, low plasticity to non-plastic.										
			23											
			24											
			25											
			26		CL/ML									
			27											
			28	28' soft, wet.										
			29											
4 CS	120 120		30											
			31											
			32											

Boring Number G206D_SB

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength (tsf)	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			33	20 - 70' **SILTY CLAY:** CL/ML, dark gray (5YR 4/1), very stiff to hard, fine sand (0-15%), low plasticity, dry to moist. *(continued)*										
			34											
			35											Water used to advance core barrel to 40 feet below ground surface (ft bgs).
			36											
			37											
			38											
			39											
5 CS	120 120		40											
			41											
			42		CL/ML									
			43											
			44											
			45											
			46											Soil sample collected from 45-47 ft bgs.
			47											
			48											
			49											
6 CS	120 120		50											
			51											
			52											

RAMBOLL

Boring Number G206D_SB

Sample									Soil Properties					
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			53	20 - 70' **SILTY CLAY:** CL/ML, dark gray (5YR 4/1), very stiff to hard, fine sand (0-15%), low plasticity, dry to moist. *(continued)*										
			54											
			55	55' - 60' dark gray (5Y 4/1) to olive gray (5Y 5/2), orange mottling (10-20%), (moisture).										
			56											Soil sample collected from 55-57 ft bgs.
			57											
			58											
			59											
7 CS	120 120		60											
			61		CL/ML									
			62											
			63											
			64											
			65											
			66											
			67											
			68	68' - 68.3' layer of clay with sand, stiff, non-plastic, moist.										Soil sample collected from 67-69 ft bgs.
			69											
			70	70' End of Boring.										

DRAFT - PENDING SURVEY INFORMATION

RAMBOLL

SOIL BORING LOG INFORMATION

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Coffeen 2024 Nature & Extent Investigation		G275D_SB

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Ethan Orange Cascade Drilling LP	3/21/2024	3/21/2024	Sonic

Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
	Feet (NAVD88)	615.58 Feet (NAVD88)	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒

State Plane 874,272.78 N, 2,516,364.19 E E/W

1/4 of 1/4 of Section , T N, R

Lat ° ' "

Long ° ' "

Local Grid Location

Feet ☐N ☐S Feet ☐E ☐W

Facility ID	County	State	Civil Town/City/ or Village
	Montgomery	Illinois	Coffeen

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	120 76		0.5	0 - 0.3' **CLAYEY SILT:** ML/CL, dark brown (10YR 3/3), organic material, grass, roots, soft, moist.	ML/CL									
			1.0	0.3 - 11' **LEAN CLAY:** CL, yellowish brown (10YR 5/6), silt (5-15%), sand (0-5%), very stiff, high plasticity, moist.										
			1.5											
			2.0											
			2.5											
			3.0	3' orange mottling (10%).										
			3.5											
			4.0											
			4.5											
			5.0											
			5.5											
			6.0		CL									
			6.5											
			7.0											
			7.5											
			8.0											
			8.5											
			9.0											
			9.5											
			10.0											
2 CS	120 120		10.5											
			11.0											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	
DRAFT - KLT	Ramboll 234 W Florida Street, 5th Floor, Milwaukee, WI 53204	Tel: (414)837-3607 Fax: (414)837-3608

RAMBOLL

Boring Number G275D_SB

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength (tsf)	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			11.5	11 - 12' **WELL-GRADED SAND:** SW, dark yellowish brown (10YR 4/6), silt (5-15%), loose, wet.	SW									Loss of drilling water.
			12.0											
			12.5	12 - 13' **SANDY SILT:** s(ML), dark yellowish brown (10YR 4/6), fine sand, hard, medium plasticity.	s(ML)									Water daylighting from well pad of adjacent monitoring wells. Stopped using water for drilling.
			13.0											
			13.5	13 - 20' **SILT WITH SAND:** (ML)s, brown (10YR 4/3), fine sand, silt (0-5%), soft, non-plastic to low plasticity, dry.										
			14.0											
			14.5											
			15.0											
			15.5											
			16.0											
			16.5		(ML)s									
			17.0											
			17.5											
			18.0											
			18.5											
			19.0											
			19.5											
3 CS	120 120		20.0	20 - 22' **WELL-GRADED SAND:** SW, dark yellowish brown (10YR 4/6), silt (5-15%), loose, wet.										
			20.5											
			21.0		SW									
			21.5											
			22.0	22 - 23' **CLAYEY SILT:** to **SILTY CLAY WITH SAND:** ML/CL, brown (10YR 5/3), yellow brown mottling (10%), gravel (0-5%), hard.	ML/CL									
			22.5											
			23.0	23 - 50' **SILTY CLAY:** CL/ML, dark gray (5YR 4/1), sand (0-5%), very stiff to hard, low plasticity, dry to moist.										
			23.5											
			24.0											
			24.5											
			25.0											
			25.5											
			26.0		CL/ML									
			26.5											
			27.0											
			27.5											
			28.0											
			28.5											
			29.0											

RAMBOLL

Boring Number G275D_SB

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength (tsf)	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
4 CS	120 120		29.5	23 - 50' **SILTY CLAY:** CL/ML, dark gray (5YR 4/1), sand (0-5%), very stiff to hard, low plasticity, dry to moist. *(continued)*	CL/ML									
			30.0											
			30.5											
			31.0											
			31.5											
			32.0											
			32.5											
			33.0											
			33.5											
			34.0											
			34.5											
			35.0											
			35.5											
			36.0											
			36.5											
			37.0											
			37.5											
			38.0											
			38.5											
			39.0											
			39.5											
5 CS	120 120		40.0											6-inch casing set to 40 feet below ground surface (ft bgs). Resumed drilling on 3/20/2024.
			40.5											
			41.0											
			41.5											
			42.0											
			42.5											
			43.0											
			43.5											
			44.0											
			44.5											
			45.0											
			45.5											
			46.0											
			46.5											
			47.0											
			47.5											

RAMBOLL

Boring Number G275D_SB

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Soil Properties: Compressive Strength (tsf)	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			48.0	23 - 50' **SILTY CLAY:** CL/ML, dark gray (5YR 4/1), sand (0-5%), very stiff to hard, low plasticity, dry to moist. *(continued)*	CL/ML									Soil sample collected from 47-49 ft bgs.
			48.5											
			49.0											
			49.5											
6 CS	120 120		50.0	50 - 53' **POORLY-GRADED SAND:** SP, white (10YR 8/1) to gray (10YR 5/1), white to gray, fine sand, angular to subangular sand, coarse sand (0-5%), loose, moist.	SP									
			50.5											
			51.0											
			51.5											
			52.0											
			52.5											Soil sample collected from 51-53 ft bgs.
			53.0	53 - 60' **SILTY CLAY:** CL/ML, very dark brown (10YR 2/2), wood (0-5%), sand (0-5%), hard, high plasticity, moist.	CL/ML									
			53.5											
			54.0											
			54.5											
			55.0											
			55.5											
			56.0	56' dark gray (10YR 4/1).										
			56.5											
			57.0											
			57.5											
			58.0											
			58.5											
			59.0											
			59.5											
			60.0	60' End of Boring.										

ATTACHMENT 9
Sequential Extraction Procedure Analytical Data

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Allison Kreinberg
Geosyntec Consultants Inc
941 Chatham Lane
Suite 103
Columbus, Ohio 43221

Generated 4/19/2024 9:44:17 AM

JOB DESCRIPTION

Vistra - Coffeen

JOB NUMBER

140-36007-1

Eurofins Knoxville
5815 Middlebrook Pike
Knoxville TN 37921

See page two for job notes and contact information.

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. 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

Generated
4/19/2024 9:44:17 AM

Authorized for release by
Ryan Henry, Project Manager I
WilliamR.Henry@et.eurofinsus.com
(865)291-3006

Table of Contents

Definitions/Glossary

Client: Geosyntec Consultants Inc
Project/Site: Vistra - Coffeen

Job ID: 140-36007-1

Qualifiers

Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
F3	Duplicate RPD exceeds the control limit
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
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

Job Narrative
140-36007-1

Receipt
The samples were received on 3/22/2024 at 9:30am and arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 18.2º C.

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

The Chain-of-Custody (COC) was incomplete as received and/or improperly completed. Analysis listed on COC is 6010B SEP (Ar,Fe,Mn), should be 6010B SEP (As,Fe,Mn).

Metals
7 Step Sequential Extraction Procedure

These soil samples were prepared and analyzed using Eurofins TestAmerica Knoxville standard operating procedure KNOX-MT-0008, "7 Step Sequential Extraction Procedure". SW-846 Method 6010B as incorporated in Eurofins TestAmerica Knoxville standard operating procedure KNOX-MT-0007 was used to perform the final instrument analyses.

An aliquot of each sample was sequentially extracted using the steps listed below:

· Step 1 - Exchangeable Fraction: A 5 gram aliquot of sample was extracted with 25 mL of 1M magnesium sulfate (MgSO4), centrifuged and filtered. 5 mL of the resulting leachate was digested using method 3010A and analyzed by method 6010B. Results are reported in mg/kg on a dry weight basis.
· Step 2 - Carbonate Fraction: The sample residue from step 1 was extracted with 25 mL of 1M sodium acetate/acetic acid (NaOAc/HOAc) at pH 5, centrifuged and filtered. 5 mL of the resulting leachate was digested using method 3010A and analyzed by method 6010B. Results are reported in mg/kg on a dry weight basis.
· Step 3 - Non-crystalline Materials Fraction: The sample residue from step 2 was extracted with 25 mL of 0.2M ammonium oxalate (pH 3), centrifuged and filtered. 5 mL of the resulting leachate was digested using method 3010A and analyzed by method 6010B. Results are reported in mg/kg on a dry weight basis.
· Step 4 - Metal Hydroxide Fraction: The sample residue from step 3 was extracted with 25 mL of 1M hydroxylamine hydrochloride solution in 25% v/v acetic acid, centrifuged and filtered. 5 mL of the resulting leachate was digested using method 3010A and analyzed by method 6010B. Results are reported in mg/kg on a dry weight basis.
· Step 5 - Organic-bound Fraction: The sample residue from step 4 was extracted three times with 25 mL of 5% sodium hypochlorite (NaClO) at pH 9.5, centrifuged and filtered. The resulting leachates were combined and 5 mL were digested using method 3010A and analyzed by method 6010B. Results are reported in mg/kg on a dry weight basis.
· Step 6 - Acid/Sulfide Fraction: The sample residue from step 5 was extracted with 25 mL of a 3:1:2 v/v solution of HCl-HNO3-H2O, centrifuged and filtered. 5 mL of the resulting leachate was diluted to 50 mL with reagent water and analyzed by method 6010B. Results are reported in mg/kg on a dry weight basis.
· Step 7 - Residual Fraction: A 1.0 g aliquot of the sample residue from step 6 was digested using HF, HNO3, HCl and H3BO3. The digestate was analyzed by ICP using method 6010B. Results are reported in mg/kg on a dry weight basis.

In addition, a 1.0 g aliquot of the original sample was digested using HF, HNO3, HCl and H3BO3. The digestate was analyzed by ICP using method 6010B. Total metal results are reported in mg/kg on a dry weight basis.

Results were calculated using the following equation:

Result, µg/g or mg/Kg, dry weight = (C × V × V1 × D) / (W × S × V2)

Where:
C = Concentration from instrument readout, µg/mL
V = Final volume of digestate, mL
D = Instrument dilution factor
V1 = Total volume of leachate, mL
V2 = Volume of leachate digested, mL
W = Wet weight of sample, g
S = Percent solids/100

A method blank, laboratory control sample and laboratory control sample duplicate were prepared and analyzed with each SEP step in order to provide information about both the presence of elements of interest in the extraction solutions, and the recovery of elements of interest from the extraction solutions. Results outside of laboratory QC limits do not reflect out of control performance,

but rather the effect of the extraction solution upon the analyte.

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 solution 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 serial dilution performed for the following samples associated with batch 140-85735 was outside control limits: SB-275D-(50-53)-20240321 (140-36007-4) and (140-36007-A-4-A SD ^5)

Methods 6010B, 6010B SEP: The following samples were diluted due to the presence of Silicon which interferes with Arsenic: SB-206D-(45-47)-20240320 (140-36007-1), SB-206D-(56-57)-20240320 (140-36007-2), SB-275D-(46-48)-20240321 (140-36007-3) and SB-275D-(50-53)-20240321 (140-36007-4). Elevated reporting limits (RLs) are provided.

Method 6010B SEP: The sample duplicate (DUP) precision for preparation batch 140-85238 and 140-85281 and analytical batch 140-85646 was outside control limits. Sample non-homogeneity is suspected.

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

General Chemistry
% Moisture: The samples were analyzed for percent moisture using SOP number KNOX-WC-0012 (based on Modified MCAWW 160.3 and SM2540B and on the percent moisture determinations described in methods 3540C and 3550B).

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

Sample Summary

Client: Geosyntec Consultants Inc
Project/Site: Vistra - Coffeen

Job ID: 140-36007-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
140-36007-1	SB-206D-(45-47)-20240320	Solid	03/20/24 11:23	03/22/24 09:30
140-36007-2	SB-206D-(56-57)-20240320	Solid	03/20/24 11:46	03/22/24 09:30
140-36007-3	SB-275D-(46-48)-20240321	Solid	03/21/24 09:25	03/22/24 09:30
140-36007-4	SB-275D-(50-53)-20240321	Solid	03/21/24 09:40	03/22/24 09:30

Client: Geosyntec Consultants Inc
Project/Site: Vistra - Coffeen

Job ID: 140-36007-1

Client Sample ID: SB-206D-(45-47)-20240320
Date Collected: 03/20/24 11:23
Date Received: 03/22/24 09:30

Lab Sample ID: 140-36007-1
Matrix: Solid
Percent Solids: 88.2

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.3	0.59	mg/Kg	☼	04/04/24 08:00	04/15/24 12:33	4
Iron	ND		23	13	mg/Kg	☼	04/04/24 08:00	04/15/24 12:33	4
Manganese	**8.1**		3.4	0.14	mg/Kg	☼	04/04/24 08:00	04/15/24 12:33	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	0.44	mg/Kg	☼	04/05/24 08:00	04/15/24 13:37	3
Iron	**950**		17	9.9	mg/Kg	☼	04/05/24 08:00	04/15/24 13:37	3
Manganese	**89**		2.6	0.95	mg/Kg	☼	04/05/24 08:00	04/15/24 13:37	3

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**1.0**		0.57	0.15	mg/Kg	☼	04/05/24 08:00	04/15/24 14:41	1
Iron	**2600**		5.7	3.3	mg/Kg	☼	04/05/24 08:00	04/15/24 14:41	1
Manganese	**64**	**B**	0.85	0.031	mg/Kg	☼	04/05/24 08:00	04/15/24 14:41	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.37**	**J**	0.57	0.25	mg/Kg	☼	04/10/24 08:00	04/16/24 13:09	1
Iron	**2900**		5.7	3.3	mg/Kg	☼	04/10/24 08:00	04/16/24 13:09	1
Manganese	**120**		0.85	0.15	mg/Kg	☼	04/10/24 08:00	04/16/24 13:09	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		8.5	2.2	mg/Kg	☼	04/11/24 08:00	04/16/24 14:15	5
Iron	ND		85	50	mg/Kg	☼	04/11/24 08:00	04/16/24 14:15	5
Manganese	**14**		13	2.1	mg/Kg	☼	04/11/24 08:00	04/16/24 14:15	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**1.7**		0.57	0.17	mg/Kg	☼	04/10/24 08:00	04/16/24 15:19	1
Iron	**6400**		5.7	3.3	mg/Kg	☼	04/10/24 08:00	04/16/24 15:19	1
Manganese	**53**		0.85	0.28	mg/Kg	☼	04/10/24 08:00	04/16/24 15:19	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**1.8**		1.1	0.68	mg/Kg	☼	04/11/24 08:00	04/17/24 13:38	2
Iron	**4200**		5.7	4.7	mg/Kg	☼	04/11/24 08:00	04/17/24 12:10	1
Manganese	**47**		0.85	0.35	mg/Kg	☼	04/11/24 08:00	04/17/24 12:10	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	**4.9**		0.50	0.13	mg/Kg			04/18/24 12:10	1
Iron	**17000**		5.0	4.1	mg/Kg			04/18/24 12:10	1
Manganese	**390**		0.75	0.052	mg/Kg			04/18/24 12:10	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**4.4**		0.57	0.34	mg/Kg	☼	04/11/24 08:00	04/17/24 12:50	1
Iron	**12000**		5.7	4.7	mg/Kg	☼	04/11/24 08:00	04/17/24 12:50	1
Manganese	**250**		0.85	0.35	mg/Kg	☼	04/11/24 08:00	04/17/24 12:50	1

Client Sample ID: SB-206D-(56-57)-20240320
Date Collected: 03/20/24 11:46
Date Received: 03/22/24 09:30

Lab Sample ID: 140-36007-2
Matrix: Solid
Percent Solids: 81.9

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.4	0.64	mg/Kg	☼	04/04/24 08:00	04/15/24 12:38	4
Iron	ND		24	14	mg/Kg	☼	04/04/24 08:00	04/15/24 12:38	4
Manganese	**4.2**		3.7	0.15	mg/Kg	☼	04/04/24 08:00	04/15/24 12:38	4

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.8	0.48	mg/Kg	☼	04/05/24 08:00	04/15/24 13:42	3
Iron	**99**		18	11	mg/Kg	☼	04/05/24 08:00	04/15/24 13:42	3
Manganese	**22**		2.7	1.0	mg/Kg	☼	04/05/24 08:00	04/15/24 13:42	3

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.55**	**J**	0.61	0.16	mg/Kg	☼	04/05/24 08:00	04/15/24 14:46	1
Iron	**1100**		6.1	3.5	mg/Kg	☼	04/05/24 08:00	04/15/24 14:46	1
Manganese	**190**	**B**	0.92	0.033	mg/Kg	☼	04/05/24 08:00	04/15/24 14:46	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**2.2**		0.61	0.27	mg/Kg	☼	04/10/24 08:00	04/16/24 13:14	1
Iron	**8200**		6.1	3.5	mg/Kg	☼	04/10/24 08:00	04/16/24 13:14	1
Manganese	**120**		0.92	0.16	mg/Kg	☼	04/10/24 08:00	04/16/24 13:14	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**2.3**	**J**	9.2	2.3	mg/Kg	☼	04/11/24 08:00	04/16/24 14:20	5
Iron	ND		92	54	mg/Kg	☼	04/11/24 08:00	04/16/24 14:20	5
Manganese	**8.6**	**J**	14	2.3	mg/Kg	☼	04/11/24 08:00	04/16/24 14:20	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**1.6**		0.61	0.18	mg/Kg	☼	04/10/24 08:00	04/16/24 15:24	1
Iron	**7200**		6.1	3.5	mg/Kg	☼	04/10/24 08:00	04/16/24 15:24	1
Manganese	**32**		0.92	0.31	mg/Kg	☼	04/10/24 08:00	04/16/24 15:24	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**2.0**		1.2	0.73	mg/Kg	☼	04/11/24 08:00	04/17/24 13:43	2
Iron	**5000**		6.1	5.0	mg/Kg	☼	04/11/24 08:00	04/17/24 12:15	1
Manganese	**36**		0.92	0.38	mg/Kg	☼	04/11/24 08:00	04/17/24 12:15	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	**8.7**		0.50	0.13	mg/Kg			04/18/24 12:10	1
Iron	**22000**		5.0	4.1	mg/Kg			04/18/24 12:10	1
Manganese	**410**		0.75	0.052	mg/Kg			04/18/24 12:10	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**8.4**		1.2	0.73	mg/Kg	☼	04/11/24 08:00	04/17/24 14:08	2
Iron	**24000**		6.1	5.0	mg/Kg	☼	04/11/24 08:00	04/17/24 12:56	1
Manganese	**260**		0.92	0.38	mg/Kg	☼	04/11/24 08:00	04/17/24 12:56	1

Client Sample ID: SB-275D-(46-48)-20240321
Date Collected: 03/21/24 09:25
Date Received: 03/22/24 09:30

Lab Sample ID: 140-36007-3
Matrix: Solid
Percent Solids: 87.2

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	☼	04/04/24 08:00	04/15/24 12:43	4
Iron	ND		23	13	mg/Kg	☼	04/04/24 08:00	04/15/24 12:43	4
Manganese	**11**		3.4	0.14	mg/Kg	☼	04/04/24 08:00	04/15/24 12:43	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	☼	04/05/24 08:00	04/15/24 13:47	3
Iron	**610**		17	10	mg/Kg	☼	04/05/24 08:00	04/15/24 13:47	3
Manganese	**81**		2.6	0.96	mg/Kg	☼	04/05/24 08:00	04/15/24 13:47	3

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**1.2**		0.57	0.15	mg/Kg	☼	04/05/24 08:00	04/15/24 14:51	1
Iron	**2400**		5.7	3.3	mg/Kg	☼	04/05/24 08:00	04/15/24 14:51	1
Manganese	**71**	**B**	0.86	0.031	mg/Kg	☼	04/05/24 08:00	04/15/24 14:51	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.66**		0.57	0.25	mg/Kg	☼	04/10/24 08:00	04/16/24 13:19	1
Iron	**2100**		5.7	3.3	mg/Kg	☼	04/10/24 08:00	04/16/24 13:19	1
Manganese	**100**		0.86	0.15	mg/Kg	☼	04/10/24 08:00	04/16/24 13:19	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**2.7**	**J**	8.6	2.2	mg/Kg	☼	04/11/24 08:00	04/16/24 14:25	5
Iron	ND		86	50	mg/Kg	☼	04/11/24 08:00	04/16/24 14:25	5
Manganese	**33**		13	2.1	mg/Kg	☼	04/11/24 08:00	04/16/24 14:25	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**3.2**		0.57	0.17	mg/Kg	☼	04/10/24 08:00	04/16/24 15:29	1
Iron	**6300**		5.7	3.3	mg/Kg	☼	04/10/24 08:00	04/16/24 15:29	1
Manganese	**50**		0.86	0.29	mg/Kg	☼	04/10/24 08:00	04/16/24 15:29	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**2.3**		1.1	0.69	mg/Kg	☼	04/11/24 08:00	04/17/24 13:48	2
Iron	**4600**		5.7	4.7	mg/Kg	☼	04/11/24 08:00	04/17/24 12:20	1
Manganese	**48**		0.86	0.36	mg/Kg	☼	04/11/24 08:00	04/17/24 12:20	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	**10**		0.50	0.13	mg/Kg			04/18/24 12:10	1
Iron	**16000**		5.0	4.1	mg/Kg			04/18/24 12:10	1
Manganese	**400**		0.75	0.052	mg/Kg			04/18/24 12:10	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**5.3**		0.57	0.34	mg/Kg	☼	04/11/24 08:00	04/17/24 13:01	1
Iron	**14000**		5.7	4.7	mg/Kg	☼	04/11/24 08:00	04/17/24 13:01	1
Manganese	**340**		0.86	0.36	mg/Kg	☼	04/11/24 08:00	04/17/24 13:01	1

Client: Geosyntec Consultants Inc
Project/Site: Vistra - Coffeen

Job ID: 140-36007-1

Client Sample ID: SB-275D-(50-53)-20240321
Date Collected: 03/21/24 09:40
Date Received: 03/22/24 09:30

Lab Sample ID: 140-36007-4
Matrix: Solid
Percent Solids: 96.6

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.1	0.54	mg/Kg	☼	04/04/24 08:00	04/15/24 12:48	4
Iron	ND		21	12	mg/Kg	☼	04/04/24 08:00	04/15/24 12:48	4
Manganese	**6.8**		3.1	0.13	mg/Kg	☼	04/04/24 08:00	04/15/24 12:48	4

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.6	0.40	mg/Kg	☼	04/05/24 08:00	04/15/24 13:52	3
Iron	**250**		16	9.0	mg/Kg	☼	04/05/24 08:00	04/15/24 13:52	3
Manganese	**52**		2.3	0.87	mg/Kg	☼	04/05/24 08:00	04/15/24 13:52	3

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.92**		0.52	0.13	mg/Kg	☼	04/05/24 08:00	04/15/24 15:06	1
Iron	**2100**		5.2	3.0	mg/Kg	☼	04/05/24 08:00	04/15/24 15:06	1
Manganese	**78**	**B**	0.78	0.028	mg/Kg	☼	04/05/24 08:00	04/15/24 15:06	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.41**	**J**	0.52	0.23	mg/Kg	☼	04/10/24 08:00	04/16/24 13:24	1
Iron	**2400**		5.2	3.0	mg/Kg	☼	04/10/24 08:00	04/16/24 13:24	1
Manganese	**170**		0.78	0.13	mg/Kg	☼	04/10/24 08:00	04/16/24 13:24	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		7.8	2.0	mg/Kg	☼	04/11/24 08:00	04/16/24 14:30	5
Iron	ND		78	46	mg/Kg	☼	04/11/24 08:00	04/16/24 14:30	5
Manganese	**14**		12	1.9	mg/Kg	☼	04/11/24 08:00	04/16/24 14:30	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**1.5**		0.52	0.16	mg/Kg	☼	04/10/24 08:00	04/16/24 15:44	1
Iron	**2900**		5.2	3.0	mg/Kg	☼	04/10/24 08:00	04/16/24 15:44	1
Manganese	**33**		0.78	0.26	mg/Kg	☼	04/10/24 08:00	04/16/24 15:44	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**1.1**		1.0	0.62	mg/Kg	☼	04/11/24 08:00	04/17/24 13:53	2
Iron	**1400**		5.2	4.2	mg/Kg	☼	04/11/24 08:00	04/17/24 12:25	1
Manganese	**19**		0.78	0.32	mg/Kg	☼	04/11/24 08:00	04/17/24 12:25	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	**4.0**		0.50	0.13	mg/Kg			04/18/24 12:10	1
Iron	**9000**		5.0	4.1	mg/Kg			04/18/24 12:10	1
Manganese	**370**		0.75	0.052	mg/Kg			04/18/24 12:10	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**4.5**		1.0	0.62	mg/Kg	☼	04/11/24 08:00	04/17/24 14:13	2
Iron	**8500**		5.2	4.2	mg/Kg	☼	04/11/24 08:00	04/17/24 13:07	1
Manganese	**360**		0.78	0.32	mg/Kg	☼	04/11/24 08:00	04/17/24 13:07	1

Default Detection Limits

Client: Geosyntec Consultants Inc
Project/Site: Vistra - Coffeen

Job ID: 140-36007-1

Method: 6010B SEP - SEP Metals (ICP) - Step 1
Prep: 3010A
SEP: Exchangeable

Analyte	RL	MDL	Units
Arsenic	0.50	0.13	mg/Kg
Iron	5.0	2.9	mg/Kg
Manganese	0.75	0.031	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
Iron	5.0	2.9	mg/Kg
Manganese	0.75	0.28	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
Iron	5.0	2.9	mg/Kg
Manganese	0.75	0.027	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
Iron	5.0	2.9	mg/Kg
Manganese	0.75	0.13	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
Iron	15	8.8	mg/Kg
Manganese	2.3	0.37	mg/Kg

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

Analyte	RL	MDL	Units
Arsenic	0.50	0.15	mg/Kg
Iron	5.0	2.9	mg/Kg
Manganese	0.75	0.25	mg/Kg

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

Analyte	RL	MDL	Units
Arsenic	0.50	0.30	mg/Kg
Iron	5.0	4.1	mg/Kg
Manganese	0.75	0.31	mg/Kg

Default Detection Limits

Client: Geosyntec Consultants Inc
Project/Site: Vistra - Coffeen

Job ID: 140-36007-1

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

Analyte	RL	MDL	Units
Arsenic	0.50	0.13	mg/Kg
Iron	5.0	4.1	mg/Kg
Manganese	0.75	0.052	mg/Kg

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

Prep: Total

Analyte	RL	MDL	Units
Arsenic	0.50	0.30	mg/Kg
Iron	5.0	4.1	mg/Kg
Manganese	0.75	0.31	mg/Kg

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

Lab Sample ID: MB 140-85062/1-A
Matrix: Solid
Analysis Batch: 85735

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 85062

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.50	0.30	mg/Kg		04/11/24 08:00	04/17/24 11:36	1
Iron	ND		5.0	4.1	mg/Kg		04/11/24 08:00	04/17/24 11:36	1
Manganese	ND		0.75	0.31	mg/Kg		04/11/24 08:00	04/17/24 11:36	1

Lab Sample ID: LCS 140-85062/2-A
Matrix: Solid
Analysis Batch: 85735

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 85062

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	5.00	5.24		mg/Kg		105	80 - 120
Iron	50.0	53.4		mg/Kg		107	80 - 120
Manganese	5.00	5.66		mg/Kg		113	80 - 120

Lab Sample ID: LCSD 140-85062/3-A
Matrix: Solid
Analysis Batch: 85735

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 85062

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	5.00	5.18		mg/Kg		104	80 - 120	1	30
Iron	50.0	52.3		mg/Kg		105	80 - 120	2	30
Manganese	5.00	5.65		mg/Kg		113	80 - 120	0	30

Lab Sample ID: 140-36007-4 DU
Matrix: Solid
Analysis Batch: 85735

Client Sample ID: SB-275D-(50-53)-20240321
Prep Type: Total/NA
Prep Batch: 85062

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Iron	8500		7620		mg/Kg	☼	11	30
Manganese	360		324		mg/Kg	☼	12	30

Lab Sample ID: 140-36007-4 DU
Matrix: Solid
Analysis Batch: 85735

Client Sample ID: SB-275D-(50-53)-20240321
Prep Type: Total/NA
Prep Batch: 85062

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Arsenic	4.5		4.59		mg/Kg	☼	3	30

Method: 6010B SEP - SEP Metals (ICP)

Lab Sample ID: MB 140-85063/1-B ^4
Matrix: Solid
Analysis Batch: 85646

Client Sample ID: Method Blank
Prep Type: Step 1
Prep Batch: 85171

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.0	0.52	mg/Kg		04/04/24 08:00	04/15/24 12:08	4
Iron	ND		20	12	mg/Kg		04/04/24 08:00	04/15/24 12:08	4
Manganese	ND		3.0	0.12	mg/Kg		04/04/24 08:00	04/15/24 12:08	4

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

Lab Sample ID: LCS 140-85063/2-B ^5
Matrix: Solid
Analysis Batch: 85646

Client Sample ID: Lab Control Sample
Prep Type: Step 1
Prep Batch: 85171

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Arsenic			5.00	4.87		mg/Kg		97	80 - 120		
Iron			50.0	49.8		mg/Kg		100	80 - 120		
Manganese			5.00	5.06		mg/Kg		101	80 - 120		

Lab Sample ID: LCSD 140-85063/3-B ^5
Matrix: Solid
Analysis Batch: 85646

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 1
Prep Batch: 85171

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic			5.00	4.98		mg/Kg		100	80 - 120	2	30
Iron			50.0	50.2		mg/Kg		100	80 - 120	1	30
Manganese			5.00	5.02		mg/Kg		100	80 - 120	1	30

Lab Sample ID: 140-36007-4 DU
Matrix: Solid
Analysis Batch: 85646

Client Sample ID: SB-275D-(50-53)-20240321
Prep Type: Step 1
Prep Batch: 85171

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Arsenic	ND			ND		mg/Kg	☼			NC	30
Iron	ND			ND		mg/Kg	☼			NC	30
Manganese	6.8			6.71		mg/Kg	☼			1	30

Lab Sample ID: MB 140-85197/1-B ^3
Matrix: Solid
Analysis Batch: 85646

Client Sample ID: Method Blank
Prep Type: Step 2
Prep Batch: 85280

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.5	0.39	mg/Kg		04/05/24 08:00	04/15/24 13:12	3
Iron	ND		15	8.7	mg/Kg		04/05/24 08:00	04/15/24 13:12	3
Manganese	ND		2.3	0.84	mg/Kg		04/05/24 08:00	04/15/24 13:12	3

Lab Sample ID: LCS 140-85197/2-B ^5
Matrix: Solid
Analysis Batch: 85646

Client Sample ID: Lab Control Sample
Prep Type: Step 2
Prep Batch: 85280

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Arsenic			5.00	3.68		mg/Kg		74	60 - 120		
Iron			50.0	ND		mg/Kg		6			
Manganese			5.00	4.94		mg/Kg		99	80 - 120		

Lab Sample ID: LCSD 140-85197/5-B ^5
Matrix: Solid
Analysis Batch: 85646

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 2
Prep Batch: 85280

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic			5.00	3.98		mg/Kg		80	60 - 120	8	30
Iron			50.0	ND		mg/Kg		5		9	
Manganese			5.00	4.84		mg/Kg		97	80 - 120	2	30

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

Lab Sample ID: 140-36007-4 DU
Matrix: Solid
Analysis Batch: 85646

Client Sample ID: SB-275D-(50-53)-20240321
Prep Type: Step 2
Prep Batch: 85280

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Arsenic	ND		ND		mg/Kg	☼	NC	30
Iron	250		235		mg/Kg	☼	7	
Manganese	52		49.0		mg/Kg	☼	6	30

Lab Sample ID: MB 140-85238/1-B
Matrix: Solid
Analysis Batch: 85646

Client Sample ID: Method Blank
Prep Type: Step 3
Prep Batch: 85281

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.50	0.13	mg/Kg		04/05/24 08:00	04/15/24 14:17	1
Iron	ND		5.0	2.9	mg/Kg		04/05/24 08:00	04/15/24 14:17	1
Manganese	0.0985	J	0.75	0.027	mg/Kg		04/05/24 08:00	04/15/24 14:17	1

Lab Sample ID: LCS 140-85238/2-B
Matrix: Solid
Analysis Batch: 85646

Client Sample ID: Lab Control Sample
Prep Type: Step 3
Prep Batch: 85281

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	5.00	4.77		mg/Kg		95	80 - 120
Iron	50.0	49.1		mg/Kg		98	80 - 120
Manganese	5.00	4.96		mg/Kg		99	80 - 120

Lab Sample ID: LCSD 140-85238/5-B
Matrix: Solid
Analysis Batch: 85646

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 3
Prep Batch: 85281

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	5.00	4.79		mg/Kg		96	80 - 120	0	30
Iron	50.0	49.5		mg/Kg		99	80 - 120	1	30
Manganese	5.00	5.03		mg/Kg		101	80 - 120	1	30

Lab Sample ID: 140-36007-4 DU
Matrix: Solid
Analysis Batch: 85646

Client Sample ID: SB-275D-(50-53)-20240321
Prep Type: Step 3
Prep Batch: 85281

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Arsenic	0.92		1.46	F3	mg/Kg	☼	45	30
Iron	2100		2090		mg/Kg	☼	0.8	30
Manganese	78	B	64.6		mg/Kg	☼	19	30

Lab Sample ID: MB 140-85288/1-B
Matrix: Solid
Analysis Batch: 85701

Client Sample ID: Method Blank
Prep Type: Step 4
Prep Batch: 85332

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.50	0.22	mg/Kg		04/10/24 08:00	04/16/24 12:45	1
Iron	ND		5.0	2.9	mg/Kg		04/10/24 08:00	04/16/24 12:45	1
Manganese	ND		0.75	0.13	mg/Kg		04/10/24 08:00	04/16/24 12:45	1

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

Lab Sample ID: LCS 140-85288/2-B
Matrix: Solid
Analysis Batch: 85701

Client Sample ID: Lab Control Sample
Prep Type: Step 4
Prep Batch: 85332

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Arsenic			5.00	4.99		mg/Kg		100	80 - 130		
Iron			50.0	49.7		mg/Kg		99	80 - 120		
Manganese			5.00	5.06		mg/Kg		101	80 - 120		

Lab Sample ID: LCSD 140-85288/5-B
Matrix: Solid
Analysis Batch: 85701

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 4
Prep Batch: 85332

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic			5.00	5.09		mg/Kg		102	80 - 130	2	30
Iron			50.0	50.7		mg/Kg		101	80 - 120	2	30
Manganese			5.00	5.19		mg/Kg		104	80 - 120	3	30

Lab Sample ID: 140-36007-4 DU
Matrix: Solid
Analysis Batch: 85701

Client Sample ID: SB-275D-(50-53)-20240321
Prep Type: Step 4
Prep Batch: 85332

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Arsenic	0.41	J		0.442	J	mg/Kg	☼			7	30
Iron	2400			2450		mg/Kg	☼			0.9	30
Manganese	170			181		mg/Kg	☼			5	30

Lab Sample ID: MB 140-85333/1-B ^5
Matrix: Solid
Analysis Batch: 85701

Client Sample ID: Method Blank
Prep Type: Step 5
Prep Batch: 85452

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		7.5	1.9	mg/Kg		04/11/24 08:00	04/16/24 13:49	5
Iron	49.9	J	75	44	mg/Kg		04/11/24 08:00	04/16/24 13:49	5
Manganese	ND		11	1.9	mg/Kg		04/11/24 08:00	04/16/24 13:49	5

Lab Sample ID: LCS 140-85333/2-B ^5
Matrix: Solid
Analysis Batch: 85701

Client Sample ID: Lab Control Sample
Prep Type: Step 5
Prep Batch: 85452

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Arsenic			15.0	12.2		mg/Kg		81	60 - 100		
Iron			150	ND		mg/Kg		2			
Manganese			15.0	4.71	J	mg/Kg		31	1 - 60		

Lab Sample ID: LCSD 140-85333/5-B ^5
Matrix: Solid
Analysis Batch: 85701

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 5
Prep Batch: 85452

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic			15.0	12.9		mg/Kg		86	60 - 100	6	30
Iron			150	ND		mg/Kg		2		38	
Manganese			15.0	4.08	J	mg/Kg		27	1 - 60	14	30

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

Lab Sample ID: 140-36007-4 DU
Matrix: Solid
Analysis Batch: 85701

Client Sample ID: SB-275D-(50-53)-20240321
Prep Type: Step 5
Prep Batch: 85452

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Arsenic	ND			2.36	J	mg/Kg	☼			NC	30
Iron	ND			ND		mg/Kg	☼			NC	
Manganese	14			12.5		mg/Kg	☼			10	30

Lab Sample ID: MB 140-85451/1-A
Matrix: Solid
Analysis Batch: 85701

Client Sample ID: Method Blank
Prep Type: Step 6
Prep Batch: 85451

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.50	0.15	mg/Kg		04/10/24 08:00	04/16/24 14:55	1
Iron	ND		5.0	2.9	mg/Kg		04/10/24 08:00	04/16/24 14:55	1
Manganese	ND		0.75	0.25	mg/Kg		04/10/24 08:00	04/16/24 14:55	1

Lab Sample ID: LCS 140-85451/2-A
Matrix: Solid
Analysis Batch: 85701

Client Sample ID: Lab Control Sample
Prep Type: Step 6
Prep Batch: 85451

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Arsenic			5.00	5.22		mg/Kg		104	80 - 120		
Iron			50.0	51.4		mg/Kg		103	80 - 120		
Manganese			5.00	5.32		mg/Kg		106	80 - 120		

Lab Sample ID: LCSD 140-85451/5-A
Matrix: Solid
Analysis Batch: 85701

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 6
Prep Batch: 85451

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic			5.00	5.17		mg/Kg		103	80 - 120	1	30
Iron			50.0	50.9		mg/Kg		102	80 - 120	1	30
Manganese			5.00	5.23		mg/Kg		105	80 - 120	2	30

Lab Sample ID: 140-36007-4 DU
Matrix: Solid
Analysis Batch: 85701

Client Sample ID: SB-275D-(50-53)-20240321
Prep Type: Step 6
Prep Batch: 85451

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Arsenic	1.5			1.55		mg/Kg	☼			3	30
Iron	2900			3000		mg/Kg	☼			5	30
Manganese	33			30.8		mg/Kg	☼			7	30

Lab Sample ID: MB 140-85512/1-A
Matrix: Solid
Analysis Batch: 85735

Client Sample ID: Method Blank
Prep Type: Step 7
Prep Batch: 85512

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.50	0.30	mg/Kg		04/11/24 08:00	04/17/24 10:35	1
Iron	ND		5.0	4.1	mg/Kg		04/11/24 08:00	04/17/24 10:35	1
Manganese	ND		0.75	0.31	mg/Kg		04/11/24 08:00	04/17/24 10:35	1

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

Lab Sample ID: LCS 140-85512/2-A
Matrix: Solid
Analysis Batch: 85735

Client Sample ID: Lab Control Sample
Prep Type: Step 7
Prep Batch: 85512

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Arsenic			5.00	5.20		mg/Kg		104	80 - 120		
Iron			50.0	51.9		mg/Kg		104	80 - 120		
Manganese			5.00	5.74		mg/Kg		115	80 - 120		

Lab Sample ID: LCSD 140-85512/5-A
Matrix: Solid
Analysis Batch: 85735

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 7
Prep Batch: 85512

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic			5.00	4.82		mg/Kg		96	80 - 120	8	30
Iron			50.0	47.3		mg/Kg		95	80 - 120	9	30
Manganese			5.00	5.40		mg/Kg		108	80 - 120	6	30

Lab Sample ID: 140-36007-4 DU
Matrix: Solid
Analysis Batch: 85735

Client Sample ID: SB-275D-(50-53)-20240321
Prep Type: Step 7
Prep Batch: 85512

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Iron	1400			1410		mg/Kg	☼			4	30
Manganese	19			18.0		mg/Kg	☼			4	30

Lab Sample ID: 140-36007-4 DU
Matrix: Solid
Analysis Batch: 85735

Client Sample ID: SB-275D-(50-53)-20240321
Prep Type: Step 7
Prep Batch: 85512

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Arsenic	1.1			1.06		mg/Kg	☼			4	30

Metals

Prep Batch: 85062

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-36007-1	SB-206D-(45-47)-20240320	Total/NA	Solid	Total	
140-36007-2	SB-206D-(56-57)-20240320	Total/NA	Solid	Total	
140-36007-3	SB-275D-(46-48)-20240321	Total/NA	Solid	Total	
140-36007-4	SB-275D-(50-53)-20240321	Total/NA	Solid	Total	
MB 140-85062/1-A	Method Blank	Total/NA	Solid	Total	
LCS 140-85062/2-A	Lab Control Sample	Total/NA	Solid	Total	
LCSD 140-85062/3-A	Lab Control Sample Dup	Total/NA	Solid	Total	
140-36007-4 DU	SB-275D-(50-53)-20240321	Total/NA	Solid	Total	

SEP Batch: 85063

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-36007-1	SB-206D-(45-47)-20240320	Step 1	Solid	Exchangeable	
140-36007-2	SB-206D-(56-57)-20240320	Step 1	Solid	Exchangeable	
140-36007-3	SB-275D-(46-48)-20240321	Step 1	Solid	Exchangeable	
140-36007-4	SB-275D-(50-53)-20240321	Step 1	Solid	Exchangeable	
MB 140-85063/1-B ^4	Method Blank	Step 1	Solid	Exchangeable	
LCS 140-85063/2-B ^5	Lab Control Sample	Step 1	Solid	Exchangeable	
LCSD 140-85063/3-B ^5	Lab Control Sample Dup	Step 1	Solid	Exchangeable	
140-36007-4 DU	SB-275D-(50-53)-20240321	Step 1	Solid	Exchangeable	

Prep Batch: 85171

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-36007-1	SB-206D-(45-47)-20240320	Step 1	Solid	3010A	85063
140-36007-2	SB-206D-(56-57)-20240320	Step 1	Solid	3010A	85063
140-36007-3	SB-275D-(46-48)-20240321	Step 1	Solid	3010A	85063
140-36007-4	SB-275D-(50-53)-20240321	Step 1	Solid	3010A	85063
MB 140-85063/1-B ^4	Method Blank	Step 1	Solid	3010A	85063
LCS 140-85063/2-B ^5	Lab Control Sample	Step 1	Solid	3010A	85063
LCSD 140-85063/3-B ^5	Lab Control Sample Dup	Step 1	Solid	3010A	85063
140-36007-4 DU	SB-275D-(50-53)-20240321	Step 1	Solid	3010A	85063

SEP Batch: 85197

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-36007-1	SB-206D-(45-47)-20240320	Step 2	Solid	Carbonate	
140-36007-2	SB-206D-(56-57)-20240320	Step 2	Solid	Carbonate	
140-36007-3	SB-275D-(46-48)-20240321	Step 2	Solid	Carbonate	
140-36007-4	SB-275D-(50-53)-20240321	Step 2	Solid	Carbonate	
MB 140-85197/1-B ^3	Method Blank	Step 2	Solid	Carbonate	
LCS 140-85197/2-B ^5	Lab Control Sample	Step 2	Solid	Carbonate	
LCSD 140-85197/5-B ^5	Lab Control Sample Dup	Step 2	Solid	Carbonate	
140-36007-4 DU	SB-275D-(50-53)-20240321	Step 2	Solid	Carbonate	

SEP Batch: 85238

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-36007-1	SB-206D-(45-47)-20240320	Step 3	Solid	Non-Crystalline	
140-36007-2	SB-206D-(56-57)-20240320	Step 3	Solid	Non-Crystalline	
140-36007-3	SB-275D-(46-48)-20240321	Step 3	Solid	Non-Crystalline	
140-36007-4	SB-275D-(50-53)-20240321	Step 3	Solid	Non-Crystalline	
MB 140-85238/1-B	Method Blank	Step 3	Solid	Non-Crystalline	
LCS 140-85238/2-B	Lab Control Sample	Step 3	Solid	Non-Crystalline	
LCSD 140-85238/5-B	Lab Control Sample Dup	Step 3	Solid	Non-Crystalline	

Metals (Continued)

SEP Batch: 85238 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-36007-4 DU	SB-275D-(50-53)-20240321	Step 3	Solid	Non-Crystalline	

Prep Batch: 85280

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-36007-1	SB-206D-(45-47)-20240320	Step 2	Solid	3010A	85197
140-36007-2	SB-206D-(56-57)-20240320	Step 2	Solid	3010A	85197
140-36007-3	SB-275D-(46-48)-20240321	Step 2	Solid	3010A	85197
140-36007-4	SB-275D-(50-53)-20240321	Step 2	Solid	3010A	85197
MB 140-85197/1-B ^3	Method Blank	Step 2	Solid	3010A	85197
LCS 140-85197/2-B ^5	Lab Control Sample	Step 2	Solid	3010A	85197
LCSD 140-85197/5-B ^5	Lab Control Sample Dup	Step 2	Solid	3010A	85197
140-36007-4 DU	SB-275D-(50-53)-20240321	Step 2	Solid	3010A	85197

Prep Batch: 85281

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-36007-1	SB-206D-(45-47)-20240320	Step 3	Solid	3010A	85238
140-36007-2	SB-206D-(56-57)-20240320	Step 3	Solid	3010A	85238
140-36007-3	SB-275D-(46-48)-20240321	Step 3	Solid	3010A	85238
140-36007-4	SB-275D-(50-53)-20240321	Step 3	Solid	3010A	85238
MB 140-85238/1-B	Method Blank	Step 3	Solid	3010A	85238
LCS 140-85238/2-B	Lab Control Sample	Step 3	Solid	3010A	85238
LCSD 140-85238/5-B	Lab Control Sample Dup	Step 3	Solid	3010A	85238
140-36007-4 DU	SB-275D-(50-53)-20240321	Step 3	Solid	3010A	85238

SEP Batch: 85288

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-36007-1	SB-206D-(45-47)-20240320	Step 4	Solid	Metal Hydroxide	
140-36007-2	SB-206D-(56-57)-20240320	Step 4	Solid	Metal Hydroxide	
140-36007-3	SB-275D-(46-48)-20240321	Step 4	Solid	Metal Hydroxide	
140-36007-4	SB-275D-(50-53)-20240321	Step 4	Solid	Metal Hydroxide	
MB 140-85288/1-B	Method Blank	Step 4	Solid	Metal Hydroxide	
LCS 140-85288/2-B	Lab Control Sample	Step 4	Solid	Metal Hydroxide	
LCSD 140-85288/5-B	Lab Control Sample Dup	Step 4	Solid	Metal Hydroxide	
140-36007-4 DU	SB-275D-(50-53)-20240321	Step 4	Solid	Metal Hydroxide	

Prep Batch: 85332

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-36007-1	SB-206D-(45-47)-20240320	Step 4	Solid	3010A	85288
140-36007-2	SB-206D-(56-57)-20240320	Step 4	Solid	3010A	85288
140-36007-3	SB-275D-(46-48)-20240321	Step 4	Solid	3010A	85288
140-36007-4	SB-275D-(50-53)-20240321	Step 4	Solid	3010A	85288
MB 140-85288/1-B	Method Blank	Step 4	Solid	3010A	85288
LCS 140-85288/2-B	Lab Control Sample	Step 4	Solid	3010A	85288
LCSD 140-85288/5-B	Lab Control Sample Dup	Step 4	Solid	3010A	85288
140-36007-4 DU	SB-275D-(50-53)-20240321	Step 4	Solid	3010A	85288

SEP Batch: 85333

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-36007-1	SB-206D-(45-47)-20240320	Step 5	Solid	Organic-Bound	
140-36007-2	SB-206D-(56-57)-20240320	Step 5	Solid	Organic-Bound	
140-36007-3	SB-275D-(46-48)-20240321	Step 5	Solid	Organic-Bound	

Metals (Continued)

SEP Batch: 85333 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-36007-4	SB-275D-(50-53)-20240321	Step 5	Solid	Organic-Bound	
MB 140-85333/1-B ^5	Method Blank	Step 5	Solid	Organic-Bound	
LCS 140-85333/2-B ^5	Lab Control Sample	Step 5	Solid	Organic-Bound	
LCSD 140-85333/5-B ^5	Lab Control Sample Dup	Step 5	Solid	Organic-Bound	
140-36007-4 DU	SB-275D-(50-53)-20240321	Step 5	Solid	Organic-Bound	

SEP Batch: 85451

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-36007-1	SB-206D-(45-47)-20240320	Step 6	Solid	Acid/Sulfide	
140-36007-2	SB-206D-(56-57)-20240320	Step 6	Solid	Acid/Sulfide	
140-36007-3	SB-275D-(46-48)-20240321	Step 6	Solid	Acid/Sulfide	
140-36007-4	SB-275D-(50-53)-20240321	Step 6	Solid	Acid/Sulfide	
MB 140-85451/1-A	Method Blank	Step 6	Solid	Acid/Sulfide	
LCS 140-85451/2-A	Lab Control Sample	Step 6	Solid	Acid/Sulfide	
LCSD 140-85451/5-A	Lab Control Sample Dup	Step 6	Solid	Acid/Sulfide	
140-36007-4 DU	SB-275D-(50-53)-20240321	Step 6	Solid	Acid/Sulfide	

Prep Batch: 85452

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-36007-1	SB-206D-(45-47)-20240320	Step 5	Solid	3010A	85333
140-36007-2	SB-206D-(56-57)-20240320	Step 5	Solid	3010A	85333
140-36007-3	SB-275D-(46-48)-20240321	Step 5	Solid	3010A	85333
140-36007-4	SB-275D-(50-53)-20240321	Step 5	Solid	3010A	85333
MB 140-85333/1-B ^5	Method Blank	Step 5	Solid	3010A	85333
LCS 140-85333/2-B ^5	Lab Control Sample	Step 5	Solid	3010A	85333
LCSD 140-85333/5-B ^5	Lab Control Sample Dup	Step 5	Solid	3010A	85333
140-36007-4 DU	SB-275D-(50-53)-20240321	Step 5	Solid	3010A	85333

Prep Batch: 85512

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-36007-1	SB-206D-(45-47)-20240320	Step 7	Solid	Residual	
140-36007-2	SB-206D-(56-57)-20240320	Step 7	Solid	Residual	
140-36007-3	SB-275D-(46-48)-20240321	Step 7	Solid	Residual	
140-36007-4	SB-275D-(50-53)-20240321	Step 7	Solid	Residual	
MB 140-85512/1-A	Method Blank	Step 7	Solid	Residual	
LCS 140-85512/2-A	Lab Control Sample	Step 7	Solid	Residual	
LCSD 140-85512/5-A	Lab Control Sample Dup	Step 7	Solid	Residual	
140-36007-4 DU	SB-275D-(50-53)-20240321	Step 7	Solid	Residual	

Analysis Batch: 85646

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-36007-1	SB-206D-(45-47)-20240320	Step 1	Solid	6010B SEP	85171
140-36007-1	SB-206D-(45-47)-20240320	Step 2	Solid	6010B SEP	85280
140-36007-1	SB-206D-(45-47)-20240320	Step 3	Solid	6010B SEP	85281
140-36007-2	SB-206D-(56-57)-20240320	Step 1	Solid	6010B SEP	85171
140-36007-2	SB-206D-(56-57)-20240320	Step 2	Solid	6010B SEP	85280
140-36007-2	SB-206D-(56-57)-20240320	Step 3	Solid	6010B SEP	85281
140-36007-3	SB-275D-(46-48)-20240321	Step 1	Solid	6010B SEP	85171
140-36007-3	SB-275D-(46-48)-20240321	Step 2	Solid	6010B SEP	85280
140-36007-3	SB-275D-(46-48)-20240321	Step 3	Solid	6010B SEP	85281
140-36007-4	SB-275D-(50-53)-20240321	Step 1	Solid	6010B SEP	85171

Metals (Continued)

Analysis Batch: 85646 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-36007-4	SB-275D-(50-53)-20240321	Step 2	Solid	6010B SEP	85280
140-36007-4	SB-275D-(50-53)-20240321	Step 3	Solid	6010B SEP	85281
MB 140-85063/1-B ^4	Method Blank	Step 1	Solid	6010B SEP	85171
MB 140-85197/1-B ^3	Method Blank	Step 2	Solid	6010B SEP	85280
MB 140-85238/1-B	Method Blank	Step 3	Solid	6010B SEP	85281
LCS 140-85063/2-B ^5	Lab Control Sample	Step 1	Solid	6010B SEP	85171
LCS 140-85197/2-B ^5	Lab Control Sample	Step 2	Solid	6010B SEP	85280
LCS 140-85238/2-B	Lab Control Sample	Step 3	Solid	6010B SEP	85281
LCSD 140-85063/3-B ^5	Lab Control Sample Dup	Step 1	Solid	6010B SEP	85171
LCSD 140-85197/5-B ^5	Lab Control Sample Dup	Step 2	Solid	6010B SEP	85280
LCSD 140-85238/5-B	Lab Control Sample Dup	Step 3	Solid	6010B SEP	85281
140-36007-4 DU	SB-275D-(50-53)-20240321	Step 1	Solid	6010B SEP	85171
140-36007-4 DU	SB-275D-(50-53)-20240321	Step 2	Solid	6010B SEP	85280
140-36007-4 DU	SB-275D-(50-53)-20240321	Step 3	Solid	6010B SEP	85281

Analysis Batch: 85701

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-36007-1	SB-206D-(45-47)-20240320	Step 4	Solid	6010B SEP	85332
140-36007-1	SB-206D-(45-47)-20240320	Step 5	Solid	6010B SEP	85452
140-36007-1	SB-206D-(45-47)-20240320	Step 6	Solid	6010B SEP	85451
140-36007-2	SB-206D-(56-57)-20240320	Step 4	Solid	6010B SEP	85332
140-36007-2	SB-206D-(56-57)-20240320	Step 5	Solid	6010B SEP	85452
140-36007-2	SB-206D-(56-57)-20240320	Step 6	Solid	6010B SEP	85451
140-36007-3	SB-275D-(46-48)-20240321	Step 4	Solid	6010B SEP	85332
140-36007-3	SB-275D-(46-48)-20240321	Step 5	Solid	6010B SEP	85452
140-36007-3	SB-275D-(46-48)-20240321	Step 6	Solid	6010B SEP	85451
140-36007-4	SB-275D-(50-53)-20240321	Step 4	Solid	6010B SEP	85332
140-36007-4	SB-275D-(50-53)-20240321	Step 5	Solid	6010B SEP	85452
140-36007-4	SB-275D-(50-53)-20240321	Step 6	Solid	6010B SEP	85451
MB 140-85288/1-B	Method Blank	Step 4	Solid	6010B SEP	85332
MB 140-85333/1-B ^5	Method Blank	Step 5	Solid	6010B SEP	85452
MB 140-85451/1-A	Method Blank	Step 6	Solid	6010B SEP	85451
LCS 140-85288/2-B	Lab Control Sample	Step 4	Solid	6010B SEP	85332
LCS 140-85333/2-B ^5	Lab Control Sample	Step 5	Solid	6010B SEP	85452
LCS 140-85451/2-A	Lab Control Sample	Step 6	Solid	6010B SEP	85451
LCSD 140-85288/5-B	Lab Control Sample Dup	Step 4	Solid	6010B SEP	85332
LCSD 140-85333/5-B ^5	Lab Control Sample Dup	Step 5	Solid	6010B SEP	85452
LCSD 140-85451/5-A	Lab Control Sample Dup	Step 6	Solid	6010B SEP	85451
140-36007-4 DU	SB-275D-(50-53)-20240321	Step 4	Solid	6010B SEP	85332
140-36007-4 DU	SB-275D-(50-53)-20240321	Step 5	Solid	6010B SEP	85452
140-36007-4 DU	SB-275D-(50-53)-20240321	Step 6	Solid	6010B SEP	85451

Analysis Batch: 85735

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-36007-1	SB-206D-(45-47)-20240320	Step 7	Solid	6010B SEP	85512
140-36007-1	SB-206D-(45-47)-20240320	Step 7	Solid	6010B SEP	85512
140-36007-1	SB-206D-(45-47)-20240320	Total/NA	Solid	6010B	85062
140-36007-2	SB-206D-(56-57)-20240320	Step 7	Solid	6010B SEP	85512
140-36007-2	SB-206D-(56-57)-20240320	Step 7	Solid	6010B SEP	85512
140-36007-2	SB-206D-(56-57)-20240320	Total/NA	Solid	6010B	85062
140-36007-2	SB-206D-(56-57)-20240320	Total/NA	Solid	6010B	85062

Metals (Continued)

Analysis Batch: 85735 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-36007-3	SB-275D-(46-48)-20240321	Step 7	Solid	6010B SEP	85512
140-36007-3	SB-275D-(46-48)-20240321	Step 7	Solid	6010B SEP	85512
140-36007-3	SB-275D-(46-48)-20240321	Total/NA	Solid	6010B	85062
140-36007-4	SB-275D-(50-53)-20240321	Step 7	Solid	6010B SEP	85512
140-36007-4	SB-275D-(50-53)-20240321	Step 7	Solid	6010B SEP	85512
140-36007-4	SB-275D-(50-53)-20240321	Total/NA	Solid	6010B	85062
140-36007-4	SB-275D-(50-53)-20240321	Total/NA	Solid	6010B	85062
MB 140-85062/1-A	Method Blank	Total/NA	Solid	6010B	85062
MB 140-85512/1-A	Method Blank	Step 7	Solid	6010B SEP	85512
LCS 140-85062/2-A	Lab Control Sample	Total/NA	Solid	6010B	85062
LCS 140-85512/2-A	Lab Control Sample	Step 7	Solid	6010B SEP	85512
LCSD 140-85062/3-A	Lab Control Sample Dup	Total/NA	Solid	6010B	85062
LCSD 140-85512/5-A	Lab Control Sample Dup	Step 7	Solid	6010B SEP	85512
140-36007-4 DU	SB-275D-(50-53)-20240321	Step 7	Solid	6010B SEP	85512
140-36007-4 DU	SB-275D-(50-53)-20240321	Step 7	Solid	6010B SEP	85512
140-36007-4 DU	SB-275D-(50-53)-20240321	Total/NA	Solid	6010B	85062
140-36007-4 DU	SB-275D-(50-53)-20240321	Total/NA	Solid	6010B	85062

Analysis Batch: 85778

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-36007-1	SB-206D-(45-47)-20240320	Sum of Steps 1-7	Solid	6010B SEP	
140-36007-2	SB-206D-(56-57)-20240320	Sum of Steps 1-7	Solid	6010B SEP	
140-36007-3	SB-275D-(46-48)-20240321	Sum of Steps 1-7	Solid	6010B SEP	
140-36007-4	SB-275D-(50-53)-20240321	Sum of Steps 1-7	Solid	6010B SEP	

General Chemistry

Analysis Batch: 84858

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-36007-1	SB-206D-(45-47)-20240320	Total/NA	Solid	Moisture	
140-36007-2	SB-206D-(56-57)-20240320	Total/NA	Solid	Moisture	
140-36007-3	SB-275D-(46-48)-20240321	Total/NA	Solid	Moisture	
140-36007-4	SB-275D-(50-53)-20240321	Total/NA	Solid	Moisture	
140-36007-4 DU	SB-275D-(50-53)-20240321	Total/NA	Solid	Moisture	

Lab Chronicle

Client: Geosyntec Consultants Inc
Project/Site: Vistra - Coffeen

Job ID: 140-36007-1

Client Sample ID: SB-206D-(45-47)-20240320

Lab Sample ID: 140-36007-1

Date Collected: 03/20/24 11:23

Matrix: Solid

Date Received: 03/22/24 09:30

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			85778	04/18/24 12:10	KNC	EET KNX
	Instrument ID: NOEQUIP									
Total/NA	Analysis	Moisture		1			84858	03/25/24 09:34	TMB	EET KNX
	Instrument ID: NOEQUIP									

Client Sample ID: SB-206D-(45-47)-20240320

Lab Sample ID: 140-36007-1

Date Collected: 03/20/24 11:23

Matrix: Solid

Date Received: 03/22/24 09:30

Percent Solids: 88.2

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	85062	04/11/24 08:00	WSK	EET KNX
Total/NA	Analysis	6010B		1			85735	04/17/24 12:50	KNC	EET KNX
	Instrument ID: DUO									
Step 1	SEP	Exchangeable			5.000 g	25 mL	85063	04/02/24 08:00	WSK	EET KNX
Step 1	Prep	3010A			5 mL	50 mL	85171	04/04/24 08:00	WSK	EET KNX
Step 1	Analysis	6010B SEP		4			85646	04/15/24 12:33	KNC	EET KNX
	Instrument ID: DUO									
Step 2	SEP	Carbonate			5.000 g	25 mL	85197	04/03/24 08:45	WSK	EET KNX
Step 2	Prep	3010A			5 mL	50 mL	85280	04/05/24 08:00	WSK	EET KNX
Step 2	Analysis	6010B SEP		3			85646	04/15/24 13:37	KNC	EET KNX
	Instrument ID: DUO									
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	85238	04/04/24 08:30	WSK	EET KNX
Step 3	Prep	3010A			5 mL	50 mL	85281	04/05/24 08:00	WSK	EET KNX
Step 3	Analysis	6010B SEP		1			85646	04/15/24 14:41	KNC	EET KNX
	Instrument ID: DUO									
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	85288	04/05/24 07:30	WSK	EET KNX
Step 4	Prep	3010A			5 mL	50 mL	85332	04/10/24 08:00	WSK	EET KNX
Step 4	Analysis	6010B SEP		1			85701	04/16/24 13:09	KNC	EET KNX
	Instrument ID: DUO									
Step 5	SEP	Organic-Bound			5.000 g	75 mL	85333	04/08/24 08:00	WSK	EET KNX
Step 5	Prep	3010A			5 mL	50 mL	85452	04/11/24 08:00	WSK	EET KNX
Step 5	Analysis	6010B SEP		5			85701	04/16/24 14:15	KNC	EET KNX
	Instrument ID: DUO									
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	85451	04/10/24 08:00	WSK	EET KNX
Step 6	Analysis	6010B SEP		1			85701	04/16/24 15:19	KNC	EET KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	85512	04/11/24 08:00	WSK	EET KNX
Step 7	Analysis	6010B SEP		1			85735	04/17/24 12:10	KNC	EET KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	85512	04/11/24 08:00	WSK	EET KNX
Step 7	Analysis	6010B SEP		2			85735	04/17/24 13:38	KNC	EET KNX
	Instrument ID: DUO									

Lab Chronicle

Client: Geosyntec Consultants Inc
Project/Site: Vistra - Coffeen

Job ID: 140-36007-1

Client Sample ID: SB-206D-(56-57)-20240320

Lab Sample ID: 140-36007-2

Date Collected: 03/20/24 11:46

Matrix: Solid

Date Received: 03/22/24 09:30

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			85778	04/18/24 12:10	KNC	EET KNX
	Instrument ID: NOEQUIP									
Total/NA	Analysis	Moisture		1			84858	03/25/24 09:34	TMB	EET KNX
	Instrument ID: NOEQUIP									

Client Sample ID: SB-206D-(56-57)-20240320

Lab Sample ID: 140-36007-2

Date Collected: 03/20/24 11:46

Matrix: Solid

Date Received: 03/22/24 09:30

Percent Solids: 81.9

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	85062	04/11/24 08:00	WSK	EET KNX
Total/NA	Analysis	6010B		1			85735	04/17/24 12:56	KNC	EET KNX
	Instrument ID: DUO									
Total/NA	Prep	Total			1.000 g	50 mL	85062	04/11/24 08:00	WSK	EET KNX
Total/NA	Analysis	6010B		2			85735	04/17/24 14:08	KNC	EET KNX
	Instrument ID: DUO									
Step 1	SEP	Exchangeable			5.000 g	25 mL	85063	04/02/24 08:00	WSK	EET KNX
Step 1	Prep	3010A			5 mL	50 mL	85171	04/04/24 08:00	WSK	EET KNX
Step 1	Analysis	6010B SEP		4			85646	04/15/24 12:38	KNC	EET KNX
	Instrument ID: DUO									
Step 2	SEP	Carbonate			5.000 g	25 mL	85197	04/03/24 08:45	WSK	EET KNX
Step 2	Prep	3010A			5 mL	50 mL	85280	04/05/24 08:00	WSK	EET KNX
Step 2	Analysis	6010B SEP		3			85646	04/15/24 13:42	KNC	EET KNX
	Instrument ID: DUO									
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	85238	04/04/24 08:30	WSK	EET KNX
Step 3	Prep	3010A			5 mL	50 mL	85281	04/05/24 08:00	WSK	EET KNX
Step 3	Analysis	6010B SEP		1			85646	04/15/24 14:46	KNC	EET KNX
	Instrument ID: DUO									
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	85288	04/05/24 07:30	WSK	EET KNX
Step 4	Prep	3010A			5 mL	50 mL	85332	04/10/24 08:00	WSK	EET KNX
Step 4	Analysis	6010B SEP		1			85701	04/16/24 13:14	KNC	EET KNX
	Instrument ID: DUO									
Step 5	SEP	Organic-Bound			5.000 g	75 mL	85333	04/08/24 08:00	WSK	EET KNX
Step 5	Prep	3010A			5 mL	50 mL	85452	04/11/24 08:00	WSK	EET KNX
Step 5	Analysis	6010B SEP		5			85701	04/16/24 14:20	KNC	EET KNX
	Instrument ID: DUO									
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	85451	04/10/24 08:00	WSK	EET KNX
Step 6	Analysis	6010B SEP		1			85701	04/16/24 15:24	KNC	EET KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	85512	04/11/24 08:00	WSK	EET KNX
Step 7	Analysis	6010B SEP		1			85735	04/17/24 12:15	KNC	EET KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	85512	04/11/24 08:00	WSK	EET KNX
Step 7	Analysis	6010B SEP		2			85735	04/17/24 13:43	KNC	EET KNX
	Instrument ID: DUO									

Lab Chronicle

Client: Geosyntec Consultants Inc
Project/Site: Vistra - Coffeen

Job ID: 140-36007-1

Client Sample ID: SB-275D-(46-48)-20240321

Date Collected: 03/21/24 09:25
Date Received: 03/22/24 09:30

Lab Sample ID: 140-36007-3

Matrix: Solid

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			85778	04/18/24 12:10	KNC	EET KNX
	Instrument ID: NOEQUIP									
Total/NA	Analysis	Moisture		1			84858	03/25/24 09:34	TMB	EET KNX
	Instrument ID: NOEQUIP									

Client Sample ID: SB-275D-(46-48)-20240321

Date Collected: 03/21/24 09:25
Date Received: 03/22/24 09:30

Lab Sample ID: 140-36007-3

Matrix: Solid
Percent Solids: 87.2

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	85062	04/11/24 08:00	WSK	EET KNX
Total/NA	Analysis	6010B		1			85735	04/17/24 13:01	KNC	EET KNX
	Instrument ID: DUO									
Step 1	SEP	Exchangeable			5.000 g	25 mL	85063	04/02/24 08:00	WSK	EET KNX
Step 1	Prep	3010A			5 mL	50 mL	85171	04/04/24 08:00	WSK	EET KNX
Step 1	Analysis	6010B SEP		4			85646	04/15/24 12:43	KNC	EET KNX
	Instrument ID: DUO									
Step 2	SEP	Carbonate			5.000 g	25 mL	85197	04/03/24 08:45	WSK	EET KNX
Step 2	Prep	3010A			5 mL	50 mL	85280	04/05/24 08:00	WSK	EET KNX
Step 2	Analysis	6010B SEP		3			85646	04/15/24 13:47	KNC	EET KNX
	Instrument ID: DUO									
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	85238	04/04/24 08:30	WSK	EET KNX
Step 3	Prep	3010A			5 mL	50 mL	85281	04/05/24 08:00	WSK	EET KNX
Step 3	Analysis	6010B SEP		1			85646	04/15/24 14:51	KNC	EET KNX
	Instrument ID: DUO									
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	85288	04/05/24 07:30	WSK	EET KNX
Step 4	Prep	3010A			5 mL	50 mL	85332	04/10/24 08:00	WSK	EET KNX
Step 4	Analysis	6010B SEP		1			85701	04/16/24 13:19	KNC	EET KNX
	Instrument ID: DUO									
Step 5	SEP	Organic-Bound			5.000 g	75 mL	85333	04/08/24 08:00	WSK	EET KNX
Step 5	Prep	3010A			5 mL	50 mL	85452	04/11/24 08:00	WSK	EET KNX
Step 5	Analysis	6010B SEP		5			85701	04/16/24 14:25	KNC	EET KNX
	Instrument ID: DUO									
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	85451	04/10/24 08:00	WSK	EET KNX
Step 6	Analysis	6010B SEP		1			85701	04/16/24 15:29	KNC	EET KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	85512	04/11/24 08:00	WSK	EET KNX
Step 7	Analysis	6010B SEP		1			85735	04/17/24 12:20	KNC	EET KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	85512	04/11/24 08:00	WSK	EET KNX
Step 7	Analysis	6010B SEP		2			85735	04/17/24 13:48	KNC	EET KNX
	Instrument ID: DUO									

Lab Chronicle

Client: Geosyntec Consultants Inc
Project/Site: Vistra - Coffeen

Job ID: 140-36007-1

Client Sample ID: SB-275D-(50-53)-20240321

Lab Sample ID: 140-36007-4

Date Collected: 03/21/24 09:40

Matrix: Solid

Date Received: 03/22/24 09:30

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			85778	04/18/24 12:10	KNC	EET KNX
	Instrument ID: NOEQUIP									
Total/NA	Analysis	Moisture		1			84858	03/25/24 09:34	TMB	EET KNX
	Instrument ID: NOEQUIP									

Client Sample ID: SB-275D-(50-53)-20240321

Lab Sample ID: 140-36007-4

Date Collected: 03/21/24 09:40

Matrix: Solid

Date Received: 03/22/24 09:30

Percent Solids: 96.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	85062	04/11/24 08:00	WSK	EET KNX
Total/NA	Analysis	6010B		1			85735	04/17/24 13:07	KNC	EET KNX
	Instrument ID: DUO									
Total/NA	Prep	Total			1.000 g	50 mL	85062	04/11/24 08:00	WSK	EET KNX
Total/NA	Analysis	6010B		2			85735	04/17/24 14:13	KNC	EET KNX
	Instrument ID: DUO									
Step 1	SEP	Exchangeable			5.000 g	25 mL	85063	04/02/24 08:00	WSK	EET KNX
Step 1	Prep	3010A			5 mL	50 mL	85171	04/04/24 08:00	WSK	EET KNX
Step 1	Analysis	6010B SEP		4			85646	04/15/24 12:48	KNC	EET KNX
	Instrument ID: DUO									
Step 2	SEP	Carbonate			5.000 g	25 mL	85197	04/03/24 08:45	WSK	EET KNX
Step 2	Prep	3010A			5 mL	50 mL	85280	04/05/24 08:00	WSK	EET KNX
Step 2	Analysis	6010B SEP		3			85646	04/15/24 13:52	KNC	EET KNX
	Instrument ID: DUO									
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	85238	04/04/24 08:30	WSK	EET KNX
Step 3	Prep	3010A			5 mL	50 mL	85281	04/05/24 08:00	WSK	EET KNX
Step 3	Analysis	6010B SEP		1			85646	04/15/24 15:06	KNC	EET KNX
	Instrument ID: DUO									
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	85288	04/05/24 07:30	WSK	EET KNX
Step 4	Prep	3010A			5 mL	50 mL	85332	04/10/24 08:00	WSK	EET KNX
Step 4	Analysis	6010B SEP		1			85701	04/16/24 13:24	KNC	EET KNX
	Instrument ID: DUO									
Step 5	SEP	Organic-Bound			5.000 g	75 mL	85333	04/08/24 08:00	WSK	EET KNX
Step 5	Prep	3010A			5 mL	50 mL	85452	04/11/24 08:00	WSK	EET KNX
Step 5	Analysis	6010B SEP		5			85701	04/16/24 14:30	KNC	EET KNX
	Instrument ID: DUO									
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	85451	04/10/24 08:00	WSK	EET KNX
Step 6	Analysis	6010B SEP		1			85701	04/16/24 15:44	KNC	EET KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	85512	04/11/24 08:00	WSK	EET KNX
Step 7	Analysis	6010B SEP		1			85735	04/17/24 12:25	KNC	EET KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	85512	04/11/24 08:00	WSK	EET KNX
Step 7	Analysis	6010B SEP		2			85735	04/17/24 13:53	KNC	EET KNX
	Instrument ID: DUO									

Lab Chronicle

Client: Geosyntec Consultants Inc
Project/Site: Vistra - Coffeen

Job ID: 140-36007-1

Client Sample ID: Method Blank
Lab Sample ID: MB 140-85062/1-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	85062	04/11/24 08:00	WSK	EET KNX
Total/NA	Analysis	6010B		1			85735	04/17/24 11:36	KNC	EET KNX
	Instrument ID: DUO									

Client Sample ID: Method Blank
Lab Sample ID: MB 140-85063/1-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	85063	04/02/24 08:00	WSK	EET KNX
Step 1	Prep	3010A			5 mL	50 mL	85171	04/04/24 08:00	WSK	EET KNX
Step 1	Analysis	6010B SEP		4			85646	04/15/24 12:08	KNC	EET KNX
	Instrument ID: DUO									

Client Sample ID: Method Blank
Lab Sample ID: MB 140-85197/1-B ^3
Date Collected: N/A
Matrix: Solid
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 2	SEP	Carbonate			5.000 g	25 mL	85197	04/03/24 08:45	WSK	EET KNX
Step 2	Prep	3010A			5 mL	50 mL	85280	04/05/24 08:00	WSK	EET KNX
Step 2	Analysis	6010B SEP		3			85646	04/15/24 13:12	KNC	EET KNX
	Instrument ID: DUO									

Client Sample ID: Method Blank
Lab Sample ID: MB 140-85238/1-B
Date Collected: N/A
Matrix: Solid
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	85238	04/04/24 08:30	WSK	EET KNX
Step 3	Prep	3010A			5 mL	50 mL	85281	04/05/24 08:00	WSK	EET KNX
Step 3	Analysis	6010B SEP		1			85646	04/15/24 14:17	KNC	EET KNX
	Instrument ID: DUO									

Client Sample ID: Method Blank
Lab Sample ID: MB 140-85288/1-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	85288	04/05/24 07:30	WSK	EET KNX
Step 4	Prep	3010A			5 mL	50 mL	85332	04/10/24 08:00	WSK	EET KNX
Step 4	Analysis	6010B SEP		1			85701	04/16/24 12:45	KNC	EET KNX
	Instrument ID: DUO									

Lab Chronicle

Client: Geosyntec Consultants Inc
Project/Site: Vistra - Coffeen

Job ID: 140-36007-1

Client Sample ID: Method Blank
Lab Sample ID: MB 140-85333/1-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	85333	04/08/24 08:00	WSK	EET KNX
Step 5	Prep	3010A			5 mL	50 mL	85452	04/11/24 08:00	WSK	EET KNX
Step 5	Analysis	6010B SEP		5			85701	04/16/24 13:49	KNC	EET KNX
	Instrument ID: DUO									

Client Sample ID: Method Blank
Lab Sample ID: MB 140-85451/1-A

Date Collected: N/A
Matrix: Solid
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	85451	04/10/24 08:00	WSK	EET KNX
Step 6	Analysis	6010B SEP		1			85701	04/16/24 14:55	KNC	EET KNX
	Instrument ID: DUO									

Client Sample ID: Method Blank
Lab Sample ID: MB 140-85512/1-A

Date Collected: N/A
Matrix: Solid
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 7	Prep	Residual			1.000 g	50 mL	85512	04/11/24 08:00	WSK	EET KNX
Step 7	Analysis	6010B SEP		1			85735	04/17/24 10:35	KNC	EET KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 140-85062/2-A

Date Collected: N/A
Matrix: Solid
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	85062	04/11/24 08:00	WSK	EET KNX
Total/NA	Analysis	6010B		1			85735	04/17/24 11:41	KNC	EET KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 140-85063/2-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	85063	04/02/24 08:00	WSK	EET KNX
Step 1	Prep	3010A			5 mL	50 mL	85171	04/04/24 08:00	WSK	EET KNX
Step 1	Analysis	6010B SEP		5			85646	04/15/24 12:13	KNC	EET KNX
	Instrument ID: DUO									

Lab Chronicle

Client: Geosyntec Consultants Inc
Project/Site: Vistra - Coffeen

Job ID: 140-36007-1

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 140-85197/2-B ^5
Date Collected: N/A
Matrix: Solid
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 2	SEP	Carbonate			5.000 g	25 mL	85197	04/03/24 08:45	WSK	EET KNX
Step 2	Prep	3010A			5 mL	50 mL	85280	04/05/24 08:00	WSK	EET KNX
Step 2	Analysis	6010B SEP		5			85646	04/15/24 13:17	KNC	EET KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 140-85238/2-B
Date Collected: N/A
Matrix: Solid
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	85238	04/04/24 08:30	WSK	EET KNX
Step 3	Prep	3010A			5 mL	50 mL	85281	04/05/24 08:00	WSK	EET KNX
Step 3	Analysis	6010B SEP		1			85646	04/15/24 14:22	KNC	EET KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 140-85288/2-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	85288	04/05/24 07:30	WSK	EET KNX
Step 4	Prep	3010A			5 mL	50 mL	85332	04/10/24 08:00	WSK	EET KNX
Step 4	Analysis	6010B SEP		1			85701	04/16/24 12:50	KNC	EET KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 140-85333/2-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	85333	04/08/24 08:00	WSK	EET KNX
Step 5	Prep	3010A			5 mL	50 mL	85452	04/11/24 08:00	WSK	EET KNX
Step 5	Analysis	6010B SEP		5			85701	04/16/24 13:55	KNC	EET KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 140-85451/2-A
Date Collected: N/A
Matrix: Solid
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	85451	04/10/24 08:00	WSK	EET KNX
Step 6	Analysis	6010B SEP		1			85701	04/16/24 15:00	KNC	EET KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 140-85512/2-A
Date Collected: N/A
Matrix: Solid
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 7	Prep	Residual			1.000 g	50 mL	85512	04/11/24 08:00	WSK	EET KNX
Step 7	Analysis	6010B SEP		1			85735	04/17/24 10:40	KNC	EET KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample Dup
Lab Sample ID: LCSD 140-85062/3-A
Date Collected: N/A
Matrix: Solid
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	85062	04/11/24 08:00	WSK	EET KNX
Total/NA	Analysis	6010B		1			85735	04/17/24 11:45	KNC	EET KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample Dup
Lab Sample ID: LCSD 140-85063/3-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	85063	04/02/24 08:00	WSK	EET KNX
Step 1	Prep	3010A			5 mL	50 mL	85171	04/04/24 08:00	WSK	EET KNX
Step 1	Analysis	6010B SEP		5			85646	04/15/24 12:18	KNC	EET KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample Dup
Lab Sample ID: LCSD 140-85197/5-B ^5
Date Collected: N/A
Matrix: Solid
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 2	SEP	Carbonate			5.000 g	25 mL	85197	04/03/24 08:45	WSK	EET KNX
Step 2	Prep	3010A			5 mL	50 mL	85280	04/05/24 08:00	WSK	EET KNX
Step 2	Analysis	6010B SEP		5			85646	04/15/24 13:22	KNC	EET KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample Dup
Lab Sample ID: LCSD 140-85238/5-B
Date Collected: N/A
Matrix: Solid
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	85238	04/04/24 08:30	WSK	EET KNX
Step 3	Prep	3010A			5 mL	50 mL	85281	04/05/24 08:00	WSK	EET KNX
Step 3	Analysis	6010B SEP		1			85646	04/15/24 14:27	KNC	EET KNX
	Instrument ID: DUO									

Lab Chronicle

Client: Geosyntec Consultants Inc
Project/Site: Vistra - Coffeen

Job ID: 140-36007-1

Client Sample ID: Lab Control Sample Dup
Lab Sample ID: LCSD 140-85288/5-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	85288	04/05/24 07:30	WSK	EET KNX
Step 4	Prep	3010A			5 mL	50 mL	85332	04/10/24 08:00	WSK	EET KNX
Step 4	Analysis	6010B SEP		1			85701	04/16/24 12:55	KNC	EET KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample Dup
Lab Sample ID: LCSD 140-85333/5-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	85333	04/08/24 08:00	WSK	EET KNX
Step 5	Prep	3010A			5 mL	50 mL	85452	04/11/24 08:00	WSK	EET KNX
Step 5	Analysis	6010B SEP		5			85701	04/16/24 14:00	KNC	EET KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample Dup
Lab Sample ID: LCSD 140-85451/5-A
Date Collected: N/A
Matrix: Solid
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	85451	04/10/24 08:00	WSK	EET KNX
Step 6	Analysis	6010B SEP		1			85701	04/16/24 15:05	KNC	EET KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample Dup
Lab Sample ID: LCSD 140-85512/5-A
Date Collected: N/A
Matrix: Solid
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 7	Prep	Residual			1.000 g	50 mL	85512	04/11/24 08:00	WSK	EET KNX
Step 7	Analysis	6010B SEP		1			85735	04/17/24 10:45	KNC	EET KNX
	Instrument ID: DUO									

Client Sample ID: SB-275D-(50-53)-20240321
Lab Sample ID: 140-36007-4 DU
Date Collected: 03/21/24 09:40
Matrix: Solid
Date Received: 03/22/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			84858	03/25/24 09:34	TMB	EET KNX
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: Geosyntec Consultants Inc
Project/Site: Vistra - Coffeen

Job ID: 140-36007-1

Client Sample ID: SB-275D-(50-53)-20240321
Date Collected: 03/21/24 09:40
Date Received: 03/22/24 09:30

Lab Sample ID: 140-36007-4 DU
Matrix: Solid
Percent Solids: 96.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	85062	04/11/24 08:00	WSK	EET KNX
Total/NA	Analysis	6010B		1			85735	04/17/24 13:12	KNC	EET KNX
	Instrument ID: DUO									
Total/NA	Prep	Total			1.000 g	50 mL	85062	04/11/24 08:00	WSK	EET KNX
Total/NA	Analysis	6010B		2			85735	04/17/24 14:18	KNC	EET KNX
	Instrument ID: DUO									
Step 1	SEP	Exchangeable			5.000 g	25 mL	85063	04/02/24 08:00	WSK	EET KNX
Step 1	Prep	3010A			5 mL	50 mL	85171	04/04/24 08:00	WSK	EET KNX
Step 1	Analysis	6010B SEP		4			85646	04/15/24 13:07	KNC	EET KNX
	Instrument ID: DUO									
Step 2	SEP	Carbonate			5.000 g	25 mL	85197	04/03/24 08:45	WSK	EET KNX
Step 2	Prep	3010A			5 mL	50 mL	85280	04/05/24 08:00	WSK	EET KNX
Step 2	Analysis	6010B SEP		3			85646	04/15/24 14:07	KNC	EET KNX
	Instrument ID: DUO									
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	85238	04/04/24 08:30	WSK	EET KNX
Step 3	Prep	3010A			5 mL	50 mL	85281	04/05/24 08:00	WSK	EET KNX
Step 3	Analysis	6010B SEP		1			85646	04/15/24 15:11	KNC	EET KNX
	Instrument ID: DUO									
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	85288	04/05/24 07:30	WSK	EET KNX
Step 4	Prep	3010A			5 mL	50 mL	85332	04/10/24 08:00	WSK	EET KNX
Step 4	Analysis	6010B SEP		1			85701	04/16/24 13:44	KNC	EET KNX
	Instrument ID: DUO									
Step 5	SEP	Organic-Bound			5.000 g	75 mL	85333	04/08/24 08:00	WSK	EET KNX
Step 5	Prep	3010A			5 mL	50 mL	85452	04/11/24 08:00	WSK	EET KNX
Step 5	Analysis	6010B SEP		5			85701	04/16/24 14:45	KNC	EET KNX
	Instrument ID: DUO									
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	85451	04/10/24 08:00	WSK	EET KNX
Step 6	Analysis	6010B SEP		1			85701	04/16/24 15:49	KNC	EET KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	85512	04/11/24 08:00	WSK	EET KNX
Step 7	Analysis	6010B SEP		1			85735	04/17/24 12:31	KNC	EET KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	85512	04/11/24 08:00	WSK	EET KNX
Step 7	Analysis	6010B SEP		2			85735	04/17/24 13:58	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: Geosyntec Consultants Inc
Project/Site: Vistra - Coffeen

Job ID: 140-36007-1

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	02-13-25
ANAB	Dept. of Energy	L2311.01	02-13-25
ANAB	ISO/IEC 17025	L2311	02-13-25
Arkansas DEQ	State	88-0688	06-16-24
Colorado	State	TN00009	02-28-25
Connecticut	State	PH-0223	10-01-26
Florida	NELAP	E87177	06-30-24
Georgia (DW)	State	906	07-27-25
Hawaii	State	NA	07-27-24
Kansas	NELAP	E-10349	10-31-24
Kentucky (DW)	State	90101	12-31-24
Louisiana (All)	NELAP	83979	06-30-24
Louisiana (DW)	State	LA019	12-31-24
Maryland	State	277	03-31-25
Michigan	State	9933	07-27-25
Nevada	State	TN00009	07-31-24
New Hampshire	NELAP	2999	01-17-25
New Jersey	NELAP	TN001	07-01-24
New York	NELAP	10781	03-31-25
North Carolina (DW)	State	21705	07-31-24
North Carolina (WW/SW)	State	64	12-31-24
Oklahoma	State	9415	08-31-24
Oregon	NELAP	TNI0189	01-01-25
Pennsylvania	NELAP	68-00576	12-31-24
Tennessee	State	02014	07-27-25
Texas	NELAP	T104704380-23-18	08-31-24
US Fish & Wildlife	US Federal Programs	058448	07-31-24
USDA	US Federal Programs	525-22-279-18762	10-06-25
Utah	NELAP	TN00009	07-31-24
Virginia	NELAP	460176	09-14-24
Washington	State	C593	01-19-25
West Virginia (DW)	State	9955C	12-31-24
West Virginia DEP	State	345	04-30-24
Wisconsin	State	998044300	08-31-24

Method Summary

Client: Geosyntec Consultants Inc
Project/Site: Vistra - Coffeen

Job ID: 140-36007-1

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

Eurofins TestAmerica, Knoxville
5815 Middlebrook Pike

Knoxville, TN 37921-5947
phone 865.291.3000 fax 865.584.4315

Chain of Custody Record

eurofins | Environment Testing TestAmerica

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☑ Other:

TestAmerica Laboratories, Inc. d/b/a Eurofins TestAmerica

Client Contact	Project Manager: Allison Kreinberg	Site Contact: NA	Date:	COC No:
Geosyntec Consultants, Inc.	Tel/Fax:	Lab Contact: Ryan Henry	Carrier:	1 of 1 COCs
941 Chatham Lane, Suite 103	Analysis Turnaround Time			Sampler:
Columbus, OH 43221	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
(614) 468-0421 Phone	TAT if different from Below _____			Walk-in Client:
	☑ 2 weeks			Lab Sampling:
Project Name: Vistra	☐ 1 week			
Site: Coffeen	☐ 2 days			Job / SDG No.:
PO# Glupsu-18	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	6010B SEP (Ar, Fe, Mn)	Sample Specific Notes:
SB-206D-(45-47)-20240320	3/20/2024	1123	G	Solid	1	N	N	X	
SB-206D-(56-57)-20240320	3/20/2024	1146	G	Solid	1	N	N	X	
SB-275D-(46-48)-20240321	3/21/2024	0925	G	Solid	1	N	N	X	
SB-275D-(50-53)-20240321	3/21/2024	0940	G	Solid	1	N	N	X	
NO CUSTODY SEALS									
RECEIVED AMBIENT AT 18.0/(T)18.2'C									
BKD 3.22.24									
1 BOX FEDEX#271247035 0358 PD									

140-36007 Chain of Custody

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

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? 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

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

☐ Return to Client ☒ Disposal by Lab ☑ Archive for _____ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:		Cooler Temp. (°C): Obs'd: _____ Corr'd: _____ Therm ID No.: _____		
Relinquished by:	Company: Geosyntec	Date/Time: 3/21/24 1600	Received by:	Company: EVKNX	Date/Time: 3-22-24 09:30
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Form No. CA-C-WI-002, Rev. 4.21, dated 4/4/2019

4/19/2024

EUROFINS KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST Log In Number:

Review Items	Yes	No	NA	If No, what was the problem?
1. Are the shipping containers intact?	✓			☐ Containers, Broken
2. Were ambient air containers received intact?			✓	☐ Checked in lab
3. The coolers/containers custody seal if present, is it intact?			✓	☐ Yes ☐ NA
4. Is the cooler temperature within limits? (> freezing temp. of water to 6 °C, VOST: 10°C) Thermometer ID : 5676 Correction factor: +0.2°C			✓	☐ Cooler Out of Temp, Client Contacted, Proceed/Cancel ☐ Cooler Out of Temp, Same Day Receipt
5. Were all of the sample containers received intact?	✓			☐ Containers, Broken
6. Were samples received in appropriate containers?	✓			☐ Containers, Improper; Client Contacted; Proceed/Cancel
7. Do sample container labels match COC? (IDs, Dates, Times)	✓			☐ COC & Samples Do Not Match ☑ COC Incorrect/Incomplete ☐ COC Not Received
8. Were all of the samples listed on the COC received?	✓			☐ Sample Received, Not on COC ☐ Sample on COC, Not Received
9. Is the date/time of sample collection noted?	✓			☐ COC; No Date/Time; Client Contacted
10. Was the sampler identified on the COC?		✓		☑ Sampler Not Listed on COC
11. Is the client and project name/# identified?	✓			☐ COC Incorrect/Incomplete
12. Are tests/parameters listed for each sample?	✓			☐ COC No tests on COC
13. Is the matrix of the samples noted?	✓			☐ COC Incorrect/Incomplete
14. Was COC relinquished? (Signed/Dated/Timed)	✓			☐ COC Incorrect/Incomplete
15. Were samples received within holding time?	✓			☐ Holding Time - Receipt
16. Were samples received with correct chemical preservative (excluding Encore)?			✓	☐ pH Adjusted, pH Included (See box 16A) ☐ Incorrect Preservative
17. Were VOA samples received without headspace?			✓	☐ Headspace (VOA only)
18. Did you check for residual chlorine, if necessary? (e.g. 1613B, 1668) Chlorine test strip lot number:			✓	☐ Residual Chlorine
19. For 1613B water samples is pH<9?			✓	☐ If no, notify lab to adjust
20. For rad samples was sample activity info. Provided?			✓	☐ Project missing info

Comments/Actions Taken

10

1, COC LIST ANALYSIS 6010B SEP (AS, FE, MN) SHOULD BE 6010B SEP (AS, FE, MN)

Labeling Verified by: **Date:**

pH test strip lot number:

	Box 16A: pH Preservation	Box 18A: Residual Chlorine
Preservative:		
Lot Number:		
Exp Date:		
Analyst:		
Date:		
Time:		

Project #: 14006199 PM Instructions:

Sample Receiving Associate: Date: 3.22.24

QA026R33.doc, 11/10/23

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, Knoxville
5815 Middlebrook Pike
Knoxville, TN 37921
Tel: (865)291-3000

Laboratory Job ID: 140-24093-1
Client Project/Site: GLP8029 Coffeen, IL

For:
Geosyntec Consultants, Inc.
941 Chatham Lane
Suite 103
Columbus, Ohio 43221

Attn: Allison Kreinberg

Ryan Henry

Authorized for release by:
8/31/2021 11:31:09 AM

Ryan Henry, Project Manager I
(865)291-3000
williamr.henry@eurofinset.com

Table of Contents

Definitions/Glossary

Client: Geosyntec Consultants, Inc.
Project/Site: GLP8029 Coffeen, IL

Job ID: 140-24093-1

Qualifiers

Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
F3	Duplicate RPD exceeds the control limit
F5	Duplicate RPD exceeds limit, and one or both sample results are less than 5 times RL, and the absolute difference between results is < the upper reporting limits for both.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
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

Job ID: 140-24093-1

Laboratory: Eurofins TestAmerica, Knoxville

Narrative

Job Narrative
140-24093-1

Receipt
The samples were received on 8/5/2021 at 9:15am and arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 3.8º C.

Metals
7 Step Sequential Extraction Procedure

These soil samples were prepared and analyzed using Eurofins TestAmerica Knoxville standard operating procedure KNOX-MT-0008, "7 Step Sequential Extraction Procedure". SW-846 Method 6010B as incorporated in Eurofins TestAmerica Knoxville standard operating procedure KNOX-MT-0007 was used to perform the final instrument analyses.

An aliquot of each sample was sequentially extracted using the steps listed below:

· Step 1 - Exchangeable Fraction: A 5 gram aliquot of sample was extracted with 25 mL of 1M magnesium sulfate (MgSO4), centrifuged and filtered. 5 mL of the resulting leachate was digested using method 3010A and analyzed by method 6010B. Results are reported in mg/kg on a dry weight basis.
· Step 2 - Carbonate Fraction: The sample residue from step 1 was extracted with 25 mL of 1M sodium acetate/acetic acid (NaOAc/HOAc) at pH 5, centrifuged and filtered. 5 mL of the resulting leachate was digested using method 3010A and analyzed by method 6010B. Results are reported in mg/kg on a dry weight basis.
· Step 3 - Non-crystalline Materials Fraction: The sample residue from step 2 was extracted with 25 mL of 0.2M ammonium oxalate (pH 3), centrifuged and filtered. 5 mL of the resulting leachate was digested using method 3010A and analyzed by method 6010B. Results are reported in mg/kg on a dry weight basis.
· Step 4 - Metal Hydroxide Fraction: The sample residue from step 3 was extracted with 25 mL of 1M hydroxylamine hydrochloride solution in 25% v/v acetic acid, centrifuged and filtered. 5 mL of the resulting leachate was digested using method 3010A and analyzed by method 6010B. Results are reported in mg/kg on a dry weight basis.
· Step 5 - Organic-bound Fraction: The sample residue from step 4 was extracted three times with 25 mL of 5% sodium hypochlorite (NaClO) at pH 9.5, centrifuged and filtered. The resulting leachates were combined and 5 mL were digested using method 3010A and analyzed by method 6010B. Results are reported in mg/kg on a dry weight basis.
· Step 6 - Acid/Sulfide Fraction: The sample residue from step 5 was extracted with 25 mL of a 3:1:2 v/v solution of HCl-HNO3-H2O, centrifuged and filtered. 5 mL of the resulting leachate was diluted to 50 mL with reagent water and analyzed by method 6010B. Results are reported in mg/kg on a dry weight basis.
· Step 7 - Residual Fraction: A 1.0 g aliquot of the sample residue from step 6 was digested using HF, HNO3, HCl and H3BO3. The digestate was analyzed by ICP using method 6010B. Results are reported in mg/kg on a dry weight basis.

In addition, a 1.0 g aliquot of the original sample was digested using HF, HNO3, HCl and H3BO3. The digestate was analyzed by ICP using method 6010B. Total metal results are reported in mg/kg on a dry weight basis.

Results were calculated using the following equation:

Result, µg/g or mg/Kg, dry weight = (C × V × V1 × D) / (W × S × V2)

Where:
C = Concentration from instrument readout, µg/mL
V = Final volume of digestate, mL
D = Instrument dilution factor
V1 = Total volume of leachate, mL
V2 = Volume of leachate digested, mL
W = Wet weight of sample, g
S = Percent solids/100

A method blank, laboratory control sample and laboratory control sample duplicate were prepared and analyzed with each SEP step in

Job ID: 140-24093-1 (Continued)

Laboratory: Eurofins TestAmerica, Knoxville (Continued)

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 sample duplicate (DUP) precision for preparation batch 140-52435 and analytical batch 140-53170 was outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample / laboratory control sample duplicate (LCS/LCSD) precision was within acceptance limits.

Method 6010B: The serial dilution performed for the following sample associated with batch 140-53170 was outside control limits: (140-24093-A-3-B SD ^5)

Methods 6010B, 6010B SEP: The following samples were diluted due to the presence of silicon which interferes with Arsenic: SB316 (140-24093-3), SB200 (140-24093-5), SB215 (140-24093-6), (140-24093-A-3-AA DU) and (140-24093-A-3-C DU). Elevated reporting limits (RLs) are provided.

Method 6010B SEP: The sample duplicate (DUP) precision for preparation batch 140-52520 and 140-52569 and analytical batch 140-52929 was outside control limits. Sample non-homogeneity is suspected.

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

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

Sample Summary

Client: Geosyntec Consultants, Inc.
Project/Site: GLP8029 Coffeen, IL

Job ID: 140-24093-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
140-24093-1	SB311	Solid	08/03/21 13:00	08/05/21 09:15
140-24093-2	SB306	Solid	08/03/21 10:00	08/05/21 09:15
140-24093-3	SB316	Solid	08/03/21 09:00	08/05/21 09:15
140-24093-4	SB313	Solid	08/03/21 08:00	08/05/21 09:15
140-24093-5	SB200	Solid	08/04/21 10:00	08/05/21 09:15
140-24093-6	SB215	Solid	08/04/21 11:00	08/05/21 09:15

Client Sample ID: SB311
Date Collected: 08/03/21 13:00
Date Received: 08/05/21 09:15

Lab Sample ID: 140-24093-1
Matrix: Solid
Percent Solids: 84.9

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	ND		12	0.21	mg/Kg	☼	08/09/21 08:00	08/19/21 14:45	4
Lithium	ND		12	0.71	mg/Kg	☼	08/09/21 08:00	08/19/21 14:45	4
Molybdenum	ND		9.4	0.39	mg/Kg	☼	08/09/21 08:00	08/19/21 14:45	4
Boron	ND		47	47	mg/Kg	☼	08/09/21 08:00	08/19/21 14:45	4

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		35	35	mg/Kg	☼	08/09/21 08:00	08/19/21 15:48	3
Cobalt	ND		8.8	0.22	mg/Kg	☼	08/09/21 08:00	08/19/21 15:48	3
Lithium	ND		8.8	0.53	mg/Kg	☼	08/09/21 08:00	08/19/21 15:48	3
Molybdenum	ND		7.1	0.29	mg/Kg	☼	08/09/21 08:00	08/19/21 15:48	3

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		12	12	mg/Kg	☼	08/10/21 08:00	08/19/21 16:52	1
Cobalt	**1.2**	**J**	2.9	0.053	mg/Kg	☼	08/10/21 08:00	08/19/21 16:52	1
Lithium	ND		2.9	0.18	mg/Kg	☼	08/10/21 08:00	08/19/21 16:52	1
Molybdenum	**0.12**	**J**	2.4	0.097	mg/Kg	☼	08/10/21 08:00	08/19/21 16:52	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		12	12	mg/Kg	☼	08/11/21 08:00	08/19/21 17:55	1
Cobalt	**1.1**	**J**	2.9	0.062	mg/Kg	☼	08/11/21 08:00	08/19/21 17:55	1
Lithium	**0.55**	**J**	2.9	0.18	mg/Kg	☼	08/11/21 08:00	08/19/21 17:55	1
Molybdenum	**0.23**	**J**	2.4	0.097	mg/Kg	☼	08/11/21 08:00	08/19/21 17:55	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		180	180	mg/Kg	☼	08/13/21 08:00	08/19/21 19:13	5
Cobalt	ND		44	0.71	mg/Kg	☼	08/13/21 08:00	08/19/21 19:13	5
Lithium	**6.5**	**J B**	44	2.6	mg/Kg	☼	08/13/21 08:00	08/19/21 19:13	5
Molybdenum	ND		35	1.5	mg/Kg	☼	08/13/21 08:00	08/19/21 19:13	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		12	12	mg/Kg	☼	08/13/21 08:00	08/19/21 20:17	1
Cobalt	**1.5**	**J**	2.9	0.054	mg/Kg	☼	08/13/21 08:00	08/19/21 20:17	1
Lithium	**3.2**		2.9	0.18	mg/Kg	☼	08/13/21 08:00	08/19/21 20:17	1
Molybdenum	ND		2.4	0.12	mg/Kg	☼	08/13/21 08:00	08/19/21 20:17	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	**0.57**	**J**	2.9	0.031	mg/Kg	☼	08/17/21 08:10	08/26/21 15:26	1
Lithium	**5.9**		2.9	0.18	mg/Kg	☼	08/17/21 08:10	08/26/21 15:26	1
Molybdenum	ND		2.4	0.097	mg/Kg	☼	08/17/21 08:10	08/26/21 15:26	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	**4.3**		2.5	0.023	mg/Kg			08/30/21 13:07	1
Molybdenum	**0.35**	**J**	2.0	0.082	mg/Kg			08/30/21 13:07	1
Lithium	**16**		2.5	0.15	mg/Kg			08/30/21 13:07	1

Client Sample Results

Client: Geosyntec Consultants, Inc.
Project/Site: GLP8029 Coffeen, IL

Job ID: 140-24093-1

Client Sample ID: SB311

Date Collected: 08/03/21 13:00
Date Received: 08/05/21 09:15

Lab Sample ID: 140-24093-1

Matrix: Solid
Percent Solids: 84.9

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	4.8		2.9	0.031	mg/Kg	☼	08/06/21 08:00	08/26/21 16:15	1
Lithium	11		2.9	0.18	mg/Kg	☼	08/06/21 08:00	08/26/21 16:15	1
Molybdenum	0.53	J	2.4	0.097	mg/Kg	☼	08/06/21 08:00	08/26/21 16:15	1

Client: Geosyntec Consultants, Inc.
Project/Site: GLP8029 Coffeen, IL

Job ID: 140-24093-1

Client Sample ID: SB306
Date Collected: 08/03/21 10:00
Date Received: 08/05/21 09:15

Lab Sample ID: 140-24093-2
Matrix: Solid
Percent Solids: 86.8

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	ND		12	0.21	mg/Kg	☼	08/09/21 08:00	08/19/21 14:49	4
Lithium	ND		12	0.69	mg/Kg	☼	08/09/21 08:00	08/19/21 14:49	4
Molybdenum	ND		9.2	0.38	mg/Kg	☼	08/09/21 08:00	08/19/21 14:49	4
Boron	ND		46	46	mg/Kg	☼	08/09/21 08:00	08/19/21 14:49	4

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		35	35	mg/Kg	☼	08/09/21 08:00	08/19/21 15:53	3
Cobalt	ND		8.6	0.22	mg/Kg	☼	08/09/21 08:00	08/19/21 15:53	3
Lithium	ND		8.6	0.52	mg/Kg	☼	08/09/21 08:00	08/19/21 15:53	3
Molybdenum	ND		6.9	0.28	mg/Kg	☼	08/09/21 08:00	08/19/21 15:53	3

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		12	12	mg/Kg	☼	08/10/21 08:00	08/19/21 16:57	1
Cobalt	**0.51**	**J**	2.9	0.052	mg/Kg	☼	08/10/21 08:00	08/19/21 16:57	1
Lithium	ND		2.9	0.17	mg/Kg	☼	08/10/21 08:00	08/19/21 16:57	1
Molybdenum	**0.096**	**J**	2.3	0.094	mg/Kg	☼	08/10/21 08:00	08/19/21 16:57	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		12	12	mg/Kg	☼	08/11/21 08:00	08/19/21 18:00	1
Cobalt	**1.5**	**J**	2.9	0.061	mg/Kg	☼	08/11/21 08:00	08/19/21 18:00	1
Lithium	**1.7**	**J**	2.9	0.17	mg/Kg	☼	08/11/21 08:00	08/19/21 18:00	1
Molybdenum	**0.28**	**J**	2.3	0.094	mg/Kg	☼	08/11/21 08:00	08/19/21 18:00	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		170	170	mg/Kg	☼	08/13/21 08:00	08/19/21 19:18	5
Cobalt	ND		43	0.69	mg/Kg	☼	08/13/21 08:00	08/19/21 19:18	5
Lithium	**6.5**	**J B**	43	2.5	mg/Kg	☼	08/13/21 08:00	08/19/21 19:18	5
Molybdenum	ND		35	1.4	mg/Kg	☼	08/13/21 08:00	08/19/21 19:18	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		12	12	mg/Kg	☼	08/13/21 08:00	08/19/21 20:22	1
Cobalt	**0.88**	**J**	2.9	0.053	mg/Kg	☼	08/13/21 08:00	08/19/21 20:22	1
Lithium	**2.9**		2.9	0.17	mg/Kg	☼	08/13/21 08:00	08/19/21 20:22	1
Molybdenum	**0.14**	**J**	2.3	0.11	mg/Kg	☼	08/13/21 08:00	08/19/21 20:22	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	**0.78**	**J**	2.9	0.030	mg/Kg	☼	08/17/21 08:10	08/26/21 15:31	1
Lithium	**7.9**		2.9	0.17	mg/Kg	☼	08/17/21 08:10	08/26/21 15:31	1
Molybdenum	**0.10**	**J**	2.3	0.094	mg/Kg	☼	08/17/21 08:10	08/26/21 15:31	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	**3.6**		2.5	0.023	mg/Kg			08/30/21 13:07	1
Molybdenum	**0.62**	**J**	2.0	0.082	mg/Kg			08/30/21 13:07	1
Lithium	**19**		2.5	0.15	mg/Kg			08/30/21 13:07	1

Client: Geosyntec Consultants, Inc.
Project/Site: GLP8029 Coffeen, IL

Job ID: 140-24093-1

Client Sample ID: SB306
Date Collected: 08/03/21 10:00
Date Received: 08/05/21 09:15

Lab Sample ID: 140-24093-2
Matrix: Solid
Percent Solids: 86.8

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	3.1		2.9	0.030	mg/Kg	☼	08/06/21 08:00	08/26/21 16:20	1
Lithium	12		2.9	0.17	mg/Kg	☼	08/06/21 08:00	08/26/21 16:20	1
Molybdenum	0.39	J	2.3	0.094	mg/Kg	☼	08/06/21 08:00	08/26/21 16:20	1

Client: Geosyntec Consultants, Inc.
Project/Site: GLP8029 Coffeen, IL

Job ID: 140-24093-1

Client Sample ID: SB316
Date Collected: 08/03/21 09:00
Date Received: 08/05/21 09:15

Lab Sample ID: 140-24093-3
Matrix: Solid
Percent Solids: 79.3

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	ND		13	0.23	mg/Kg	☼	08/09/21 08:00	08/19/21 14:54	4
Lithium	ND		13	0.76	mg/Kg	☼	08/09/21 08:00	08/19/21 14:54	4
Molybdenum	ND		10	0.41	mg/Kg	☼	08/09/21 08:00	08/19/21 14:54	4
Boron	ND		50	50	mg/Kg	☼	08/09/21 08:00	08/19/21 14:54	4

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		38	38	mg/Kg	☼	08/09/21 08:00	08/19/21 15:58	3
Cobalt	ND		9.5	0.24	mg/Kg	☼	08/09/21 08:00	08/19/21 15:58	3
Lithium	ND		9.5	0.57	mg/Kg	☼	08/09/21 08:00	08/19/21 15:58	3
Molybdenum	ND		7.6	0.31	mg/Kg	☼	08/09/21 08:00	08/19/21 15:58	3

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		13	13	mg/Kg	☼	08/10/21 08:00	08/19/21 17:02	1
Cobalt	**0.34**	**J**	3.2	0.057	mg/Kg	☼	08/10/21 08:00	08/19/21 17:02	1
Lithium	ND		3.2	0.19	mg/Kg	☼	08/10/21 08:00	08/19/21 17:02	1
Molybdenum	ND		2.5	0.10	mg/Kg	☼	08/10/21 08:00	08/19/21 17:02	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		13	13	mg/Kg	☼	08/11/21 08:00	08/19/21 18:05	1
Cobalt	**0.87**	**J**	3.2	0.067	mg/Kg	☼	08/11/21 08:00	08/19/21 18:05	1
Lithium	**1.9**	**J**	3.2	0.19	mg/Kg	☼	08/11/21 08:00	08/19/21 18:05	1
Molybdenum	**0.15**	**J**	2.5	0.10	mg/Kg	☼	08/11/21 08:00	08/19/21 18:05	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		190	190	mg/Kg	☼	08/13/21 08:00	08/19/21 19:23	5
Cobalt	ND		47	0.76	mg/Kg	☼	08/13/21 08:00	08/19/21 19:23	5
Lithium	**8.3**	**J B**	47	2.8	mg/Kg	☼	08/13/21 08:00	08/19/21 19:23	5
Molybdenum	ND		38	1.6	mg/Kg	☼	08/13/21 08:00	08/19/21 19:23	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		13	13	mg/Kg	☼	08/13/21 08:00	08/19/21 20:27	1
Cobalt	**0.71**	**J**	3.2	0.058	mg/Kg	☼	08/13/21 08:00	08/19/21 20:27	1
Lithium	**3.3**		3.2	0.19	mg/Kg	☼	08/13/21 08:00	08/19/21 20:27	1
Molybdenum	ND		2.5	0.12	mg/Kg	☼	08/13/21 08:00	08/19/21 20:27	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	**0.44**	**J**	3.2	0.033	mg/Kg	☼	08/17/21 08:10	08/26/21 15:36	1
Lithium	**8.6**		3.2	0.19	mg/Kg	☼	08/17/21 08:10	08/26/21 15:36	1
Molybdenum	ND		2.5	0.10	mg/Kg	☼	08/17/21 08:10	08/26/21 15:36	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	**2.4**	**J**	2.5	0.023	mg/Kg			08/30/21 13:07	1
Molybdenum	**0.15**	**J**	2.0	0.082	mg/Kg			08/30/21 13:07	1
Lithium	**22**		2.5	0.15	mg/Kg			08/30/21 13:07	1

Client Sample Results

Client: Geosyntec Consultants, Inc.
Project/Site: GLP8029 Coffeen, IL

Job ID: 140-24093-1

Client Sample ID: SB316
Date Collected: 08/03/21 09:00
Date Received: 08/05/21 09:15

Lab Sample ID: 140-24093-3
Matrix: Solid
Percent Solids: 79.3

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	4.2		3.2	0.033	mg/Kg	☼	08/06/21 08:00	08/26/21 16:26	1
Lithium	13		3.2	0.19	mg/Kg	☼	08/06/21 08:00	08/26/21 16:26	1
Molybdenum	0.96	J	2.5	0.10	mg/Kg	☼	08/06/21 08:00	08/26/21 16:26	1

Client: Geosyntec Consultants, Inc.
Project/Site: GLP8029 Coffeen, IL

Job ID: 140-24093-1

Client Sample ID: SB313

Date Collected: 08/03/21 08:00
Date Received: 08/05/21 09:15

Lab Sample ID: 140-24093-4

Matrix: Solid
Percent Solids: 94.0

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	ND		11	0.19	mg/Kg	☼	08/09/21 08:00	08/19/21 15:04	4
Lithium	ND		11	0.64	mg/Kg	☼	08/09/21 08:00	08/19/21 15:04	4
Molybdenum	ND		8.5	0.35	mg/Kg	☼	08/09/21 08:00	08/19/21 15:04	4
Boron	ND		43	43	mg/Kg	☼	08/09/21 08:00	08/19/21 15:04	4

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		32	32	mg/Kg	☼	08/09/21 08:00	08/19/21 16:08	3
Cobalt	**0.32**	**J**	8.0	0.20	mg/Kg	☼	08/09/21 08:00	08/19/21 16:08	3
Lithium	**0.60**	**J**	8.0	0.48	mg/Kg	☼	08/09/21 08:00	08/19/21 16:08	3
Molybdenum	ND		6.4	0.26	mg/Kg	☼	08/09/21 08:00	08/19/21 16:08	3

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		11	11	mg/Kg	☼	08/10/21 08:00	08/19/21 17:26	1
Cobalt	**0.56**	**J**	2.7	0.048	mg/Kg	☼	08/10/21 08:00	08/19/21 17:26	1
Lithium	ND		2.7	0.16	mg/Kg	☼	08/10/21 08:00	08/19/21 17:26	1
Molybdenum	ND		2.1	0.087	mg/Kg	☼	08/10/21 08:00	08/19/21 17:26	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		11	11	mg/Kg	☼	08/11/21 08:00	08/19/21 18:34	1
Cobalt	**1.0**	**J**	2.7	0.056	mg/Kg	☼	08/11/21 08:00	08/19/21 18:34	1
Lithium	**1.0**	**J**	2.7	0.16	mg/Kg	☼	08/11/21 08:00	08/19/21 18:34	1
Molybdenum	**0.32**	**J**	2.1	0.087	mg/Kg	☼	08/11/21 08:00	08/19/21 18:34	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		160	160	mg/Kg	☼	08/13/21 08:00	08/19/21 19:33	5
Cobalt	ND		40	0.64	mg/Kg	☼	08/13/21 08:00	08/19/21 19:33	5
Lithium	**6.9**	**J B**	40	2.3	mg/Kg	☼	08/13/21 08:00	08/19/21 19:33	5
Molybdenum	ND		32	1.3	mg/Kg	☼	08/13/21 08:00	08/19/21 19:33	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		11	11	mg/Kg	☼	08/13/21 08:00	08/19/21 20:37	1
Cobalt	**2.0**	**J**	2.7	0.049	mg/Kg	☼	08/13/21 08:00	08/19/21 20:37	1
Lithium	**5.7**		2.7	0.16	mg/Kg	☼	08/13/21 08:00	08/19/21 20:37	1
Molybdenum	**0.13**	**J**	2.1	0.11	mg/Kg	☼	08/13/21 08:00	08/19/21 20:37	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	**0.83**	**J**	2.7	0.028	mg/Kg	☼	08/17/21 08:10	08/26/21 15:45	1
Lithium	**9.0**		2.7	0.16	mg/Kg	☼	08/17/21 08:10	08/26/21 15:45	1
Molybdenum	ND		2.1	0.087	mg/Kg	☼	08/17/21 08:10	08/26/21 15:45	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	**4.7**		2.5	0.023	mg/Kg			08/30/21 13:07	1
Molybdenum	**0.46**	**J**	2.0	0.082	mg/Kg			08/30/21 13:07	1
Lithium	**23**		2.5	0.15	mg/Kg			08/30/21 13:07	1

Client Sample Results

Client: Geosyntec Consultants, Inc.
Project/Site: GLP8029 Coffeen, IL

Job ID: 140-24093-1

Client Sample ID: SB313

Date Collected: 08/03/21 08:00
Date Received: 08/05/21 09:15

Lab Sample ID: 140-24093-4

Matrix: Solid
Percent Solids: 94.0

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	4.7		2.7	0.028	mg/Kg	☼	08/06/21 08:00	08/26/21 16:36	1
Lithium	18		2.7	0.16	mg/Kg	☼	08/06/21 08:00	08/26/21 16:36	1
Molybdenum	0.78	J	2.1	0.087	mg/Kg	☼	08/06/21 08:00	08/26/21 16:36	1

Client: Geosyntec Consultants, Inc.
Project/Site: GLP8029 Coffeen, IL

Job ID: 140-24093-1

Client Sample ID: SB200

Date Collected: 08/04/21 10:00
Date Received: 08/05/21 09:15

Lab Sample ID: 140-24093-5

Matrix: Solid
Percent Solids: 85.0

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.4	0.61	mg/Kg	☼	08/09/21 08:00	08/19/21 15:09	4

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.8	0.46	mg/Kg	☼	08/09/21 08:00	08/19/21 16:28	3

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.37**	**J**	0.59	0.15	mg/Kg	☼	08/10/21 08:00	08/19/21 17:31	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.87**		0.59	0.26	mg/Kg	☼	08/11/21 08:00	08/19/21 18:39	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		8.8	2.2	mg/Kg	☼	08/13/21 08:00	08/19/21 19:38	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**3.3**		0.59	0.18	mg/Kg	☼	08/13/21 08:00	08/19/21 20:57	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**1.6**	**B**	0.59	0.15	mg/Kg	☼	08/17/21 08:10	08/26/21 15:51	1

Method: 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			08/30/21 13:07	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**7.5**		1.2	0.31	mg/Kg	☼	08/06/21 08:00	08/26/21 17:52	2

Client: Geosyntec Consultants, Inc.
Project/Site: GLP8029 Coffeen, IL

Job ID: 140-24093-1

Client Sample ID: SB215
Date Collected: 08/04/21 11:00
Date Received: 08/05/21 09:15

Lab Sample ID: 140-24093-6
Matrix: Solid
Percent Solids: 88.6

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.3	0.59	mg/Kg	☼	08/09/21 08:00	08/19/21 15:28	4

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.7	0.44	mg/Kg	☼	08/09/21 08:00	08/19/21 16:33	3

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.30**	**J**	0.56	0.15	mg/Kg	☼	08/10/21 08:00	08/19/21 17:36	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.55**	**J**	0.56	0.25	mg/Kg	☼	08/11/21 08:00	08/19/21 18:44	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**3.2**	**J**	8.5	2.1	mg/Kg	☼	08/13/21 08:00	08/19/21 19:58	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**7.1**		0.56	0.17	mg/Kg	☼	08/13/21 08:00	08/19/21 21:01	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**2.3**	**B**	1.1	0.29	mg/Kg	☼	08/17/21 08:10	08/26/21 17:33	2

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**13**		0.50	0.13	mg/Kg			08/30/21 13:07	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**21**		0.56	0.15	mg/Kg	☼	08/06/21 08:00	08/26/21 16:47	1

Default Detection Limits

Client: Geosyntec Consultants, Inc.
Project/Site: GLP8029 Coffeen, IL

Job ID: 140-24093-1

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
Lithium	2.5	0.15	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
Lithium	2.5	0.15	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
Lithium	2.5	0.15	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
Lithium	2.5	0.15	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
Cobalt	7.5	0.12	mg/Kg
Lithium	7.5	0.44	mg/Kg
Molybdenum	6.0	0.25	mg/Kg

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

Default Detection Limits

Client: Geosyntec Consultants, Inc.
Project/Site: GLP8029 Coffeen, IL

Job ID: 140-24093-1

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
Lithium	2.5	0.15	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
Lithium	2.5	0.15	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
Lithium	2.5	0.15	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
Lithium	2.5	0.15	mg/Kg
Molybdenum	2.0	0.082	mg/Kg

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

Lab Sample ID: MB 140-52435/8-A
Matrix: Solid
Analysis Batch: 53170

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 52435

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.50	0.13	mg/Kg		08/06/21 08:00	08/26/21 12:46	1
Cobalt	ND		2.5	0.026	mg/Kg		08/06/21 08:00	08/26/21 12:46	1
Lithium	ND		2.5	0.15	mg/Kg		08/06/21 08:00	08/26/21 12:46	1
Molybdenum	ND		2.0	0.082	mg/Kg		08/06/21 08:00	08/26/21 12:46	1

Lab Sample ID: LCS 140-52435/9-A
Matrix: Solid
Analysis Batch: 53170

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 52435

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	5.00	5.04		mg/Kg		101	80 - 120
Cobalt	5.00	5.09		mg/Kg		102	80 - 125
Lithium	5.00	4.92		mg/Kg		98	80 - 120
Molybdenum	25.0	25.6		mg/Kg		102	80 - 125

Lab Sample ID: LCSD 140-52435/10-A
Matrix: Solid
Analysis Batch: 53170

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 52435

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	5.00	5.08		mg/Kg		102	80 - 120	1	30
Cobalt	5.00	5.16		mg/Kg		103	80 - 125	1	30
Lithium	5.00	5.02		mg/Kg		100	80 - 120	2	30
Molybdenum	25.0	25.7		mg/Kg		103	80 - 125	1	30

Lab Sample ID: 140-24093-3 DU
Matrix: Solid
Analysis Batch: 53170

Client Sample ID: SB316
Prep Type: Total/NA
Prep Batch: 52435

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Cobalt	4.2		2.57	J F5	mg/Kg	☼	49	30
Lithium	13		13.4		mg/Kg	☼	0.3	30
Molybdenum	0.96	J	0.416	J F5	mg/Kg	☼	79	30

Lab Sample ID: 140-24093-3 DU
Matrix: Solid
Analysis Batch: 53170

Client Sample ID: SB316
Prep Type: Total/NA
Prep Batch: 52435

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Arsenic	12		5.06	F3	mg/Kg	☼	78	30

Method: 6010B SEP - SEP Metals (ICP)

Lab Sample ID: MB 140-52456/8-B ^4
Matrix: Solid
Analysis Batch: 52929

Client Sample ID: Method Blank
Prep Type: Step 1
Prep Batch: 52459

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.0	0.52	mg/Kg		08/09/21 08:00	08/19/21 14:30	4
Cobalt	ND		10	0.18	mg/Kg		08/09/21 08:00	08/19/21 14:30	4

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

Lab Sample ID: MB 140-52456/8-B ^4
Matrix: Solid
Analysis Batch: 52929

Client Sample ID: Method Blank
Prep Type: Step 1
Prep Batch: 52459

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	ND		10	0.60	mg/Kg		08/09/21 08:00	08/19/21 14:30	4
Molybdenum	ND		8.0	0.33	mg/Kg		08/09/21 08:00	08/19/21 14:30	4
Boron	ND		40	40	mg/Kg		08/09/21 08:00	08/19/21 14:30	4

Lab Sample ID: LCS 140-52456/9-B ^5
Matrix: Solid
Analysis Batch: 52929

Client Sample ID: Lab Control Sample
Prep Type: Step 1
Prep Batch: 52459

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	5.00	4.44		mg/Kg		89	80 - 120
Cobalt	5.00	4.70	J	mg/Kg		94	80 - 120
Lithium	5.00	4.85	J	mg/Kg		97	80 - 120
Molybdenum	25.0	23.4		mg/Kg		94	80 - 120
Boron	50.0	ND		mg/Kg		93	

Lab Sample ID: LCSD 140-52456/10-B ^5
Matrix: Solid
Analysis Batch: 52929

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 1
Prep Batch: 52459

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	5.00	4.58		mg/Kg		92	80 - 120	3	30
Cobalt	5.00	4.70	J	mg/Kg		94	80 - 120	0	30
Lithium	5.00	4.94	J	mg/Kg		99	80 - 120	2	30
Molybdenum	25.0	23.5		mg/Kg		94	80 - 120	1	30
Boron	50.0	ND		mg/Kg		95		2	

Lab Sample ID: 140-24093-3 DU
Matrix: Solid
Analysis Batch: 52929

Client Sample ID: SB316
Prep Type: Step 1
Prep Batch: 52459

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Arsenic	ND		ND		mg/Kg	☼	NC	30
Cobalt	ND		ND		mg/Kg	☼	NC	30
Lithium	ND		ND		mg/Kg	☼	NC	30
Molybdenum	ND		ND		mg/Kg	☼	NC	30
Boron	ND		ND		mg/Kg	☼	NC	

Lab Sample ID: MB 140-52457/8-B ^3
Matrix: Solid
Analysis Batch: 52929

Client Sample ID: Method Blank
Prep Type: Step 2
Prep Batch: 52460

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.5	0.39	mg/Kg		08/09/21 08:00	08/19/21 15:33	3
Cobalt	ND		7.5	0.19	mg/Kg		08/09/21 08:00	08/19/21 15:33	3
Lithium	ND		7.5	0.45	mg/Kg		08/09/21 08:00	08/19/21 15:33	3
Molybdenum	ND		6.0	0.25	mg/Kg		08/09/21 08:00	08/19/21 15:33	3
Boron	ND		30	30	mg/Kg		08/09/21 08:00	08/19/21 15:33	3

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

Lab Sample ID: LCS 140-52457/9-B ^5
Matrix: Solid
Analysis Batch: 52929

Client Sample ID: Lab Control Sample
Prep Type: Step 2
Prep Batch: 52460

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Arsenic			5.00	3.91		mg/Kg		78	60 - 120		
Cobalt			5.00	4.69	J	mg/Kg		94	80 - 120		
Lithium			5.00	4.41	J	mg/Kg		88	80 - 120		
Molybdenum			25.0	20.9		mg/Kg		83	70 - 120		
Boron			50.0	ND		mg/Kg		91			

Lab Sample ID: LCSD 140-52457/10-B ^5
Matrix: Solid
Analysis Batch: 52929

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 2
Prep Batch: 52460

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic			5.00	3.92		mg/Kg		78	60 - 120	0	30
Cobalt			5.00	4.74	J	mg/Kg		95	80 - 120	1	30
Lithium			5.00	5.12	J	mg/Kg		102	80 - 120	15	30
Molybdenum			25.0	20.9		mg/Kg		84	70 - 120	0	30
Boron			50.0	ND		mg/Kg		92		1	

Lab Sample ID: 140-24093-3 DU
Matrix: Solid
Analysis Batch: 52929

Client Sample ID: SB316
Prep Type: Step 2
Prep Batch: 52460

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Arsenic	ND			ND		mg/Kg	☼			NC	30
Cobalt	ND			ND		mg/Kg	☼			NC	30
Lithium	ND			0.592	J	mg/Kg	☼			NC	30
Molybdenum	ND			ND		mg/Kg	☼			NC	30
Boron	ND			ND		mg/Kg	☼			NC	

Lab Sample ID: MB 140-52463/8-B
Matrix: Solid
Analysis Batch: 52929

Client Sample ID: Method Blank
Prep Type: Step 3
Prep Batch: 52518

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.50	0.13	mg/Kg		08/10/21 08:00	08/19/21 16:38	1
Cobalt	ND		2.5	0.045	mg/Kg		08/10/21 08:00	08/19/21 16:38	1
Lithium	ND		2.5	0.15	mg/Kg		08/10/21 08:00	08/19/21 16:38	1
Molybdenum	ND		2.0	0.082	mg/Kg		08/10/21 08:00	08/19/21 16:38	1
Boron	ND		10	10	mg/Kg		08/10/21 08:00	08/19/21 16:38	1

Lab Sample ID: LCS 140-52463/9-B
Matrix: Solid
Analysis Batch: 52929

Client Sample ID: Lab Control Sample
Prep Type: Step 3
Prep Batch: 52518

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Arsenic			5.00	4.68		mg/Kg		94	80 - 120		
Cobalt			5.00	4.91		mg/Kg		98	80 - 120		
Lithium			5.00	4.68		mg/Kg		94	80 - 120		
Molybdenum			25.0	24.3		mg/Kg		97	80 - 120		
Boron			50.0	47.8		mg/Kg		96			

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

Lab Sample ID: LCSD 140-52463/10-B
Matrix: Solid
Analysis Batch: 52929

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 3
Prep Batch: 52518

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic			5.00	4.66		mg/Kg		93	80 - 120	0	30
Cobalt			5.00	4.89		mg/Kg		98	80 - 120	0	30
Lithium			5.00	4.68		mg/Kg		94	80 - 120	0	30
Molybdenum			25.0	24.2		mg/Kg		97	80 - 120	1	30
Boron			50.0	47.4		mg/Kg		95		1	

Lab Sample ID: 140-24093-3 DU
Matrix: Solid
Analysis Batch: 52929

Client Sample ID: SB316
Prep Type: Step 3
Prep Batch: 52518

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Arsenic	0.64			0.668		mg/Kg	☼			5	30
Cobalt	0.34	J		0.357	J	mg/Kg	☼			5	30
Lithium	ND			ND		mg/Kg	☼			NC	30
Molybdenum	ND			0.118	J	mg/Kg	☼			NC	30
Boron	ND			ND		mg/Kg	☼			NC	

Lab Sample ID: MB 140-52520/8-B
Matrix: Solid
Analysis Batch: 52929

Client Sample ID: Method Blank
Prep Type: Step 4
Prep Batch: 52569

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.50	0.22	mg/Kg		08/11/21 08:00	08/19/21 17:41	1
Cobalt	ND		2.5	0.053	mg/Kg		08/11/21 08:00	08/19/21 17:41	1
Lithium	ND		2.5	0.15	mg/Kg		08/11/21 08:00	08/19/21 17:41	1
Molybdenum	ND		2.0	0.082	mg/Kg		08/11/21 08:00	08/19/21 17:41	1
Boron	ND		10	10	mg/Kg		08/11/21 08:00	08/19/21 17:41	1

Lab Sample ID: LCS 140-52520/9-B
Matrix: Solid
Analysis Batch: 52929

Client Sample ID: Lab Control Sample
Prep Type: Step 4
Prep Batch: 52569

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic			5.00	5.05		mg/Kg		101	80 - 130
Cobalt			5.00	5.07		mg/Kg		101	80 - 120
Lithium			5.00	4.81		mg/Kg		96	80 - 120
Molybdenum			25.0	25.6		mg/Kg		102	80 - 120
Boron			50.0	49.8		mg/Kg		100	

Lab Sample ID: LCSD 140-52520/10-B
Matrix: Solid
Analysis Batch: 52929

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 4
Prep Batch: 52569

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic			5.00	5.22		mg/Kg		104	80 - 130	3	30
Cobalt			5.00	5.31		mg/Kg		106	80 - 120	5	30
Lithium			5.00	5.13		mg/Kg		103	80 - 120	6	30
Molybdenum			25.0	26.8		mg/Kg		107	80 - 120	5	30
Boron			50.0	52.3		mg/Kg		105		5	

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

Lab Sample ID: 140-24093-3 DU
Matrix: Solid
Analysis Batch: 52929

Client Sample ID: SB316
Prep Type: Step 4
Prep Batch: 52569

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Arsenic	1.6			2.01		mg/Kg	☼			23	30
Cobalt	0.87	J		1.01	J	mg/Kg	☼			15	30
Lithium	1.9	J		2.17	J	mg/Kg	☼			12	30
Molybdenum	0.15	J		0.210	J F5	mg/Kg	☼			33	30
Boron	ND			ND		mg/Kg	☼			NC	

Lab Sample ID: MB 140-52572/8-B ^5
Matrix: Solid
Analysis Batch: 52929

Client Sample ID: Method Blank
Prep Type: Step 5
Prep Batch: 52655

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		7.5	1.9	mg/Kg		08/13/21 08:00	08/19/21 18:58	5
Cobalt	ND		38	0.60	mg/Kg		08/13/21 08:00	08/19/21 18:58	5
Lithium	5.12	J	38	2.2	mg/Kg		08/13/21 08:00	08/19/21 18:58	5
Molybdenum	ND		30	1.3	mg/Kg		08/13/21 08:00	08/19/21 18:58	5
Boron	ND		150	150	mg/Kg		08/13/21 08:00	08/19/21 18:58	5

Lab Sample ID: LCS 140-52572/9-B ^5
Matrix: Solid
Analysis Batch: 52929

Client Sample ID: Lab Control Sample
Prep Type: Step 5
Prep Batch: 52655

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Arsenic			15.0	9.67		mg/Kg		64	60 - 100		
Cobalt			15.0	1.01	J	mg/Kg		7	1 - 60		
Lithium			15.0	19.6	J	mg/Kg		131	80 - 150		
Molybdenum			75.0	56.4		mg/Kg		75	60 - 100		
Boron			150	153		mg/Kg		102			

Lab Sample ID: LCSD 140-52572/10-B ^5
Matrix: Solid
Analysis Batch: 52929

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 5
Prep Batch: 52655

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic			15.0	9.98		mg/Kg		67	60 - 100	3	30
Cobalt			15.0	0.990	J	mg/Kg		7	1 - 60	2	30
Lithium			15.0	21.0	J	mg/Kg		140	80 - 150	7	30
Molybdenum			75.0	57.8		mg/Kg		77	60 - 100	2	30
Boron			150	157		mg/Kg		105		3	

Lab Sample ID: 140-24093-3 DU
Matrix: Solid
Analysis Batch: 52929

Client Sample ID: SB316
Prep Type: Step 5
Prep Batch: 52655

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Arsenic	ND			ND		mg/Kg	☼			NC	30
Cobalt	ND			ND		mg/Kg	☼			NC	30
Lithium	8.3	J B		7.76	J	mg/Kg	☼			6	30
Molybdenum	ND			ND		mg/Kg	☼			NC	30
Boron	ND			ND		mg/Kg	☼			NC	

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

Lab Sample ID: MB 140-52656/8-A
Matrix: Solid
Analysis Batch: 52929

Client Sample ID: Method Blank
Prep Type: Step 6
Prep Batch: 52656

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.50	0.15	mg/Kg		08/13/21 08:00	08/19/21 20:03	1
Cobalt	ND		2.5	0.046	mg/Kg		08/13/21 08:00	08/19/21 20:03	1
Lithium	ND		2.5	0.15	mg/Kg		08/13/21 08:00	08/19/21 20:03	1
Molybdenum	ND		2.0	0.099	mg/Kg		08/13/21 08:00	08/19/21 20:03	1
Boron	ND		10	10	mg/Kg		08/13/21 08:00	08/19/21 20:03	1

Lab Sample ID: LCS 140-52656/9-A
Matrix: Solid
Analysis Batch: 52929

Client Sample ID: Lab Control Sample
Prep Type: Step 6
Prep Batch: 52656

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Arsenic			5.00	5.09		mg/Kg		102	80 - 120		
Cobalt			5.00	5.09		mg/Kg		102	80 - 120		
Lithium			5.00	4.83		mg/Kg		97	80 - 120		
Molybdenum			25.0	25.5		mg/Kg		102	80 - 120		
Boron			50.0	52.3		mg/Kg		105			

Lab Sample ID: LCSD 140-52656/10-A
Matrix: Solid
Analysis Batch: 52929

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 6
Prep Batch: 52656

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic			5.00	5.00		mg/Kg		100	80 - 120	2	30
Cobalt			5.00	5.01		mg/Kg		100	80 - 120	2	30
Lithium			5.00	4.72		mg/Kg		94	80 - 120	2	30
Molybdenum			25.0	25.0		mg/Kg		100	80 - 120	2	30
Boron			50.0	51.3		mg/Kg		103		2	

Lab Sample ID: 140-24093-3 DU
Matrix: Solid
Analysis Batch: 52929

Client Sample ID: SB316
Prep Type: Step 6
Prep Batch: 52656

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Arsenic	1.2			1.17		mg/Kg	☼			0.9	30
Cobalt	0.71	J		0.725	J	mg/Kg	☼			2	30
Lithium	3.3			3.34		mg/Kg	☼			2	30
Molybdenum	ND			ND		mg/Kg	☼			NC	30
Boron	ND			ND		mg/Kg	☼			NC	

Lab Sample ID: MB 140-52770/8-A
Matrix: Solid
Analysis Batch: 53170

Client Sample ID: Method Blank
Prep Type: Step 7
Prep Batch: 52770

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.139	J	0.50	0.13	mg/Kg		08/17/21 08:10	08/26/21 12:31	1
Cobalt	ND		2.5	0.026	mg/Kg		08/17/21 08:10	08/26/21 12:31	1
Lithium	ND		2.5	0.15	mg/Kg		08/17/21 08:10	08/26/21 12:31	1
Molybdenum	ND		2.0	0.082	mg/Kg		08/17/21 08:10	08/26/21 12:31	1

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

Lab Sample ID: LCS 140-52770/9-A
Matrix: Solid
Analysis Batch: 53170

Client Sample ID: Lab Control Sample
Prep Type: Step 7
Prep Batch: 52770

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Arsenic			5.00	5.13		mg/Kg		103	80 - 120		
Cobalt			5.00	5.14		mg/Kg		103	80 - 125		
Lithium			5.00	5.01		mg/Kg		100	80 - 120		
Molybdenum			25.0	25.7		mg/Kg		103	80 - 125		

Lab Sample ID: LCSD 140-52770/10-A
Matrix: Solid
Analysis Batch: 53170

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 7
Prep Batch: 52770

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic			5.00	5.04		mg/Kg		101	80 - 120	2	30
Cobalt			5.00	5.10		mg/Kg		102	80 - 125	1	30
Lithium			5.00	4.95		mg/Kg		99	80 - 120	1	30
Molybdenum			25.0	25.6		mg/Kg		102	80 - 125	0	30

Lab Sample ID: 140-24093-3 DU
Matrix: Solid
Analysis Batch: 53170

Client Sample ID: SB316
Prep Type: Step 7
Prep Batch: 52770

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Cobalt	0.44	J		0.364	J	mg/Kg	☼			20	30
Lithium	8.6			8.06		mg/Kg	☼			6	30
Molybdenum	ND			ND		mg/Kg	☼			NC	30

Lab Sample ID: 140-24093-3 DU
Matrix: Solid
Analysis Batch: 53170

Client Sample ID: SB316
Prep Type: Step 7
Prep Batch: 52770

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Arsenic	1.5	B		1.46		mg/Kg	☼			5	30

Metals

Prep Batch: 52435

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-24093-1	SB311	Total/NA	Solid	Total	
140-24093-2	SB306	Total/NA	Solid	Total	
140-24093-3	SB316	Total/NA	Solid	Total	
140-24093-4	SB313	Total/NA	Solid	Total	
140-24093-5	SB200	Total/NA	Solid	Total	
140-24093-6	SB215	Total/NA	Solid	Total	
MB 140-52435/8-A	Method Blank	Total/NA	Solid	Total	
LCS 140-52435/9-A	Lab Control Sample	Total/NA	Solid	Total	
LCSD 140-52435/10-A	Lab Control Sample Dup	Total/NA	Solid	Total	
140-24093-3 DU	SB316	Total/NA	Solid	Total	

SEP Batch: 52456

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-24093-1	SB311	Step 1	Solid	Exchangeable	
140-24093-2	SB306	Step 1	Solid	Exchangeable	
140-24093-3	SB316	Step 1	Solid	Exchangeable	
140-24093-4	SB313	Step 1	Solid	Exchangeable	
140-24093-5	SB200	Step 1	Solid	Exchangeable	
140-24093-6	SB215	Step 1	Solid	Exchangeable	
MB 140-52456/8-B ^4	Method Blank	Step 1	Solid	Exchangeable	
LCS 140-52456/9-B ^5	Lab Control Sample	Step 1	Solid	Exchangeable	
LCSD 140-52456/10-B ^5	Lab Control Sample Dup	Step 1	Solid	Exchangeable	
140-24093-3 DU	SB316	Step 1	Solid	Exchangeable	

SEP Batch: 52457

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-24093-1	SB311	Step 2	Solid	Carbonate	
140-24093-2	SB306	Step 2	Solid	Carbonate	
140-24093-3	SB316	Step 2	Solid	Carbonate	
140-24093-4	SB313	Step 2	Solid	Carbonate	
140-24093-5	SB200	Step 2	Solid	Carbonate	
140-24093-6	SB215	Step 2	Solid	Carbonate	
MB 140-52457/8-B ^3	Method Blank	Step 2	Solid	Carbonate	
LCS 140-52457/9-B ^5	Lab Control Sample	Step 2	Solid	Carbonate	
LCSD 140-52457/10-B ^5	Lab Control Sample Dup	Step 2	Solid	Carbonate	
140-24093-3 DU	SB316	Step 2	Solid	Carbonate	

Prep Batch: 52459

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-24093-1	SB311	Step 1	Solid	3010A	52456
140-24093-2	SB306	Step 1	Solid	3010A	52456
140-24093-3	SB316	Step 1	Solid	3010A	52456
140-24093-4	SB313	Step 1	Solid	3010A	52456
140-24093-5	SB200	Step 1	Solid	3010A	52456
140-24093-6	SB215	Step 1	Solid	3010A	52456
MB 140-52456/8-B ^4	Method Blank	Step 1	Solid	3010A	52456
LCS 140-52456/9-B ^5	Lab Control Sample	Step 1	Solid	3010A	52456
LCSD 140-52456/10-B ^5	Lab Control Sample Dup	Step 1	Solid	3010A	52456
140-24093-3 DU	SB316	Step 1	Solid	3010A	52456

Metals

Prep Batch: 52460

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-24093-1	SB311	Step 2	Solid	3010A	52457
140-24093-2	SB306	Step 2	Solid	3010A	52457
140-24093-3	SB316	Step 2	Solid	3010A	52457
140-24093-4	SB313	Step 2	Solid	3010A	52457
140-24093-5	SB200	Step 2	Solid	3010A	52457
140-24093-6	SB215	Step 2	Solid	3010A	52457
MB 140-52457/8-B ^3	Method Blank	Step 2	Solid	3010A	52457
LCS 140-52457/9-B ^5	Lab Control Sample	Step 2	Solid	3010A	52457
LCSD 140-52457/10-B ^5	Lab Control Sample Dup	Step 2	Solid	3010A	52457
140-24093-3 DU	SB316	Step 2	Solid	3010A	52457

SEP Batch: 52463

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-24093-1	SB311	Step 3	Solid	Non-Crystalline	
140-24093-2	SB306	Step 3	Solid	Non-Crystalline	
140-24093-3	SB316	Step 3	Solid	Non-Crystalline	
140-24093-4	SB313	Step 3	Solid	Non-Crystalline	
140-24093-5	SB200	Step 3	Solid	Non-Crystalline	
140-24093-6	SB215	Step 3	Solid	Non-Crystalline	
MB 140-52463/8-B	Method Blank	Step 3	Solid	Non-Crystalline	
LCS 140-52463/9-B	Lab Control Sample	Step 3	Solid	Non-Crystalline	
LCSD 140-52463/10-B	Lab Control Sample Dup	Step 3	Solid	Non-Crystalline	
140-24093-3 DU	SB316	Step 3	Solid	Non-Crystalline	

Prep Batch: 52518

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-24093-1	SB311	Step 3	Solid	3010A	52463
140-24093-2	SB306	Step 3	Solid	3010A	52463
140-24093-3	SB316	Step 3	Solid	3010A	52463
140-24093-4	SB313	Step 3	Solid	3010A	52463
140-24093-5	SB200	Step 3	Solid	3010A	52463
140-24093-6	SB215	Step 3	Solid	3010A	52463
MB 140-52463/8-B	Method Blank	Step 3	Solid	3010A	52463
LCS 140-52463/9-B	Lab Control Sample	Step 3	Solid	3010A	52463
LCSD 140-52463/10-B	Lab Control Sample Dup	Step 3	Solid	3010A	52463
140-24093-3 DU	SB316	Step 3	Solid	3010A	52463

SEP Batch: 52520

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-24093-1	SB311	Step 4	Solid	Metal Hydroxide	
140-24093-2	SB306	Step 4	Solid	Metal Hydroxide	
140-24093-3	SB316	Step 4	Solid	Metal Hydroxide	
140-24093-4	SB313	Step 4	Solid	Metal Hydroxide	
140-24093-5	SB200	Step 4	Solid	Metal Hydroxide	
140-24093-6	SB215	Step 4	Solid	Metal Hydroxide	
MB 140-52520/8-B	Method Blank	Step 4	Solid	Metal Hydroxide	
LCS 140-52520/9-B	Lab Control Sample	Step 4	Solid	Metal Hydroxide	
LCSD 140-52520/10-B	Lab Control Sample Dup	Step 4	Solid	Metal Hydroxide	
140-24093-3 DU	SB316	Step 4	Solid	Metal Hydroxide	

Metals

Prep Batch: 52569

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-24093-1	SB311	Step 4	Solid	3010A	52520
140-24093-2	SB306	Step 4	Solid	3010A	52520
140-24093-3	SB316	Step 4	Solid	3010A	52520
140-24093-4	SB313	Step 4	Solid	3010A	52520
140-24093-5	SB200	Step 4	Solid	3010A	52520
140-24093-6	SB215	Step 4	Solid	3010A	52520
MB 140-52520/8-B	Method Blank	Step 4	Solid	3010A	52520
LCS 140-52520/9-B	Lab Control Sample	Step 4	Solid	3010A	52520
LCSD 140-52520/10-B	Lab Control Sample Dup	Step 4	Solid	3010A	52520
140-24093-3 DU	SB316	Step 4	Solid	3010A	52520

SEP Batch: 52572

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-24093-1	SB311	Step 5	Solid	Organic-Bound	
140-24093-2	SB306	Step 5	Solid	Organic-Bound	
140-24093-3	SB316	Step 5	Solid	Organic-Bound	
140-24093-4	SB313	Step 5	Solid	Organic-Bound	
140-24093-5	SB200	Step 5	Solid	Organic-Bound	
140-24093-6	SB215	Step 5	Solid	Organic-Bound	
MB 140-52572/8-B ^5	Method Blank	Step 5	Solid	Organic-Bound	
LCS 140-52572/9-B ^5	Lab Control Sample	Step 5	Solid	Organic-Bound	
LCSD 140-52572/10-B ^5	Lab Control Sample Dup	Step 5	Solid	Organic-Bound	
140-24093-3 DU	SB316	Step 5	Solid	Organic-Bound	

Prep Batch: 52655

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-24093-1	SB311	Step 5	Solid	3010A	52572
140-24093-2	SB306	Step 5	Solid	3010A	52572
140-24093-3	SB316	Step 5	Solid	3010A	52572
140-24093-4	SB313	Step 5	Solid	3010A	52572
140-24093-5	SB200	Step 5	Solid	3010A	52572
140-24093-6	SB215	Step 5	Solid	3010A	52572
MB 140-52572/8-B ^5	Method Blank	Step 5	Solid	3010A	52572
LCS 140-52572/9-B ^5	Lab Control Sample	Step 5	Solid	3010A	52572
LCSD 140-52572/10-B ^5	Lab Control Sample Dup	Step 5	Solid	3010A	52572
140-24093-3 DU	SB316	Step 5	Solid	3010A	52572

SEP Batch: 52656

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-24093-1	SB311	Step 6	Solid	Acid/Sulfide	
140-24093-2	SB306	Step 6	Solid	Acid/Sulfide	
140-24093-3	SB316	Step 6	Solid	Acid/Sulfide	
140-24093-4	SB313	Step 6	Solid	Acid/Sulfide	
140-24093-5	SB200	Step 6	Solid	Acid/Sulfide	
140-24093-6	SB215	Step 6	Solid	Acid/Sulfide	
MB 140-52656/8-A	Method Blank	Step 6	Solid	Acid/Sulfide	
LCS 140-52656/9-A	Lab Control Sample	Step 6	Solid	Acid/Sulfide	
LCSD 140-52656/10-A	Lab Control Sample Dup	Step 6	Solid	Acid/Sulfide	
140-24093-3 DU	SB316	Step 6	Solid	Acid/Sulfide	

Metals

Prep Batch: 52770

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-24093-1	SB311	Step 7	Solid	Residual	
140-24093-2	SB306	Step 7	Solid	Residual	
140-24093-3	SB316	Step 7	Solid	Residual	
140-24093-4	SB313	Step 7	Solid	Residual	
140-24093-5	SB200	Step 7	Solid	Residual	
140-24093-6	SB215	Step 7	Solid	Residual	
MB 140-52770/8-A	Method Blank	Step 7	Solid	Residual	
LCS 140-52770/9-A	Lab Control Sample	Step 7	Solid	Residual	
LCSD 140-52770/10-A	Lab Control Sample Dup	Step 7	Solid	Residual	
140-24093-3 DU	SB316	Step 7	Solid	Residual	

Analysis Batch: 52929

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-24093-1	SB311	Step 1	Solid	6010B SEP	52459
140-24093-1	SB311	Step 2	Solid	6010B SEP	52460
140-24093-1	SB311	Step 3	Solid	6010B SEP	52518
140-24093-1	SB311	Step 4	Solid	6010B SEP	52569
140-24093-1	SB311	Step 5	Solid	6010B SEP	52655
140-24093-1	SB311	Step 6	Solid	6010B SEP	52656
140-24093-2	SB306	Step 1	Solid	6010B SEP	52459
140-24093-2	SB306	Step 2	Solid	6010B SEP	52460
140-24093-2	SB306	Step 3	Solid	6010B SEP	52518
140-24093-2	SB306	Step 4	Solid	6010B SEP	52569
140-24093-2	SB306	Step 5	Solid	6010B SEP	52655
140-24093-2	SB306	Step 6	Solid	6010B SEP	52656
140-24093-3	SB316	Step 1	Solid	6010B SEP	52459
140-24093-3	SB316	Step 2	Solid	6010B SEP	52460
140-24093-3	SB316	Step 3	Solid	6010B SEP	52518
140-24093-3	SB316	Step 4	Solid	6010B SEP	52569
140-24093-3	SB316	Step 5	Solid	6010B SEP	52655
140-24093-3	SB316	Step 6	Solid	6010B SEP	52656
140-24093-4	SB313	Step 1	Solid	6010B SEP	52459
140-24093-4	SB313	Step 2	Solid	6010B SEP	52460
140-24093-4	SB313	Step 3	Solid	6010B SEP	52518
140-24093-4	SB313	Step 4	Solid	6010B SEP	52569
140-24093-4	SB313	Step 5	Solid	6010B SEP	52655
140-24093-4	SB313	Step 6	Solid	6010B SEP	52656
140-24093-5	SB200	Step 1	Solid	6010B SEP	52459
140-24093-5	SB200	Step 2	Solid	6010B SEP	52460
140-24093-5	SB200	Step 3	Solid	6010B SEP	52518
140-24093-5	SB200	Step 4	Solid	6010B SEP	52569
140-24093-5	SB200	Step 5	Solid	6010B SEP	52655
140-24093-5	SB200	Step 6	Solid	6010B SEP	52656
140-24093-6	SB215	Step 1	Solid	6010B SEP	52459
140-24093-6	SB215	Step 2	Solid	6010B SEP	52460
140-24093-6	SB215	Step 3	Solid	6010B SEP	52518
140-24093-6	SB215	Step 4	Solid	6010B SEP	52569
140-24093-6	SB215	Step 5	Solid	6010B SEP	52655
140-24093-6	SB215	Step 6	Solid	6010B SEP	52656
MB 140-52456/8-B ^4	Method Blank	Step 1	Solid	6010B SEP	52459
MB 140-52457/8-B ^3	Method Blank	Step 2	Solid	6010B SEP	52460

Metals (Continued)

Analysis Batch: 52929 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 140-52463/8-B	Method Blank	Step 3	Solid	6010B SEP	52518
MB 140-52520/8-B	Method Blank	Step 4	Solid	6010B SEP	52569
MB 140-52572/8-B ^5	Method Blank	Step 5	Solid	6010B SEP	52655
MB 140-52656/8-A	Method Blank	Step 6	Solid	6010B SEP	52656
LCS 140-52456/9-B ^5	Lab Control Sample	Step 1	Solid	6010B SEP	52459
LCS 140-52457/9-B ^5	Lab Control Sample	Step 2	Solid	6010B SEP	52460
LCS 140-52463/9-B	Lab Control Sample	Step 3	Solid	6010B SEP	52518
LCS 140-52520/9-B	Lab Control Sample	Step 4	Solid	6010B SEP	52569
LCS 140-52572/9-B ^5	Lab Control Sample	Step 5	Solid	6010B SEP	52655
LCS 140-52656/9-A	Lab Control Sample	Step 6	Solid	6010B SEP	52656
LCSD 140-52456/10-B ^5	Lab Control Sample Dup	Step 1	Solid	6010B SEP	52459
LCSD 140-52457/10-B ^5	Lab Control Sample Dup	Step 2	Solid	6010B SEP	52460
LCSD 140-52463/10-B	Lab Control Sample Dup	Step 3	Solid	6010B SEP	52518
LCSD 140-52520/10-B	Lab Control Sample Dup	Step 4	Solid	6010B SEP	52569
LCSD 140-52572/10-B ^5	Lab Control Sample Dup	Step 5	Solid	6010B SEP	52655
LCSD 140-52656/10-A	Lab Control Sample Dup	Step 6	Solid	6010B SEP	52656
140-24093-3 DU	SB316	Step 1	Solid	6010B SEP	52459
140-24093-3 DU	SB316	Step 2	Solid	6010B SEP	52460
140-24093-3 DU	SB316	Step 3	Solid	6010B SEP	52518
140-24093-3 DU	SB316	Step 4	Solid	6010B SEP	52569
140-24093-3 DU	SB316	Step 5	Solid	6010B SEP	52655
140-24093-3 DU	SB316	Step 6	Solid	6010B SEP	52656

Analysis Batch: 53170

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-24093-1	SB311	Step 7	Solid	6010B SEP	52770
140-24093-1	SB311	Total/NA	Solid	6010B	52435
140-24093-2	SB306	Step 7	Solid	6010B SEP	52770
140-24093-2	SB306	Total/NA	Solid	6010B	52435
140-24093-3	SB316	Step 7	Solid	6010B SEP	52770
140-24093-3	SB316	Total/NA	Solid	6010B	52435
140-24093-4	SB313	Step 7	Solid	6010B SEP	52770
140-24093-4	SB313	Total/NA	Solid	6010B	52435
140-24093-5	SB200	Step 7	Solid	6010B SEP	52770
140-24093-5	SB200	Total/NA	Solid	6010B	52435
140-24093-6	SB215	Step 7	Solid	6010B SEP	52770
140-24093-6	SB215	Total/NA	Solid	6010B	52435
MB 140-52435/8-A	Method Blank	Total/NA	Solid	6010B	52435
MB 140-52770/8-A	Method Blank	Step 7	Solid	6010B SEP	52770
LCS 140-52435/9-A	Lab Control Sample	Total/NA	Solid	6010B	52435
LCS 140-52770/9-A	Lab Control Sample	Step 7	Solid	6010B SEP	52770
LCSD 140-52435/10-A	Lab Control Sample Dup	Total/NA	Solid	6010B	52435
LCSD 140-52770/10-A	Lab Control Sample Dup	Step 7	Solid	6010B SEP	52770
140-24093-3 DU	SB316	Step 7	Solid	6010B SEP	52770
140-24093-3 DU	SB316	Step 7	Solid	6010B SEP	52770
140-24093-3 DU	SB316	Total/NA	Solid	6010B	52435
140-24093-3 DU	SB316	Total/NA	Solid	6010B	52435

Analysis Batch: 53271

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-24093-1	SB311	Sum of Steps 1-7	Solid	6010B SEP	

Metals (Continued)

Analysis Batch: 53271 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-24093-2	SB306	Sum of Steps 1-7	Solid	6010B SEP	
140-24093-3	SB316	Sum of Steps 1-7	Solid	6010B SEP	
140-24093-4	SB313	Sum of Steps 1-7	Solid	6010B SEP	
140-24093-5	SB200	Sum of Steps 1-7	Solid	6010B SEP	
140-24093-6	SB215	Sum of Steps 1-7	Solid	6010B SEP	

General Chemistry

Analysis Batch: 52489

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-24093-1	SB311	Total/NA	Solid	Moisture	
140-24093-2	SB306	Total/NA	Solid	Moisture	
140-24093-3	SB316	Total/NA	Solid	Moisture	
140-24093-4	SB313	Total/NA	Solid	Moisture	
140-24093-5	SB200	Total/NA	Solid	Moisture	
140-24093-6	SB215	Total/NA	Solid	Moisture	

Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: GLP8029 Coffeen, IL

Job ID: 140-24093-1

Client Sample ID: SB311
Date Collected: 08/03/21 13:00
Date Received: 08/05/21 09:15

Lab Sample ID: 140-24093-1
Matrix: Solid

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			53271	08/30/21 13:07	DKW	TAL KNX
	Instrument ID: NOEQUIP									
Total/NA	Analysis	Moisture		1			52489	08/12/21 10:04	BKD	TAL KNX
	Instrument ID: NOEQUIP									

Client Sample ID: SB311
Date Collected: 08/03/21 13:00
Date Received: 08/05/21 09:15

Lab Sample ID: 140-24093-1
Matrix: Solid
Percent Solids: 84.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.0 g	50 mL	52435	08/06/21 08:00	JTB	TAL KNX
Total/NA	Analysis	6010B		1			53170	08/26/21 16:15	KNC	TAL KNX
	Instrument ID: DUO									
Step 1	SEP	Exchangeable			5.00 g	25.00 mL	52456	08/06/21 08:00	JTB	TAL KNX
Step 1	Prep	3010A			5 mL	50 mL	52459	08/09/21 08:00	JTB	TAL KNX
Step 1	Analysis	6010B SEP		4			52929	08/19/21 14:45	KNC	TAL KNX
	Instrument ID: DUO									
Step 2	SEP	Carbonate			5.00 g	25.00 mL	52457	08/06/21 11:00	JTB	TAL KNX
Step 2	Prep	3010A			5 mL	50 mL	52460	08/09/21 08:00	JTB	TAL KNX
Step 2	Analysis	6010B SEP		3			52929	08/19/21 15:48	KNC	TAL KNX
	Instrument ID: DUO									
Step 3	SEP	Non-Crystalline			5 g	25 mL	52463	08/09/21 08:00	JTB	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	52518	08/10/21 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			52929	08/19/21 16:52	KNC	TAL KNX
	Instrument ID: DUO									
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	52520	08/10/21 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	52569	08/11/21 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			52929	08/19/21 17:55	KNC	TAL KNX
	Instrument ID: DUO									
Step 5	SEP	Organic-Bound			5.000 g	75 mL	52572	08/11/21 08:00	KNC	TAL KNX
Step 5	Prep	3010A			5 mL	50 mL	52655	08/13/21 08:00	KNC	TAL KNX
Step 5	Analysis	6010B SEP		5			52929	08/19/21 19:13	KNC	TAL KNX
	Instrument ID: DUO									
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	52656	08/13/21 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		1			52929	08/19/21 20:17	KNC	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	52770	08/17/21 08:10	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			53170	08/26/21 15:26	KNC	TAL KNX
	Instrument ID: DUO									

Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: GLP8029 Coffeen, IL

Job ID: 140-24093-1

Client Sample ID: SB306
Date Collected: 08/03/21 10:00
Date Received: 08/05/21 09:15

Lab Sample ID: 140-24093-2
Matrix: Solid

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			53271	08/30/21 13:07	DKW	TAL KNX
	Instrument ID: NOEQUIP									
Total/NA	Analysis	Moisture		1			52489	08/12/21 10:04	BKD	TAL KNX
	Instrument ID: NOEQUIP									

Client Sample ID: SB306
Date Collected: 08/03/21 10:00
Date Received: 08/05/21 09:15

Lab Sample ID: 140-24093-2
Matrix: Solid
Percent Solids: 86.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.0 g	50 mL	52435	08/06/21 08:00	JTB	TAL KNX
Total/NA	Analysis	6010B		1			53170	08/26/21 16:20	KNC	TAL KNX
	Instrument ID: DUO									
Step 1	SEP	Exchangeable			5.00 g	25.00 mL	52456	08/06/21 08:00	JTB	TAL KNX
Step 1	Prep	3010A			5 mL	50 mL	52459	08/09/21 08:00	JTB	TAL KNX
Step 1	Analysis	6010B SEP		4			52929	08/19/21 14:49	KNC	TAL KNX
	Instrument ID: DUO									
Step 2	SEP	Carbonate			5.00 g	25.00 mL	52457	08/06/21 11:00	JTB	TAL KNX
Step 2	Prep	3010A			5 mL	50 mL	52460	08/09/21 08:00	JTB	TAL KNX
Step 2	Analysis	6010B SEP		3			52929	08/19/21 15:53	KNC	TAL KNX
	Instrument ID: DUO									
Step 3	SEP	Non-Crystalline			5 g	25 mL	52463	08/09/21 08:00	JTB	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	52518	08/10/21 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			52929	08/19/21 16:57	KNC	TAL KNX
	Instrument ID: DUO									
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	52520	08/10/21 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	52569	08/11/21 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			52929	08/19/21 18:00	KNC	TAL KNX
	Instrument ID: DUO									
Step 5	SEP	Organic-Bound			5.000 g	75 mL	52572	08/11/21 08:00	KNC	TAL KNX
Step 5	Prep	3010A			5 mL	50 mL	52655	08/13/21 08:00	KNC	TAL KNX
Step 5	Analysis	6010B SEP		5			52929	08/19/21 19:18	KNC	TAL KNX
	Instrument ID: DUO									
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	52656	08/13/21 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		1			52929	08/19/21 20:22	KNC	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	52770	08/17/21 08:10	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			53170	08/26/21 15:31	KNC	TAL KNX
	Instrument ID: DUO									

Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: GLP8029 Coffeen, IL

Job ID: 140-24093-1

Client Sample ID: SB316
Date Collected: 08/03/21 09:00
Date Received: 08/05/21 09:15

Lab Sample ID: 140-24093-3
Matrix: Solid

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			53271	08/30/21 13:07	DKW	TAL KNX
	Instrument ID: NOEQUIP									
Total/NA	Analysis	Moisture		1			52489	08/12/21 10:04	BKD	TAL KNX
	Instrument ID: NOEQUIP									

Client Sample ID: SB316
Date Collected: 08/03/21 09:00
Date Received: 08/05/21 09:15

Lab Sample ID: 140-24093-3
Matrix: Solid
Percent Solids: 79.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.0 g	50 mL	52435	08/06/21 08:00	JTB	TAL KNX
Total/NA	Analysis	6010B		1			53170	08/26/21 16:26	KNC	TAL KNX
	Instrument ID: DUO									
Step 1	SEP	Exchangeable			5.00 g	25.00 mL	52456	08/06/21 08:00	JTB	TAL KNX
Step 1	Prep	3010A			5 mL	50 mL	52459	08/09/21 08:00	JTB	TAL KNX
Step 1	Analysis	6010B SEP		4			52929	08/19/21 14:54	KNC	TAL KNX
	Instrument ID: DUO									
Step 2	SEP	Carbonate			5.00 g	25.00 mL	52457	08/06/21 11:00	JTB	TAL KNX
Step 2	Prep	3010A			5 mL	50 mL	52460	08/09/21 08:00	JTB	TAL KNX
Step 2	Analysis	6010B SEP		3			52929	08/19/21 15:58	KNC	TAL KNX
	Instrument ID: DUO									
Step 3	SEP	Non-Crystalline			5 g	25 mL	52463	08/09/21 08:00	JTB	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	52518	08/10/21 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			52929	08/19/21 17:02	KNC	TAL KNX
	Instrument ID: DUO									
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	52520	08/10/21 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	52569	08/11/21 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			52929	08/19/21 18:05	KNC	TAL KNX
	Instrument ID: DUO									
Step 5	SEP	Organic-Bound			5.000 g	75 mL	52572	08/11/21 08:00	KNC	TAL KNX
Step 5	Prep	3010A			5 mL	50 mL	52655	08/13/21 08:00	KNC	TAL KNX
Step 5	Analysis	6010B SEP		5			52929	08/19/21 19:23	KNC	TAL KNX
	Instrument ID: DUO									
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	52656	08/13/21 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		1			52929	08/19/21 20:27	KNC	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	52770	08/17/21 08:10	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			53170	08/26/21 15:36	KNC	TAL KNX
	Instrument ID: DUO									

Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: GLP8029 Coffeen, IL

Job ID: 140-24093-1

Client Sample ID: SB313
Date Collected: 08/03/21 08:00
Date Received: 08/05/21 09:15

Lab Sample ID: 140-24093-4
Matrix: Solid

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			53271	08/30/21 13:07	DKW	TAL KNX
	Instrument ID: NOEQUIP									
Total/NA	Analysis	Moisture		1			52489	08/12/21 10:04	BKD	TAL KNX
	Instrument ID: NOEQUIP									

Client Sample ID: SB313
Date Collected: 08/03/21 08:00
Date Received: 08/05/21 09:15

Lab Sample ID: 140-24093-4
Matrix: Solid
Percent Solids: 94.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.0 g	50 mL	52435	08/06/21 08:00	JTB	TAL KNX
Total/NA	Analysis	6010B		1			53170	08/26/21 16:36	KNC	TAL KNX
	Instrument ID: DUO									
Step 1	SEP	Exchangeable			5.00 g	25.00 mL	52456	08/06/21 08:00	JTB	TAL KNX
Step 1	Prep	3010A			5 mL	50 mL	52459	08/09/21 08:00	JTB	TAL KNX
Step 1	Analysis	6010B SEP		4			52929	08/19/21 15:04	KNC	TAL KNX
	Instrument ID: DUO									
Step 2	SEP	Carbonate			5.00 g	25.00 mL	52457	08/06/21 11:00	JTB	TAL KNX
Step 2	Prep	3010A			5 mL	50 mL	52460	08/09/21 08:00	JTB	TAL KNX
Step 2	Analysis	6010B SEP		3			52929	08/19/21 16:08	KNC	TAL KNX
	Instrument ID: DUO									
Step 3	SEP	Non-Crystalline			5 g	25 mL	52463	08/09/21 08:00	JTB	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	52518	08/10/21 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			52929	08/19/21 17:26	KNC	TAL KNX
	Instrument ID: DUO									
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	52520	08/10/21 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	52569	08/11/21 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			52929	08/19/21 18:34	KNC	TAL KNX
	Instrument ID: DUO									
Step 5	SEP	Organic-Bound			5.000 g	75 mL	52572	08/11/21 08:00	KNC	TAL KNX
Step 5	Prep	3010A			5 mL	50 mL	52655	08/13/21 08:00	KNC	TAL KNX
Step 5	Analysis	6010B SEP		5			52929	08/19/21 19:33	KNC	TAL KNX
	Instrument ID: DUO									
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	52656	08/13/21 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		1			52929	08/19/21 20:37	KNC	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	52770	08/17/21 08:10	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			53170	08/26/21 15:45	KNC	TAL KNX
	Instrument ID: DUO									

Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: GLP8029 Coffeen, IL

Job ID: 140-24093-1

Client Sample ID: SB200

Date Collected: 08/04/21 10:00
Date Received: 08/05/21 09:15

Lab Sample ID: 140-24093-5

Matrix: Solid

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			53271	08/30/21 13:07	DKW	TAL KNX
	Instrument ID: NOEQUIP									
Total/NA	Analysis	Moisture		1			52489	08/12/21 10:04	BKD	TAL KNX
	Instrument ID: NOEQUIP									

Client Sample ID: SB200

Date Collected: 08/04/21 10:00
Date Received: 08/05/21 09:15

Lab Sample ID: 140-24093-5

Matrix: Solid
Percent Solids: 85.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.0 g	50 mL	52435	08/06/21 08:00	JTB	TAL KNX
Total/NA	Analysis	6010B		2			53170	08/26/21 17:52	KNC	TAL KNX
	Instrument ID: DUO									
Step 1	SEP	Exchangeable			5.00 g	25.00 mL	52456	08/06/21 08:00	JTB	TAL KNX
Step 1	Prep	3010A			5 mL	50 mL	52459	08/09/21 08:00	JTB	TAL KNX
Step 1	Analysis	6010B SEP		4			52929	08/19/21 15:09	KNC	TAL KNX
	Instrument ID: DUO									
Step 2	SEP	Carbonate			5.00 g	25.00 mL	52457	08/06/21 11:00	JTB	TAL KNX
Step 2	Prep	3010A			5 mL	50 mL	52460	08/09/21 08:00	JTB	TAL KNX
Step 2	Analysis	6010B SEP		3			52929	08/19/21 16:28	KNC	TAL KNX
	Instrument ID: DUO									
Step 3	SEP	Non-Crystalline			5 g	25 mL	52463	08/09/21 08:00	JTB	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	52518	08/10/21 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			52929	08/19/21 17:31	KNC	TAL KNX
	Instrument ID: DUO									
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	52520	08/10/21 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	52569	08/11/21 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			52929	08/19/21 18:39	KNC	TAL KNX
	Instrument ID: DUO									
Step 5	SEP	Organic-Bound			5.000 g	75 mL	52572	08/11/21 08:00	KNC	TAL KNX
Step 5	Prep	3010A			5 mL	50 mL	52655	08/13/21 08:00	KNC	TAL KNX
Step 5	Analysis	6010B SEP		5			52929	08/19/21 19:38	KNC	TAL KNX
	Instrument ID: DUO									
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	52656	08/13/21 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		1			52929	08/19/21 20:57	KNC	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	52770	08/17/21 08:10	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			53170	08/26/21 15:51	KNC	TAL KNX
	Instrument ID: DUO									

Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: GLP8029 Coffeen, IL

Job ID: 140-24093-1

Client Sample ID: SB215

Date Collected: 08/04/21 11:00
Date Received: 08/05/21 09:15

Lab Sample ID: 140-24093-6

Matrix: Solid

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			53271	08/30/21 13:07	DKW	TAL KNX
	Instrument ID: NOEQUIP									
Total/NA	Analysis	Moisture		1			52489	08/12/21 10:04	BKD	TAL KNX
	Instrument ID: NOEQUIP									

Client Sample ID: SB215

Date Collected: 08/04/21 11:00
Date Received: 08/05/21 09:15

Lab Sample ID: 140-24093-6

Matrix: Solid
Percent Solids: 88.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.0 g	50 mL	52435	08/06/21 08:00	JTB	TAL KNX
Total/NA	Analysis	6010B		1			53170	08/26/21 16:47	KNC	TAL KNX
	Instrument ID: DUO									
Step 1	SEP	Exchangeable			5.00 g	25.00 mL	52456	08/06/21 08:00	JTB	TAL KNX
Step 1	Prep	3010A			5 mL	50 mL	52459	08/09/21 08:00	JTB	TAL KNX
Step 1	Analysis	6010B SEP		4			52929	08/19/21 15:28	KNC	TAL KNX
	Instrument ID: DUO									
Step 2	SEP	Carbonate			5.00 g	25.00 mL	52457	08/06/21 11:00	JTB	TAL KNX
Step 2	Prep	3010A			5 mL	50 mL	52460	08/09/21 08:00	JTB	TAL KNX
Step 2	Analysis	6010B SEP		3			52929	08/19/21 16:33	KNC	TAL KNX
	Instrument ID: DUO									
Step 3	SEP	Non-Crystalline			5 g	25 mL	52463	08/09/21 08:00	JTB	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	52518	08/10/21 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			52929	08/19/21 17:36	KNC	TAL KNX
	Instrument ID: DUO									
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	52520	08/10/21 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	52569	08/11/21 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			52929	08/19/21 18:44	KNC	TAL KNX
	Instrument ID: DUO									
Step 5	SEP	Organic-Bound			5.000 g	75 mL	52572	08/11/21 08:00	KNC	TAL KNX
Step 5	Prep	3010A			5 mL	50 mL	52655	08/13/21 08:00	KNC	TAL KNX
Step 5	Analysis	6010B SEP		5			52929	08/19/21 19:58	KNC	TAL KNX
	Instrument ID: DUO									
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	52656	08/13/21 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		1			52929	08/19/21 21:01	KNC	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	52770	08/17/21 08:10	KNC	TAL KNX
Step 7	Analysis	6010B SEP		2			53170	08/26/21 17:33	KNC	TAL KNX
	Instrument ID: DUO									

Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: GLP8029 Coffeen, IL

Job ID: 140-24093-1

Client Sample ID: Method Blank
Date Collected: N/A
Date Received: N/A

Lab Sample ID: MB 140-52435/8-A
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.0 g	50 mL	52435	08/06/21 08:00	JTB	TAL KNX
Total/NA	Analysis	6010B		1			53170	08/26/21 12:46	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Method Blank
Date Collected: N/A
Date Received: N/A

Lab Sample ID: MB 140-52456/8-B ^4
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 1	SEP	Exchangeable			5.00 g	25.00 mL	52456	08/06/21 08:00	JTB	TAL KNX
Step 1	Prep	3010A			5 mL	50 mL	52459	08/09/21 08:00	JTB	TAL KNX
Step 1	Analysis	6010B SEP		4			52929	08/19/21 14:30	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Method Blank
Date Collected: N/A
Date Received: N/A

Lab Sample ID: MB 140-52457/8-B ^3
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 2	SEP	Carbonate			5.00 g	25.00 mL	52457	08/06/21 11:00	JTB	TAL KNX
Step 2	Prep	3010A			5 mL	50 mL	52460	08/09/21 08:00	JTB	TAL KNX
Step 2	Analysis	6010B SEP		3			52929	08/19/21 15:33	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Method Blank
Date Collected: N/A
Date Received: N/A

Lab Sample ID: MB 140-52463/8-B
Matrix: Solid

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	52463	08/09/21 08:00	JTB	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	52518	08/10/21 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			52929	08/19/21 16:38	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Method Blank
Date Collected: N/A
Date Received: N/A

Lab Sample ID: MB 140-52520/8-B
Matrix: Solid

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	52520	08/10/21 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	52569	08/11/21 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			52929	08/19/21 17:41	KNC	TAL KNX
	Instrument ID: DUO									

Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: GLP8029 Coffeen, IL

Job ID: 140-24093-1

Client Sample ID: Method Blank
Lab Sample ID: MB 140-52572/8-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	52572	08/11/21 08:00	KNC	TAL KNX
Step 5	Prep	3010A			5 mL	50 mL	52655	08/13/21 08:00	KNC	TAL KNX
Step 5	Analysis	6010B SEP		5			52929	08/19/21 18:58	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Method Blank
Lab Sample ID: MB 140-52656/8-A

Date Collected: N/A
Matrix: Solid
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	52656	08/13/21 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		1			52929	08/19/21 20:03	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Method Blank
Lab Sample ID: MB 140-52770/8-A

Date Collected: N/A
Matrix: Solid
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 7	Prep	Residual			1.000 g	50 mL	52770	08/17/21 08:10	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			53170	08/26/21 12:31	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 140-52435/9-A

Date Collected: N/A
Matrix: Solid
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.0 g	50 mL	52435	08/06/21 08:00	JTB	TAL KNX
Total/NA	Analysis	6010B		1			53170	08/26/21 12:51	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 140-52456/9-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			5.00 g	25.00 mL	52456	08/06/21 08:00	JTB	TAL KNX
Step 1	Prep	3010A			5 mL	50 mL	52459	08/09/21 08:00	JTB	TAL KNX
Step 1	Analysis	6010B SEP		5			52929	08/19/21 14:35	KNC	TAL KNX
	Instrument ID: DUO									

Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: GLP8029 Coffeen, IL

Job ID: 140-24093-1

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 140-52457/9-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			5.00 g	25.00 mL	52457	08/06/21 11:00	JTB	TAL KNX
Step 2	Prep	3010A			5 mL	50 mL	52460	08/09/21 08:00	JTB	TAL KNX
Step 2	Analysis	6010B SEP		5			52929	08/19/21 15:38	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 140-52463/9-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	52463	08/09/21 08:00	JTB	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	52518	08/10/21 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			52929	08/19/21 16:42	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 140-52520/9-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	52520	08/10/21 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	52569	08/11/21 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			52929	08/19/21 17:46	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 140-52572/9-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	52572	08/11/21 08:00	KNC	TAL KNX
Step 5	Prep	3010A			5 mL	50 mL	52655	08/13/21 08:00	KNC	TAL KNX
Step 5	Analysis	6010B SEP		5			52929	08/19/21 19:03	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 140-52656/9-A
Date Collected: N/A
Matrix: Solid
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	52656	08/13/21 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		1			52929	08/19/21 20:08	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 140-52770/9-A
Date Collected: N/A
Matrix: Solid
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 7	Prep	Residual			1.000 g	50 mL	52770	08/17/21 08:10	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			53170	08/26/21 12:36	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample Dup
Lab Sample ID: LCSD 140-52435/10-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			1.0 g	50 mL	52435	08/06/21 08:00	JTB	TAL KNX
Total/NA	Analysis	6010B		1			53170	08/26/21 12:56	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample Dup
Lab Sample ID: LCSD 140-52456/10-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			5.00 g	25.00 mL	52456	08/06/21 08:00	JTB	TAL KNX
Step 1	Prep	3010A			5 mL	50 mL	52459	08/09/21 08:00	JTB	TAL KNX
Step 1	Analysis	6010B SEP		5			52929	08/19/21 14:40	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample Dup
Lab Sample ID: LCSD 140-52457/10-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			5.00 g	25.00 mL	52457	08/06/21 11:00	JTB	TAL KNX
Step 2	Prep	3010A			5 mL	50 mL	52460	08/09/21 08:00	JTB	TAL KNX
Step 2	Analysis	6010B SEP		5			52929	08/19/21 15:43	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample Dup
Lab Sample ID: LCSD 140-52463/10-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	52463	08/09/21 08:00	JTB	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	52518	08/10/21 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			52929	08/19/21 16:47	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample Dup
Date Collected: N/A
Date Received: N/A

Lab Sample ID: LCSD 140-52520/10-B
Matrix: Solid

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	52520	08/10/21 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	52569	08/11/21 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			52929	08/19/21 17:51	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample Dup
Date Collected: N/A
Date Received: N/A

Lab Sample ID: LCSD 140-52572/10-B ^5
Matrix: Solid

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	52572	08/11/21 08:00	KNC	TAL KNX
Step 5	Prep	3010A			5 mL	50 mL	52655	08/13/21 08:00	KNC	TAL KNX
Step 5	Analysis	6010B SEP		5			52929	08/19/21 19:08	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample Dup
Date Collected: N/A
Date Received: N/A

Lab Sample ID: LCSD 140-52656/10-A
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	52656	08/13/21 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		1			52929	08/19/21 20:13	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample Dup
Date Collected: N/A
Date Received: N/A

Lab Sample ID: LCSD 140-52770/10-A
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 7	Prep	Residual			1.000 g	50 mL	52770	08/17/21 08:10	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			53170	08/26/21 12:41	KNC	TAL KNX
	Instrument ID: DUO									

Client Sample ID: SB316
Date Collected: 08/03/21 09:00
Date Received: 08/05/21 09:15

Lab Sample ID: 140-24093-3 DU
Matrix: Solid
Percent Solids: 79.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.0 g	50 mL	52435	08/06/21 08:00	JTB	TAL KNX
Total/NA	Analysis	6010B		1			53170	08/26/21 16:31	KNC	TAL KNX
	Instrument ID: DUO									
Total/NA	Prep	Total			1.0 g	50 mL	52435	08/06/21 08:00	JTB	TAL KNX
Total/NA	Analysis	6010B		2			53170	08/26/21 17:43	KNC	TAL KNX
	Instrument ID: DUO									

Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: GLP8029 Coffeen, IL

Job ID: 140-24093-1

Client Sample ID: SB316

Date Collected: 08/03/21 09:00
Date Received: 08/05/21 09:15

Lab Sample ID: 140-24093-3 DU

Matrix: Solid
Percent Solids: 79.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 1	SEP	Exchangeable			5.00 g	25.00 mL	52456	08/06/21 08:00	JTB	TAL KNX
Step 1	Prep	3010A			5 mL	50 mL	52459	08/09/21 08:00	JTB	TAL KNX
Step 1	Analysis	6010B SEP		4			52929	08/19/21 14:59	KNC	TAL KNX
	Instrument ID: DUO									
Step 2	SEP	Carbonate			5.00 g	25.00 mL	52457	08/06/21 11:00	JTB	TAL KNX
Step 2	Prep	3010A			5 mL	50 mL	52460	08/09/21 08:00	JTB	TAL KNX
Step 2	Analysis	6010B SEP		3			52929	08/19/21 16:03	KNC	TAL KNX
	Instrument ID: DUO									
Step 3	SEP	Non-Crystalline			5 g	25 mL	52463	08/09/21 08:00	JTB	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	52518	08/10/21 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			52929	08/19/21 17:07	KNC	TAL KNX
	Instrument ID: DUO									
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	52520	08/10/21 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	52569	08/11/21 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			52929	08/19/21 18:29	KNC	TAL KNX
	Instrument ID: DUO									
Step 5	SEP	Organic-Bound			5.000 g	75 mL	52572	08/11/21 08:00	KNC	TAL KNX
Step 5	Prep	3010A			5 mL	50 mL	52655	08/13/21 08:00	KNC	TAL KNX
Step 5	Analysis	6010B SEP		5			52929	08/19/21 19:28	KNC	TAL KNX
	Instrument ID: DUO									
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	52656	08/13/21 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		1			52929	08/19/21 20:32	KNC	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	52770	08/17/21 08:10	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			53170	08/26/21 15:41	KNC	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	52770	08/17/21 08:10	KNC	TAL KNX
Step 7	Analysis	6010B SEP		2			53170	08/26/21 17:23	KNC	TAL KNX
	Instrument ID: DUO									

Laboratory References:

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

Accreditation/Certification Summary

Client: Geosyntec Consultants, Inc.
Job ID: 140-24093-1
Project/Site: GLP8029 Coffeen, IL

Laboratory: Eurofins TestAmerica, 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	02-13-22
ANAB	Dept. of Energy	L2311.01	02-13-22
ANAB	ISO/IEC 17025	L2311	02-13-22
Arkansas DEQ	State	88-0688	06-17-22
California	State	2423	06-30-22
Colorado	State	TN00009	02-28-22
Connecticut	State	PH-0223	09-30-21
Florida	NELAP	E87177	06-30-22
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	06-30-22
Louisiana (DW)	State	LA019	12-31-21
Maryland	State	277	03-31-22
Michigan	State	9933	12-11-22
Nevada	State	TN00009	07-31-22
New Hampshire	NELAP	299919	01-17-22
New Jersey	NELAP	TN001	06-30-22
New York	NELAP	10781	03-31-22
North Carolina (DW)	State	21705	07-31-22
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	01-01-22
Pennsylvania	NELAP	68-00576	12-31-21
Tennessee	State	02014	12-11-22
Texas	NELAP	T104704380-18-12	08-31-21
US Fish & Wildlife	US Federal Programs	058448	07-31-22
USDA	US Federal Programs	P330-19-00236	08-20-22
Utah	NELAP	TN00009	07-31-21 *
Virginia	NELAP	460176	09-14-21
Washington	State	C593	01-19-22
West Virginia (DW)	State	9955C	01-02-22
West Virginia DEP	State	345	04-30-22
Wisconsin	State	998044300	08-31-22

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Geosyntec Consultants, Inc.
Project/Site: GLP8029 Coffeen, IL

Job ID: 140-24093-1

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

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

TAL-KNOX = TestAmerica Laboratories, Knoxville, Facility Standard Operating Procedure.

Laboratory References:

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

Eurofins TestAmerica, Chicago
2417 Bond Street
University Park, IL 60484
Phone: 708-534-5200 Fax: 708-534-5211

Knoxville

Chain of Custody Record

eurofins | Environment Testing America

Client Information	Sampler: A Tyge	Lab PM: Kintz, Robin M	Carrier Tracking No(s):	COC No: 500-93566-41606.2
Client Contact: Brian Ares	Phone:	E-Mail: Robin.Kintz@Eurofinset.com	State of Origin: IL	Page: Page 2 of 3
Company: Geosyntec Consultants, Inc.	PWSID:			Job #:
Address: 2100 Commonwealth Blvd. Suite 100	Due Date Requested:			
City: Ann Arbor	TAT Requested (days):			
State, Zip: MI, 48105	Compliance Project: Δ Yes Δ No			
Phone: 734-794-1548(Tel)	PO #: Purchase Order not required			
Email: bares@geosyntec.com	WO #:			
Project Name: GLP8029 Coffeen, IL	Project #: 50019213			
Site:	SSOW#:			

Analysis Requested

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9056A - Chloride, Sulfate	6010B - Metals (ICP) - 9 elements	6010B - Dissolved Metals (ICP) - 9 elements	4500_P_E - Phosphorus as PO4	SM4500_S2_E - Sulfide	9060A_Diss - Organic Carbon, Dissolved (DOC)	2320B, 2540C, 3500_F+2_B_Calc; 3500_F+3_B_Calc	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	D	D	S	CB	S	N		
SB311	8/13/21	1300	C	S									1		
SB306	8/13/21	1000	C	S									1		
SB316	8/13/21	0900	C	S									1		
SB313	8/13/21	0800	C	S									1		
SB200	8/14/21	1000	C	S									1		
SB215	8/14/21	1100	C	S									1		
CUSTODY SEALS INTACT															
RECEIVED AT LT 3.7/CT 3.8°C															
DKD 8-5-21															
COOLER FED X # 2822 1510 5400 PO															

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

140-24093 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		8/14/21 530			8-5-21 09:15	ETA KNX
2	Relinquished by:	Date/Time: 8-5-21 11:30	Company ETA KNX	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

Ver: 06/08/2021

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

Log In Number:

Review Items	Yes	No	NA	If No, what was the problem?	Comments/Actions Taken
1. Are the shipping containers intact?	/		/	☐ **Containers, Broken**	
2. Were ambient air containers received intact?			/	☐ Checked in lab	
3. The coolers/containers custody seal if present, is it intact?	/			☐ Yes ☐ NA	
4. Is the cooler temperature within limits? (> freezing temp. of water to 6 °C, VOST: 10°C) Thermometer ID : 5471 Correction factor: +0.1°C	/			☐ **Cooler Out of Temp, Client Contacted, Proceed/Cancel** ☐ **Cooler Out of Temp, Same Day Receipt**	
5. Were all of the sample containers received intact?	/			☐ **Containers, Broken**	
6. Were samples received in appropriate containers?	/			☐ **Containers, Improper; Client Contacted; Proceed/Cancel**	
7. Do sample container labels match COC? (IDs, Dates, Times)	/			☐ **COC & Samples Do Not Match** ☐ **COC Incorrect/Incomplete** ☐ **COC Not Received**	
8. Were all of the samples listed on the COC received?	/			☐ **Sample Received, Not on COC** ☐ **Sample on COC, Not Received**	
9. Is the date/time of sample collection noted?	/			☐ **COC; No Date/Time; Client Contacted**	
10. Was the sampler identified on the COC?	/			☐ **Sampler Not Listed on COC**	
11. Is the client and project name/# identified?	/			☐ **COC Incorrect/Incomplete**	
12. Are tests/parameters listed for each sample?	/			☐ **COC No tests on COC**	
13. Is the matrix of the samples noted?	/			☐ **COC Incorrect/Incomplete**	
14. Was COC relinquished? (Signed/Dated/Timed)	/			☐ **COC Incorrect/Incomplete**	
15. Were samples received within holding time?	/			☐ **Holding Time - Receipt**	
16. Were samples received with correct chemical preservative (excluding Encore)?			/	☐ **pH Adjusted, pH Included (See box 16A)** ☐ **Incorrect Preservative**	
17. Were VOA samples received without headspace?			/	☐ **Headspace (VOA only)**	
18. Did you check for residual chlorine, if necessary? (e.g. 1613B, 1668) Chlorine test strip lot number:			/	☐ **Residual Chlorine**	
19. For 1613B water samples is pH<9?			/	☐ If no, notify lab to adjust	
20. For rad samples was sample activity info. Provided?			/	☐ Project missing info	

Labeling Verified by: **Date:**

pH test strip lot number:

Box 16A: pH Preservation	Box 18A: Residual Chlorine
Preservative:	
Lot Number:	
Exp Date:	
Analyst:	
Date:	
Time:	

Project #: _____ PM Instructions: _____

Sample Receiving Associate: _____ Date: 8-31-21

QA026R32.doc, 062719

ATTACHMENT 10
Speciation Data

BROOKS APPLIED LABS
13751 Lake City Way NE, Ste 108, Seattle, WA 98125 • USA • T:206-632-6206 • info@brooksapplied.com

April 19, 2024

Geosyntec Consultants, Inc.
ATTN: Allison Kreinberg
1 McBride and Son Center Drive, Suite 202
Chesterfield, MO 63005
akreinberg@geosyntec.com

RE: Project GST-CB2401

Dear Allison Kreinberg,

On March 28, 2024, Brooks Applied Labs (BAL) received one (1) groundwater sample. The sample was logged-in for the analyses of arsenic speciation (As(III), As(V), MMAs, DMAs, and the sum of unknown As species) according to the chain-of-custody form. All samples were received and stored according to BAL SOPs and EPA methodology.

Samples were field filtered.

Arsenic Speciation Quantitation by IC-ICP-CRC-MS
Arsenic speciation was performed by ion chromatography inductively coupled plasma collision reaction cell mass spectrometry (IC-ICP-CRC-MS). Arsenic species are first chromatographically separated on an ion exchange column and then quantified using inductively coupled plasma collision reaction cell mass spectrometry (ICP-CRC-MS). For more information on this determinative technique, please visit the Interference Reduction Technology section on our website.

In instances where the native sample result and/or the associated duplicate (DUP) result were below the MDL the RPD was not calculated (**N/C**).

The results were not method blank corrected, as described in the calculations section of the relevant BAL SOP(s), and were evaluated using reporting limits adjusted to account for sample aliquot size. Please refer to the *Sample Results* page for sample-specific MDLs, MRLs, and other details.

All data was reported without further qualification and all other associated quality control sample results met the acceptance criteria.

BAL verifies that the reported results of all analyses for which the laboratory is accredited meet the requirements of the accrediting body, unless otherwise noted in the report narrative. For more information regarding accreditations please see the *Report Information* and *Batch Summary* pages. This report must be used in its entirety for interpretation of results.

Please feel free to contact us if you have any questions regarding this report.

Sincerely,

Amy Goodall
Project Manager
Brooks Applied Labs
amy@brooksapplied.com

Report Information

General Disclaimers

Test results are based solely upon the sample submitted to Brooks Applied Labs in the condition it was received . This report shall not be reproduced or copied, except in full, without written approval of the laboratory. Brooks Applied Labs is not responsible for the consequences arising from the use of a partial report.

Laboratory Accreditation

BAL maintains accreditation with various state and national agencies for select test methods. For a current list of BAL accreditations, please visit our website at <http://www.brooksapplied.com/resources/certificates-permits/>. The reported analyte/matrix/method combination shall be considered outside BAL's scopes of accreditation unless otherwise identified as ISO, TNI, or ISO,TNI in the tables. It is the responsibility of the client to verify whether a specific accreditation is required for the intended data use.

ISO: ISO/IEC 17025:2017 accredited test method. Issued by ANSI National Accreditation Board (ANAB), #ADE-1447.02

TNI: NELAP accredited test method. Issued by the State of Florida Department of Health, #E87982.

ISO,TNI: Test method is accredited under both the ISO/IEC 17025:2017 and NELAP accreditations referenced above.

Field Quality Control Samples

Please be notified that certain EPA methods require the collection of field quality control samples of an appropriate type and frequency; failure to do so is considered a deviation from some methods and for compliance purposes should only be done with the approval of regulatory authorities. Please see the specific EPA methods for details regarding required field quality control samples.

Common Abbreviations

AR	as received	**MS**	matrix spike
BAL	Brooks Applied Labs	**MSD**	matrix spike duplicate
BLK	method blank	**ND**	non-detect
BS	blank spike	**NR**	non-reportable
CAL	calibration standard	**N/C**	not calculated
CCB	continuing calibration blank	**PS**	post preparation spike
CCV	continuing calibration verification	**REC**	percent recovery
COC	chain of custody record	**RPD**	relative percent difference
D	dissolved fraction	**SCV**	secondary calibration verification
DUP	duplicate	**SOP**	standard operating procedure
IBL	instrument blank	**SRM**	reference material
ICV	initial calibration verification	**T**	total fraction
MDL	method detection limit	**TR**	total recoverable fraction
MRL	method reporting limit		

Definition of Data Qualifiers

E	An estimated value due to the presence of interferences. A full explanation is presented in the narrative.
H	Holding time and/or preservation requirements not met. Please see narrative for explanation.
J	Detected by the instrument, the result is > the MDL but ≤ the MRL. Result is reported and considered an estimate.
J-1	Estimated value. A full explanation is presented in the narrative.
M	Duplicate precision (RPD) was not within acceptance criteria. Please see narrative for explanation.
N	Spike recovery was not within acceptance criteria. Please see narrative for explanation.
R	Rejected, unusable value. A full explanation is presented in the narrative.
U	Result is ≤ the MDL or client requested reporting limit (CRRL). Result reported as the MDL or CRRL.
X	Result is not BLK-corrected and is within 10x the absolute value of the highest detectable BLK in the batch. Result is estimated.
Z	Holding time and/or preservation requirements not established for this method; however, BAL recommendations for holding time were not followed. Please see narrative for explanation.

13751 Lake City Way NE, Suite 108, Seattle, WA 98125 · P(206) 632-6206 · F(206) 632-6017 · info@brooksapplied.com · www.brooksapplied.com

Sample Information

Sample	Lab ID	Report Matrix	Type	Sampled	Received
G206D-20240326	2403414-01	GW	Sample	03/26/2024	03/28/2024

Batch Summary

Analyte	Lab Matrix	Method	Accred.	Prepared	Analyzed	Batch	Sequence
As(III)	Water	SOP BAL-4100	ISO,TNI	04/09/24	04/11/24	B240777	S240325
As(V)	Water	SOP BAL-4100	ISO,TNI	04/09/24	04/11/24	B240777	S240325
DMAs	Water	SOP BAL-4100	ISO	04/09/24	04/11/24	B240777	S240325
MMAs	Water	SOP BAL-4100	ISO	04/09/24	04/11/24	B240777	S240325
Unk As Sp	Water	SOP BAL-4100		04/09/24	04/11/24	B240777	S240325

Sample Results

Sample	Analyte	Report Matrix	Basis	Result	Qualifier	MDL	MRL	Unit	Batch	Sequence
G206D-20240326										
2403414-01	As(III)	GW	D	8.16		0.040	0.210	µg/L	B240777	S240325
2403414-01	As(V)	GW	D	0.905		0.100	0.210	µg/L	B240777	S240325
2403414-01	DMAs	GW	D	≤ 0.050	U	0.050	0.210	µg/L	B240777	S240325
2403414-01	MMAs	GW	D	≤ 0.040	U	0.040	0.210	µg/L	B240777	S240325
2403414-01	Unk As Sp	GW	D	1.05		0.050	0.210	µg/L	B240777	S240325

13751 Lake City Way NE, Suite 108, Seattle, WA 98125 · P(206) 632-6206 · F(206) 632-6017 · info@brooksapplied.com · www.brooksapplied.com

Accuracy & Precision Summary

Batch: B240777
Lab Matrix: Water
Method: SOP BAL-4100

Sample	Analyte	Native	Spike	Result	Units	REC & Limits	RPD & Limits
B240777-BS1	**Blank Spike, (2331029)**						
	As(III)		5.000	4.793	µg/L	96% 75-125	
	As(V)		5.000	4.408	µg/L	88% 75-125	
B240777-BS2	**Blank Spike, (2306015)**						
	DMAs		5.000	5.070	µg/L	101% 75-125	
	MMAs		4.400	4.281	µg/L	97% 75-125	
B240777-DUP1	**Duplicate, (2404079-06)**						
	As(III)	0.602		0.639	µg/L		6% 25
	As(V)	29.53		30.04	µg/L		2% 25
	DMAs	ND		ND	µg/L		N/C 25
	MMAs	ND		ND	µg/L		N/C 25
	Unk As Sp	0.267		0.296	µg/L		10% 25
B240777-MS1	**Matrix Spike, (2404079-06)**						
	As(III)	0.602	52.25	50.66	µg/L	96% 75-125	
	As(V)	29.53	48.55	76.35	µg/L	96% 75-125	
	DMAs	ND	55.55	52.92	µg/L	95% 75-125	
	MMAs	ND	50.00	47.97	µg/L	96% 75-125	
B240777-MSD1	**Matrix Spike Duplicate, (2404079-06)**						
	As(III)	0.602	52.25	52.49	µg/L	99% 75-125	4% 25
	As(V)	29.53	48.55	75.54	µg/L	95% 75-125	1% 25
	DMAs	ND	55.55	53.33	µg/L	96% 75-125	0.8% 25
	MMAs	ND	50.00	49.24	µg/L	98% 75-125	3% 25

13751 Lake City Way NE, Suite 108, Seattle, WA 98125 · P(206) 632-6206 · F(206) 632-6017 · info@brooksapplied.com · www.brooksapplied.com

Method Blanks & Reporting Limits

Batch: B240777
Matrix: Water
Method: SOP BAL-4100
Analyte: As(III)

Sample	Result	Units
B240777-BLK1	0.00	µg/L
B240777-BLK2	0.00	µg/L
B240777-BLK3	0.00	µg/L
B240777-BLK4	0.00	µg/L

Average: 0.000
Limit: 0.021
MDL: 0.004
MRL: 0.021

Analyte: As(V)

Sample	Result	Units
B240777-BLK1	0.002	µg/L
B240777-BLK2	0.001	µg/L
B240777-BLK3	0.0009	µg/L
B240777-BLK4	0.003	µg/L

Average: 0.002
Limit: 0.021
MDL: 0.010
MRL: 0.021

Analyte: DMAs

Sample	Result	Units
B240777-BLK1	0.00	µg/L
B240777-BLK2	0.00	µg/L
B240777-BLK3	0.00	µg/L
B240777-BLK4	0.00	µg/L

Average: 0.000
Limit: 0.021
MDL: 0.005
MRL: 0.021

13751 Lake City Way NE, Suite 108, Seattle, WA 98125 · P(206) 632-6206 · F(206) 632-6017 · info@brooksapplied.com · www.brooksapplied.com

Method Blanks & Reporting Limits

Analyte: MMAs

Sample	Result	Units
B240777-BLK1	0.00	µg/L
B240777-BLK2	0.00	µg/L
B240777-BLK3	0.00	µg/L
B240777-BLK4	0.00	µg/L

Average: 0.000
Limit: 0.021

MDL: 0.004
MRL: 0.021

Analyte: Unk As Sp

Sample	Result	Units
B240777-BLK1	0.00	µg/L
B240777-BLK2	0.00	µg/L
B240777-BLK3	0.00	µg/L
B240777-BLK4	0.00	µg/L

Average: 0.000
Limit: 0.021

MDL: 0.005
MRL: 0.021

13751 Lake City Way NE, Suite 108, Seattle, WA 98125 · P(206) 632-6206 · F(206) 632-6017 · info@brooksapplied.com · www.brooksapplied.com

Sample Containers

Lab ID: 2403414-01
Sample: G206D-20240326
Report Matrix: GW
Sample Type: Sample
Collected: 03/26/2024
Received: 03/28/2024

Des	Container	Size	Lot	Preservation	P-Lot	pH	Ship. Cont.
A	Vacutainer	10 mL	23-0112	EDTA (in vial)	N/A	N/A	Cooler - 2403414
B	XTRA_VOL	10 mL	23-0112	EDTA (in vial)	N/A	N/A	Cooler - 2403414

Shipping Containers

Cooler - 2403414

Received: March 28, 2024 9:50
Tracking No: 2727 0567 6533 via FedEx
Coolant Type: Ice
Temperature: 5.2 °C

Description: Cooler
Damaged in transit? No
Returned to client? No
Comments: R-IR-5

Custody seals present? Yes
Custody seals intact? Yes
COC present? Yes

13751 Lake City Way NE, Suite 108, Seattle, WA 98125 · P(206) 632-6206 · F(206) 632-6017 · info@brooksapplied.com · www.brooksapplied.com

Chain-of-Custody Form

BROOKS APPLIED LABS

Ship samples to:
13751 Lake City Way NE, Suite 108
Seattle, WA 98125

For BAL use only — BAL Report 2403414
Received by: EC Date: 03/28/24
Work Order ID: Time: 0950
Project ID:

Client: Geosyntec PO Number: GP8078 Mailing Address: L McBride and Sam Center Dr Ste 200 Chesterfield, MO 63005
Contact: Allison Kreinberg Phone: 636-812-0810
Client Project ID: GST-CB2401 Email: AKreinberg@geosyntec.com Email Receipt Confirmation? (Yes/No)
Samples Collected By: Amanda Schaeffer BAL PM: Amy Goodall

Requested TAT (business days)
- [x] 20 (standard)
- [ ] 15*
- [x] 10*
- [ ] 5*
- [ ] Other ____

*Surcharges may apply to expedited TATs

	Sample ID	Collection: Date	Collection: Time	Client Sample Info: Matrix Type	Client Sample Info: Number of Containers	Client Sample Info: Field Filtered? (Yes/No)	Client Sample Info: Preservation Type HCl /HNO_3/Other	BAL Analyses Required: Total Hg, EPA 1631	Methyl Hg, EPA 1630	ICP-MS Metals (specify)	As Species (specify) InOrg, III, V, MMA, DMA	Se Species (specify) Se(IV), Se(VI), SeCN, Uknown	Filtration	Other (specify)	Other (specify)	Comments: Specify Here
1	G206D-20240326	3/27/24	1105	GW	2	Y	EDTA				X					
2																
3																
4																
5																
6																
7																
8																
9																
10																
	Trip Blank															

Relinquished By:	Date: 3/27/24	Time: 1600	Relinquished By:	Date:	Time:
Received By:	Date:	Time:	Total Number of Packages:		

Page____of____ List Hazardous Contaminants: ____

samples@brooksapplied.com | brooksapplied.com